

LIFE

CYCLE

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MANAGEMENT

Good Practice Guide
GPG-FM-002

CRITICAL DECISION CRITERIA

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1. INTRODUCTION

This Guide provides criteria and guidelines to promote effective, comprehensive, and consistent Department of Energy (DOE)-wide preparation of requests for critical decisions. Critical decisions are formal determinations made at specific points in a project, which should be made before a project proceeds. The four Critical Decisions are Approval of Mission Need, Approval of Baseline, Approval to Start Build / Remedial Action and Completion/Start of Operations. The criteria and guidelines in this Guide will help ensure that relevant issues or factors have been thoroughly evaluated and documented so that the decision maker is prepared to make a well-reasoned determination. (See *Project Management Overview*, GPG-FM-001).

These criteria should be used for all projects, adopting a graded approach, and should consider project-specific factors such as project cost, complexity, uncertainty, and risk factors. Environment, safety, and health (ES&H) requirements are not graded and should be addressed for each critical decision.

This Guide is divided into separate sections for each critical decision. Within each section, criteria are shown in italics. The criteria are followed by actions that may be taken to ensure the criteria are fulfilled. In some cases, background information is also provided to help the reader better understand the criteria and the processes/procedures for meeting the criteria. Although a project will generally progress through all phases, this guidance may be used at any point during a project to identify areas for potential consideration. Note that certain functions carry over from one critical decision to the next. Such functions are numbered the same way in each section. For example, criteria for financial management are always the second subsection and would therefore be numbered 2.1.2, 2.2.2, 2.3.2, etc.

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2. PRINCIPLES AND PROCESSES

2.1 Graded Approach

The information in this Guide covers all the criteria that might be appropriate to a very large project. The criteria are not project-specific in that they can be used on construction, environmental restoration, or other types of projects.

Not all criteria will apply to each project. Ideally, however, all criteria listed should be considered (at the relevant organizational level) to ensure that relevant factors are not missed. A graded approach should be used so that the rigor with which the criteria are applied is appropriate, as a minimum, to the cost, complexity, and risk of the project. Criteria not appropriate to a particular project need not be addressed, but, to be complete, project documentation should note that the criteria were considered and found not to apply.

The criteria applicable to each critical decision point are described in the following sections. However, for a specific project, a mix of criteria that differs from the norm, which may include areas not usually covered at a decision point, is to be expected.

Table 1 lists all critical decision criteria, denoting where they generally apply within the life of a project.

2.2 Critical Decision - One (CD-1): Approval of Mission Need

2.2.1 Mission/Goal/Program Criteria

DOE Strategic Plan. *Project proposal demonstrates that the project supports execution of, and project need relates to, DOE Strategic Plan goals and objectives.*

- Develop clearly stated goals for the proposed project to support the goals and concepts of the DOE Strategic Plan.
- Demonstrate how the success of the project will advance the Strategic Plan.
- If the project objectives are required by Congress or other authorities, demonstrate how the project will meet the requirements.

Program Strategic Plan. *Project proposal has been integrated with, and supports execution of, the goals and objectives established in the Program Strategic Plan.*

- In the project proposal, demonstrate that the project is an integral part of the Program Office's Strategic Plan and that project success will result in meeting the Plan's goals.

Involvement of Related Agencies. *Participation of related agencies with overlapping requirements has been evaluated. Agreements with State and regulatory agencies have been planned in conjunction with the critical decision-making process.*

- Identify organizations or authorities outside the project's direct management control whose cooperation or collaboration is required and evaluate their potential impact on the project.

Site Location. *For new facility projects, the siting evaluation factors and site selection criteria have been established.*

- Early identification of the site is a prerequisite for determining many other project-critical decisions. Therefore, include site studies or indicate why they have not been included.
- For programs/projects to construct new facilities, identify alternatives to the proposed site and state the criteria for making the selection.
- Where alternative sites are being considered, clearly show within the proposal the decision criteria and the methodology for making the siting decision.

2.2.2 Financial Management Criteria

Funding Profile. *Preliminary funding profile has been developed, and proposed budget is consistent with Chief Financial Officer (CFO) budget guidance.*

- Estimate total funding required for project to allow review of a mortgage analysis.
- Ensure documentation exists to demonstrate that the project has been reviewed and the budget for the conceptual phase has been agreed to.

Mortgage. *The impact of the funding profile has been analyzed and the life cycle cost (LCC) estimate for DOE resources has been completed.*

- Provide information to demonstrate that funding is consistent with the LCC estimate.

Priority. *Project funding priority within the multi-year program budget has been determined and the priority, consistent with all DOE programs, has been established.*

- Address the potential for reduction in funding levels.
- Estimate the priority of this project in relation to all projects in this and other programs.

Alternative Funding Analysis. *Alternative funding sources, such as other agencies, governments, and organizations, have been sought and the impact on the project analyzed.*

- Analyze the impact of alternative funding profiles or levels (both higher and lower than planned) as specified by the cognizant Operations Office.
- Define actions (both actual and planned) to identify ways to obtain outside funding for the project.
- Describe how changes in outside funding and any possible dependency on outside funding may affect the availability of DOE funds.

2.2.3 Baseline: Work Scope (Technical) Criteria

Systems Engineering. *Systems engineering has been initiated, alternatives identified, tradeoff studies begun, and preliminary functional and operational requirements defined and documented.*

- Determine operational requirements from the mission need.
- Define preliminary functional requirements to meet the operational requirements and draft the functional flow diagram.
- From the flow diagram, identify preliminary technical requirements and initiate tradeoff analysis among possible technical solutions.
- Use results from the tradeoff analysis as the basis for a configuration baseline and the conceptual design criteria. (See *Project Execution and Engineering Management Planning*, GPG-FM-010.)

2.2.4 Baseline: Cost Criteria

Total Estimated Cost (TEC). *A preliminary TEC has been developed that includes specific estimated costs for the conceptual phase.*

- Use the systems engineering, evaluations, and assessments conducted during the pre-conceptual activities as the basis for the preliminary TEC. A reasonably accurate estimate should be available to start the conceptual design phase.

Total Project Cost (TPC). *A preliminary estimate of TPC has been developed.*

At CD-1, a rough idea of the TPC is needed. By evaluating cost, priority, urgency, and other factors, the decision maker can determine the affordability of the project.

- Use information from the preliminary systems engineering as a basis for TPC, including costs of research and development (R&D) and other high-risk factors. A reasonably accurate estimate should be available for the conceptual design activities.
- Develop the preliminary TEC and estimates for associated R&D and other project costs.
- Consider available cost information and employ appropriate types of cost estimates.
- Identify costs involving other agencies separately.

Life Cycle Cost (LCC). *Preliminary LCC estimate has been developed, including a rough estimate of operating costs.*

- Develop the preliminary LCC estimate, including the rough estimate of operating costs, using data available from the preconceptual activities.
- Include cost/benefit considerations and appropriate types of cost estimates in the LCC methodology.

2.2.5 Baseline: Schedule Criteria

Milestone. *A preliminary milestone schedule has been developed and denotes the desired start and end dates.*

- Prepare an initial master schedule that shows a completion date for the proposed activity and the dates for major critical items such as completion of conceptual and/or detailed design, completion of R&D, initiation of long lead procurements, etc., to meet the project need date.
- Present sufficient detail in the preliminary milestone schedule to determine when funding will be required, by fiscal year, to meet the master schedule.

2.2.6 Environment, Safety, and Health Criteria

ES&H Program Plan. *ES&H requirements have been identified. Activities and functions include, but are not limited to, environmental protection, occupational safety, fire protection, industrial hygiene, health physics, occupational medicine, process and facility safety, nuclear safety, emergency preparedness, quality assurance (QA), and radioactive and hazardous waste management.*

At CD-1, identification, characterization, and evaluation of ES&H requirements and considerations form the foundation for the development, planning, and implementation of ES&H preparation criteria; therefore, it is critical that the following issues be thoroughly addressed.

- Identification of the regulatory mandates that are driving a project.
- Analysis of regulatory requests and directives to determine whether they are "wishes," interpretations, or requirements stipulated in regulations.
- Identification of ES&H requirements associated with each stage of the project (e.g., worker safety during execution and operation and permitting and licensing requirements).
- Preliminary estimation of the costs and schedules associated with meeting the requirements identified.
- Characterization of anticipated ES&H benefits (e.g., reduction of waste volumes or removal of contamination) and impacts (e.g., increased risks of worker and public exposure during execution and operation).
- Evaluation of a project's ability to manage DOE ES&H risks and address stakeholder issues.

- Evaluation of options to control risks and mitigate impacts.
- Analysis of options to address ES&H issues, maximize benefits, and minimize or eliminate impacts.
- Development of preliminary plans for implementing ES&H Orders.

National Environmental Policy Act (NEPA) Activities. *NEPA activities, including NEPA strategy and requirements, have been initiated.*

NEPA requires all Federal agencies to identify and evaluate the impacts of major projects on human health and welfare, the biosphere, and the environment.

- Prepare the Action Description Memorandum and Environmental Impact Statement Implementation Plan, which should address the following.
 - Impacts associated with a project.
 - Strategies to mitigate the impacts.
 - NEPA milestones.
 - Efforts to coordinate NEPA activities with states that host DOE facilities.

At CD-1, the focus is on major NEPA issues. For example, a major impact could be public health concerns associated with one location for a project versus another location.

Waste Minimization/Pollution Prevention. *A preliminary estimate has been made of the waste stream contents and pollutants. Waste minimization and pollution prevention strategies have been included in the conceptual design criteria.*

The definition of waste minimization/pollution prevention opportunities and the development of strategies and mechanisms to realize these opportunities are critical because they can be incorporated most easily at the conceptual design stage.

- Integrate waste quantity and quality information developed for the waste management criterion with initial design and project planning efforts.

Waste Management. *A plan to manage all wastes has been initiated.*

Develop a preliminary estimate of waste type and quantity and incorporate it into the ES&H issues evaluation. The following activities may be included in the evaluation.

- Prepare waste type and quantity estimates for the execution, completion, operation, and closeout phases of a project.
- Prepare cost estimates for waste transport, treatment, and/or disposal.
- Develop estimates characterizing the waste generation impacts of options to fulfill a project's needs.
- Characterize environmental and regulatory issues (e.g., a Resource Conservation and Recovery Act permit modification may be required or avoided) associated with the anticipated waste types and quantities in each project stage, for each project option.
- Prepare preliminary plans to manage and reduce the types and quantities of waste generated.

2.2.7 Project Risk Criteria

Risk Assessment. *Potential risk factors have been identified and overall impact on the project estimated. Risk factors include any needed R&D and ES&H risks. A preliminary estimate of the impact of risks on the cost, schedule, and functional requirements has been developed. (See Risk Analysis and Management, GPG-FM-007.)*

Project Benefits. *A preliminary estimate of the economic, social, and other benefits of the project has been developed.*

This CD-1 criterion is intended to initiate the process of benefit identification and quantification. The initial environmental goal of the project may be identified either by statute, legal agreement, or environmental requirements.

- As part of the initial planning for the project, enumerate any economic, social, or other benefits for further examination and planning.
- Identify stakeholder groups, which may also reveal benefits of the project as their needs become known. Quantification of benefits, where possible, assists project personnel in validating the project.

Project Vulnerability. *A preliminary evaluation of the project vulnerabilities to stakeholder and Congressional concerns has been developed.*

- Identify potential opposition groups and their concerns.
- Identify Congressional concerns.
- Suggest possible mitigating actions.

It is important, at the CD-1 level, to understand potential opposition in order to plan activities that may mitigate or eliminate opposition to the project. Project approval may depend on a clear definition of its vulnerabilities.

2.2.8 Acquisition Strategy Criteria

Diversity. *Opportunities for disadvantaged businesses to participate have been identified for the project design activities and goals established consistent with site-wide goals.*

- Identify opportunities for diversity in contracting participants.
- Contact the Small Disadvantaged Business Office for potential contractors.
- Identify and consider contractors used in previous programs.

Partnering. *The potential non-Federal Government organizations that may participate in the project have been identified.*

- Identify and assess the potential of non-Federal Government organizations that might participate in the project as partners by cost sharing, privatization, or other methods.

Cost Sharing. *Possible sources for cost sharing have been identified.*

Contracting Methods. *Acquisition plans for obtaining work scope participants have been developed and presented as part of the acquisition strategy.*

- Develop evaluation criteria for selection of the design agency.
- Address diversity goals, avoidance of consolidated work statements, well-defined project specific statements of work, gold plating, and overly restrictive specifications.

2.2.9 Project Management Criteria

Organizational Planning. *Organizational elements have been established to conduct conceptual activities, including, but not limited to, identification of a project manager.*

- Identify the program manager, project manager, and project team during the pre-conceptual activities.
- Identify the individual who will lead the conceptual design activities.

2.2.10 Stakeholder Criteria

Stakeholders. *Stakeholders have been identified and their relationship to the project evaluated.*

- At CD-1, identify the proposed project's impact on stakeholder interests and potential stakeholder groups within the community.

Early identification of stakeholders is needed to fully develop stakeholder participation plans. Stakeholders are any affected or interested party with links to project activities. Specific parties that may be of interest include Federal and State regulators, local governments, DOE employees and contractors, and Indian Nations. Other special interest groups can be identified through the project's analysis of technical and other issues.

Public Participation. *The initial Public Participation Plan has been completed.*

There are two types of Public Participation Plans: the site integrated plan and project-specific plan. The site integrated plan covers all project activities at a site. Small and/or medium-sized projects may be incorporated into the site integrated plan; a large project (as defined by cost or project duration) may require its own project-specific plan.

- At CD-1, on the basis of available stakeholder information and the size and scope of the project, recommend the type of Public Participation Plan to be used.

2.3 Critical Decision - Two (CD-2): Approve Baseline

2.3.1 Mission/Goal/Program Criteria

DOE Strategic Plan. *Project continues to support and is consistent with DOE Strategic Plan goals and objectives.*

- Identify any new technical information or increased understanding that has changed project plans and goals.

- Demonstrate that the project continues to support the DOE Strategic Plan or the requirements of Congress or other authorities.

Program Strategic Plan. *Project remains integrated with goals and objectives established in the Program Strategic Plan.*

- Identify any new technical information or increased understanding that has changed the Program Plan or project plans and goals.
- Demonstrate that the project continues to support the Program Office's Strategic Plan.
- Identify definitive project outcomes and link them to the Program Office Plan.

Involvement of Related Agencies. *Identifiable outside requirements and/or constraints that could affect project mission and benefits have been evaluated for applicability to the design/execution.*

- Demonstrate that all related outside organizations and their potential impact on the project have been considered and that working relations have been established.
- Include resolution of potential problems as part of the project documentation.

Site Location. *For new facility projects, site selection has been completed.*

At CD-2, the project is in the baseline stage and the full scope of the technical and operational requirements are known.

- Demonstrate the correctness of the site selection decision,
- Specify factors affecting the site, construction, operation, and disposal and show their impacts.

2.3.2 Financial Management Criteria

Funding Profile. *Funding profile has been updated and validated. Funding profile is consistent with the status of the project and with the cost estimate, schedule, and technical requirements in the current budget request documentation (i.e., Project Data Sheet, Activity Data Sheet, or other funding document). Future years budget requirements for baselines have been endorsed by CFO.*

- Demonstrate that the CFO has concurred with future year project budget baselines, and that annual budget requirements are consistent with the schedule baseline.

Mortgage. *The funding impacts on DOE and Program budgets have been assessed/updated.*

Priority. *Project funding priority has been reviewed in relation to all DOE projects and current Congressional/Office of Management and Budget/CFO budget guidance.*

Alternative Funding Analysis. *Alternative funding source availability has been confirmed. Assessment of impact on cost and schedule resulting from alternative funding sources has been completed.*

2.3.3 Baseline: Work Scope (Technical) Criteria

Systems Engineering. *Systems engineering alternative tradeoff studies have been completed, the functional and operational requirements have been identified and developed into the final design criteria, and the configuration baseline has been established. (See Project Execution and Engineering Management Planning, GPG-FM-010.)*

Conceptual Design Report. *The Conceptual Design Report has been completed.*

Value Engineering. *A value engineering plan has been developed and implemented. (See Value Engineering, GPG-FM-011.)*

Thresholds. *Technical performance thresholds have been set for systems, subsystems, and equipment. [See Baseline Development, GPG-FM-016.]*

Quality Assurance (QA) Requirements. *QA factors, including standards, specifications, and limitations, have been identified; a QA plan has been established; and the quality control (QC) and the QA oversight organization have been identified. (See Quality Assurance/Quality Control, GPG-FM-017.)*

Site Characterization. *For environmental restoration activities, the site or specific sub-projects have been characterized, environmental hazards have been identified, and health and safety concerns are known.*

Feasibility Studies. *For the characterized site(s), studies have been completed of feasible alternative cleanup methods, using systems engineering principles for specific*

subprojects, and a Record of Decision issued identifying the selected alternative(s). The feasibility of the approach has been demonstrated for new or unusual proposed technology.

Performance Measures. *Technical performance objectives have been developed to assess progress against approved technical baselines appropriate to the risk.*

2.3.4 Baseline: Cost Criteria

Total Estimated Cost. *TEC, representing the cost of all approved work scope requirements, including costs of alternatives, tradeoffs, escalation, and contingency appropriate to the cost risk, has been developed. TEC cost estimating methodology has been defined.*

The TEC estimate must be in sufficient detail to substantiate expenditures anticipated during the execution phase and subsequent project phases. The estimating process should be integral to the change control process.

- Include the Estimate to Complete (ETC), Estimate at Completion (EAC), comparisons of actual and forecasted costs against funding constraints, and evaluations against baseline evaluation of the TEC.
- Use the TEC to develop funding documentation; show that the TEC is consistent with the congressional authorization for the project.
- Show that the estimating process can be documented on the basis of historical data, where available, and that it is based on a thorough understanding of the work scope.
- Structure cost estimates in accordance with the project structure, incorporate them into all EAC revisions, and use them for developing and updating funding requests.
- Prepare a contingency estimate, at both summary and detailed levels, from an assessment of the risk associated with achieving the estimated cost.

Total Project Cost. *TPC is developed and includes the TEC plus all other project costs related to the project. An acceptable, well-defined cost estimating methodology has been used to develop the TPC.*

- Demonstrate that the estimating process (including the methods, types, equations, and relationships) is supportable on the basis of historical data, where available, and is based on a thorough understanding of the work scope.
- Demonstrate that the estimating process is integral to the change control process.
- Define and establish the TPC cost estimating processes for TEC and other project costs, including cost control elements.
- Conduct cost tradeoff analyses, including alternative funding profiles, and assess the effect of expediting or delaying the project.
- Perform cost evaluations to establish current fiscal year and cumulative incurred costs; define current and potential problems (i.e., cost drivers).
- Demonstrate that the estimating process (including the methods, types, equations, and relationships) is supportable on the basis of historical data, where available, and is based on a thorough understanding of the work scope.
- Demonstrate that the TPC estimate for the execution phase and subsequent project phases is traceable, supportable, and in sufficient detail, including assumptions, to substantiate the expenditures anticipated.
- In evaluating the TPC, include ETCs, EACs, comparisons of actual and forecasted costs against funding constraints, and evaluations against baseline.
- Use TPC to develop project funding documents and represent the Department's cost management initiative.
- Structure cost estimates in accordance with the project structure and incorporate estimates into all EAC revisions and to develop and update funding requests.
- Prepare and allocate a contingency estimate, at both summary and detailed levels, from an assessment of the risk associated with achieving the estimated cost.
- Develop and allocate contingency and escalation levels for major risk areas.

Life Cycle Cost. *LCC analyses of alternatives have been completed and LCC reflects cost risk analysis. LCC is acceptable for developing a funding profile through operations and decommissioning or through land or facilities turnover at the completion of environmental restoration. (See Systems Analysis and Assessment, GPG-FM-029.)*

- Prepare the LCC investment and ownership cost estimate for required costs (present, future, fixed, and variable) for all fiscal years, cost categories, and appropriations.
- Use LCC estimates to determine when costs are to be incurred over the project life cycle, to determine an affordability analysis, and to calculate costs to determine the benefits of ownership.
- Use a method consistent with the project structure to organize the LCC estimate.
- Include the cost of Government-furnished material.
- Address cost sensitivity, cost-risk, and cost-benefit analyses.
- Document the methods, models, data bases, and levels of detail used to produce the LCC.

Independent Cost Estimate (ICE). *The ICE has been developed outside the project line management. Cost estimating methodology has been defined.*

- Develop an ICE to test the reasonableness of the LCC. The estimating methodology for the ICE may be different from that used to formulate the LCC.
- Demonstrate how well the LCC correlates to the project plan or how it may be or was modified to correlate to the proposed execution and follow-on phases.

Thresholds. *Cost thresholds have been developed for the project and have considered, as a minimum, project size, complexity, and risks.*

- Represent, for the execution phase, the maximum total increase (in percentage terms) in project cost that each decision level is authorized to approve.

Cost threshold(s) must be realistic, consistent, and related to the schedule and technical baselines and thresholds.

Reconciliation (LCC/ICE). *ICE and LCE issues have been resolved.*

- Complete an in-depth comparison between the LCC and the ICE and develop a detailed explanation of the differences.

2.3.5 Baseline: Schedule Criteria

Milestones. *Key project milestones for completing the design have been defined and execution milestones have been scheduled.*

- Develop a proposed baseline milestone schedule against which actual performance of all major activities and milestones for the execution phase and subsequent project phases can be compared and from which forecast data can be generated.

Master Schedule. *The master schedule defines work sequence and significant task interdependencies and includes critical path and contingency appropriate for schedule risk. Intermediate and detailed schedules appropriate to the design phase and complexity of the project have been integrated into the master schedule.*

- Develop a network master schedule that depicts the major tasks needed to meet milestone dates.
- Develop schedules that integrate with the structure of the project and cost estimate and represent all work scope, regardless of funding source.
- Identify on the schedules all constraints and decision points required for work accomplishment, activity logic relationships, and critical path activities.
- Develop and summarize detail schedules to form intermediate and master schedules that provide critical path visibility and depict progress against the schedule baseline. Detailed and intermediate schedules should be consistent with higher-level schedules.
- Define and estimate the impact of fast-track approaches, concurrent activities, potential conflicts, and other time-critical schedule elements.

Thresholds. *Schedule thresholds emphasize the design phase and consider project size, complexity, and risks.*

- Develop the proposed schedule baseline threshold(s) and represent, for the execution phase, the maximum increase (in months) in the project schedule that each level is authorized to approve. Threshold(s) must be realistic, consistent, and related to the cost and technical baselines and thresholds.

2.3.6 Environment, Safety and Health Criteria

ES&H Program Plan. *A preliminary ES&H program plan has been completed and implemented.*

- Review, update as necessary, and incorporate into the preliminary plan the information developed for CD-1. (See section 2.2.6.)
 - Applicable regulations.
 - ES&H responsibilities and authorities.
 - Approaches, resources, and schedule for implementing ES&H Orders.
 - Current project needs, decisions, and conditions.
 - Level of requirements definition, cost and schedule estimation, and issues and options analysis necessary to support CD-2.
- Ensure that elements of the ES&H program plan appropriate to the conceptual phase are implemented at CD-2, facility safety including the development of Implementation Plans for the DOE 5480 series of Orders, as necessary. Examples of such plans include documentation of NEPA determinations and the proposed NEPA strategy and milestones, preparation of the preliminary safety assessment, and preparation of safeguard and security documentation.

NEPA Activities. *The Environmental Assessment (EA) has been completed, a Finding of No Significant Impact (FONSI) issued and/or an Environmental Impact Statement (EIS) completed, and a Record of Decision issued.*

- Demonstrate completion of the EA, FONSI, and/or EIS.

Projects cannot proceed to construction/execution without consideration and resolution of applicable NEPA requirements. As a result, CD-2 is the point at which all NEPA determinations, decisions, and strategies should be completed. (10 CFR 1021 details the actions to be completed in complying with NEPA requirements.)

The NEPA process provides an opportunity to consider alternative approaches to fulfilling a need and to mitigate any adverse environmental impacts. Any alternatives or mitigatory actions developed in the NEPA process (and their associated costs and schedules) should

be considered in the overall process to identify and evaluate ES&H requirements and characterize ES&H benefits and impacts.

Safety Analysis. *The safety analysis has been completed and the information provided as an input to the NEPA documentation.*

- Demonstrate that the safety analysis:
 - identifies applicable guides, codes, and standards;
 - identifies (following a systematic process) potential hazards; and
 - analyzes potential consequences.
- Demonstrate that reasonable measures to eliminate, control, or mitigate the hazards have been taken.
- Demonstrate that documented management authorization is based on an objective assessment of the safety analysis.

The preliminary safety analysis takes on greater importance as projects become more complex or expensive. Key aspects of the safety analysis, relative to the critical decision process, include, but are not limited to, the need to ensure the following.

- The analysis is scoped to cover classes of efforts so that individual efforts or operations are bounded by the general analysis.
- The analysis has been subjected to objective, independent review.
- The level of management authorization is commensurate with the type and magnitude of hazards.
- All details are documented and traceable.

Other DOE facility safety Orders contain elements that apply to and may be supported by this critical decision criterion. Of particular note, the NEPA process may use the hazards identification, consequences analysis, and problem mitigation/elimination information developed for this criterion. Within the context of NEPA, the safety analysis permits an evaluation of whether the design/project plan will meet performance/project assumptions made in the EIS, thereby providing the first level of assurance that environmental protection will be as intended.

Occupational Safety Concerns. *A detailed compliance plan has been completed and implemented, and consistency among other relevant documents has been established.*

- Demonstrate that the occupational safety and health compliance plan accomplishes the following.
 - Conforms with the requirements of applicable DOE 5400 series Orders, and Occupational Safety and Health Administration (OSHA) standards.
 - Identifies the potential occupational safety and health risks associated with the execution, completion, operation, and closeout of a project.
 - Identifies and evaluates the effectiveness and the cost and schedule impacts of options to minimize or avoid potential risks.
 - Describes the practices, procedures, and measures that will be implemented to mitigate or eliminate potential health and occupational risks.

The specific information in the detailed compliance plan may include, but is not limited to:

- detailed identification and characterization of occupational health and safety risks associated with the project;
- detailed descriptions of the measures, methods, and practices to mitigate or eliminate these risks;
- a schedule (with milestones) for implementing the facilities, methods, and practices identified above.

Decontamination and Decommissioning (D&D) Plans. *D&D considerations have been factored into detailed design criteria. (See Project Termination GPG.)*

- Address D&D at CD-2 to ensure that the cost, schedule, and ES&H impacts associated with closing out a project are considered as part of the decision to proceed. Example elements of a D&D plan are:
 - description of the ES&H concerns expected at closeout/conclusion and the proposed actions (including summary schedule) to resolve these concerns;
 - projected date for closing out/concluding the project;

- projected regulatory constraints and requirements (based on analysis of current requirements, planned regulatory reviews, and analysis of stakeholder concerns) at the time of closeout; and
- the types and quantities of wastes expected to result from D&D.

As noted previously, the ES&H preparation criteria are closely integrated. D&D is a good example because it incorporates elements of all ES&H criteria (e.g., safety analysis, occupational safety, and waste management).

Waste Minimization/Pollution Prevention. *A detailed waste minimization/pollution prevention plan for the project and operations phases has been completed for the selected design/project scope. (See Waste Minimization/Pollution Prevention, GPG-FM-025.)*

CD-2 presents a unique opportunity to address and resolve environmental impacts in an integrated and proactive manner. One such impact is waste generation.

- Describe, estimate the costs for, and present an Implementation Plan for the design, operational, and mitigatory features that will minimize wastes and prevent pollution.

It is important to recognize that minimization and prevention can be provided by facilities. Staff preparing the minimization and prevention options analysis and the resulting plan should consider all project phases and actions. (For example, an action or facility that generates less waste may also require less raw material, power, treatment chemicals, or water, in turn reducing construction and operational costs.)

Waste Management. *A detailed waste management plan describing quantity and type of wastes expected to be generated and plans for waste treatment, storage, and disposal has been initiated. (See Waste Minimization/Pollution Prevention, GPG-FM-025.)*

- Support estimation of waste management costs for operations as well as facilities. (The estimated costs are considered in the critical decision process.)
- Identify project options for waste treatment, storage, and disposal, including an assessment of the availability of future disposal capacity and sites.
- Integrate waste management plans with waste minimization/pollution prevention plans.

- Characterize the relative regulatory benefits and concerns associated with the types and quantities of wastes expected. (For example, certain actions or facilities may generate a combined waste stream that is more costly to treat or dispose of than the aggregate of costs for separate lower and higher hazard waste streams.)

Permits, Licenses, and Regulatory Approvals. *Applicable Federal, State, and local government permits, licenses, and regulatory approvals and requirements have been identified and a plan to obtain them, including milestone dates (for permit and license applications), has been completed. (See Environmental Interfaces, GPG-FM-021.)*

- Establish a thorough plan and realistic schedule for obtaining permits, licenses, and regulatory approvals.

Interim approvals or permits may not be an option at project commencement; therefore, a project could be delayed pending receipt of the necessary approvals. Early discussions with the involved authorities can avert delays and allow resolution of issues that could affect the facilities and actions within a project.

2.3.7 Project Risk

Risk Assessment. *Project risk factors, including R&D, have been identified and evaluated and impact on project success has been determined. (See Risk Analysis and Management, GPG-FM-007.)*

- Identify risks and describe how they were identified.
- Rank risks according to the probability of their occurrence and their impact potential relative to the technical, ES&H, cost, and schedule aspects of the project.

The risk identification process should reflect an organized and comprehensive process for determining the real risks associated with the execution phase and remaining project phases. Techniques for identifying risks should include, at a minimum, examinations of analogous projects, lessons learned studies, technology assessments, comprehensive analyses of the project's technical and management plans, schedules, funding profiles, and expert knowledge from interviews or literature.

The risk ranking should provide a relative ordering of the identified risks to focus attention on critical factors. The assessment should explain the quantitative risk measures and techniques used to quantify and rank risks.

Risk Management. *Risk management plan has been developed. Risk mitigation/elimination strategy has been implemented. (See Risk Analysis and Management, GPG-FM-007.)*

- Address the major elements of the process (e.g., risk planning, risk assessment, risk analysis, risk handling).
- Identify and quantify risks for the critical factors for the execution and follow-on phases, assess risk drivers, develop alternatives to reduce risk, and monitor and control risks.
- Address the major facets of project risk: technical, cost, schedule, ES&H, operations, support, and programmatic.
- Describe how the Risk Mitigation/Elimination Strategy has been implemented (i.e., by developing solutions, transforming them into courses of action, and applying resources).
- Evaluate progress in reducing and eliminating known risks, and reassess and analyze new or changed risks.
- Include project procedures and documentation. [See *Risk Analysis and Management*, GPG-FM-007.]

Project Benefits. *The economic, social, and other benefits of the project have been reviewed and are incorporated into the Public Participation Plan. (See Public Participation, GPG-FM-022.)*

- In the Public Participation Plan, address economic, social, and other benefits of the project in terms of the milestones or other measures of project accomplishment, as enumerated in the project's baseline plan defined at CD-2.

Developing the plan in this manner allows stakeholder groups to follow those project activities that most closely affect their goals and enhances communications between the groups and the project manager.

Project Vulnerability. *Economic, social, and other vulnerabilities have been further assessed and plans to reduce these vulnerabilities have been incorporated into the Public Participation Plan. (See Public Participation, GPG-FM-022.)*

- Clearly define the project's economic, social, and other vulnerabilities and state their relationships to project goals.
- Use the project plan and baseline to identify stakeholder groups potentially opposed to specific project goals.
- Incorporate into project plans project alternatives that may satisfy opponents.

Stakeholder concerns and viable alternatives for overcoming them may then be incorporated into the Public Participation Plan.

Socioeconomic Impact. *The socioeconomic impacts of the project plans have been assessed and incorporated into the Public Participation Plan. Activities to mitigate negative impacts have been included. (See Public Participation, GPG-FM-022.)*

Stakeholder groups with socioeconomic concerns are usually identified during the process of developing the project benefits and vulnerability criteria.

- At CD-2, identify the socioeconomic concerns and address them in the Public Participation Plan.

2.3.8 Acquisition Strategy (For this entire section, see Contracting Options/Acquisition Resource Planning/Application of Performance Measures GPG-FM-020.)

Diversity. *Goals for diversity and plans for minority contracting during design phase have been established.*

- Develop written diversity plan with input and concurrence from appropriate site and institutional management.
- Describe activities that have been and will be taken to promote disadvantaged business contracting and subcontracting during the design phases.

Partnering. *Partnering arrangements (i.e., joint venture, teaming and/or cooperative agreement) have been evaluated and the most favorable implemented.*

- Provide justification, evaluation, and/or explanation for involvement or lack of involvement of "partners" in the project.
- Include a summary of efforts to involve non-Federal Government organizations.

Cost Sharing. *Comprehensive acquisition plan for identified cost sharing has been developed and included in project planning documentation.*

- Present steps planned and activities undertaken to obtain cost-sharing participation by contractors and stakeholders.
- Review Government estimates for cost and schedule to assess the impact of cost sharing.

Contracting Methods. *Contracting methods intended to result in the most favorable (to the Government) technical/cost/schedule performance have been identified.*

- Explain the development of performance based statements of work.
- Identify results-oriented performance criteria and measures that will be included in contracts.
- Link monetary and nonmonetary incentives to performance criteria to reward accomplishments and discourage substandard performance.
- Justify the use of other than fixed-price or cost-sharing contracting.

Procurement. *The need for long-lead procurement requirements, and the associated risk, has been identified and a plan for completing those procurements has been presented.*

- Identify long-lead procurement requirements and include a plan for achieving these requirements within the project schedule.
- Discuss alternative approaches, if available, that would avoid or minimize risk to the project and DOE.

2.3.9 Project Management Criteria

Project Planning Documentation. *Initial project documentation, graded to match risks with the management approach, has been established to guide the execution phase. Include proposed scope, schedule, and cost baselines; mission need justification; project description; organizational structure; roles, responsibilities, and authorities; funding requirements; ES&H documentation; project reporting; and control systems and resource requirements.*

- Develop and present a plan to describe, justify, baseline, and guide a project, as outlined in the criteria, as the primary basis for the Approval of the Baseline critical decision.

Baseline Change Control. *Procedures have been established to review proposed changes to the cost, schedule, and scope baselines to determine the impact of the changes on the other baselines and project performance. Baseline Change Control Boards (BCCB) have been established at appropriate levels of the organization, thresholds for each level have been agreed to, and configuration controls have been set. (See Baseline Change Control, GPG-FM-009.)*

- Demonstrate that a BCCB is in place at the Secretarial, Secretarial Officer with Program Responsibility, and Operations Office levels.
- Define thresholds at which changes to the baselines will be referred to the next higher level for decision.
- Establish procedures to analyze and document proposed baseline changes to determine the impact on the other baselines. (For example, a technical change due to value engineering, materials change, or systems engineering analysis should be analyzed to determine the impact on cost and schedule.)

Quality Assurance Plan. *A QA Plan has been established to ensure the quality of the design and to control the quality of contributors' design(s) as appropriate. (See Quality Assurance/Quality Control, GPG-FM-017.)*

- Establish a QA plan to ensure that quality is designed and built into the project and that inspection is used to confirm quality, not to achieve quality.

Configuration Management. *A configuration management program has been established to ensure consistency among the design, physical configuration, and project or facility documentation. All changes above agreed to thresholds are reviewed and approved by the BCCB. (See Configuration and Data Management, GPG-FM-012.)*

- Establish within the configuration management program procedures to fully document changes made to the design and/or physical characteristics of the facility and to ensure that the as-built drawings accurately reflect the final facility as constructed or remediated.

Contingency Management. *Plans have been established to manage contingency funds. Contingency funds for design activities are controlled and auditable records are kept.*

- Include contingency funds in the cost estimates for the design and construction or remediation commensurate with the level of risk and the probability of the success of mitigation plans.
- Establish procedures within the contingency management plan to ensure that contingency funds are carefully controlled, fully accounted for, and used only for the purposes intended.

2.3.10 Stakeholder Considerations

Stakeholders. *Initial stakeholder identification has been assessed on the basis of the project's progress to date. Planning for each group has been incorporated into the Public Participation Plan. (See Public Participation, GPG-FM-022.)*

Linkage is the identification of specific stakeholder group(s) with the mission, technical issues, and/or other significant features of the project. Identification of a stakeholder group's interests enables the project manager to plan for the participation of that group during project implementation, including the timing of their participation, and the size, type, and cost of the Public Participation Program that may be needed.

- Identify specific stakeholder groups and establish their interest in project goals and objectives, technical issues, project risk, and potential environmental impacts.

Public Participation. *The Public Participation Plan has been prepared, and its supporting personnel requirements and budget have been approved. The Public Participation Plan has been made available to the public. (See Public Participation, GPG-FM-022.)*

- Identify activities necessary to address public and stakeholder concerns.
- Identify resources indicated in the Public Participation Plan as necessary to the activities specified in the Plan.
- Demonstrate that the Public Participation Plan is available to the stakeholders for review, comment, and participation.

2.4 Critical Decision - Three (CD-3): Start Build/Remedial Action

2.4.1 Mission/Goal/Program Criteria

DOE Strategic Plan. *The mission has been reaffirmed and remains consistent with DOE Strategic Plan goals and objectives.*

- Complete detailed planning and make all project plan adjustments.
- Prior to start of physical work (e.g., construction, etc.) review and reaffirm that project goals and/or products support the DOE Strategic Plan.
- Readdress such questions as the impact of new technology on the project.

2.4.2 Financial Management

Funding Profile. *Funding profile has been updated based on project status, Congressional authorizations, appropriations, and cognizant Operations Office guidance.*

Mortgage. *Procedures have been developed to track funding changes, during construction and/or cleanup, that may affect future costs.*

Priority. *Funding priority has been reviewed.*

2.4.3 Baseline: Work Scope (Technical) Criteria

Systems Engineering. *As appropriate, revisions to the systems engineering alternatives tradeoff studies have been completed. (See Engineering Tradeoff Studies, GPG-FM-003.)*

Detail Design. *Final working drawings, specifications, and bid documents have been prepared and coordinated with all parties affected by the project.*

Value Engineering (VE). *VE studies have been performed and VE recommendations have been implemented as appropriate. (See Value Engineering, GPG-FM-011.)*

Thresholds. *Thresholds have been reviewed and revised as necessary and approved through formal change control procedures.*

Performance Measures. *Technical performance measures have been established and incorporated into the design and inspection specifications. (See Contracting Options/Acquisition Resource Planning/Application of Performance Measures, GPG-FM-020.)*

Operational Readiness Review (ORR). *Planning for an ORR has been initiated for the transition to the operations phase.*

2.4.4 Baseline: Cost Criteria

Total Estimated Cost. *TEC has been updated based on the approved design and includes incurred costs, estimate to complete, escalation, and contingency appropriate to project risk.*

- Ensure that the TEC is consistent with the congressional authorization and represents the cost of the approved design.
- Define the TEC cost estimating methodology and grading approach.

Total Project Cost. *TPC has been updated based on the detailed design and reflects the DOE cost management initiative.*

- Ensure that TPC includes incurred costs, estimate to complete, escalation, and contingency appropriate to cost risk.
- Use TPC to update the cost baseline and develop the budget.
- Define the TPC cost estimating methodology and grading approach.

Life Cycle Cost. *LCC analyses have been updated based on detailed design. (See Systems Analysis and Assessment GPP.)*

- Complete LCC analyses for the approved design.
- Ensure that the LCC reflects the cost risk analysis.
- Define the LCC cost estimating methodology and grading approach.

Independent Cost Estimate. *ICE has been updated to reflect current cost information.*

- Update the ICE and use it to test the reasonableness of the LCC and its correlation to the project cost plan or its modification to correlate to the proposed construction and follow-on phases.

Thresholds. *Baseline thresholds have been updated for the construction and/or cleanup and operations phases based on detailed design. Cost changes are documented and traceable.*

- Address project size, visibility, uncertainties, and risks as used to develop cost baseline threshold(s).

Reconciliation (LCC/ICE). *Independent Cost Estimate and Life Cycle Cost issues have been resolved.*

- Complete an in-depth comparison between the LCC and the ICE and provide a detailed explanation of the differences.
- Resolve the differences between the LCC and the ICE.

Time-Phased Cost Plan. *A time-phased cost plan has been developed to identify costs for major milestone events. This plan provides the basis for comparison of actual versus forecast costs with available funds and obligations.*

- Develop a time-phased cost plan consistent with the project schedule and the resources necessary to accomplish that schedule.
- Include costs for the approved work scope and for all approved but unfunded work scope requirements.
- Categorize planned costs (e.g., labor, material) to allow effective variance analysis.

Operating Cost Estimate. *Preliminary cost estimate for maintenance, training, and operations has been developed.*

2.4.5 Baseline: Schedule Criteria

Milestones. *Accomplishments against milestones have been documented and are traceable. Key project milestones for the construction phase have been defined.*

- Develop a proposed baseline milestone schedule to which actual performance of all major activities and milestones for construction and other execution phase activities and subsequent phases can be compared and from which forecast data can be generated.

Master Schedule. *The master schedule has been updated to define the work sequence and significant task interdependencies, including critical path and contingencies for the construction and/or cleanup phase.*

- Update the master, intermediate, and detailed schedules to depict the major tasks needed to meet the construction and follow-on milestone dates.
- Update schedules to identify the constraints and decision points for work accomplishment, to provide critical path visibility, and to depict progress against the schedule baseline.
- Define and estimate the scheduling impact of compressed time frames, concurrent activities, potential conflicts, and other time-critical schedule elements.

Thresholds. *Baseline thresholds have been reaffirmed for the construction and/or cleanup phase.*

- Develop proposed schedule baseline threshold(s) for the execution phase, representing the maximum increase (in months) in the project schedule that each level is authorized to approve. Threshold(s) should be realistic, consistent, and related to the cost and technical baselines.

2.4.6 Environment, Safety, and Health Criteria

ES&H Program Plan. *A detailed ES&H program plan has been completed.*

- Demonstrate how the detailed ES&H program plan accomplishes the following.
 - Identifies the specific, detailed ES&H requirements and considerations affecting a project.
 - Describes the actions taken and the determinations and decisions made to that time.

- Relates these actions, determinations, and decisions to the ES&H requirements, issues, and considerations addressed.
- Presents a detailed schedule (with milestones) to fulfill the remaining ES&H requirements.
- The ES&H elements to be addressed at CD-3 include, but are not limited to, the following.
 - Environmental documentation needed to start construction or commence project activities.
 - Design and/or project plan reviews to ensure compliance with applicable ES&H codes and standards and with the ES&H scope.
 - Human health and environmental risk analyses.

Safety Analysis. *A Preliminary Safety Analysis Report (PSAR) has been prepared and approved.*

The PSAR should accomplish the following.

- Identify and demonstrate conformance with applicable guides, codes, and standards.
- Identify the hazards of an operation/project.
- Provide details on the probability of occurrence and the predicted consequences of the identified hazards.
- Describe both normal and emergency operating procedures for construction as well as nonconstruction projects (e.g., remedial or site investigatory activities).
- Describe and provide a documented analysis of the adequacy of specific measures to eliminate, control, or mitigate the identified hazards.
- Describe the operational limitations of the constructed facility or the nonconstruction project/action.
- Identify and analyze potential accidents and their associated risks.

- Provide sufficient, traceable documentation to allow independent evaluation of the adequacy of the safety analysis.
- Summarize concerns raised during the safety review, their resolutions, commitments made, and final conclusions.

Occupational Safety Concerns. *The detailed compliance plan has been reviewed and revised as appropriate and has been implemented.*

The detailed occupational safety and health compliance plan should accomplish the following.

- Incorporate all current design features, scope requirements, and technical and management decision considerations.
- Document review appropriate to the project scope and level of decision authority.
- Incorporate the level of design, technical scope, occupational safety and health requirements definition, and compliance schedule detail necessary to move the project into the execution phase.

D&D Plans. *A D&D plan has been initiated.*

The D&D plan should accomplish the following.

- Incorporate current ES&H concerns, safety considerations, design features, scope requirements, and technical and management decision considerations that could affect D&D activities and obligations.
- Document review appropriate to the level of decision authority and project requirements/scope.
- Incorporate the level of D&D detail, for example:
 - projected date of closeout;
 - designation of the systems, locations, or facilities that would require D&D;
 - types and level of contamination expected at closeout;

- D&D procedures;
- D&D waste disposal/treatment options; and
- expected use, if any, of the facilities, location, etc., after closeout.

Waste Minimization/Pollution Prevention. *The detailed waste minimization/pollution prevention plan has been reviewed and revised as appropriate for implementation during operations.*

The detailed waste minimization/pollution prevention plan should accomplish the following.

- Reflect current design features, scope requirements, and technical and management decisions for the project.
- Confirm types and quantities of wastes expected to be generated with and without implementation of the waste minimization/pollution plan.
- Document the review and approval process, including a summary of comments made and their resolution.
- Detail the practices and measures to be followed during facility operation/project performance to minimize the volume and toxicity of wastes generated. (These practices will form the basis for operating/project performance procedures.)
- Provide a schedule for implementing the waste management and pollution prevention measures and practices.

Waste Management. *The detailed waste management plan has been reviewed and revised as appropriate.*

The detailed waste management plan should accomplish the following.

- Identify/confirm the types and quantities of waste expected during construction and operation or project initiation and conduct.
- Identify all current features, decisions, and needs.

- Provide documentation of applicable reviews and approvals (e.g., verification of waste type and quantity estimates).
- Describe in detail, including an implementation schedule, the measures and practices that will be used to manage, treat, and dispose of wastes.

Permits, Licenses, and Regulatory Approvals. *Applicable permits, licenses, and regulatory approvals have been obtained and milestone dates for pending and new applications have been reviewed and revised as appropriate.*

- Ensure that all permits, licenses, and approvals necessary to construct and operate a facility or to initiate and perform project activities have been identified.
- Verify that all permits, approvals, and licenses needed to commence the execution phase have been obtained or will be obtained when needed to continue project execution.
- Confirm that project permit, approval, and license requirement determinations are based on current project features, decisions, and scope requirements.
- Document all DOE-internal and external reviews and approvals (e.g., response to and action on regulator comments). A summary or road map is sufficient.
- Develop a schedule, including milestone dates, for submitting applications and receiving authorization for any remaining permits, licenses, and approvals.

The schedule for receipt of authorization from regulators should be realistic based on recent history. DOE should be as aggressive as possible in commencing discussions with regulatory authorities and involved stakeholders and should submit applications as early as possible.

2.4.7 Project Risk Criteria

Risk Assessment. *Emerging or changing risk factors have been identified and evaluated and impact on project success has been determined.*

- Update the risk assessment for the execution phase and subsequent phases.

The updated assessment ranks the major sources of uncertainty, provides a range of projected project costs and completion dates, and quantifies the likely outcome of any changes in the acquisition strategy.

Risk Management. *Risk management plan has been updated. Risk Mitigation/Elimination Strategy continues to reduce risks.*

- Update the risk management plan to review the range of risks that may affect the project and to compare alternative approaches and plans.
- Use the Risk Mitigation/Elimination Strategy to reduce variances in project performance and to adjust project contingency allocations. The plan provides for a lessons learned report.

Research and Development. *All R&D needed to finalize the design has been completed.*

- Document performance tests to verify the readiness of technology development efforts to support project execution.

Project Benefits. *The economic, social, and other benefits have been reassessed and revised as necessary based on the project's accomplishments. Revisions have been incorporated into the Public Participation Plan.*

- Identify the magnitude of each benefit change and reasons for the change.
- Identify, quantify, and incorporate into the Public Participation Plan any changes in benefits.

Project Vulnerability. *Economic, social, and other vulnerabilities have been reassessed based on the project's accomplishments and revised as necessary. Revisions have been incorporated into the Public Participation Plan.*

The progress of the project may affect potential stakeholder opposition groups in both positive and negative ways.

- Assess the project's impact on stakeholder opposition groups and develop activities to accommodate those impacts.
- Incorporate all changes in project plans into the Public Participation Plan.

Socioeconomic Impact. *Based on the project's progress to date, changes in socioeconomic impacts have been incorporated into the Public Participation Plan.*

Project progress may affect many stakeholder concerns. In particular, local stakeholders may, or may not, be pleased with the conduct of the project because they are immediately aware of project activities.

- Document how the project's progress is recognized for its effects on stakeholders and how those effects are fully integrated into the Public Participation Plan.

2.4.8 Acquisition Strategy Criteria

Diversity. *Diversity goals and plans have been updated for construction activities and accomplishments have been noted.*

- Review successes and failures to date.
- Delineate plan to meet goals for diversity and disadvantaged contracting during construction.

Cost Sharing. *Cost and schedule impact of cost sharing participants has been factored into construction plans.*

Contracting Methods. *Review of the acquisition plan to maximize contractor performance during construction has been completed and a strategy for selection of the construction inspection contractor (if appropriate) has been developed.*

- Review contract performance based objectives and measures that have been incorporated for project use; include any additions and/or modifications to those objectives and measures.
- Include the acquisition strategy for selection of the Title III Inspection Contractor. If the Architect/Engineer (A/E) has been the Construction Management Contractor, a justification for their use as Title III inspection may be required.

2.4.9 Project Management

Project Planning Documentation. *The project planning documentation has been updated to fit the needs of the project.*

Baseline Change Control. *The Baseline Change Control Boards (BCCB) are operating, and all changes to the project baselines have been approved and fully documented.*

QA Plan. *Controls to ensure quality of construction or remediation are commensurate with the project requirements. The quality of supplier products meets necessary standards, and process improvement plans have been implemented.*

Configuration Management. *Procedures have been established to ensure that the design, physical configuration, and/or documentation remain consistent and that changes in the design or physical configuration are reflected in the documentation. The appropriate BCCB has been kept informed of any changes requiring approval.*

Contingency Management. *Contingency funds have been included in the cost estimates commensurate with the project risk, and management controls have been established to ensure appropriate expenditure of contingency funds.*

2.4.10 Stakeholder Considerations

Stakeholders. *Stakeholder participation in the Public Participation Plan has been reviewed and affirmed.*

This criterion relates to projects that are mature in their planning and execution. Project plans and baselines are in existence and the Public Participation Plan is operable.

- Ensure that project personnel maintain communications with the various stakeholder groups.

Public Participation. *The Public Participation Plan has been reassessed. Revisions have been made as required by the project's progress and the success of the Plan's activities. The revised Public Participation Plan has been made available to the public.*

By the time of the CD-3 review, the Public Participation Plan should have been developed, approved, and operational.

- Review the information available from other stakeholder criteria and indicate how the revised Plan meets each stakeholder group's concerns.
- Analyze major changes in previously established linkage and the adjustments made in the Plan to accommodate the changes.

- Once it is approved, make the Public Participation Plan available to the stakeholders for review, comment, and participation.

2.5 Critical Decision - Four (CD-4): Completion/Acceptance

2.5.1 Mission/Goal/Program Criteria

Does not apply to this critical decision.

2.5.2 Financial Management Criteria

Does not apply to this critical decision.

2.5.3 Baseline: Work Scope (Technical) Criteria

Systems Engineering. Systems engineering has been documented and made a part of the project record.

Operational Readiness Review (ORR). *An ORR has been successfully performed.*

2.5.4 Baseline: Cost Criteria

Life Cycle Cost. *LCC analyses have been updated to include uncertainties inherent in operational phase based on the facility completion.*

- Develop LCC analyses; include costs for facilities, operations, maintenance, turnover, D&D, and closure.
- Reflect the cost risk analysis of uncertainties inherent in the operational phase.
- Define the LCC cost estimating methodology and grading approach.

Independent Cost Estimate. *The ICE of operating and disposal costs has been completed.*

- Complete the ICE and use it to test the reasonableness of the operating and disposal costs and their correlation to the operation and closeout plans or their modification to correlate to the proposed operation and closeout phases.

Operating Cost Estimate. *Detailed cost estimate of maintenance, training, and operations has been completed.*

2.5.5 Baseline: Schedule Criteria

Does not apply to this critical decision.

2.5.6 Environment, Safety, and Health

ES&H Program Plan. *The detailed ES&H program plan has been reviewed and revised as necessary to meet conduct of operation requirements.*

Key ES&H program plan considerations at CD-4 include, but are not limited to, the need for the following.

- ES&H requirements identified in the plan reflect as-built conditions or current project decisions, objectives, and technical scope.
- Necessary reviews and approvals have been identified, obtained, and documented.
- Operations and activities will be managed, organized, and conducted to protect human health and the environment and to provide an acceptable level of public and worker safety.
- ES&H goals and requirements are clearly defined, auditable, measurable, realistic, and challenging.

Safety Analysis. *A Final Safety Analysis Report (FSAR) has been prepared and approved.*

- To prepare the FSAR, update and revise the PSAR, as necessary, to reflect as-built conditions and current project decisions, objectives, and technical scope.
- Review and approve the FSAR prior to the start of operations or initiation of affected project activities. (See *Safety Analysis*, GPG-FM-023.)

Occupational Safety Concerns. *The detailed compliance plan has been reviewed and revised as necessary based on as-built conditions to guide operations.*

The detailed occupational safety and health compliance plan at CD-4 should accomplish the following.

- Reflect as-built conditions and current project decisions, objectives, and technical scope.
- Provide specific recognition that the plan has been revised as necessary (including a further analysis of occupational safety and health requirements) to reflect current conditions.
- Document all necessary reviews and approvals, including reviews and approvals of any plan revisions.
- Clearly describe occupational safety and health procedures and practices, including recognition of inspections, audits, reviews, investigations, and self-assessments.

D&D Plans. *The detailed D&D plan has been reviewed and revised based on the completed project.*

The detailed D&D plan at CD-4 should accomplish the following.

- Reflect as-built conditions and current project decisions, objectives, and technical scope.
- Specifically acknowledge that the D&D plan has been revised, as necessary, to reflect current circumstances.
- Provide documentation for all reviews and approvals, including the resolution of comments.
- Clearly identify all D&D assumptions, practices, procedures, and requirements.

Waste Minimization/Pollution Prevention. *A report on waste minimization/pollution prevention techniques for use in operation has been prepared and provided to the operators.*

The waste minimization/pollution prevention report serves as a guide for operators or staff performing project activities.

- Ensure that the report reflects as-built and current project conditions.

- Determine and demonstrate the need for a project-specific training program for operators and project personnel. Project complexity, cost, and waste generation potential and impact could be used as criteria to assess the value of a training program.

Waste Management. *The detailed waste management plan for operation has been reviewed and revised as appropriate based on project completion.*

At CD-4, the detailed waste management plan should accomplish the following.

- Clearly describe the measures and practices used to manage, treat, and dispose of wastes generated as a result of the project. References to other requirements, manuals, and policies should be included.
- Reflect as-built conditions and current project decisions, objectives, and technical scope in its measures and practices descriptions. If necessary, the measures and practices should be revised.
- Document reviews and approvals, including resolution of comments.

Permits, Licenses, and Regulatory Approvals. *Applicable permits, licenses, and regulatory approvals have been obtained.*

- Demonstrate that permits, licenses, and approvals reflect as-built conditions (both facilities and operations) and current project decisions, objectives, scope, and activities.
- Prepare and submit any necessary permit, license, and approval modifications (to reflect current conditions) to the authorizing organization.
- Determine whether the modifications affect the ability to commence or initiate project activities. Situations that could affect operations or the conduct of a project indicate the need to monitor project activities during the execution phase.
- Verify that the necessary permit, license, and approval requirements have been identified and that the required authorizations have been received.
- Ensure that originals and copies of permits, licenses, and approvals are maintained in locations mandated by statute and deemed necessary to manage risks and provide stakeholder access.

2.5.7 Project Risk Criteria

Project Benefits. *Project benefits have been verified and fully stated in the Public Participation Plan's closeout activities.*

- Identify all benefits, even those that were not recognized in the plans but were identified as the project closed.

Project closeout could be the most important phase of stakeholder relations. The Public Participation Plan has identified the project's benefits throughout the duration of the project and each benefit must be accounted for and valued during closeout. The benefits must be communicated to each stakeholder group and the rationale for achieving, or not achieving, the benefits to the levels initially planned. A full statement of the benefits the project has achieved may enable stakeholders to understand the values they have gained and to associate them with the costs of the project.

Socioeconomic Impact. *Project socioeconomic benefits and impacts have been fully stated in the Public Participation Plan's project closeout activities.*

Project closeout is very important to good stakeholder relations and is often overlooked as activities are completed.

- Address stakeholder concerns that should be considered during closeout planning.
- In large projects, include any concerns specific to sub-projects that might be overlooked as the project is ending.
- Address socioeconomic impacts that have been accomplished during earlier phases of the project.

2.5.8 Acquisition Strategy Criteria

Does not apply to this critical decision.

2.5.9 Project Management

Configuration Management. *A review has been performed to confirm that the as-built drawings and related documentation reflect the physical configuration of the project or facility as completed.*

2.5.10 Stakeholder Considerations

Public Participation. *Project closeout activities of the Public Participation Plan have been reviewed and adjusted in accordance with the success of the project and the perceptions of the public. The Public Participation Plan has been made available to the public.*

Project closeout is critical to the success of the public participation effort. Major projects with project-specific plans are highly visible and identification of their benefits to stakeholders is normally easily accomplished. Smaller projects included in site-specific plans require more stakeholder consideration at this stage to ensure that stakeholders understand the benefits and accept the project's value.

- During closeout, adjust the Public Participation Plan to ensure it accomplishes the following.
 - Identifies stakeholder benefits.
 - Ensure resources are available to obtain benefits.
- Make the Public Participation Plan available to stakeholders for review, comment, and participation.

3. MEASURING FOR RESULTS

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4. SUGGESTED READING

For further information on the topics covered in this Guide, see Attachment 1.

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5. DEFINITIONS

For a complete listing of the definitions of major terms used in this Guide, see the Consolidated Glossary.

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6. ASSISTANCE

Questions concerning this Guide may be referred to the Office of Field Management in Washington, D.C. at (202) 586-4041.

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7. RELATED TRAINING

For in-depth discussions on the topics covered in this Guide, see Attachment 2 for course synopsis and scheduled offerings.

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8. EXAMPLES

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MATRIX OF PREPARATION CRITERIA FOR CRITICAL DECISION REVIEWS

These criteria are not intended to establish project management requirements but should be used as a guide or checklist for the areas of concern that may be addressed at each critical decision.

The intent is for the criteria listed below to be addressed at critical decision reviews; however, a graded approach should be used so that the rigor with which the criteria are addressed is appropriate to the cost, complexity, uncertainty, and risk of the project. Criteria not appropriate to a particular project need not be addressed, but it should be noted in the project documentation that the criteria were considered and found to be not applicable.

Table 1. Matrix of Critical Decision Documentation.

Table 1. MATRIX OF CRITICAL DECISION DOCUMENTATION				
MISSION/GOAL/PROGRAM	CRITICAL DECISION			
	1	2	3	4
DOE Strategic Plan	X	X	X	
Program Strategic Plan	X	X		
Involvement of Related Agencies	X	X		
WORK SCOPE	CRITICAL DECISION			
	1	2	3	4
Systems Engineering	X	X	X	X
Quality Assurance Requirements		X		
Site Location		X		
Site Characterization		X		
Feasibility Studies		X		

Table 1. MATRIX OF CRITICAL DECISION DOCUMENTATION				
TECHNICAL	CRITICAL DECISION			
	1	2	3	4
Conceptual Design Report		X		
Detail Design			X	
Value Engineering		X	X	
Thresholds		X	X	
Performance Indicators		X	X	
Operational Readiness Review			X	X
COST	CRITICAL DECISION			
	1	2	3	4
Total Estimated Cost	X	X	X	
Total Project Cost	X	X	X	
Life Cycle Cost	X	X	X	X
Independent Cost Estimate		X	X	X
Baseline Thresholds		X	X	
Reconciliation of Total Project Cost/Life Cycle Cost		X	X	
Time Phased Cost Plan			X	
Operating Cost Estimate			X	X
SCHEDULE	CRITICAL DECISION			
	1	2	3	4
Milestones	X	X	X	
Master Schedule		X	X	
Thresholds		X	X	

Table 1. MATRIX OF CRITICAL DECISION DOCUMENTATION				
FINANCIAL MANAGEMENT	CRITICAL DECISION			
	1	2	3	4
Funding Profile	X	X	X	
Mortgage	X	X	X	
Priority	X	X	X	
Alternative Funding Analysis	X	X		
STAKEHOLDER	CRITICAL DECISION			
	1	2	3	4
Stakeholders	X	X	X	
Public Participation	X	X	X	X
ENVIRONMENT, SAFETY AND HEALTH	CRITICAL DECISION			
	1	2	3	4
Environment, Safety and Health Program Plan	X	X	X	X
NEPA Activities	X	X		
Safety Analysis		X	X	X
Occupational Safety Concerns		X	X	X
Decontamination and Decommissioning Plans		X	X	X
Waste Minimization/Pollution Prevention	X	X	X	X
Waste Management	X	X	X	X
Permits, Licenses and Regulatory Approvals		X	X	X
PROJECT RISK	CRITICAL DECISION			
	1	2	3	4
Risk Assessment	X	X	X	
Risk Management		X	X	
Project Benefits	X	X	X	X
Project Vulnerability	X	X	X	

Table 1. MATRIX OF CRITICAL DECISION DOCUMENTATION				
Socioeconomic Impact		X	X	X
Research and Development			X	
ACQUISITION STRATEGY	CRITICAL DECISION			
	1	2	3	4
Diversity	X	X	X	
Partnering	X	X		
Cost Sharing	X	X	X	
Contracting Methods	X	X	X	
Procurement		X		
PROJECT MANAGEMENT	CRITICAL DECISION			
	1	2	3	4
Baseline Change Control		X	X	
Quality Assurance Plan		X	X	
Configuration Management		X	X	
Contingency Management		X	X	
Project Planning Documentation		X	X	
Transition Plan			X	X
Closeout Plan			X	X

Attachment 1. List of Source Documents.

DOE HQ and DOE Field Cost Quality Management Assessment Handbooks.

Memorandum from the Secretary of Energy referenced as Revision of the Energy System Acquisition Advisory Board Process with attachments titled "Presentations-Specific Areas That Should be Addressed" and "Additional Areas for ESAAB Emphasis," September 7, 1993.

Memorandum from the Acting Associate Deputy Secretary for FM referenced as Restructure of the Energy System Acquisition Advisory Board, August 26, 1993.

OMB Circular A-109: Policies for Major Systems Acquisition, April 15, 1993.

ESAAB Actions Completed October 1992 to Present.

"Improving Existing Policies and Procedures of the Major System Acquisition (MSA) and Energy System Acquisition Advisory Board (ESAAB) Process, November 30, 1994 Memorandum from Don Pearman.

Action Plan - Draft Project Performance Improvement, Office of Environmental Management, May 3, 1994.

The Project Manager's Handbook for Improved Project Definition, Draft, October 1994, DOE.

DOE O 430.1, LIFE-CYCLE ASSET MANAGEMENT, August 24, 1995.

DOE O 451.1, NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE PROGRAM, November 10, 1992.

DOE O 5700.6C: QUALITY ASSURANCE, August 21, 1991.

DOE Environmental Management, Public Participation Desk References, November 1994.

DOE O 5480.19, Change 1, CONDUCT OF OPERATIONS REQUIREMENTS FOR DOE FACILITIES, May 18, 1992.

OMB Circular A131, Value Engineering, May 21, 1993.

DOE Strategic Plan for Diversity, 1994.

DOE Waste Minimization/Pollution Prevention Cross-Cut Plan, 1994.