EXTERNAL INDEPENDENT REVIEW (EIR)

STANDARD OPERATING PROCEDURES (SOP)

Rev 3.6

U.S. DEPARTMENT OF ENERGY (DOE)

OFFICE OF PROJECT MANAGEMENT (PM)

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1.0 PURPOSE AND AUTHORITY

The Office of Project Management (PM) performs External Independent Reviews (EIRs) to provide Project Management Executives (PMEs), senior leaders within the Department of Energy (DOE), and Congress an unbiased assessment of whether a capital asset project can be executed within proposed scope, schedule and cost commitments, while also meeting its key performance parameters and fulfilling its associated mission need. The objectives of this EIR Standard Operating Procedure (SOP) document are to clarify EIR expectations and to facilitate EIR planning and execution by PM, its support contractors, DOE Program offices and project teams.

The approval process for DOE capital asset projects includes five sequential approval steps, each of which is referred to as a Critical Decision (CD):

- CD-0, *Approve Mission Need*. There is a need that cannot be met through other than material means
- CD-1, *Approve Alternative Selection and Cost Range*. The selected alternative and approach is the optimum solution
- CD-2, *Approve Performance Baseline (PB)*. Definitive integrated scope, schedule and cost baselines has been developed
- CD-3, *Approve Start of Construction or Execution*. The project is ready for implementation.
- CD-4, *Approve Start of Operations or Project Completion*. The project is ready for turnover or transition to operations, if applicable

DOE O 413.3B, *Project Management for the Acquisition of Capital Assets*, requires PM to perform a "performance baseline EIR" prior to CD-2, *Approve Performance Baseline*, for all capital asset projects with a Total Project Cost (TPC) ≥ $100 million (unless the program office has qualified for an exemption). An EIR is also required for projects with a TPC > $50 million for Program Offices that have not established a Project Management Support Office (PMSO) capable of performing an Independent Project Review (IPR). For Program Offices with an established PMSO, the PME may request that PM perform an EIR in lieu of an IPR for projects less than $100 million. PM must also perform an EIR prior to the approval of a Baseline Change Proposal (BCP) for projects with a TPC >$100M that have a new PB established as a result of a PB deviation.

In conducting a PB EIR, PM has two underlying objectives:

- To validate a project's proposed PB (including both the original PB and any major revisions to a previous established PB)
- To verify that numerous project planning and management requirements identified in the 2008 DOE Contract and Project Management Root Cause Analysis and Corrective Action Plan (RCA/CAP) have been satisfied

Upon completion of a PB EIR, PM should be able to complete an assessment that:

- A project is poised for success to complete its scope and meet its Key Performance Parameters (KPPs) if applicable within the approved/defined PB cost and schedule, TPC and CD-4, respectively
- Project planning has progressed to a point where a PB and associated funding profile can be "locked-in" with an assurance that it will remain intact and stable through project completion

- A fully staffed, trained and skilled integrated project team is or will be in place along with appropriate management systems and tools to successfully execute a project

While the DOE *2008 RCA/CAP* defines capital asset project success as achieving project completion (CD-4) within the original scope baseline and within 10% of the original approved cost baseline, DOE O 413.3B notes that the ultimate objective is to deliver a project at the original PB, on schedule, within budget, and fully capable of meeting mission performance, safeguards and security, quality assurance, sustainability, and environmental, safety, and health requirements. Consistent with this objective, a project shall be completed at CD-4 within the original approved PB (CD-2), unless otherwise impacted by a directed change. Appendix A is a "cross-walk" demonstrating how the EIR protocol addresses various RCA/CAP requirements.

A PM *Independent Cost Review and Independent Cost Estimate (ICR-ICE) SOP* is available for guidance when performing an ICE or an ICR. It should be used in conjunction with this SOP when both an EIR and an ICE or ICR are being performed.

DOE O 413.3B also requires PM to perform a "construction/execution readiness EIR" prior to CD-3, *Approve Start of Construction/Execution*, for all major system projects (i.e., projects with a TPC ≥ $750 million or as otherwise designated by the Deputy Secretary). For major system projects, the purpose of an EIR conducted prior to approval of CD-3 is to assess the readiness for the start of construction and to reconfirm the completeness and accuracy of the PB. Besides using many of the review elements for the CD-2 PB review, the CD-3 EIR focuses on the final drawings, specifications, and construction/execution planning. Ideally, PM will conduct the CD-3 EIR prior to the release of the Request for Proposals or Invitation for Bid packages.

In addition to the required EIRs at CD-2, CD-3, and BCP, PM may, either on it own or at the request of a PME or Program office, use a "tailored" EIR process to support any of the following:

- Assist project teams in the front-end planning process and the development of the PB, including evaluating project technical, cost and schedule bases and assumptions, assessing the risks and benefits of optional acquisition strategies, examining all project requirements, and assessing project risks
- Assess performance during the execution stage, including design, procurement, construction, testing, startup, commissioning and turnover
- Assess the adequacy and function of the IPT and its management of the project
- Address any other issues defined during the EIR scoping or development process
- Assess the readiness of a project for an EIR team visit
- Assist the project team in recovering from unsatisfactory performance trends
- Assess site preparation execution readiness prior to establishing a PB

2.0 EIR BUDGETING

PM provides funding for all EIRs that it is required to perform pursuant to DOE O 413.3B. At CD-2, this includes all projects with a TPC ≥ $100 million, and at CD-3, it includes all major system projects. EIRs for projects ≤ $100 million will be funded by the DOE Program office requesting the review, unless the Program does not have an established and capable PMSO, in which case PM will provide the funding. The program office will also fund any emergent, unplanned EIRs, and EIRs required to establish a new PBs resulting from a BCP.

It is extremely important for DOE Program offices which sponsor capital asset projects to provide PM with sufficient advance notice of when an EIR must be performed. This is best done using the Project Assessment and Reporting System (PARS II). PARS II provides the means to identify when EIRs are required for each project and to maintain planning data on upcoming EIRs. Planned dates for future critical decisions are identified in PARS II in the "Planned Dates" section of the latest approved Critical Decision. This information is used by PM analysts to forecast when a project will require an EIR. Detailed planning information is maintained in PARS II on any EIR that is forecast to occur within the current fiscal year or following fiscal year. Planning information includes dates of the EIR review period, dates of on-site review, funding, and estimated costs. This information is entered/updated in the BCP/Review section of PARS II. FPDs and sponsoring DOE Program Offices are responsible for providing PM with the information it needs to properly plan upcoming EIRs. PM analysts are responsible for entering/updating planned Critical Decision dates and EIR planning information in PARS II. (Note: This applies to projects sponsored by Program offices including; EM, NNSA, EERE, FE or NE. Within the Office of Science, a Program Manager or Federal Project Director (FPD) is responsible for maintaining this information in PARS II).

In order to initiate an EIR, a PMSO or Program Manager (if no PMSO exists) should submit a request (e.g., e-mail or memorandum) to PM ideally 12 weeks prior, but no less than 8 weeks prior to the desired start of the EIR on-site visit. This advance notice is required to ensure that an appropriate review scope is developed (tailored) for the project, and that all necessary resources (including funding and personnel with appropriate subject matter expertise) are available. Of equal importance, Program offices and FPDs should ensure that they are prepared to provide the substantial documentation that is required to support an EIR. Insufficient documentation is a major contributor to both schedule delays and less than optimum EIR results. Appendix D identifies documents that are needed for an EIR.

3.0 EIR TEAM COMPOSITION

This section outlines procedures for determining staffing and resource requirements for an EIR.

3.1 EIR Scoping Meeting

As noted in the previous section, a PMSO or Program Manager (if no PMSO exists) should submit a request (e.g., e-mail or memorandum) to PM ideally 12 weeks prior, but no less than 8 weeks prior to the desired start of the EIR on-site visit. The DOE Program office and PM representatives should subsequently conduct a "Feds-only" EIR scoping meeting to collaboratively define the scope, bounds, and objectives of the EIR. The PM Lead chairs the EIR scoping meeting, and attendance should include appropriate Program and project personnel, including the designated FPD and review team members. An EIR scoping meeting agreement template is available on the PM Reviews and Validations web page.

3.2 Roles and Responsibilities

PM is responsible for coordinating all EIR activities and for directing the work with the EIR team. However, the EIR process is a collaborative effort and the EIR team typically includes both contractor and DOE personnel external to the project team and its line management.

During the EIR process, roles and responsibilities should be clearly understood by all participants. In general, the roles and responsibilities indicated in the following table apply:

Role	Responsibility
PM Lead	Federal lead; conduct scoping meeting; prepare statement of work for contractor support and evaluate contractor proposals; facilitate the process and resolve issues; lead the onsite entrance and exit briefs; prepare draft EIR plan and approve final plan; provide input to and review/approve EIR report
Program/Project/FPD	Support EIR process with resources, time, data, and personnel
EIR Contractor Lead	Leads EIR Contractor Team and serves as EIR Contractor Point of Contact
EIR Contractor	EIR team; prepare draft report; support Corrective Action Plan comment resolution; recommend validation
EIR Team Member	Member of EIR team; provide input to Review Plan, out briefing, and draft report. Provide continuity and future follow-up.
Observer	Observes with minimal to no disruption to the EIR team activities. Applicable for on-site visits.

The name of the EIR support contractor should be identified in EIR documentation. However, all EIR team deliverables – including but not limited to the review plan, entrance and exit briefs, and the EIR report - are to be written as, viewed as, and communicated as PM products.

3.3 EIR Team Selection and Staffing

Based on the agreed-upon review scope, the scoping meeting attendees will outline the subject matter expertise and skills required of the EIR team members. Ideally, teams will include individuals with appropriate experience in project management and cost engineering, as well as subject matter experts (SMEs) with knowledge of specific areas required to understand and analyze a particular project (e.g., any unique technical areas such as nuclear safety expertise Hazard Category 1, 2, and 3 nuclear facilities or project execution strategies). To the greatest possible extent, the PM team lead and key subcommittee leads should hold appropriate professional and/or academic/industry credentials (e.g. Professional Engineer, Certified Cost Professional, Project Management Professional, advanced degrees in a particular scientific discipline). Team size should be driven by the complexity and scope of the review, the project's risk and performance profiles, and the schedule for completion. The PM Lead should ensure that all review areas [Lines of Inquiry (LOIs)] are covered with qualified team members. In addition to any "core" EIR contractor members, the team should include DOE Program office representatives including Federal or contracted employees (to include lab and/or Management & Operating (M&O) contract employees).

An EIR Team has a PM Lead and typically includes the following sub-groups (colors denote potential groupings):

- Management (Acquisition and Project Execution)
- Earned Value Management System
- Scope
- Schedule
- Cost
- Risk

  Could be done by ICE team prior to EIR
- Environment, Safety, & Health
- Quality Assurance
- **Safeguards and Security**
- Startup/Commissioning & Transfer to Operations

EIRs are conducted by pursuing and accessing various LOIs. Appendix D provides example LOIs to pursue as applicable to the project. The EIR Team composition is determined by identifying a

sufficient number of qualified individuals to adequately address all of the LOIs during the time available. In a large EIR Team, each sub-group will typically have its own lead plus additional members as needed. On smaller EIRs, the same person may be able to lead multiple sub-groups.

PM staff will often be assisted by representatives of other DOE offices. In order to preserve the independent nature of the EIR, project advocates (i.e., the DOE site office line management, the DOE Program manager, the DOE site project contractor) should not participate as a member of an EIR Team. A DOE Program office project advocate may, however, participate as an observer. DOE Program office staff members who are not project advocates can serve on the EIR Team and the Program office may suggest individuals to satisfy special skill set requirements. Notably, the inclusion of Program office representatives – whether as regular members or observers - will help provide a pool of talent for future "peer reviews." Having a core of qualified people who can "carry over" from one review to the next is essential to maintaining continuity over the course of a project. In this regard, the Program office representatives should be people who will serve on future peer reviews.

The PM Lead should prepare the statement of work (SOW) for contractor support and evaluate any resulting contractor proposals. The support contractor can be asked to assist the PM Lead in developing the EIR Plan, assigning areas of responsibility to team members, executing the review, developing the in-brief and exit brief, and drafting the EIR Report. PM will approve the final EIR team membership via approval of the EIR Plan. The support contractor will assist the PM Lead in developing the EIR Plan, assigning areas of responsibility to team members, executing the review, developing the in-brief and exit brief, and drafting the report. The PM Reviews and Validations website also contains a sample SOW template for an EIR support contractor.

To document that the team meets the desired qualifications, biographies (for all team members actively participating on the team as reviewers) - one page or less, per person—are required to be included as an appendix to the EIR Plan and to the subsequent EIR Report. Biographies are not required for observers.

Team members should have expertise in appropriate disciplines to conduct the review, including schedule and cost analysis, risk analysis, management, safety, and project-specific technical disciplines. All EIR Team members are expected to provide independent input to the pre-onsite activities, on-site review and interview activities, in-brief, exit brief, report, and follow-up activities (including assessment of corrective actions) while adhering to the schedule approved by PM in the EIR Plan.

4.0 SCHEDULE

Appendix C contains a Gantt chart based on a Microsoft Project schedule for a hypothetical EIR. The Microsoft Project software template for that schedule is available in the PM shared drive in the EIR SOP folder. [Note: All support documents will migrate to the new PARS II Document Management System (DMS)]. PM analysts are strongly encouraged to use this template as a starting point for planning an EIR. A logic-driven Gantt Chart depicting the responsibilities of all parties provides an excellent tool for discussing calendar commitments with stakeholders in a realistic and professional manner. DOE Program offices and Project Teams frequently ask why it takes so long to complete an EIR. The "reasons why" are more easily communicated by a logic-driven schedule. In addition, potential opportunities for schedule compression can be readily explored using the Microsoft Project software.

The typical process for conducting an EIR takes approximately 12-16 weeks from the time PM and the EIR team receives the required project documents until the CAP is resolved. (EIRs with

limited scope should typically require less time to complete.) While the on-site EIR visit is usually limited to one week, the specific duration of the EIR depends on the size and complexity of the project being reviewed. Preliminary identification of major findings and findings presented on-site may change during preparation of the draft report. During the EIR, on-going project activities may continue.

5.0 CONDUCTING AN EIR

An EIR generally consists of the following: an EIR team reviews available project documentation; receives briefings from and holds discussions with the project team; assesses the reasonableness of project assumptions and the adequacy and maturity of the technical design; evaluates the competencies of the federal and contractor project team staff, including the integrated project team; checks to ensure that all prerequisites for CD-2, CD-3, CD-3A, or BCP, as applicable, have been completed and satisfactorily documented; assesses the adequacy of the proposed PB, including KPPs, cost and schedule estimates and associated risk assessments and quantitative project reserve determinations; and explores any other issues that may have a bearing on project performance. For a CD-3A evaluate the business case for and execution plan to support construction in advance of CD-3. The result is an EIR report that details the findings, which may include a need for corrective measures that must be undertaken before PM will validate the project's proposed PB.

Sections 5.1.1 through 5.1.6 provide details on the various steps involved in an EIR, and Section 6 describes how an EIR Report should be structured.

The following appendices provide guidance in other areas, as noted:

- Appendix A is a reviewers' checklist for topical areas related to 2008 DOE RCA/CAP corrective measures. This checklist *prescribes* the minimum number of LOIs that ***must*** be pursued in order to adequately address mandatory RCA/CAP items.
- Appendix B is a checklist of activities that must normally be completed during an EIR. While PM analysts should find this checklist useful, its use is optional.
- Appendix D contains example LOIs to pursue when conducting an EIR, and a list of documents that are normally required.

5.1.1 Prepare EIR Review Plan

The EIR team develops a draft EIR Review Plan based on the results of the initial scoping meeting. Appendix D to DOE Guide 413.3-9A, *Project Review Guide for Capital Asset Projects,* provides a sample format and template for an EIR Review Plan. Sample EIR Review Plans can also be found on the PM shared drive in the EIR SOP folder. (Note: All support documents will migrate to the new PARS II DMS).

PM supplies the draft review plan to the project, which contains a listing of required documentation. Following receipt of all the required project documents, the EIR team revises the draft EIR Review Plan based on the results of the initial scoping meeting and a cursory review of the project documentation. The project team, PMSO, and/or Program comments are resolved and/or incorporated into the draft Review Plan. The EIR team finalizes the EIR Review Plan and distributes to the PMSO, Program, and project team.

5.1.2 Assemble/Review Project Documentation

Once the EIR start date is confirmed, the FPD and project team must submit all necessary project documentation to PM and the EIR team at least 4 weeks prior to the start date of the on-site review. Typically, the DOE Program office or project team establishes a web based document collaboration platform such as SharePoint or eRoom to which the applicable project documentation is posted. To establish a PARS EIR SharePoint, analysts should send their request to the PARS helpdesk with required project details (including names needing access). Once the project's EIR PARS SharePoint is no longer needed and all final review documents have been uploaded into PARS, analysts should again notify the PARS helpdesk to archive the project's EIR PARS SharePoint.

The EIR process places a great deal of importance on having documents available well in advance of the on-site review. This allows the EIR team to:

- Determine the adequacy and completeness of the documentation, thus minimizing expenditure of EIR (as well as site and project) resources for on-site visits for which the Program, FPD, IPT and contractor are unprepared;
- Develop specific EIR lines of inquiry that will be the focus of the on-site portion of the EIR;
- Inform the project team in advance of the on-site review of the logistics and specific data and information needed to address EIR concerns related to the various review elements identified in the Review Plan; and
- Perform comprehensive assessments efficiently while on-site.

The EIR is a snapshot evaluation by the EIR team of the project status at a specific point in time; it is not a moving picture of project activities and status. *The project team is encouraged to provide a checklist of the submitted documentation and the preparation and/or approval date of each document along with the required documentation.* If the project team intends to transmit any additional documents or update any documents already submitted, it should notify PM and the EIR team when project documentation is first submitted, and should note this information on the documentation checklist.

If project documentation is submitted to PM and the EIR contractor less than 4 weeks prior to the requested start date of the on-site review, the quality of the EIR may be compromised, and PM and the EIR team may recommend postponement of the scheduled EIR site visit start date. Updates of project documentation received within 2 weeks of the on-site visit may cause the EIR review time to be extended with resultant recommendations to be delayed accordingly, so that the EIR review team has adequate time to review documentation. Exceptions will be handled on a case-by-case basis.

5.1.3 Conduct On-Site Review

Representatives of the EIR team conduct an on-site review, and conclude it with an exit brief to the PMSO/Program and project team. In the exit brief, the EIR team should identify those preliminary major findings, findings and observations to the project team. The EIR team should highlight those major findings that require satisfactory resolution prior to the EIR team being able to recommend validation of the proposed PB (CD-2) or revised PB (BCP), or to proceed with construction/execution (CD-3). Once the project team is informed, it may take the opportunity to begin resolution, as appropriate. However, preliminary findings presented during the exit brief may change as the EIR team further analyzes the review results, discusses issues internally, and prepares the draft report. *Note: The PMSO/Program is encouraged to arrange for a*

teleconference/video connection to the site exit brief when physical attendance is not possible. As a minimum, a telephone conference call-in number should be available.

The PM Lead is responsible for briefing the PM Deputy Director of Project Management Oversight and Assessment and Division Chief of Office of Departmental Project Oversight, as appropriate, prior to the exit brief at the site. In addition, the PM Lead is responsible for briefing the Director of PM upon return to the office and may be requested to also brief the Project Management Risk Committee (PMRC).

5.1.4 Prepare Draft and Final EIR Reports

After the on-site review and typically no later than two weeks after the on-site review, the EIR team provides an electronic copy of the draft EIR report (recommended format found in Section 6) to the PM team lead, which then issues the draft report electronically to the PMSO/Program and project team for a factual accuracy review. An EIR Report includes a CAP template ("shell") as an appendix. EIR team Observations should similarly be listed in a separate template, but these do not require follow-up action by the EIR team.

In parallel, the project team starts preparation of a CAP, if corrective action is necessary, for resolving the EIR team's findings. The project team submits its proposed CAP to the PM team lead and the EIR Team for review, and begins to address the findings.

Typically, no later than three weeks after the on-site review, the PMSO/Program and project team provide a consolidated list of factual accuracy comments to PM, which then works with the EIR team to resolve in finalizing the EIR Report. The PMSO/Program and project team shall strictly limit their comments to the factual content of the draft EIR Report. If necessary, a teleconference may be conducted between the EIR team and project team to resolve factual accuracy comments. The PMSO or Program may request PM to set up a resolution conference, as appropriate, to discuss findings, observations, or other unresolved issues with the draft report. The PMSO or Program office must contact PM no later than one week after receipt of the draft report to coordinate this effort. Any disagreements with specific findings, or observations should be transmitted to PM along with supporting back-up documentation and a request to schedule a resolution conference. The Program/PMSO and project team are encouraged to discuss such contentious issues at this forum and not as part of the factual accuracy submittal. The project team should continue to resolve the findings through appropriate on-site action and evidence documentation for PM and EIR Team review, while the EIR team provides any comments it may have on the proposed corrective action plan back to the project.

If necessary, the EIR contractor addresses the factual accuracy comments and submits an electronic pre-final EIR report to PM. In some instances, PM hosts a Pre-Final Management Brief (given by the EIR team leader) and comment/issue resolution conference. The Pre-Final Management Brief is intended for senior Program and project team management. The Director of PM, or designee, will attend the Pre-Final Management Brief for all major system projects, and may attend similar sessions for other projects as the schedule permits.

If the EIR Team has concluded that all major findings have been adequately addressed by the project team, and the EIR team resolves comments/issues as agreed to during the Pre-Final Management Brief and resolution conference, the EIR Team issues the final EIR Report with a validation recommendation and/or recommended corrective actions to PM. PM then forwards the final EIR Report to the PMSO/Program and project team.

The PM Lead is responsible for briefing the PMRC after the draft report is completed.

5.1.5 Prepare Corrective Action Plan

An EIR team's Major Findings must generally be resolved before PM will validate a proposed performance baseline. Resolution of Major Findings must precede critical decision approval. The resolution is handled through a formal corrective action process. An EIR Report includes a CAP template ("shell") as an appendix. The template will include fields to be completed by the Program office and project team. The CAP template will include, at a minimum, the following fields:

- EIR team Major Finding or Finding (reference report page and paragraph)
- Program and Project team response (including whether the EIR team Major Finding or Finding is accepted or rejected), and proposed corrective actions/plans, including names of personnel assigned actions, and dates by when actions will be started and completed)
- Program and Project team action plan status (identifying whether corrective actions are completed or pending including actual and planned dates for beginning and completing actions)
- EIR team Response (identifying whether the EIR team agrees or disagrees with the action/plan, issues with the action/plan, whether the action/plan is accepted, if the Major Finding/Finding is closed, etc.).

As indicated in Section 5.1.3, the project team submits its proposed CAP to PM and the EIR team for review. The EIR team's response to the CAP should indicate its concurrence or rebuttal and the supporting technical rationale. In the event of unresolved findings, the PM representative will continue to monitor progress towards acceptable resolution. In certain cases, a follow-up EIR team visit may be required prior to validation, especially when the timeline for resolution is protracted for a number of months. Every effort should be made to resolve all Major Findings and Findings as quickly as possible after the CAP has been developed.

5.1.6 EIR Report Transmittal

PM will use the final EIR Report, in combination with any corrective actions identified in the approved CAP, to assess whether the proposed performance baseline should be validated or project construction/execution should be started. PM may also use information from Independent Cost Estimates, Independent Cost Reviews, Independent Project Reviews, Inspector General (IG) reports, or other such information in assessing whether a PB baseline can be validated or project construction/execution should be started. PM will transmit the final EIR Report and document its decision and/or recommendation with respect to validation of the performance baseline or the start of construction/execution in a memorandum from the PM Director to the PME or Program Secretarial Office (PSO).

5.1.7 Implement/Review Corrective Actions

Following transmittal of the final EIR report from the Director of PM to the applicable PSO/DA, the project team will address the Major Findings, Findings and Observations identified in the CAP shell included in the EIR report. The PMSO/project team should initially identify their proposed corrective actions in the CAP shell and provide it to PM for review. PM may engage the EIR team, and in particular its Team Lead, to participate in the review of the CAP in order to provide constructive feedback and to help focus the project team on acceptable actions to resolve the Major Findings and Findings.

When all applicable corrective actions have been taken and the appropriate project and cost/schedule baseline documentation has been updated, the project team should provide the

completed CAP and updated documentation (an Evidence File that corresponds to a Major Finding or Finding) to PM through the appropriate headquarters Program Office. The EIR team will review the CAP and updated documentation submitted in the Evidence Files (typically without having to revisit the site), conduct teleconferences as necessary to resolve questions and open issues, and provide PM an updated recommendation in a CAP Review report (i.e., an Addendum to the EIR Report) to validate (or not) the proposed PB. All major findings have to be resolved before the proposed PB is validated by PM. If the recommendation is to not validate the proposed PB, appropriate justification will be provided by the EIR team in the CAP Review report, including which Findings are not yet resolved. As with the EIR report, the Program and project team will have the opportunity to review for factual accuracy the draft CAP Review report.

This cycle of CAP reviews will continue until either the EIR team is able to recommend *validation, or PM intervenes and determines that the open issues have been* satisfactorily addressed by the Program and project team and validates the proposed baseline and/or endorses approval of the applicable Critical Decision. If an acceptable CAP is not presented and appropriate corrective actions have not been completed within 6 months of the original EIR team on-site visit, PM may require that a new EIR be conducted. Similarly, if within 6 months of a PM memo validating the PB and/or endorsing approval of the applicable Critical Decision, the baseline or Critical Decision has not been approved by the PME, a new EIR or limited EIR may be required to verify or update the original PM validation or endorsement. Again, all Major Findings have to be closed in order for the PB to be validated. EIR Team Leads are an integral part of the corrective action closure process following validation, for any findings where a closure plan and schedule were agreed upon. They will, as the project progresses, have the opportunity to observe closure of identified findings throughout the span of the project.

Findings for which the EIR team has accepted the project team's corrective action plan and schedule to make appropriate corrective actions (following the EIR team recommendation to validate the PB or proceed with execution) must be tracked until properly closed out. The EIR Team Lead and the responsible PM project team members should periodically assess the status of these actions until closed by holding the project team and Program/PMSO responsible for ensuring closeout of these actions per the agreed-to plan and schedule. If necessary, a follow-up review by the EIR team may be warranted. If the agreed-to corrective actions are not accomplished per the corrective action plan and schedule, it may be appropriate to change the project's monthly/quarterly assessment status in PARS in order to focus closer management attention to the unresolved issues. At CD-3, or for BCPs following CD-2 or CD-3, there should be a minimal number of such actions, and the length of time allowed to complete these planned corrective actions should be limited to about 3 months.

6.0 EIR REPORT

This section outlines the format for an EIR report.

6.1 Report Format and Content

The EIR Report should be organized into the following sections; if justified, sections may be consolidated, as appropriate (e.g., schedule, cost, and risk may be combined in a section):

Table of Contents
Acronyms
Executive Summary

1.0 Management ((Acquisition and Project Execution))
2.0 Scope
3.0 Schedule
4.0 Cost
5.0 Environment, Safety, & Health
6.0 Quality Assurance
7.0 Risk
8.0 Safeguards and Security
9.0 Startup/Commissioning & Transfer to Operations

Report Appendices:

A. EIR Team Members, Assignments, and Biographical Sketches
B. Detailed Comments on Project Execution Plan (PEP) *(if applicable)*
C. Detailed Comments on Other Documents *(if applicable)*
D. CAP Recommendations
E. ICE Report (Option for Review Team Leader)
E. Key Definitions and Acronyms

Modifications may be appropriate based upon the scope of the final EIR Review Plan. The EIR Report shall indicate that all lines of inquiry suggested in the references herein have been considered, although not all such lines of inquiry necessarily warrant the same level of incorporation and investigation.

Additional report guidance is contained in the EIR Report Template, which is provided in the PM shared drive in the **EIR SOP folder**.

6.2 Table Templates

The EIR Report may contain completed versions of the following twelve (12) tables EIRs, as applicable. EIR reports typically include Tables 1, 8, 9, 11, and 12. The information required to complete these tables should be carefully considered when developing LOIs.

Table 1 – Budget Cost Breakdown – Funding Source Specific (future and sunk)								
Description	**FY15**	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**	**FY21**	**Total**
TEC								
OPC								
TPC								

Note: above values include MR/Contingency

Table 2– Project Data Sheet Cost Breakdown – Funding Source Specific			
Description	**Costs to Date**	**Costs to Go**	**Total**

	(as of _____)		
PED			
Construction			
TEC			
OPC			
TPC			

Table 3 - Earned Value Management System Breakdown- Fund Source Neutral								
Description	**<FY 15**	**FY 16**	**FY 17**	**FY 18**	**FY 19**	**FY 20**	**FY 21**	**Total**
*Contract Budget Base								
Fee/Profit								
Other DOE Direct Costs								
Contingency								
Performance baseline (TPC)								

** Contract Budget Base is inclusive of the Performance Measurement Baseline, any Undistributed Budget, and, Management Reserve.*

Table 4 - Earned Value Management System Breakdown- Fund Source Neutral			
Description	**Costs to Date (as of _____)**	**Costs to Go**	**Total**
PMB			
Undistributed Budget			
MR			
*Contract Budget Base			
Fee/Profit			
Other DOE Direct Costs			
Contingency			
Performance baseline (TPC)			

** Contract Budget Base is inclusive of the Performance Measurement Baseline, any Undistributed Budget, and, Management Reserve.*

Table 5 - Funding Constrained TPC versus Unconstrained TPC								
Description	**<FY 15**	**FY 16**	**FY 17**	**FY 18**	**FY 19**	**FY 20**	**FY 21**	**Total**

TPC (as funded, constrained)								
TPC (if unconstrained funding available)								
Difference								

Table 6 - CD-4 Date – Funding Constrained versus Unconstrained	
Element	**Date (or Months)**
Constrained (as currently planned) CD-4 date)	
Unconstrained CD-4 date (if funding available)	
Difference in Months	

Table 7- Life Cycle Cost Estimate - Updated		
Cost Element	**Original CD-1**	**Updated**
Design		
Construction		
Startup-Testing-Commissioning		
Operations (over_____years)		
Shutdown, Dismantling, Decommissioning		
Total Life Cycle Cost		

Table 8- Summary Critical Decisions and Other Key Milestones			
Milestone	**Description**	**Scheduled Date**	**Actual Date**
Critical Decision 0	Approval of Mission Need		
Critical Decision 1	Approve Alternative Selection		
Critical Decision 2	Approve Performance Baseline		
Critical Decision 3	Approve Start of Construction		
Critical Decision 4	Approve Start of Operations		

Table 9 - EIR Team Evaluation of Project Key Performance Parameters		
KPP	**EIR Team Evaluation**	
	Measurable at CD-4?	**Critical Requirement or Function**
	yes/no	yes/no
	yes/no	yes/no

Table 10- Comparison of EIR Team and Project Team TRLs (for new technologies)

New or newly applied technologies	EIR Team assessed TRLs and date	Project Team assessed TRLs and date
New Technology A	TRL X (date)	TRL Y (date)
New Technology B		

Table 11 - Comparison of EIR Team and Project Team PDRI Scores				
	EIR Team Scores	Project Team Scores		
Categories	Date	Date	Date	Date
Cost				
Schedule				
Scope/Technical				
Management Planning and Control				
Safety				
Total				

* Provide table for each PDRI scoring by Project Team

Table 12- Comparison of EIR Team and Project recommended staffing level			
	EIR Team recommended staffing level (for CD-1, CD-2, and CD-3 phases)[1]	**Project desired staffing level (for CD-1, CD-2, and CD-3 phases)**	**Current Project Team staffing level (at the time of the EIR)**
Integrated Project Team[2]			

1. *Based on DOE G 413.3-19, Staffing Guide for Project Management*
2. *Table should decompose Integrated Project Team (IPT) in terms of the number of personnel and skills set, as appropriate, and differentiate between full and part-time IPT members.*

6.3 EIR Team Assessment Criteria

The EIR report will provide an overall assessment, and then provide detailed Major Findings, Findings, and Observations. Definitions of Major Findings, Findings, and Observations are provided below. Additionally, each finding or observation should be tagged with one of the following five categories: 1-Cost, 2-Schedule, 3-Scope/Technical, 4-Management Planning and Control, or 5-Safety.

A Major Finding is any deficiency, condition, shortcoming, error, or omission that affects the project mission, the proposed PB scope, KPPs, TPC, and/or CD-4 schedule, or in the professional judgment of the EIR team, is of such significance that safety, quality, risk management, planning, funding, other documented basis, or the ability of the project team to successfully execute the baseline is jeopardized. Major Findings also include any failure to satisfy a CD or baseline change prerequisite, as identified in DOE Order 413.3B. The EIR team must review and accept the

corrective actions (e.g., updated project documents and evidence files) by the project team to resolve Major Findings before the PME approves the critical decision and signs the PEP. PM may validate the PB before the project team resolves a Major Finding only on the condition that the project team resolves the Major Finding before the PME approves the critical decision.. (This could be a two-step process where the critical deficiency, condition, shortcoming, error, or omission is corrected and where appropriate, an acceptable definitive plan and schedule have been identified for any minor outstanding corrective actions remaining open after the EIR team recommendation.)

A Finding is any lesser deficiency, condition, shortcoming, error, or omission, which does not impact the project mission, scope, KPPs, TPC, or CD-4 schedule, but in the professional judgment of the EIR team, could diminish safety, quality, risk management, planning, funding, other documented basis, or the ability of the project team to successfully execute the proposed PB, unless corrected. At a minimum, a definitive corrective action plan and schedule to make necessary changes that will satisfactorily resolve the Finding(s) must be reviewed and accepted by the EIR team prior to recommending that PM validate the proposed PB or to proceed with project execution.

Observations are not findings, but are comments on other project aspects that were evaluated by the EIR team. Observations may be positive, neutral, or negative. Negative Observations typically identify actual or potential project management issues (not considered Findings). The EIR team will provide a recommendation for negative Observations that the project team should consider for improving project planning, management, or performance. Positive Observations give credit for project management measures taken by the project team that merit recognition and may serve as a "lessons learned" for other project teams. Neutral Observations, while neither negative nor positive, are included in the EIR report to show that an area was, in fact, reviewed by the EIR team. Negative Observations for which suggested improvements are recommended do not require resolution acceptance by the EIR team. However, in any subsequent review, the EIR team or peer review team should note the project team response to Observation recommendations and assess whether there has been any negative impact to project performance where the Observation and suggested improvement were not totally addressed and incorporated. Negative Observations of a prevalent or systemic nature will result in a Finding with an associated recommendation.

To the greatest extent possible, the EIR team should make its determination of Major Findings, Findings, Observations, and related recommendations based on clearly identified and observed nonconformance with stated requirements, such as those in DOE orders, policies, and directives, and note the nonconforming basis in the EIR report. However, consistent with good project management practices recognized by the Project Management Institute (PMI), independent expert judgment of EIR team members is also an acceptable basis to make these determinations on a case-by-case basis, where there may be a perceived weakness in project planning and execution that could potentially result in the project not being executed in a safe manner, or result in breaching the scope, cost, and/or schedule baseline. The EIR team must clearly note its basis for such determinations in the EIR report. Since this EIR SOP is a general guide for planning and performing the EIR, it is not prudent or possible to list or identify specific acceptance criteria for the LOIs in each area—especially where expert judgment is concerned.

7.0 EIR EVALUATION AND FEEDBACK

Post-EIR feedback should be shared to help continuously improve the project review process.

Upon completing the EIR, the PM team lead should solicit and consolidate lessons learned from participating team members. Lessons should then be distributed in a timely manner to help improve future EIRs.

The PM team lead, in coordination with other government team members, should also provide feedback on contractor support to the PM Contracting Officer's Representative (COR). This information is used to prepare annual contractor performance assessment ratings.

ACRONYMS

ANSI	American National Standards Institute
BCP	Baseline Change Proposal
CAP	Corrective Action Plan
CD	Critical Decision
CE	Chief Executive for Project Management
COR	Contracting Officer's Representative
DA	Deputy Administrator
DOE	U.S. Department of Energy
DMS	Document Management System
DNFSB	Defense Nuclear Facilities Safety Board
EIR	External Independent Review
EVMS	Earned Value Management System
FHA	Fire Hazard Analysis
FPD	Federal Project Director
G	Guide
GAO	Government Accountability Office
HA	Hazard Analysis
ICE	Independent Cost Estimate
ICR	Independent Cost Review
IG	Inspector General
IPR	Independent Project Review
IPT	Integrated Project Team
KPP	Key Performance Parameter
LOI	Lines of Inquiry
M&O	Management and Operating
MR	Management Reserve
NNSA	National Nuclear Security Administration
NRC	Nuclear Regulatory Commission
O	Order
OPC	Other Project Cost
PED	Project Engineering and Design
PARS	Project Assessment and Reporting System
PB	Performance Baseline
PDRI	Project Definition Rating Index
PEP	Project Execution Plan
PM	Office of Project Management
PMB	Performance Measurement Baseline
PME	Project Management Executive
PMI	Project Management Institute
PMSO	Project Management Support Office
PRD	Program Requirements Document
PSDR	Preliminary Safety Design Report
PSO	Program Secretarial Officer
PSVR	Preliminary Safety Validation Report
PMP	Project Management Plan
PMRC	Project Management Risk Committee
RCA	Root Cause Analysis
SDS	Safety Design Strategy
SME	Subject Matter Expert
SOP	Standard Operating Procedure

SOW	Statement of Work
SSC	Systems, Structures, and Components
TEC	Total Estimated Cost
TPC	Total Project Cost
TRA	Technology Readiness Assessment
TRL	Technology Readiness Levels
WBS	Work Breakdown Structure

APPENDIX A – REVIEWER'S CHECKLIST FOR 2008 RCA/CAP TOPICS

Reviewer's Checklist for DOE 2008 RCA/CAP Topics			
DOE Contract and Project Management Issues	**Corrective Measures**	**Core Competencies** ***(EIR in support of CD-2)***	**EIR Team Validation Checklist** ***(Minimum LOIs to address RCA/CAP items)***
1. DOE often does not complete front-end planning to an appropriate level before establishing project PBs.	Corrective Measure 1: Establish and implement measures to ensure adequate project requirements definition is accomplished before a project PB is established. This would include defining planning benchmarks, ensuring adequate resource allocation, and conducting third-party reviews prior to project approval, additional funding authorization, and project execution.	(1) Are the scope, cost, and schedule firmly supported, and validated with appropriate tools, with sound underlying technical, economic, and programmatic bases, assumptions, and front-end planning (i.e., comparison with EIR Team PDRI)? (2) Has the design matured to the appropriate degree and been validated through appropriate and credible processes? (3) Is new technology mature enough and validated through appropriate tools [i.e., comparison with EIR Team's Technology Readiness Assessment (TRA)]? (4) Has the project minimized risk by desegregating a single base project into multiple smaller projects, where appropriate?	☐ Is the design mature enough to validate a PB? ☐ Should the project be decomposed into smaller, discrete (completed and useable) projects to reduce risk, specific project time horizons and enhance the probability of project success? ☐ Has the EIR Team conducted an independent TRA, reviewed the TRA maturation plan and resolved differences with the IPT? ☐ Has the EIR Team conducted an independent PDRI and resolved differences with the IPT?
2. DOE does not have an adequate number of federal contracting and project management personnel with the appropriate skills (e.g., cost estimating, scheduling, risk management and technical) to plan, direct and	Corrective Measure 2: Develop and implement a comprehensive federal staffing plan, with an associated resource plan, to recruit, develop and retain the optimum contract and project management federal workforce.	(5) Does the IPT have an appropriate complement of committed personnel having the requisite skill set who are aware of their role and prepared to successfully execute the project? Has the composition been developed and validated through an appropriate staffing algorithm (i.e., utilizing best practices such as DOE's Staffing Guide)?	☐ Has the EIR Team validated the staffing methodology and resolved differences with the IPT? ☐ Is the project team staff size adequate? ☐ Is the project team skill set mix acceptable? ☐ Is the Management Team effective?

Reviewer's Checklist for DOE 2008 RCA/CAP Topics			
DOE Contract and Project Management Issues	**Corrective Measures**	**Core Competencies** ***(EIR in support of CD-2)***	**EIR Team Validation Checklist** ***(Minimum LOIs to address RCA/CAP items)***
oversee project execution.		(6) Is the FPD certified at the appropriate level and is prepared to manage the project or program?	
3. Risks associated with projects are not objectively identified, assessed, communicated, and managed through all phases of planning and execution.	Corrective Measure 3: Establish objective, uniform methods for assessing, communicating and managing project risks uncertainties. This would include the development of realistic budgets and schedules, and the consistent definition, development, and use of management reserve (MR) and contingency.	(7) Have relevant and comprehensive risk and contingency analyses and Risk Management Plans been conducted and developed by Federal IPT (for contingency) and the Contractor (MR)?	☐ Did the IPT follow best practices in handling risks? ☐ Was the IPT aware of risk management tools such as the Centralized Risk Register Tool? ☐ Are distinctions made and well understood between MR and contingency?
4. Failure to request and obtain full funding of planned incremental funding results in increased risk of project failure.	Corrective Measure 4: Improve the alignment and integration of cost baselines with budget funding profiles to account for federal budget fiscal realities and to ensure uninterrupted project execution. Enhance project and program prioritization and associated resource allocation to minimize negative impacts to the PB.	(8) Has the project established a valid project funding profile?	☐ Has the EIR Team validated that for projects with a TPC<$50M, full funding been provided? ☐ Has the EIR Team assessed that the funding profile remains viable and intact throughout project lifetime? ☐ Is the funding profile "affordable" with the Program/Site budget?
5. Contracts for projects are too often awarded prior to the development of an adequate independent government cost estimate.	Corrective Measure 5: Establish and implement a federal independent government cost estimating capability, including the development of appropriate policy and standards, allocation of required resources, and	(9) Have credible and sufficiently accurate cost and schedule baselines been developed and supported by applicable tools and benchmarks (i.e., best practices such as those identified in the GAO Cost Estimating and Assessment Guide)? *(Refer to Appendix D for*	☐ Has the EIR Team conducted an ICE or ICR? ☐ Have GAO's best practices been incorporated into the cost estimate?

Reviewer's Checklist for DOE 2008 RCA/CAP Topics			
DOE Contract and Project Management Issues	**Corrective Measures**	**Core Competencies** ***(EIR in support of CD-2)***	**EIR Team Validation Checklist** ***(Minimum LOIs to address RCA/CAP items)***
	compilation of unit cost labor and material databases.	*GAO's Twelve Steps of a High-Quality Cost Estimating Process.)*	
6. DOE's acquisition strategies and plans are often ineffective and are not developed and driven by federal personnel. DOE does not begin acquisition planning early enough in the process or devote the time and resources to do it well.	Corrective Measure 6: Strengthen the commitment to federal ownership by aligning and integrating acquisition strategies and acquisition plans, and project plans; clearly defines roles and responsibilities, enhance integrated project teams participation, and ensure accountability for ownership and integration.	(10) Are the Acquisition Strategy and Plan appropriate, support project delivery and provide the best value to the Government? (11) Is the contract aligned with the project and is contractual incentives aligned with project team success metrics?	☐ Are contract and project scope, cost and schedule in alignment with change control? ☐ Is the project Contracting Officer engaged (a key member of the project team)?
7. DOE's organizational structure is not optimized for managing projects.	Corrective Measure 7: Identify and implement opportunities to improve the management and oversight of projects; clarify federal project management roles, responsibilities, and authorities, including field and headquarters integration; establish a project oversight benchmark; and align the program and project organization structures.	(12) Are appropriate management systems and processes in place and functional (i.e. PARSII, EVMS, etc) to allow for FPD and IPT to allow for clear communication throughout organization to ensure authority, accountability and responsibility? (13) Is there a system in place to hold personnel (Feds and Contractors) accountable?	☐ Are IPT and Program roles, responsibilities and authorities clearly defined? ☐ Do HQ and field organizations work well together? ☐ Is PARS II in place? ☐ Is EVMS System certified or is there a timeline in place to do so?
8. DOE has not ensured that its project management requirements are consistently followed. In some instances projects are initiated or carried out	Corrective Measure 8: Re-evaluate program and project management policy, guidance, and standards for alignment and consistency. Establish measures and procedures to ensure that all project	(14) Is the project team cognizant of and complying with DOE policy and guidance? (15) Has the project met all applicable critical decision requirements?	☐ Have DOE O 413.3B requirements been met at each Critical Decision?

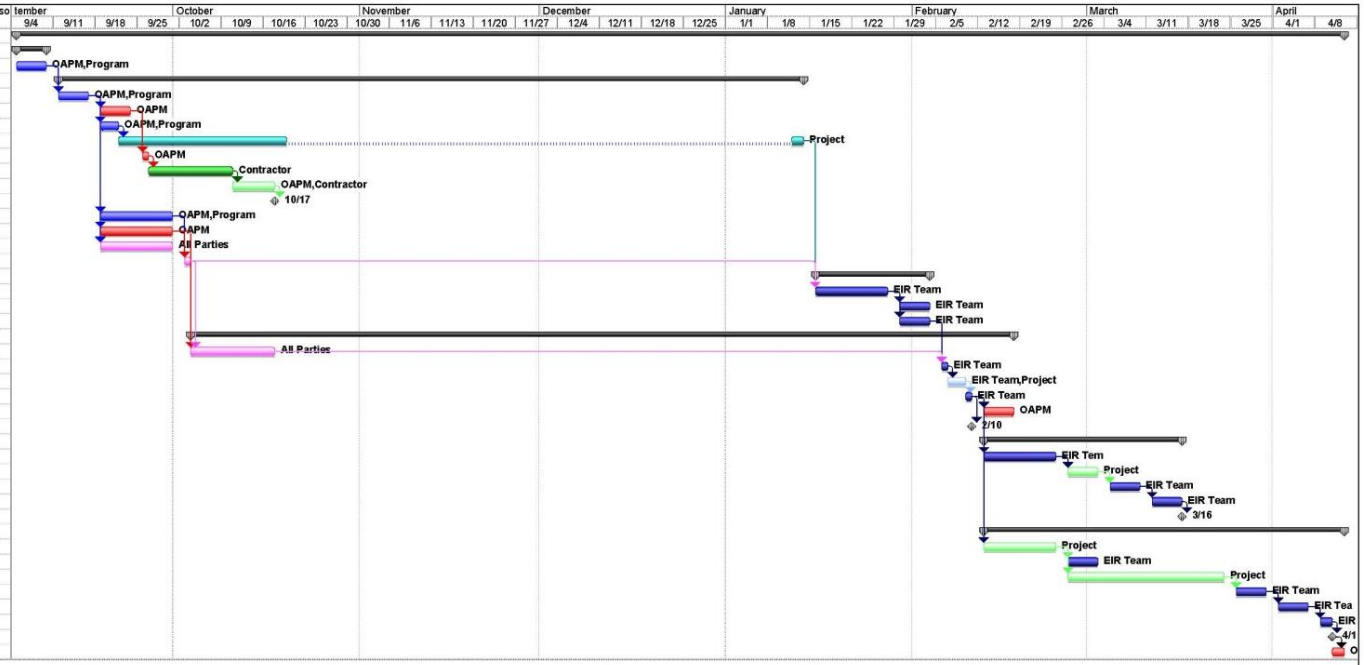
Reviewer's Checklist for DOE 2008 RCA/CAP Topics			
DOE Contract and Project Management Issues	**Corrective Measures**	**Core Competencies** ***(EIR in support of CD-2)***	**EIR Team Validation Checklist** ***(Minimum LOIs to address RCA/CAP items)***
without fully complying with the processes and controls contained in DOE policy and guidance.	management requirements are clearly documented and followed and responsible personnel are held accountable.	(16) Have Lessons Learned from other similar projects and previous reviews been consulted and applied?	

APPENDIX B – EIR PROCESS CHECKLIST

- ☐ Conduct Feds-only EIR Scoping Meeting
- ☐ Develop Statement of Work for Contractor support
- ☐ Ensure that SOW enables EIR Contractor to utilize subject matter expertise (not overly prescriptive), yet encompassing appropriate scope
- ☐ Ensure SOW encompasses document requirements (all project documents reviewed are submitted to PM and EIR findings are submitted in excel spreadsheet)
- ☐ Issue SOW to EIR Contractor requesting cost proposal. Accept (or request modification of) cost proposal and have COR authorize start of work
- ☐ Assemble EIR Review Team members, including Peer Review Team members from Program
- ☐ Develop draft EIR Review Plan
- ☐ Request, receive and review documents from project
- ☐ Complete a sufficiency review of the project documents.
- ☐ Ensure that LOIs identified in the EIR SOP have been consulted and incorporated in project-specific, tailored, and comprehensive LOIs. (See Appendix D)
- ☐ Ensure LOIs from RCA/CAP activities have been incorporated. (See Appendix A)
- ☐ Revise, finalize and distribute EIR Review Plan
- ☐ Conduct on-site review
- ☐ Brief PM Deputy Director of Office of Project Management Oversight & Assessment and Division Chief of Office of Departmental Project Oversight before exit brief
- ☐ Conduct exit brief to include preliminary major findings, findings and observations
- ☐ Disseminate and collect, if appropriate, EIR Feedback forms
- ☐ Brief PM Director upon return to office
- ☐ EIR Team/PM issues Draft EIR Report and coordinates on proposed Corrective Action Plan (CAP)
- ☐ Receive factual accuracy comments from Program Office. If necessary, coordinate pre-final brief and pre-final management brief
- ☐ Brief the PMRC as required
- ☐ Program provides approach, status and evidence files for CAP items
- ☐ EIR team concurs (or does not concur) with completed CAP items
- ☐ EIR team completes Addendum to the EIR Report (or CAP Review Report) to document its determinations regarding the CAP and its recommendation on validation
- ☐ Transmit final EIR Report to PMSO/Program
- ☐ Ensure EIR Report is archived appropriately in PARS II
- ☐ Ensure EIR project documents reviewed are submitted to PM and are archived (Note: Analysts should strive to delete all working draft documents from the network and only post final documents upon finalization of the EIR)
- ☐ Ensure EIR findings are submitted in an excel spreadsheet format for categorization

APPENDIX C – NOTIONAL EIR GAANT CHART SCHEDULE

ID	Task Name	Duration	Predecesso
1	**EIR at CD-2 For Notional Project**	**159 days?**	
2	**Pre-Initiation Planning**	**5 days**	
3	DOE requirement recognized, approved, and budgeted.	5 days	
4	**Initiation**	**90 days**	
5	Conduct & Document Feds-Only Scoping Meeting	5 days	3
6	Prepare Statement of Work for Contractor Support	5 days	5
7	Request EIR Documents from Project	3 days	5
8	Provide project documentation	22 days	7
9	Issue SOW to Contractor	1 day	6
10	Prepare/Submit Proposal	10 days	9
11	Negotiate task, as required.	5 days	10
12	Issue Task Order	0 days	11
13	Coordinate EIR Team Membership	10 days	5
14	Prepare Draft EIR Review Plan	10 days	5
15	On-site Readiness Assessment (if required)	10 days	5
16	Kickoff meeting (conference call)	1 day	13,14
17	**Sufficiency Review**	**15 days**	
18	Perform Initial Sufficiency Review	10 days	8,16
19	Request additional information/Agree to Proceed	5 days	18
20	Finalize EIR Plan	5 days	18
21	**Conduct On-site Review**	**99 days?**	
22	Confirm Dates and Logistics for Review	10 days	14,16
23	In-Brief	1 day?	20,22
24	Interviews	3 days	23
25	Conduct Out-Briefing	1 day	24
26	Disseminate/Collect EIR Feedback Forms	5 days	25
27	Brief MA-60	0 days	25
28	**Report Preparation**	**25 days**	
29	Prepare/Issue Draft Report	10 days	25
30	Factual Accuracy Review	5 days	29
31	Incorporate Factual Accuracy Comments/Review C.A.P.	5 days	30
32	Brief MA-60/OAPM Review	5 days	31
33	Issue Final Report	0 days	32
34	**Corrective Action Process**	**44 days**	
35	Prepare/Submit Corrective Action Plan	10 days	25
36	Review Corrective Action Plan/Provide Comments	5 days	35
37	Prepare/Submit documentation to Implement Major Findings	20 days	35
38	Review documents for major findings	5 days	37
39	Prepare Corrective Action Report	5 days	38
40	Review Corrective Action Report	2 days	39
41	Submit Final CAP Report.	0 days	40
42	OAPM approves report.	2 days	41



Notional Schedule for EIR
Undated

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

APPENDIX D – LINES OF INQUIRY/REQUIRED DOCUMENTATION[1]

D.1 EIR IN SUPPORT OF CD-2, BCP, and CD-3

The following sections identify required documentation and LOIs which, taken together, will generally form the scope of the CD-2/BCP PB EIR and CD-3, Construction/Execution Readiness Reviews but may not be applicable in all reviews. Additional elements or LOIs beyond those presented in this document may be based on unique aspects of the project being reviewed and decisions reached during the scoping meeting. Both the EIR scope and required documentation may vary depending on the type of project and any tailoring that may be applied to the EIR. On a project-by-project basis, one or more of the core elements may be deleted from the review while others areas may be added to the EIR. The focus areas will vary with each project.

The minimum LOIs should include those to address RCA/CAP items (see Appendix A), which are noted accordingly. Also included in the Example LOIs are the core competency questions that are in relation to the specific areas, those areas including Cost, Schedule, Scope, Management (Contract and Project), Risk, and Environment, Safety, & Health, Quality Assurance, and Safeguards & Security.

D.1.1 Required Documentation for CD-2, BCP, and CD-3

The following documents (or equivalents) are normally required for the CD-2/BCP PB EIR and CD-3, Construction/Execution Readiness EIR. Other associated material may be requested by PM and the EIR team to ensure that a complete and accurate review is performed.

- CD-0 Documents (e.g., Mission Need Statement, Approval of Mission Need)
- CD-1 Documents (e.g., Approval of Alternative Selection and Cost Range)
- Work Breakdown Structure (WBS) and WBS Dictionary
- Detailed Resource Loaded Schedule
- Summary project or milestone schedule
- Detailed Cost and Schedule Estimates, including Basis of Cost Estimate, Basis of Schedule Estimate, and all project-basis and assumptions
- Program Requirements Document (PRD) (or equivalent)
- Cost estimate backup, including vendor quotations, parametric formulas, engineering calculation, historical costs, and the like.
- Critical Path and Near-Critical Path Schedules
- System Functions and Requirements Document (also referred to as the "Design-to" requirements or Design Criteria)
- Results of and Responses to Project Design Reviews and Technical Independent Project Reviews
- Design documents including drawings, specifications and design lists
- Design Review Report and comments resolution
- Conceptual Design Report
- Project Execution/Management Plans
- Preliminary Construction Execution Plan
- Integrated Project Team Charter (assignment letters as appropriate)
- Integrated Project Team recent minutes
- Documented Integrated Project Team Processes
- Integrated Project Team Project Definition Rating Index (PDRI)

[1] The same documents and lines of inquiry should be assessed for establishment of the Performance Baseline at CD-2 and BCP.

- FPD Certification status and Integrated Project Team qualifications (resumes as appropriate)
- Federal and contractor organization chart and staffing plans
- Start-up Testing and Turnover Planning documents and other operations readiness plans (as appropriate)
- Hazards Analysis Report
- Defense Nuclear Facilities Safety Board (DNFSB) and Nuclear Regulatory Commission (NRC) Reports and correspondence
- Responses to DNFSB and NRC reports
- Preliminary Documented Safety Analysis (PDSA) reports
- Documentation of DOE and DFNSB endorsement of design and operational safety basis.
- Preliminary Safety Design Report (PSDR) (Hazard Category 1, 2, or 3 nuclear facilities)
- Preliminary Safety Validation Report (PSVR) (Hazard Category 1, 2, or 3 nuclear facilities)
- Preliminary Security Vulnerability Assessment Report
- National Environmental Policy Act documentation
- Risk Management Plan/Process
- Risk Register
- Risk Analysis, including probabilistic (e.g. Monte Carlo) results for both contractor and federal risks
- Acquisition Strategy/Acquisition Plan
- Value Management/Engineering Report
- Quality Control/Assurance Plan
- Interface Documentation (procedures, Memorandum of Understanding/Memorandum of Agreement with site M&O)
- Reports and CAPs from previous internal and external project reviews (if applicable)
- Project Control System description
- Change Control Process
- Configuration Management processes, plans and procedures
- Monthly and Quarterly Progress reports for past year; Quarterly Project Review briefings for past year
- Contracts applicable to the project
- Contract Management Plan
- Pending contract modifications/Requests for Equitable Adjustment
- Project Data Sheets
- Project Funding Profile (Program budget/planning office should identify if this profile is within the Program target budget profile)
- Regulatory agreement documentation (project commitments, milestones, deliverables, dates)
- Responsibility Assignment Matrix **(**RAM)
- Work Authorization Documents (WADs)
- Earned Value Techniques (EVTs)
- EVM Cost Tool/Control Account Plans (CAPs)
- Contractor Disclosure Statement
- Schedule Risk Assessments
- EVM System Description

Additional documents required for BCP and CD-3

- Crosswalk of changes, including narrative explanation, from CD-2 (or previous BCP) PB scope, cost and schedule elements to the submitted BCP PB scope, cost and schedule elements
- CD-2 or prior BCP Documents (e.g., Approval of PB)
- Program Requirements Document (or equivalent)
- All Baseline Change Proposal and disposition documentation

- Evidence and results of constructability reviews of the design
- Final Design Documents (including drawings, specifications, design lists)
- Detailed bottoms-up Cost and Schedule Estimates based on the completed design (includes bases of estimate and assumptions)
- Construction Execution/Management Plans (not Preliminary)
- Constructability Reviews
- Updated Risk Management Plan and Risk Analysis
- Safety Documentation including:
    - PSDR Report
    - Safety Evaluation Report
    - Construction Project Safety and Health Plan

D.1.2 Lines of Inquiry

D.1.2.1 Management (Acquisition, Contract, and Project Execution)

Management / Integrated Project Team (IPT)

- Ensure project is consistent with DOE O 413.3B requirements
- Ensure the IPT has an appropriate complement of personnel possessing the requisite skill set, commitment, and effectiveness in place and prepared to successfully execute the project (i.e. compared to DOE's Staffing Guide or other appropriate staffing model)? (RCA/CAP)
- Review Federal and contractor IPT Charters and determine if all appropriate disciplines are included, including the Contracting Officer. (RCA/CAP)
- Ensure the FPD is certified at the appropriate level, prepared and capable to manage the project or program? (RCA/CAP)
- Confirm that IPT and Program roles, responsibilities and authority and clearly defined. (RCA/CAP)
- Is the project team aware of and well-informed of DOE policy and guidance?
- Assess whether HQ and Field Organizations exhibit a working relationship that will ensure effective interaction. (RCA/CAP)
- Determine if an appropriate Communications Plan or Public Participation Plan is in place based on available stakeholder information and size and scope of project, and if specific stakeholder group issues are addressed relative to project goals and objectives, technical issues, project risk, and environmental strategies.
- Identify applicable GAO, IG, and other oversight body reports and determine if issues or concerns have been resolved or otherwise adequately addressed. Similarly, identify and assess relevant Congressional language in authorization and appropriation bills.
- Is Are the Acquisition Strategy and Plan appropriate, support project delivery and provide the best value to the Government?
- Assess project plans to self-perform construction and operations readiness versus subcontracting that work.
- Validate the developed staffing model and methodology. Assess both Federal and contractor project management staffing in terms of number of personnel, skill set, effectiveness, quality, organizational structure, division of roles/responsibilities, and processes for assigning work and measuring performance. Ensure a Project staffing comparison table is included in the EIR report. (Differentiate between full and part-time IPT members.) (RCA/CAP)

- Ensure IPT membership includes appropriate safety experts. Identify if the Federal IPT nuclear safety expert is validated as qualified by the Chief of Nuclear Safety/Chief of Defense Nuclear Safety in accord with DOE O 413.3B.
- Assess the span of control (in terms of supervisory responsibility, fund and contract management, risk management) of key project management personnel, including the FPD, to determine whether they are established to successfully execute the project.
- Are the scope, cost, and schedule firmly supported with sound underlying technical, economic, and programmatic bases, assumptions, and front-end planning (i.e., PDRI)?
- Assess whether the project team is reviewing and incorporating lessons learned from this and other projects.
- Assess whether the project team is documenting and sharing lessons learned from their project internally and externally.

Project & Construction Execution and Planning

- Review the PEP and determine if it establishes a plan for successful execution of the project, if the project is being managed and executed in accordance with the PEP, and if it is consistent with other project documents. Determine if the PEP has been reviewed by appropriate site and Headquarters' organizations, and if all comments have been resolved.
- Assess key inter-site and intra-site coordination issues and determine if they are identified, addressed and resolved or appropriate plans in place to accomplish resolution.
- Determine if all regulators and stakeholders are identified, and assess if their relationship to the project is evaluated, project impacts on them and their interests identified, and required interfaces with external organizations or authorities addressed.
- Assess adequacy of construction/execution planning.
- Review the adequacy of constructability reviews to assess whether construction documents have been reviewed for accuracy, completeness, and systems coordination issues.
- Assess status of logistics including interface with operating facilities and maintenance organizations, infrastructure interfaces, adequacy of lay-down areas, temporary construction facilities, security and badging readiness, and other logistical elements.
- Identify potential coordination issues, missed details, time delays, potential liability, or inter-contractor coordination items.
- Determine oversight and management of the construction contractor by IPT and site prime contractor.
- Assess adequacy of the Federal IPT, Site M&O/Prime Contractor, and/or Construction Management Organization (as applicable), and construction contractor staffing for construction execution to ensure adequate oversight of the work, including safety, performance, and quality.

Project Acquisition / Contract Management (CD-2, CD-3, and BCP)

- Is the contract aligned with the project and are contractual incentives aligned with project team success metrics?
- Are there appropriate management systems and processes in place and functional to allow FPDs and IPTs to have clear communication throughout the organization to ensure authority, accountability and responsibility?
- Is there a system in place to hold personnel (Feds and Contractors) accountable?

- Does the IPT have an appropriate definition and understanding of their role in effectively providing project oversight?
- Assess the current existing contract including cost, schedule, and work scope against the proposed PB and identify any potential contract and project integration issues. Ensure contract and project scope, cost and schedule are in alignment with change control. **(RCA/CAP)**
- Determine whether the terms of the current contract support the project as currently planned and identify any gaps between the current contract and proposed PB.
- Assess effectiveness of integrated change control and use of change control boards by both Federal and contractor organizations.
- Likewise, assess any planned contract modifications and requests for equitable adjustments relative to the proposed PB.
- Evaluate the status of contract management, and if applicable, plans and schedule to bring the contract up to date.
- Assess draft documents to be provided to the services (e.g., construction) and product (e.g., purchased materials and equipment) subcontractors including submittal of documents by the subcontractors required before notice to proceed (e.g., design requirements, EVMS, and systems testing and turnover requirements).
- Ensure the project Contracting Officer is engaged and a member of the project team. **(RCA/CAP)**

Project Acquisition / Contract Management (CD-3)

- Evaluate any changes from previously approved Acquisition Strategies/Plans and assess whether the current Strategy/Plan still represents best value to the Government.
- Review the PEP and determine if the project is being managed and executed in accordance with it. It should be updated to reflect any changes as a result of final design and be consistent with the other project documents.
- Identify and assess changes to the integrated regulatory oversight program since CD-2. Determine if applicable Federal, state, and local government permits, licenses, and regulatory approvals, including strategies and requirements necessary to construct and operate a facility or to initiate and perform project activities are being obtained when needed to continue project execution on schedule or milestone dates established. Identify if schedule for receipt of authorization from regulators is updated and kept current.

Project Controls/Earned Value Management System[2]

- For CD-2, BCP, and CD-3, assess the status of the contractor's project control system to include the EVMS relative to the requirements of the contract and DOE O 413.3B. If the EVMS system is not certified verify that a timeline is in place to do so. (RCA/CAP)
- For CD-2, BCP, and CD-3, assess whether project control systems and reports are being used to report project performance, whether the data is being analyzed by the Federal IPT and contractor management, and that management action is taking place as an outcome of the analysis function.
- For CD-2, BCP, and CD-3, evaluate the control process whereby projects incorporate formal changes, conduct internal re-planning, and adjust present and future information to accommodate changes.

[2] The EIR Team review of a contractor's Earned Value Management System (EVMS) does not constitute an EVMS Certification Review or Surveillance Review.

Determine if changes, including acceptable retroactive changes (correcting errors, routine accounting adjustments, or improving accuracy of the performance measurement data), are documented, justified, and explained.

- For CD-2, BCP, and CD-3, if the project contractor has a certified EVMS, determine whether a surveillance system is in place to maintain the system for continued compliance with the American National Standards Institute (ANSI) Standard (ANSI/EIA-748A or applicable version).
- Review the contractor's EVMS system/project control description.
- Assess the contractor's EVMS surveillance program.
- For CD-2, BCP, and CD-3, if the project contractor does not have a certified EVMS, assess the likelihood of the EVMS being certified no later than CD-3.
- Determine if there is an EVMS certification review scheduled to occur within sufficient time to permit EVMS certification, and assess the status of efforts and management focus on ensuring the EVMS is ready for certification review.
- If a certification review is in process, assess the status of efforts and management focus on resolving open issues to obtain certification within sufficient time preceding the baseline Critical Decision dates.
- For CD-3, if the project contractor does not have a certified EVMS, but a certification review is in process of being completed, assess the status of efforts and management focus on resolving open issues to obtain certification consistent with the baseline CD-3 date.
- Ensure that the project has a reporting capability through PARS II. (RCA/CAP) Ensure contract requires Contractor to perform electronic upload. Ensure Contractor has extraction tools (is is developing) to enable capability to electronically upload when CD-2 is approved.
- Assess the contractors Earned Value Methods and EVTs allowed.
- Do the Earned Value Methods/EVTs allow for the objective measurement of work effort?
- Is Level of Effort (LOE) minimized and used only for effort that is support in nature and cannot be discretely measured?
- If percent complete is used as an EVT, does the contractor have quantifiable backup data to support the percent complete? Is it reasonable?
- Is subcontractor effort objectively measured?
- Reconcile the contract dollar value to the budgeted value of work authorized by month, quarter, and/or year.
- Is a rolling wave or block planning approach being followed to recognize that it may not be practicable or possible to do grassroots planning for an entire project?
- Are work package activity and planning package durations sufficient to successfully complete the work?
- How do resource requirements, availability, and hours compare to the work package activity and planning package durations?
- Does the rationale provided for long duration work package activities (> 2-3 mo.) and planning packages (> 6 mo.) make sense?
- Are the control account budgeted hours/dollars sufficient to complete the work package activity and planning packages?
- Are control accounts budgeted by Element of Cost?
- Are work package level risks and assumptions understand and articulated?
- Are Earned Value Techniques (EVT) assigned at the work package level?
- Is the work package earned value technique supported by activity level rules of credit? If so are they consistent with the discrete, LOE, or apportioned effort characterization of the work package.

- Where required, is quantifiable backup information documented and reasonable at the work package level? Are they supported by rules of credit for activities greater than 2 months or activities with discrete titles if under 2 months?
- Is BCWP is calculated in a manner consistent with the way work is planned, scheduled and budgeted?
- Does the control account critical path make sense?
- Are there control account driving (or near critical) paths?
- What is the percentage of control account work package activities and planning packages on the project critical path (≤ 0 days float @ 10-40%) and/or near critical paths (≤ 10 days float @ 25-50%)?
- Is the availability of procurement items, material resource requirements, and specialized equipment factored into work package activity and planning package durations?
- How do resource requirements, availability, and hours compare to the work package activity and planning package durations?
- If work package activities are occurring concurrently, does the resourcing across these activities make sense?
- Is there a logical sequence of design and construction work package activities and planning packages in the project schedule from start to finish capable of meeting the scope requirements?
- Can project milestones and events be successfully completed by baseline finish dates, and at the baseline cost value?
- Has a valid time-phased performance measurement baseline been developed for monitoring progress and performance?
- Is there an adequate level of MR budget identified to cover anticipated risks and emerging risks?
- Are there documented business processes in place to manage the work and being followed?

Value Management/Engineering

- Assess the applicability of Value Management/Engineering and if a Value Management/Engineering analysis has been performed with results being incorporated into the proposed PB.
- Provide an assessment of the Value Management/Engineering process for this project. Include whether the Value Management team had a reasonable skill mix and experience background.
- Assess whether life cycle cost analysis was reasonably performed as part of the trade-off studies and various alternatives reviewed.
- For CD-3, assess the application of Value Management/Engineering during final design, and if results have been incorporated into the approved PB.

D.1.2.2 Scope

- Are the scope, cost, and schedule firmly supported with sound underlying technical, economic, and programmatic bases, assumptions, and front-end planning (i.e., PDRI)?
- Has the design matured to the appropriate degree and been validated through appropriate and credible processes?
- Is the new technology or technology applied in a new application mature enough and validated through appropriate tools (i.e. comparison with EIR Team's TRA)?
- Have design review comments, integration issues (with Operations and other projects) and constructability constraints been addressed sufficiently?

Basis of Scope[3]

- Assess whether the WBS and WBS dictionary incorporate all project work scope, and that the defined work scope and system requirements are derived from and consistent with the approved Mission Need and Program Requirements Document and include a clear definition of responsibility for execution of each of the defined portions of work.
- Assess whether the Integrated Master Schedule (IMS)/Resource Loaded Schedule (RLS) is consistent with the WBS for the project work scope.
- Assess if the WBS represents a reasonable breakdown of the project work scope and if it is effective for internal management control and reporting. (RCA/CAP
- Identify and assess the basis for (and reasonableness of) key programmatic, economic, and project scope assumptions as related to the quality and completeness of the WBS, technical and design requirements, and risk management planning and contingency requirements.
- Confirm that a PRD exists and that project planning reflects the PRD.
- Assess to ensure consistency between PRD, PEP and contractor PMP; ensure KPPs are clearly defined and documented.
- Assess whether the CD-4 (project completion) activities and requirements and project KPP are clearly defined in the PRD. Assess whether these activities and requirements are sufficiently defined, achievable, under change control and not expected to change, quantified, measurable, and can reasonably be determined as complete. Identify the CD-4 requirements/activities/KPPs in a separate table in the EIR report, including summary analysis results.
- Assess whether the requirements have been defined well enough to validate a PB.(RCA/CAP)
- Assess adequacy and completeness of standards and requirements to include DOE Directives (e.g., Policies, Orders, Standards, and Guides to include DOE O 413.3B, DOE-STD-1189, etc.) identified as being applicable and appropriate to the project either due to the nature of the project or contract requirements. Identify any areas of non-compliance with the identified standards and requirements.
- Ensure that an independent PDRI is conducted by the EIR Team and a PDRI Score Summary Table is included. Differences with the IPT PDRI should be assessed. (RCA/CAP)

Additional Requirements for BCP or CD-3

- Identify the source and reason for any proposed changes to the project mission need, scope, or WBS since CD-2. Assess the basis and justification for these changes.
- Identify and assess any changes to the basis for and reasonableness of key programmatic, economic and project scope assumptions as related to the quality and completeness of the WBS, technical and design requirements, and risk management planning and contingency requirements since CD-2.
- Identify any changes to the CD-4 (project completion) activities and requirements and project KPPs since CD-2. Assess the basis and justification for any changes.
- Assess completeness and quality of drawings and design specifications. Review selected construction elements or systems, including the key project elements posing the more difficult construction challenges.
- Assess whether bid packages are sufficiently clear and well-defined as to be ready for bid.

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[3] For CD-2 and BCP, as defined in the Work Breakdown Structure, System Functions and Requirements; for CD-3, as defined in Work Breakdown Structure, Final Drawings and Specifications, Final Design Functions and Requirements, and Site Final Design Review.

- Assess whether all final design functions and requirements are reflected in the approved PB, including safety SSCs and external requirements, such as permits, licenses, and regulatory approvals.
- Assess whether all required changes from the Site Final Design Review are incorporated into the approved PB, and assess whether the technical scope elements of the approved PB remain consistent with that approved at CD-2. Assess the basis and justification for any scope changes since CD-2.

D.1.2.3 Basis of Design/Engineering (for CD-2 or BCP)

- Review the basis of design and assess the reasonableness of the design requirements and output for each function/operation (summarize the assessment by providing a description of the unit operation, the design parameters, the basis of the design parameters and an assessment of whether the design basis is reasonable).
- Determine if engineering and design requirements and expectations are being met for modification activities within an existing nuclear facility consistent with DOE Order 413.3B and DOE-STD-1189, *Integration of Safety into the Design Process*, including establishment of a Code of Record, clearly and consistently stated design requirements and criteria, and an effective change control process. Lessons learned from previous similar projects have been incorporated, and significant unresolved issues are being properly managed.
- Ensure safety requirements resulting from review of safety documents (e.g., PSDR and PSVR) are incorporated into the design and baseline
- Verify appropriate consensus codes, standards, and design guides have been used in development of the design of the project and that the project has established and maintained a "Code of Record." (DOE Order 413.3B, Attachment 1, Item 12)
- Determine if potential needs for any exemptions or equivalencies from safety requirements have been evaluated, and there is a well-developed plan to address those needs.
- Has the project established design requirements and performance criteria documents to guide the design efforts.
- Verify there is an effective change control process in place, particularly for safety-related systems, compatible with the Un-reviewed Safety Question Determinations (USQD) process for nuclear facilities.
- Interfaces with the existing facility are understood and being actively managed. For example, there is evidence that enclosure ventilation requirements are compatible with the facility's capabilities. As another example, automatic fire suppression in the enclosures is being addressed.
- Seismic and criticality safety requirements are adequately incorporated into the design process.
- Lessons learned from completion of prior work packages are being considered in development of the new work scope. Work scope that is different from prior installations has been identified, the differences are understood, and those differences are being properly addressed.
- Significant unresolved issues associated with technology, design, or nuclear safety, including any outstanding DNFSB issues, are being tracked and have a clear path to closure.
- Review process and material balance flow sheets to assess the reasonableness of the input and output parameters for each unit operation, and adequacy to support environmental permitting, licensing and other regulatory decisions.
- Ensure that the design addresses results of reliability, availability, maintainability, and “inspectability” (RAMI) analyses.

Preliminary Design Review and Comment Disposition (for CD-2 or BCP)

- Assess whether the design has progressed far enough (design maturity) to support the proposed PB.
- Confirm that a design review has been performed by a qualified team, to ensure the adequacy of the preliminary design including adequacy of the drawings and specifications, and assess whether they are consistent with system functions, requirements, and KPPs.
- Review the design review comments and responses. Based on a reasonable sample, assess whether these comments have been incorporated into the design, and whether the costs and schedule associated with design changes have been incorporated into the PB.

Sustainable Design

- Assess whether the project team has identified sustainable design features, in accordance with the Energy Policy Act of 2005, Executive Orders 13423 and 13514, and DOE O 450.1 chg 3, and that these features have been properly accounted for within the proposed PB.
- Assess whether the project is eligible for LEED certification.
- (For EIR in support of BCP or CD-3) Identify and assess any changes to sustainable design requirements and plans since CD-2.

New Technology and Technology Readiness

- Review all technology decisions that have been made to date and determine whether the project is incorporating new technologies or existing technologies in new applications. Identify critical technologies.
- Assess the plans for and results of tests of new technologies or new applications of existing technology. Determine if the scale of the test is adequate to mitigate risks and/or safety concerns.
- Assess whether identified technologies are at a sufficient level of maturity to be incorporated into the design and baseline. A TRA should be conducted by the EIR Team on new technologies and differences with the IPT Technology Readiness Levels (TRLs) assessed. Ensure a TRL Score Summary table is included in the EIR report.(RCA/CAP)
- Assess the TRA and respective scoring plan for completeness and consistency with industry/Federal standards and benchmarks.
- Assess whether the proposed PB adequately provides for sufficient cost and schedule to accomplish required research, development, testing, and implementation of these new technologies or new applications of existing technologies.
- Determine if the Risk Management Plan accounts for risks associated with new technologies or new applications of existing technologies, and that adequate contingency has been included.
- Identify and assess any changes to technology readiness since CD-2, a BCP, or CD-3.
- Assess whether the identified technologies are at an increased and sufficient level of maturity to be included in construction. To the extent possible, provide an analysis of the TRL for the applicable technologies identified [Government Accountability Office Report 07-336 Major Construction Projects Need a Consistent Approach for Assessing Technology Readiness to Help Avoid Cost Increases and Delays, March 2007]
- Assess whether the approved PB adequately provides for sufficient cost and schedule to implement these new technologies or new applications of existing technologies.
- Determine if the Risk Management Plan accounts for risks associated with new technologies or new applications of existing technologies, and that adequate contingency has been included.

D.1.2.4 Schedule

Basis of Schedule[4]

- For the selected WBS elements, summarize the detailed basis of schedule estimate.
- Assess the Integrated Master Schedule (IMS) to determine if it meets the Generally Accepted Scheduling Principles (GASP) as outlined in Planning and Scheduling Excellence Guide (PASEG).
- Assess reasonableness of resource loading, including what resources are loaded.
- Identify and assess the basis for and reasonableness of key programmatic, economic and project schedule assumptions as related to the quality of estimates for each WBS element, and risk management planning and contingency requirements.
- Determine if schedule contingency is derived quantitatively and if the calculated duration is placed between the end of the last project critical path activity and the "Submit Request for CD-4" milestone.
- Identify whether the estimated schedule for the project is reasonable based on professional expertise, parametric estimates, historical data, etc.
- Include CD milestone data on the project cost profile table referenced above and include summary baseline schedule tables of the proposed milestones (i.e., CD dates and other significant or critical project dates) in the EIR report.
- Is the entire authorized scope of work in the schedule?
- Are critical subcontractor schedules fully integrated with the prime schedule at a level that defines key interfaces and the manner in which the effort will be accomplished?
- Is the schedule period of performance consistent with authorized contractual dates?
- Are all key schedule milestones and events identified?
- Are the necessary deliverables identified within the schedule and planned appropriately?
- Is the schedule vertically integrated and logical: Do the lower level schedules support the higher level schedules so that each higher level reflects the lower level status?
- Is the schedule horizontally integrated: Are work package activity and planning package predecessors and successors correct?
- Are interdependencies (key hand-offs) identified between prime control accounts and subcontractor work?
- What percentage of the project schedule is sequenced concurrently, sequentially?
- Does the rationale provided for constraints, leads and lags make sense?
- Are there any "hard" constrained dates in the schedule, and are they minimized to requirement dates?
- Are soft constraints, if any, reasonable and justified?
- Is the WBS and corresponding work package activity coding scheme a direct representation of the work scope in the project?
- Is the project schedule responsibility based to the work package activity level?

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[4] As defined in the Integrated Master Schedule/Resource Loaded Schedule

Critical Path

- Assess whether the Critical Path is reasonably defined. Assess whether the Critical Path reflects an integrated schedule and schedule durations are reasonable.
- For BCP or CD-3, identify any changes since CD-2.
- For CD-2, BCP, and CD-3, provide the duration between the Critical Path completion date and the Project Completion date (CD-4). Assess whether the schedule contingency (float) is reasonable for this type of project.
- For CD-2, BCP, and CD-3, determine if there is a clearly defined critical path leading to submission of the CD-4 request.
- For CD-2, BCP, and CD-3, assess the critical path schedule for level of effort activities.
- For CD-2, BCP, and CD-3, verify that "near critical paths" are clearly identified.
- Does the scheduling process calculate a project critical path being the longest path, with the least amount of float from start (or status period) to finish?

D.1.2.5 Cost

Basis of Cost[5]

- For selected WBS elements (typically, those constituting significant cost and/or risk), summarize the detailed basis for the cost estimate.
- Assess the method of estimation and the strengths/weaknesses of the estimates for each WBS element reviewed, including application of GAO's best practices in cost estimating (RCA/CAP).
- Identify and assess the basis for and reasonableness of key programmatic, economic and project cost assumptions as related to the quality of estimates for each WBS element, and risk management planning and contingency requirements.
- Identify whether the estimated costs for the project are reasonable based on professional expertise, parametric estimates, historical data, etc.
- Assess the amount of, and the basis, for escalation.
- Assess the reasonableness of MR and cost contingency and verify that the cost value of schedule contingency is included in the TPC.
- Are the costs identified by Element of Cost (EOCs)?
- Are all tasks budgeted for? Does the budget match the authorized budget on the Work Authorization Document (WAD)?
- Are all EOCs included in the work package?
- Does the span of the work package budgets match the activities on the formal schedule?
- Does the span of the work packages seem reasonable (relatively short term)?
- What is the basis of budget for vendors/subcontractors? Firm purchase order? Subcontract?
- Are there historical costs or factors that may be relevant to the current and future work?

[5] As defined in the Integrated Master Schedule/Resource Loaded Schedule

- Are indirect rates stable? What impact might they have on future rates and project costs?
- Is the time phased budget in the EVM Cost Tool based on a reasonable BOE and logical schedule?
- Are there any cost variances or developing cost variances? What are the reasons and any impacts on future costs?
- Have any cost risks been identified? Are they included in the Risk Register?
- Assess the MR/contingency drawdown and utilization history for reasonableness and determine if sufficient MR and contingency remains to execute the project plan.
- Assess Undistributed Budget (UB) and its remaining scope and budget (if any). What effort is included in UB? Does it include Authorized Unpriced Work (AUW)? What is the impact of the scope and budget in UB for future effort?

Additional Cost Basis Requirements for BCP or CD-3

- Identify the source and reason for any proposed substantive changes to the Resource Loaded Schedule since CD-2 relative to its consistency with the approved PB (TPC, CD-4 completion schedule). Assess the basis and justification for these changes.
- Identify and assess any changes since CD-2 to the basis for and reasonableness of key programmatic, economic, and project cost assumptions as related to the quality of estimates, and risk management planning and contingency requirements.
- Identify the amount of, and basis for, escalation. Assess the basis and justification for any changes since CD-2.
- Assess basis of resource loading, including what resources are loaded. Determine if resource requirements factor in project performance since CD-2 or performance of other similar projects in execution.
- Provide updated project cost profile tables (See Section 6.2).
- Identify and assess the basis and justification for any changes to the TPC and CD-4 schedule since CD-2.
- For BCP, ensure that the PB is reanalyzed for both cost and schedule risks at 95% confidence level; and ensure the revised PB is reflected in budgetary requests and funding profiles.

Funding Profile and Budget

- Review and provide the basis for the Funding Profile (e.g., latest Project Data Sheet).
- Compare the annual budget with the cost requirements, and provide an assessment of whether the costs and budget are reasonably linked and can withstand normal budget turbulence during fiscal year transition periods (e.g., continuing resolutions, new start restrictions, etc.)
- Identify any significant disconnects between the PB requirements and budget/out-year funding. Determine the reasonableness of the Budget Authority versus Budget Obligation profiles and assess the affordability of the project within the Program's budget profile. (RCA/CAP)
- Validate the funding profile remains viable and intact throughout the project lifetime. (RCA/CAP)
- Include budget/funding information in project cost profile tables (Must Do).
- Determine for those projects with a TPC<$50M whether full funding has been requested in the same appropriation year (a DOE Order 413.3B recommendation), and indicate whether it has been approved.

D.1.2.6 ES&H, QA, Safety & Security

Environmental, Safety and Health

- Are ES&H requirements, resources, and plans adequate to establish a performance baseline and support start of construction?
- Has a Construction Project Safety and Health Plan been developed and prepared to assure worker construction hazards will be evaluated and controls adequately addressed?
- Review the Integrated Safety Management System and assess whether safety has been appropriately addressed throughout the lifecycle of the project.
- Do the project teams have the right resources in place to provide oversight?
- What environmental permits are required and are they in place?

Quality Control/Assurance

- Assess the applicability, completeness, adequacy, and flow-down of the Project Quality Assurance Program, including software quality assurance (SQA), based on DOE Order 414.1C and 10 CFR 830 Subpart A.
- Review the record of QA audits performed on the project and the disposition of the audit findings.
- Determine if the QA/QC Plan and implementing procedures address personnel training and qualifications, quality improvement programs, document and record management, work processes, receipt inspection, commercial grade dedication, management and independent assessments, acceptance test planning and implementation, and the process for making field changes. Assure that the contractor QA/QC Plan addressing the scope and content for the CD-2 phase of the project has been reviewed and approved by the appropriate DOE organization.
- Assess the QA/QC requirements for procurement, installation and construction planning and work processes.
- Assess whether QA requirements (NQA-1 if applicable) have been appropriately incorporated into the "Design-to" functions, and costs, time and resources adequately estimated and included in the baseline.

D.1.2.7 Safeguards and Security

- Assess whether a Preliminary Security Vulnerability Assessment Report as defined in DOE O 470.4B has been updated as required by DOE O 413.3B.
- Assess the completeness and accuracy of the applicable safeguards and security requirements, the methods selected to satisfy those requirements, and any potential risk acceptance issues applied to the project and their incorporation into the project.
- Assess adequacy of incorporation of Design Basis Threat requirements into the baseline.
- Review the proposed PB to ensure that cost, schedule, and integration aspects of safeguards and security are appropriately addressed.
- Assess whether all feasible risk mitigation has been identified and that the safeguards and security concerns for which explicit line management risk acceptance will be required are appropriately supported.

D.1.2.8 Risk and Contingency Management

- Describe the approach used to identify project risks and assess the adequacy of this approach, as well ensure best practices are incorporated. (RCA/CAP)
- Assess adequacy and completeness of both DOE and contractor risk management planning including the method(s) used to identify risks, and whether a reasonably complete list of potential risks was developed for analysis.
- List key risks (e.g., programmatic, economic, those resulting from assumptions, technical, including those associated with use of critical technologies, etc.) and risk rankings in a table, and provide the EIR team's assessment of the risk.
- Assess whether all appropriate risk handling and mitigation actions, including accepted risks and residual risks, have been incorporated into the PB. Provide an assessment of whether the analysis for and basis of contingency is reasonable for this type of project and its associated risks.
- Identify and assess cost and schedule contingency (both contractor and DOE).
- Ensure contingency analysis and allowances are tied to risk assessments.
- Ensure contingency accounts for estimate uncertainty, which is directly tied to design maturity and the estimating methodologies used.
- Assess adequacy of the qualitative analysis and rating (high, medium, or low) of current risks (including site specific factors such as availability of contractors) for probability of occurrence and for consequence of occurrence.
- Evaluate the extent and adequacy of quantitative risk analysis.
- Evaluate whether the risk watch list and risk assessment sheets appear to be complete.
- Evaluate the adequacy of the management control process for risk status/updating.
- Ensure the project team is aware of risk management tools (such as the Centralized Risk Register Tool). (RCA/CAP)
- Ensure the project team fully understands the distinction between MR and Contingency. (RCA/CAP)

Additional Risk Requirements for BCP and CD-3

- Identify and assess any substantive changes to the Federal and contractor risk and contingency management plans or processes since CD-2.
- Assess whether the risk assessment and management plan have been updated, as appropriate, to address any new risks identified in final design and evaluate the adequacy of the management control process for risk status/updating.
- Assess MR/contingency drawdown and utilization history for reasonableness, and determine if sufficient contingency remains.
- For BCP, ensure that the PB is reanalyzed for both cost and schedule risks at 95% confidence level; and ensure the revised PB is reflected in budgetary requests and funding profiles.

D.1.2.9 Start-Up Planning and Operations Readiness

- Ensure the start-up test plan identifies how tests will be determined to be successful, and that associated equipment and instrumentation has been included in the preliminary design.
- Review the startup and operational readiness test requirements and plans and assess whether they represent:

    - The acceptance and operational system tests required to demonstrate that the system meets design performance specifications, safety requirements, and KPPs, and
    - Sufficient scope definition to enable reasonable estimates of cost, schedule, and resources.
- Ensure traceability of functional, operational, and safety requirements into the start-up test plan.
- Determine any exceptions taken by potential construction contractor or project consultants in meeting startup test specifications.
- Assess whether cost, time and resource estimates are defensible to accomplish the required startup activities and have been included in the PB.
- Assess whether there is sufficient cost and schedule contingency for test and equipment failure during start-up testing.
- Assess whether the start-up plan has been fully integrated with existing functional organizations including security.
- Assess whether results of tests (e.g., equipment tests, process tests, surrogate tests, etc.) have been factored into startup and operational readiness planning.

D.2 EIR IN SUPPORT OF OTHER ACTIVITIES

D.2.1 Front-End Planning Review

Lines of Inquiry

- Determine the extent to which a complete WBS and a network schedule have been developed.
- Evaluate the completeness and appropriateness of key project requirements, including alignment with approved mission need.
- Review all major programmatic, regulatory, budget funding, economic, and project assumptions.
- Assess the quality of the preliminary PEP.
- Assess the Analysis of Alternatives (AoA) study.
- Determine continued relevance/appropriateness of Acquisition Strategy.
- Examine whether the preliminary design has an integrated approach to engineering and operations.
- Examine completeness of VE activities.
- Assess whether the IPT Charter is complete with representation from key functions and areas.
- Assess whether safety has been appropriately incorporated into design, management, and work process.
- Review any DNFSB and/or NRC interfaces and discuss with the local representatives the status of their involvement. Assess whether DNFSB/NRC issues are being reasonably considered and addressed. If not, identify the outstanding issues, assess when they will be resolved and determine what risks they pose.
- Assess completeness of process for IPRs including Technical IPRs.
- Review any requirements for Long-Lead Procurement or early site work and associated plans.
- Determine whether regulatory requirements are being met and/or addressed by design and management (i.e. NEPA, RCRA, TSCA, CERCLA, CWA, CAA, etc).
- Determine the quality of Hazards Analysis.
- Assess incorporations of Sustainable Development.
- Determine completeness of Quality Assurance Plan.

- Assess plans for compliance with safeguards and security requirements.

Required Documentation

In general, the following documents are useful for a Front-End Planning Review. Other associated material may be requested by PM and the EIR team to ensure a complete and accurate review.

- CD-0 Document (e.g., Mission Need Statement, Approval of Mission Need)
- CD-1 Documents (e.g., AoA Study, Approval of Alternative Selection and Cost Range)
- WBS and WBS Dictionary
- Network Schedule
- Conceptual Design Report
- Acquisition Strategy
- PEP
- Risk Management Plan
- IPT Charter
- IPT PDRI documentation
- Design Review documents
- Technical Independent Project Review documents
- Long-Lead Procurement documentation
- Environmental Documents
- Sustainable Development documentation
- Preliminary Security Vulnerability Assessment Reports
- Conceptual Safety Design Report
- Preliminary Hazards Analysis Report
- Quality Assurance Program documentation

D.2.2 Project Status Assessment Review

Lines of Inquiry

- Assess the current contract including cost, schedule, and scope of work relative to the current baseline and identify any potential contract and project integration issues or gaps between the terms of the current contract and the project as currently planned and executed.
- Likewise, assess any planned contract modifications and requests for equitable adjustments relative to the proposed PB.
- Evaluate the status of contract management, and if applicable, plans and schedule to bring the contract up to date.
- Assess and identify any deficiencies in the Federal or contractor IPTs that could hinder successful execution of the project.

- Review the PEP and assess if the project is being successfully managed and executed in accordance with the PEP.
- Review Project Acquisition Strategy/Plan and assess if the project is being successfully managed and executed in accordance with the Strategy/Plan.
- Review the Project Quality Assurance/Quality Control Plan and assess if the project is being successfully managed and executed in accordance with it.
- Assess the status of the contractor's project control system to include the EVMS relative to the requirements of the contract and DOE O 413.3B.
- Assess whether the project control system and reports are being used to report project performance, whether the data are being analyzed by the Federal IPT and contractor management, and that management action is taking place as an outcome of the analysis function.
- Evaluate the control process whereby projects incorporate formal changes, conduct internal re-planning, and adjust present and future information to accommodate changes. Determine if changes, including acceptable retroactive changes (correcting errors, routine accounting adjustments, or improving accuracy of the performance measurement data), are documented, justified, and explained.
- Assess the status and results of the EVMS surveillance system for maintaining compliance with the ANSI/EIA-748.
- Assess status of start-up planning and operations readiness.
- Assess the status of updated hazards/safety analysis documentation and identify potential impacts to the approved PB.
- Assess whether the risk assessment and management plan have been updated, as appropriate, to address any new risks identified, and evaluate the adequacy of the management control process for risk status/updating.
- Evaluate whether the risk watch list appears to be complete.
- Identify status of cost and schedule contingency, and provide an assessment of whether it remains reasonable for the project and its associated risks at the current state of execution.
- Assess MR/contingency drawdown and utilization history for reasonableness, and determine if sufficient contingency remains.
- Assess the status of the Critical Path is reasonably defined. Assess whether the Critical Path continues to reflect an integrated schedule and that schedule durations are reasonable.
- Provide the duration between the Critical Path completion date and the Project Completion date (CD-4). Assess whether the schedule contingency (float) remains reasonable at this phase of the project.
- Ensure changes are implemented in a timely and orderly manner: Have changes to the project schedule been recorded following an approved process to include instances where existing activities with assigned chargeable accounts have been deleted or new activities added?

Required Documentation

In general, the following documents are useful for a Project Status Assessment Review. Other associated material may be requested by PM and the EIR team to ensure a complete and accurate review.

- PEP
- BCPs and supporting backup
- Documentation of prior independent reviews
- Construction Execution Plan
- IPT Charter and Recent Meeting Minutes

- IPR Documents
- Hazards/Safety Analysis documentation
- Quality Assurance Program documentation
- Applicable contract documentation
- Project Controls/EVMS reports
- Risk management documentation (Risk Management Plan, including the Federal and Contractor Plan, risk register)
- Regulatory agreement documentation (project commitments, milestones, deliverables, dates)
- Federal and contractor organization and staffing plans

D.3 ADDITIONAL SOURCES OF INFORMATION

Program Office Lines of Inquiry

- NNSA, Project Review Business Operating Procedure
  https://nnsaportal.energy.gov/intranet/na-mb/Active%20Policies/BOP-06.04.pdf

- SC, Independent Review Handbook
  http://science.energy.gov/~/media/opa/pdf/processes-and-procedures/1201_Review_Process.pdf

- EM, Project Management Resources:
  http://energy.gov/em/services/program-management/project-management/project-management-resources

Other LOI Resources

- GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs:
  http://www.energy.gov/projectmanagement/project-management-policy-guidance-documents

  ADD GAO Schedule Guide

- DOE G 413.3-X Series Guides:
  http://www.energy.gov/projectmanagement/project-management-policy-guidance-documents