

INDEPENDENT COST ESTIMATE (ICE)
and
INDEPENDENT COST REVIEW (ICR)
STANDARD OPERATING PROCEDURE (SOP)
Revision 5

DEPARTMENT OF ENERGY (DOE)
OFFICE OF
PROJECT MANAGEMENT (PM)

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SUMMARY OF UPDATES: This revision includes the following significant changes since the August 2018 interim update:

1. *Appendix F- Templates/Examples (e.g., in-brief, Estimate Plan, IGCE, etc.)*
2. *Clarification on the use of Estimate and Review Plans*
3. *Clarification regarding the required degrees of independence for an ICE / ICR*
4. *Requirement to include a concise scope statement for the project being reviewed*
5. *Clarification on GAO's best practices for validating estimates*
6. *Clarification GAO best practice tailoring different kinds of assessments based on the Critical Decision (CD) level for the project being reviewed*
7. *ICE/ICR Report submission timeline expectations after the on-site review*
8. *Internal PM leadership briefing expectations*
9. *ICE/ICR "shelf life"*

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1. PURPOSE AND AUTHORITY

This PM Standard Operating Procedure (SOP) provides guidance for Department of Energy (DOE) Office of Project Management (PM) staff and contractors performing either an Independent Cost Review (ICR) or an Independent Cost Estimate (ICE) for a capital asset project.

The approval process for DOE capital asset projects includes five 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 are the optimum solution to satisfy the mission need.
- CD-2, *Approve Performance Baseline*. Definitive scope, schedule and cost baselines have been developed.
- CD-3, *Approve Start of Construction/Execution*. The project is ready for construction.
- CD-4, *Approve Start of Operations or Project Completion*. The project is ready for turnover or transition to operations, as applicable.

Each CD is approved by the appropriate Project Management Executive (PME) for a particular project. For all Major System Projects¹, the Deputy Secretary, as the Chief Executive for Project Management (CE), is the approval authority (unless otherwise appropriately delegated).

The combined federal/contractor Integrated Project Team (IPT) is required to develop a cost estimate for each critical decision except CD-4, at which point a summary of estimated actual costs must be provided. In addition to the cost estimate developed by the IPT, a second estimate is also required for certain Critical Decisions for projects with a TPC over \$100M. The second estimate, prepared by PM (with one exception discussed below), must be developed independently of the IPT and project sponsor to avoid any possible perception of a conflict of interest.

Public Law 2055, enacted December 23, 2011, and restated in each subsequent Appropriations Act through publication of this SOP, ***specifically requires that independent cost estimates be prepared prior to CD-2 and CD-3 (and by extension this applies to CD-3As over \$100M) for projects with a Total Project Cost (TPC) over \$100M.*** PM performs these ICEs as an independent office within the DOE organization. The wording in Public Law 2055 reads as follows:

¹ A Major System Project is a capital asset project with a Total Project Cost over \$750 million.

SEC. 310. None of the funds made available in this title may be used to approve critical decision-2 or critical decision-3 under Department of Energy Order 413.3B, or any successive departmental guidance, for construction projects where the total project cost exceeds \$100,000,000, until a separate independent cost estimate has been developed for the project for that critical decision.

PM performs the following cost evaluations pursuant to DOE O 413.3B requirements (see footnote for NNSA and EM exceptions²):

- Either an ICE or an ICR prior to CD-1 (or a CD-1 Reaffirmation) approval for all projects with a TPC over \$100M.
- An ICR prior to CD-0 for all Major System Projects, and for any other projects as designated by the CE/PME.
- An External Independent Review (EIR) (with a standalone or embedded ICR), or an ICE (if appropriate) for new scope or significant factors as defined in a Baseline Change Proposal (BCP), or major cost overruns requiring a re-baseline for a project over \$100M.

To expand on the final bullet above, when a significant baseline deviation³ occurs during the execution of a project, the PME must make a specific determination whether to terminate the project or establish a new performance baseline. The Federal Project Director (FPD) will submit a BCP request. Pursuant to DOE O 413.3B, PM must validate new and revised performance baselines that are established because of a deviation for projects with a TPC greater than or equal to \$100M. PM-20 project analysts should coordinate with PM leadership to determine whether an ICE or ICR (as standalone or part of an EIR) is more appropriate in such instances.

DOE O 413.3B also requires that a Project Management Support Office (PMSO) conduct an Independent Project Review (IPR) prior to CD-2 to validate the proposed Performance Baseline (PB) for projects with a TPC less than \$100M. For DOE program offices that do not have a PMSO, PM conducts the IPR. In such instances, either an ICR or an ICE would typically be conducted in conjunction with the IPR.

Appendix B outlines a process for determining whether to perform an ICE or ICR using various criteria including the phase of a project, its TPC value, and risk considerations. In the final analysis, PM-1 maintains the authority to determine whether an ICE or ICR is appropriate.

² As of October 1, 2019, NNSA's Office of Cost Estimating and Program Evaluation (CEPE) performs required ICEs/ICRs for NA programs at CD-0 and CD-1. PM will coordinate with CEPE, as needed. The EM PMSO will perform an IPR on lieu of an ICE/ICR for all EM managed demolition projects under DOE O 413.3B, Appendix D.

³ Per DOE O 413.3B Appendix A, Section 6.a and Attachment 2, Item 33, Deviation. Occurs when the TPC, CD-4 completion date, or performance and scope parameters, defined by the approved PB at CD-2, cannot be met.

2. BUDGETING

PM plans and implements all cost reviews and estimates under its purview, including arranging for and managing the services of support contractors when required. However, the funds to pay for an ICR and ICE are provided by the DOE Program Office sponsoring the project under review. PM does not budget for the funds to perform ICEs and ICRs, so it is important for FPDs and the sponsoring DOE Program Offices to budget adequate funds (as a best practice, Programs typically should use Other Project Cost (OPC) funds associated with the specific project and identify these as Other Direct Costs in the TPC breakout for this purpose), as required.

Request for Funds

To ensure adequate funding is in place to secure contract support for an ICE/ICR, PM analysts should request a funding memorandum from the program at least 6 weeks prior to the desired contract support task order approval date. Funds are typically requested via PM-2 memorandum (see [funds request memorandum template](#) in PM-Max). Once received, the PM analyst then sends the funding memorandum to PM's Funds Manager and Contracting Officer Representative (COR) to commit the funds to the appropriate task order.

Request for PM ICE/ICR Support

To initiate an ICE or ICR, a Federal Project Director (FPD), Project Management Support Office (PMSO), or Program Manager (if no PMSO exists) should aim to notify PM at least 12 weeks prior to the desired start of the ICE or ICR on-site visit. This advance notice, which may be tailored for large, complex, or unique projects is required to ensure that an appropriate review/estimate scope is developed for the project, and that all necessary resources (including funding and personnel with appropriate subject matter expertise) are available.

3. ROLES, RESPONSIBILITIES, AND TEAM COMPOSITION

3.1 ICE/ICR Roles and Responsibilities

Table 1. Key players in an ICE/ICR and their typical responsibilities.	
Roles	Responsibilities
PM Lead	Federal lead; conduct scoping meeting; prepare statement of work for contractor support, estimate contractor support work order costs, and evaluate contractor proposals; facilitate the process and resolve issues; kick-off onsite entrance and exit briefs; prepare review plan (ICR) or estimate plan (ICE) and, in coordination with PM-20 and the IPT, approve final plan; provide input to and review/approve review/estimate report.
Program/Project/FPD	Support review process with resources, time, data, and personnel; ensure that funds are available to perform ICE/ICR; review report for factual accuracy and, together with the PM Lead, facilitate reconciliation with IPT estimate as needed.
ICE/ICR Contractor Team Lead	Leads contractor team members (if applicable) serves as contractor POC for PM lead. This is typical when using USACE for support.
ICE/ICR Contractor (other active review participants)	ICE/ICR team members perform assigned review tasks in coordination contractor team lead; participate in on-site review; provide input to draft report; post back-up calculations to ICE/ICR collaboration site.
ICE/ICR Peer Members (from DOE Program offices)	ICE/ICR team members provide input to Review/Estimate Plan, perform assigned reviews, provide input to out briefing, draft report, and provide continuity and future follow-up during DOE Program Office project peer reviews.

All ICE/ICR team documents, including the review plan (for the ICR), estimate plan (for the ICE), entrance and exit briefs, and the report are PM products and should be written, viewed, and communicated as such. The name(s) of any PM support contractor(s) selected to support an ICE/ICR should be appropriately identified in the ICE/ICR documentation (e.g., ICE/ICR team description annex). The report document title page should clearly show it is an Office of Project Management product, include the DOE logo, and identify the program/project, type of review and date.

3.2 ICE/ICR Scope and Team Selection

The PM team lead should define the scope, bounds, and objectives of a cost review or cost estimate and identify the subject matter expertise and skills required of the ICE/ICR team members.

ICE/ICR teams should include individuals with appropriate experience, as applicable, in project management, scheduling, cost estimating/cost engineering, risk

management, as well as technical subject matter experts (SMEs) with knowledge of specific areas required to understand and analyze a particular project (e.g., unique technical areas such as nuclear safety expertise, Hazard Category 1, 2, and 3 nuclear facilities or project execution strategies). The ICE team should include the appropriate representation for cursory EVMS discussion as the project begins to formulate its initial PMB. Not every ICE or ICR team needs to include all conceivable professional disciplines. The team size and composition depend on the complexity and scope of the review/estimate, the project's risk and performance profiles, the schedule for completion, and the ICE/ICR budget. The PM lead should ensure that all necessary review areas or estimate areas are covered by qualified team members.

PM staff will often be assisted by representatives of other DOE offices. To preserve the independent nature of the ICR or ICE, it is inappropriate for the project advocates (i.e., the DOE site office line management, the DOE program manager, or the DOE site project contractor) to participate as a member of an ICR or ICE team. If the DOE Program Office staff desires to provide team members, none of the assigned staff members should be a project advocate. A Program Office project advocate may, however, participate as an observer. All team members are expected to provide independent assessments and input to the out-brief presentation and the final report while adhering to the schedule approved by PM in the review/estimate plan.

Contractor support is typically used to assist PM in conducting reviews and estimates. The support contractor(s) will assist the PM lead in developing the review/estimate plan, executing the review/estimate, developing the out brief, and drafting the ICE/ICR report. PM-20 will approve the final review/estimate team membership via approval of the review/estimate plan.

4. CONDUCTING AN INDEPENDENT COST REVIEW (ICR)

An ICR is an independent evaluation of a project team's cost estimate that examines the reasonableness of the estimate quality, assumptions, and risks. An ICR team reviews all available project documentation; receives briefings and holds discussions with the project team; completes sufficient analysis to assess the reasonableness of project assumptions supporting the cost and schedule estimates; assesses the rationale for the methodology used in preparing the estimate; and checks the completeness of the estimate, including appropriate allowances for risks and uncertainties. The result of the ICR is a report that details the conclusions and recommendations.

For all ICRs, the ICR team should assess whether the IPT's cost and schedule estimate is comprehensive, well-documented, accurate, and credible using the 12 step-process in GAO's *Cost Estimating and Assessment Guide*, GAO-20-195G, March 2020, as a framework. For CD-0 and CD-1 ICRs, it is recognized that cost estimates will typically not yet be fully compliant with these best practices as the up-front

planning and estimate are still maturing. As a result, the ICR team feedback should be provided to assist IPT as a “look-ahead” to expectations when the project is baselined at CD-2. This evaluation should be documented within an appendix of the ICR report and include the IPT’s self-assessment against the same 12 steps.

The following sections provide details on developing a schedule for an ICR, determining technical requirements for ICRs at various phases of a project, and preparing an ICR report.

4.1 ICR Requirements at Each Critical Decision

The purpose of an ICR and the way it will be used depends primarily on the stage of project development at which it is performed. The following sections describe the ICR requirements at each critical decision.

4.1.2 ICR at CD-0

The purpose of an ICR prior to CD-0, *Approve Mission Need*, is to evaluate the reasonableness of the project’s initial rough order-of-magnitude (ROM) cost range based on the statement of mission need. This provides decision-makers a frame of reference relative to potential future resource requirements. Affordability is an implied consideration at this stage.

An ICR at CD-0 should carefully evaluate both the functional requirements and the range of possible solutions, since they may be the only basis for the estimate at this stage. Functional requirements that must be met should be defined at this stage. (See DOE Order 413.3B, Appendix B, (page A-4) and DOE Guide 413.3-17, *Mission Need Statement*). To perform this review, SMEs with experience in similar programs and functions may be needed. CD-0 ICR reports should include an analysis of whether the funding profile supports the proposed timeline to get to CD-1.

To develop the ROM cost range, a list of possible solutions is needed with enough definition to allow some level of cost estimating so that a bounding assumption and basis for the CD-0 cost and schedule range can be identified. However, these possible solutions are not intended to restrict the investigation of alternatives conducted during the conceptual design and alternative selection phase of the project. At CD-0, a proposed project should be site-agnostic to the maximum extent practicable, and it is generally premature to have selected a design concept or to have developed a detailed physical definition of any alternative.

Because no specific capital asset alternative has yet been selected, a CD-0 ROM cost range should not be construed as representing a preliminary cost and schedule estimate for a particular capital asset project. Similarly, ROM cost range estimates should not be considered budget-quality, since they are likely to change as more detailed project requirements and design concepts evolve during the conceptual design stage. Therefore, no subsequent evaluation of project performance (i.e., success or failure) can or should be made relative to the initial ROM cost range

estimates.

The high-end of the ROM cost range is typically used to determine the organizational level at which the PME will likely be assigned. It is very important that the ROM cost range be realistic, because any substantial understatement could send false signals regarding both affordability and the proper level of project and acquisition management oversight. Given that no alternative has been selected, it is essential to document the key bounding assumptions used to develop the CD-0 cost and schedule ranges.

4.1.3 ICR at CD-1

An ICR prior to CD-1, *Approve Alternative Selection and Cost Range*, (and any subsequent CD-1 Reaffirmations, or Revisions (as necessary)) should conduct a summary review of the cost and schedule estimates for all alternatives considered. If serious concerns arise over the technical adequacy of the recommended alternative or the reasonableness of its estimated cost or schedule, then the PME making the CD-1 alternative selection should also be apprised of the costs, benefits, and technical adequacy of other alternatives. The estimated costs of those alternatives should be as credible as those for the recommended alternative at a summary level, in advance of the conceptual design phase (of the preferred alternative).

In most instances, an ICR will be performed at CD-1, but an ICE may be warranted if it's determined that there is significant uncertainty as to the quality of the range estimate or the ability of the project/program team to develop a reasonable estimate. Appendix B outlines a process for determining whether an ICR or ICE should be performed.

In preparation for CD-1, the project team should have developed a conceptual design report and an estimate of the design and construction costs and schedules for various alternatives. A life-cycle cost estimate (LCCE) is also required (by the IPT) for all alternatives under consideration. The DOE LCC Handbook as well as DOE Guide 413.3-21A, *Cost Estimating Guide*, provides further information on preparing a LCCE as well as life cycle cost analysis (LCCA).

DOE Order 413.3B requires that for all projects with a TPC greater than \$50M, the responsible program office shall conduct prior to CD-1, an AoA, which includes LCCE and LCCA that is independent of the contractor organization responsible for managing the construction or constructing the proposed capital asset project. The PME may also require an independent AoA be conducted if a performance baseline deviation occurs or if new technologies or solutions become available.

In addition, the Order requires that AoAs be conducted consistent with best practices identified in Appendix XI of GAO's *Cost Estimating and Assessment Guide*, GAO-20-195G, March 2020.

The ICR team should ensure that CD-1 documentation clearly presents the AoA and

respective life-cycle cost information that could reasonably impact the PME's approval of the recommended alternative. In making such a determination, the ICR team must consider whether the procedures that a Program Office follows in reaching CD-1 reasonably satisfy OMB Circular A-11 requirements. Section 1.5.3 of the *Capital Programming Guide* (supplement to Part 7 of OMB Circular A-11) states that both the initial acquisition cost and the other life-cycle cost elements of the various alternatives should be considered, and that the selection of the best alternative should be based on a systematic analysis of expected benefits and costs.

OMB Circular A-11 further indicates that the fundamental method for formal economic analysis is Benefit-Cost Analysis (BCA). Benefits and costs should be quantified in monetary terms wherever possible and should be discussed in a narrative. The level of detail should be commensurate with the size and criticality of the investment. The benefits should be linked to the program goals and needs identified in the Mission Need Statement prepared at CD-0. Benefits and costs should be estimated over the full life cycle of each alternative considered. Life-cycle costs include all initial costs, plus the periodic or continuing costs of operation and maintenance (including staffing costs), and any costs of decommissioning or disposal. Estimates of costs and benefits should show explicitly the performance and budget changes that result from undertaking the project.

To summarize the preceding paragraph, OMB clearly states:

- Benefit-Cost Analysis (BCA) must be used
- Life Cycle Costs are part of a BCA
- A quantitative ranking of alternatives-based BCA results is preferred

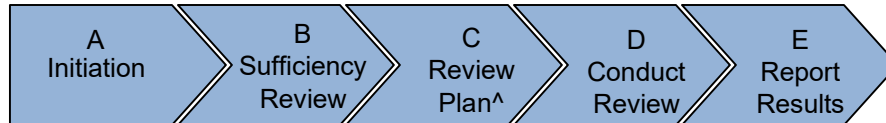
PM's role in performing an ICR is to help ensure that the PME's decision is made with due consideration of all reasonable alternatives, that it is based on information that is complete and accurate, and that the selection process has used quantitative BCA to the greatest practical extent.

4.1.4 Other ICRs During Project Lifecycle

An ICR may be conducted at other project phases as requested by the PME or other officials. The scope of the review, documentation required, and the lines of inquiry (LOI) should be tailored for the specific project phase.

4.2 ICR Planning Schedule

Figure 1 is a high-level summary which breaks the ICR process into five phases. Table 2 identifies work activities associated with each phase. The time to conduct an ICR varies, and the process can take a nominal 10 to 20 weeks, depending on the scope of the review and the project's size and complexity.

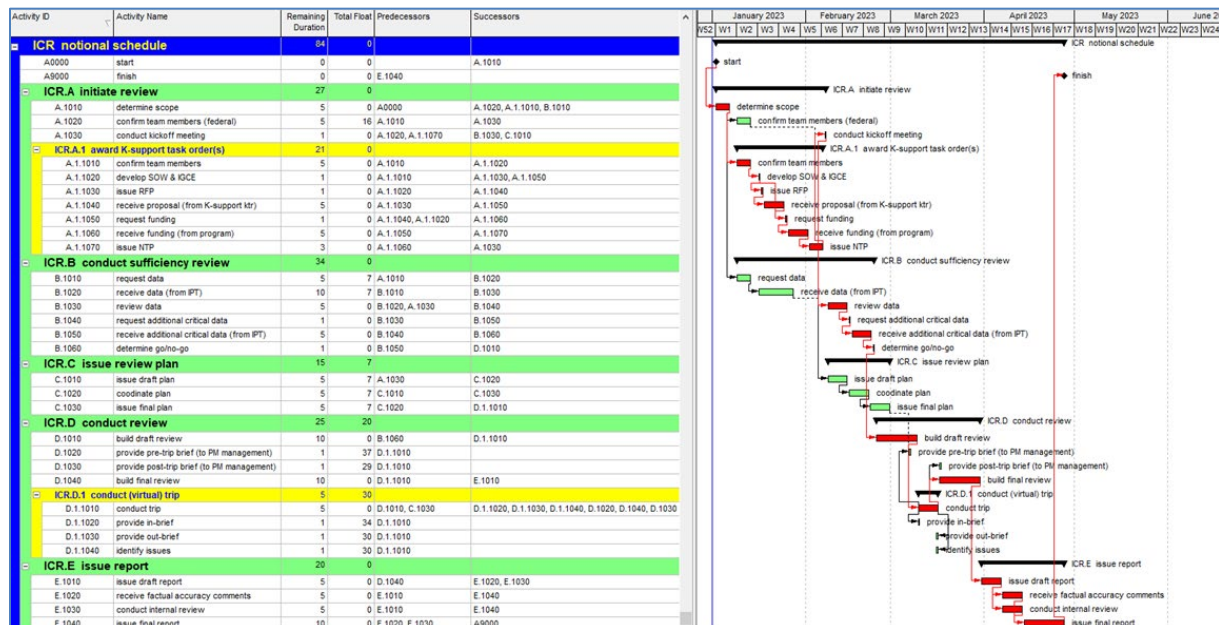


* Target date of Review Plan approval by PM-20 is three weeks before onsite visit.

Figure 1. Simplified ICR Process Timeline

Table 2. ICR Phases and Work Activities	
Phase	Activities
A	Initiation Activities – Planning, scoping, SOW and task assignment to SME support team, kickoff meeting. Initiate the Review Plan.
B	Sufficiency Review – Receive and evaluate program documents; perform acceptance/sufficiency review (see Appendix E).
C	Finalize the Review Plan – coordination with project team.
D	Conduct Review – Additional document review, on-site review, out-brief, completion of document review.
E	Report Results – Draft report, factual accuracy review, PM internal review, issue resolution, final report.

Below is a Gantt chart derived from a P6 schedule for a notional ICR. PM-20 analysts are encouraged to reference this as a starting point for planning an ICR. It shows the assumed logic ties between activities and can consequently be used to easily evaluate various schedule scenarios. Alternatively, analysts may utilize the [planning schedule template](#) in PM-Max, which is a simple spreadsheet that can be populated with proposed dates. For additional details on contract support timing, see the Contracting Officer’s Representative (COR) SOP.



4.3 ICR Activities and Deliverables

The sections below describe the key activities and deliverables associated with the execution of an ICR.

4.3.1 Define ICR Scope

The PM team lead, in coordination with the FPD or Project Manager, should define the scope, bounds, and objectives of a cost review and outline the subject matter expertise and skills required of the team members.

4.3.2 SOW and Contract for Contractor/SME Support

PM typically employs contractor support to assist in conducting reviews and estimates. The PM lead should facilitate the PSO funding commitment, prepare the statement of work (see [SOW template](#) in PM-Max) and independent government cost estimate (see [IGCE worksheet](#) in PM-Max) for contractor support and evaluate resulting contractor proposals. The SOW should include a requirement for the contractor to post to Max.gov all relevant ICE/ICR back-up information to support any future audits of the estimate. For more information, see the “PM Support Contracts & USACE Technical Support” learning session available on max.gov: <https://community.max.gov/x/Lbu2gw>).

The following table should be used as general planning guidance to allow sufficient time to get contract support resources in place to support the review. However, there is flexibility in the process, so analysts should coordinate closely with the COR and the funds provider to have contract support in place when needed. In every case, PM must have funds in hand before task order award.

Task	Weeks From Prior Step	Weeks From Start
<ul style="list-style-type: none"> • SOW & IGCE to COR. SOW to contractor for cost proposal 	-	-
<ul style="list-style-type: none"> • Cost proposal received from contractor • PM analyst submits funding request memorandum in workflow 	2*	2
<ul style="list-style-type: none"> • PM-2 issues funding request memorandum 	1	3
<ul style="list-style-type: none"> • Funding memorandum received & provided to PM (COR/Funds) 	3	6
<ul style="list-style-type: none"> • Funds placed on task order (contracting office process) • COR issues contractor NTP w/ NTE cost (task start) 	2	8

**Assumes PM analyst has pre-coordinated SME availability. If not, allow additional 2 weeks.*

4.3.3 Review Plan

A written review plan (GAO best practice) should be prepared as soon as possible after relevant project documentation is available. The initial plan should be published within 10 days of document availability and any unknown details, such as the escalation rate or the date for finalizing the review methodology, will be listed as “to be determined.” The plan will be updated as this information becomes available. The draft review plan will be provided to PM-20 for review prior to finalizing, which includes formal agreement (via signature) by the FPD. Include a descriptive scope statement written in a plain language narrative in the review plan. The same scope statement should appear in the final report (executive summary and main body). Although PM will need the Work Breakdown Structure (WBS) to complete the review, it does not need the WBS to prepare a review plan.

The Review Plan is required to be reviewed and approved by PM-20, with a target date of approval no later than three weeks before the onsite review.

[Sample review plans](#) are available in PM-Max. The length and complexity of review plans will vary considerably based on the purpose of the review and the make-up of the review team. However, there are several common elements that should be addressed by any ICR. A suggested general outline for a review plan is as follows:

- Purpose and Scope
- Project Description
- Review Process – Describe the various elements of the review process; identify lines of inquiry; provide list of documents required for the review; describe roles and responsibilities; estimate assumptions and constraints, proposed escalation rates, etc.
- Schedule – Provide an overall schedule showing, as a minimum, major activities and milestones.
- Review Logistics – Dates of site visit; detailed site visit schedule (agenda); site report format, report review process and distribution; on-site support requirements
- Team Members; Stakeholders, and Assignments
- Concurrence – the Review Plan should be formally (in writing) concurred with by the review team lead and the FPD. Upon finalization, it should be posted to the associated Max.gov ICE/ICR review page (linked on home page).

4.3.4 Review

The review includes three basic phases:

1. Initial Sufficiency Review to determine whether the project team’s cost estimate and associated documents have been completed. See Appendix D for required

documentation.

2. Detailed Review of the project team's cost estimate and associated documentation. The subsections below describe some of the specific issues to be included as part of the ICR:
 - a. Cost Range. The ICR team should develop a cost range. This is typically developed by determining the point estimate established at the p50 confidence level (which should include estimate uncertainty, MR, and contingency). A higher confidence level may be used if a more conservative cost range is desired. This "all in" point estimate should then be assigned an AACEI range (+/-) based on the estimate class (typically Class 4 at CD-1, which is -30% to +50% around the point estimate). Note that while many IPT's utilize a quantitative risk analysis at CD-1, this is not required; as a result, the ICR team may not always be able to perform a quantitative risk analysis at CD-1 and hence will rely on an assessment of the IPT's qualitative risk analysis and results.
 - b. Integrated Master Schedule . The CD-1 schedule, which is used for the ICE/ICR must be developed to show a critical path to project completion. This schedule is used to inform the ICE/ICR in developing the ROM estimate. At CD-1, an IMS is typically at a high level for the selected alternative, with additional detail added as project maturity increases. The IMS at CD-1 should be loaded with budgeted hours through CD-2 to ensure proper integration.
 - c. Schedule Range. The ICR team should also develop a schedule range. This is typically developed by first calculating the critical path schedule and then adding schedule contingency and schedule reserve (determined through Monte Carlo analysis of the DOE and contractor schedule impacts included in the risk register).
 - d. Design Maturity. Include a specific statement on design maturity based on the ICE/ICR team's professional judgment, which ultimately supports the team's estimate classification.
 - e. Earned Value Management System (EVMS). The implementation of EVMS (unless exempted) should be considered at each CD gate, including CD-1, and appropriate EVMS clauses should be included in any solicitations and contracts. The use of EVMS as early as possible can be beneficial to the ICE/ICR team as the cost and schedule estimates are developed.
3. On-site Review where the ICR team can resolve questions raised during the review and gain insight that cannot be gleaned simply by reading the written materials. When travel to the site is not practical, the "onsite" may be conducted virtually through WebEx, Teams, or other video teleconference platforms.

Appendix D contains review checklists that should be used to help ensure the thoroughness of the review.

4.3.5 Required Review Briefings

To ensure PM leadership is aware of the ICR team's progress and supportive of proposed results, the PM ICR team lead will provide the following briefings:

Brief Description	When Required	Attendees	Content
Pre-Onsite Trip Brief	≥ 3 days prior to trip	PM-1 (as available), PM-2, PM-20	Project description, estimate/review methodology summary, timeline, ICR team members, logistics, special issues, etc. [PowerPoint]
Onsite In-brief	Start of On-site	FPD/IPT, ICR Team	Summary of how the ICR team will conduct the review that week, to include special areas of focus, schedule, additional required documentation, etc. [PowerPoint]
Pre-Onsite Summary Brief Draft Review	Prior to onsite Out-brief	PM-1 (as available), PM-2, PM-20	Review of proposed on-site summary brief as prepared by the ICR team leader. Email draft slide deck to PM leadership with sufficient time to review and allow for phone call follow-up, if needed.
On-site Summary Brief	End of the On-site	FPD/IPT, ICR Team	Areas of concern, documentation still required, follow-on interviews, tentative recommendations, and timeline going forward. Preliminary results (i.e., cost range, TPC, CD-4 range, CD-4) will not be provided. [PowerPoint].
Post-Onsite Trip Brief (Per PM-1 discretion)	≤ 3 days after return from trip	PM-1 (as available), PM-2, PM-20	Preliminary review results, recommendations, timeline going forward, special issues. Use of on-site summary brief is acceptable, with editorial mark-ups as appropriate.

4.3.6 Nominal Contents of ICR Report

An ICR report (see [ICR report template](#) in PM-Max) should be prepared and reviewed by the ICR team upon completion of the review. The ICR report should contain the following general sections:

- Executive Summary (include scope statement, key recommendations, funding profile, and shelf life (see section 5.5.4 for more info))
- Project Background
- Scope of Work and respective Key Performance Parameters
- Cost Estimating Process

- Basis of Estimate
- Schedule
- Risks
- Conclusions (specific results of the ICR)
- Recommendations (actions the IPT should take going forward to the next CD)
- Appendices (Assignments and bios of team members, GAO best practices assessment, risk register (if available) and others as needed)

The following GAO best practices assessments will be documented in tabular form in appendices to the ICR report:

GAO Best Practices Assessment	IPT Self-Assessment	ICR Team Assessment of IPT	ICR Team Self-Assessment
Cost Estimating (12-Steps)	Yes	Yes	n/a
Scheduling (10-Steps)	Yes	Yes	n/a
Analysis of Alternatives (22-Steps)	Yes	Yes	n/a

The length and level of detail in the report should be tailored based on the critical decision and complexity of the project. The ICR team is expected to review all available project documentation, receive briefings from and hold discussions with the project team, complete sufficient analysis to assess the reasonableness of the project assumptions supporting the cost and schedule estimates, ascertain the validity of those assumptions, assesses the rationale for the methodology used, and check the completeness of the estimate, including appropriate allowances for risks and uncertainties. The result should be a report that sufficiently documents what work was done and that details the results and recommendations.

Draft reports should be issued no later than 30 days from the time of the review. The project team, Program Office, and other stakeholders should be provided an opportunity to correct any factual errors or misrepresentations in the draft report or to provide any additional information that may be required. Unless the ICR team considers the corrections to any factual errors or misrepresentations to be material to its conclusions, the conclusions and recommendations in the final report should be essentially the same as those in the draft report.

FPDs and PMEs should receive draft and final ICR reports in a timely manner. The timeline for report submission and review is as follows:

- The draft report should be submitted for factual accuracy review and comment within 30 days of the onsite visit.
- PM's internal review should be accomplished concurrently with or within 7 days

of factual accuracy review from the FPD.

- Submission of the final report should be completed within 30 days of receipt of factual accuracy comments.

Formal transmittal of the final ICR report will be from the Director, Office of Project Management (PM-1) to the appropriate Project Management Executive (PME). For archival purposes, the final ICR report and transmittal memorandum should be uploaded to both the PARS document management system (DMS) and the “Final Reports” tab of the PM-Max ICE/ICR page (<https://community.max.gov/x/9YTiRw>).

4.3.7 Post-ICR Data Collection

Upon finalization of the ICR report, PM analysts should ensure their support contractors post to Max.gov all relevant ICE/ICR back-up information to support an audit of the estimate (to be included as a requirement in the SOW). Intent is that individual Max.gov review collaboration sites will serve as a repository where all base “raw” documents can be stored to facilitate any future audit questions related to the ICR. This would include, among others, the P6 schedule (and associated notebook) in its appropriate level of detail, rates used, risk analysis documentation, any cost data from the EVMS that should be under development, Mii documentation, etc.

5. CONDUCTING AN INDEPENDENT COST ESTIMATE (ICE)

An ICE⁴ is a cost estimate prepared by an organization independent of the project sponsor, using the same detailed technical and procurement information that was used to make the project cost and schedule estimate. An ICE typically uses alternative methods and tools to those used for the project estimate and includes an independent cost risk analysis and an independent schedule risk analysis. PM uses an ICE as part of the process to validate the program/project estimate and determine its reasonableness. The actual validation of the project’s performance baseline (PB) is normally accomplished through an external independent review (EIR) team that has access to both the ICE and the project team’s estimate.

The following sections provide details on the overall ICE approach, estimating methodologies, requirements at each critical decision; technical and schedule requirements, preparation of an ICE report, and reconciling an ICE with a project team estimate.

5.1 Overall ICE Approach

The PM ICE team lead determines what details of the project cost estimate and supporting information to include quantities, installation rates, and schedule durations,

⁴ The definition used in this document is taken from DOE O 413.3B, and applies to ICEs performed by PM.

will be supplied to the ICE team. Some elements of the project team's cost estimate and supporting information may be redacted to mitigate estimate bias by the ICE team. This determination will be made by the PM ICE team lead and the project team.

A PM-led ICE is normally prepared assuming an unconstrained budget, which should represent the most cost-effective method of execution. However, if the project's proposed cost and schedule estimates are based on constrained funding, then the ICE team estimates should be similarly constrained using the funding profile provided by the Program Office.

5.2 Independent Cost Estimating Methodologies

DOE ICEs are typically developed using several estimating methodologies (e.g., bottom-up, parametric, etc.) and use the WBS to annotate which methodology was used for each major WBS element. As such, PM does not typically assign an overall estimate class to the ICE (See DOE Guide 413.3-21A, *Cost Estimating Guide*, for further information on estimate classes.). Estimating methodologies are further explained in sections below.

5.2.1 Reasonableness Review

This methodology is the same as described in the DOE O 413.3B definition of an ICR (see Section 4 of this SOP). The ICE team reviews all available project documentation, receives briefings from, and holds discussions with the project team; completes sufficient analysis to assess the reasonableness of the project assumptions that support the cost and schedule estimates; ascertains the validity of those assumptions; assesses the rationale for the estimating methodology used; and checks the completeness of the estimate, including appropriate allowances for risks and uncertainties. The result is a report that details the conclusions and recommendations.

5.2.2 Parametric

This methodology utilizes parametric techniques (using unit costs from analogous projects and adjusting for escalation and locality impacts), factors, etc., to analyze project costs and schedules in addition to assessing the reasonableness of the project assumptions that support the cost and schedule estimates; ascertains the validity of those assumptions; assesses the rationale for the estimating methodology used; and checks the completeness of the estimate, including appropriate allowances for risks and uncertainties. It is usually accomplished at a summary WBS level. The parametric techniques—including cost estimating relationships (CERs) and factors—should be based on accepted historical cost/schedule analyses. This method analyzes data from completed analogous programs and is derived using the most defensible mathematical and statistical techniques.

5.2.3 Sampling

This methodology identifies the key cost drivers in addition to assessing the reasonableness of the project assumptions that support the cost and schedule estimates; ascertains the validity of those assumptions; assesses the rationale for the estimating methodology used; and checks the completeness of the estimate, including appropriate allowances for risks and uncertainties. A “cost driver” is a major estimate element whose sensitivity significantly impacts the TPC value. Detailed, independent estimates should be developed for these cost drivers. Such estimates should include vendor quotes for major equipment, and detailed estimates of other materials, labor, and subcontracts. For some portions of the project, the project team’s estimate may be used (if deemed reasonable), or, if appropriate, parametric techniques may be used for certain portions of the project costs. Note that cost drivers are the key elements of the estimate that significantly influence the estimate, such as special process equipment or systems, structural features, and hazard category requirements. An independent schedule assessment and cost and schedule risk analyses are typically conducted as well.

5.2.4 Bottom-up

This is the most detailed and extensive methodology used in an ICE. It begins with the activities needed for a Reasonableness Review. In addition, this approach requires a detailed bottom-up independent cost estimate, a schedule assessment, and an independent cost and schedule risk analysis. This may require quantity take-offs/development, vendor quotations, productivity analysis, use of historical information, and any other means available to do a thorough and complete estimate of at least 75 percent of the project’s “to-go” PMB. It may not be possible to do a completely independent estimate on some portions of the project estimate. Estimate portions, which cannot be independently estimated should not exceed 25 percent of the total estimate. The project (IPT) estimate may be used for these portions if it has passed the reasonableness assessment by the ICE team.

5.3 ICE Requirements at Each Critical Decision

The purpose of an ICE and the way it will be used depends primarily on the stage of project development at which it is performed. The requirements for an ICE at various critical decisions are discussed in the following sections. The ICE should be conducted in accordance with industry best practices and DOE guidance, which includes the DOE Order 413 Guide series and the DOE Office of Project Management (PM) EVMS Compliance Review Standard Operating Procedure as well as GAO best practices, specifically those for high-quality cost estimates and schedule assessments.

5.3.1 ICE at CD-1

DOE O 413.3B requires PM⁵ to perform an ICR or ICE at CD-1 for projects with a TPC greater than or equal to \$100 million. The scoping process conducted with the

⁵ As of October 1, 2019, NNSA’s Office of Cost Estimating and Program Evaluation (CEPE) performs required ICEs/ICRs for NA programs at CD-0 and CD-1. PM will coordinate with CEPE, as needed.

Program Office and/or project team should initially determine if an ICR or ICE is to be conducted. Appendix B provides guidance for determining whether an ICR or an ICE is required.

As discussed in Appendix B, if an ICR is initiated at CD-1, it may subsequently develop into an ICE under certain circumstances. If an ICE is performed, the expectation is that a parametric estimate would be the most appropriate for this project stage. However, the specific estimating methods to be used should be developed as part of the Estimate Plan.

At CD-1, project cost and schedule ranges are established for the selected alternative and other alternatives are also evaluated. Life-cycle costs are also evaluated and used in selection of the preferred alternative. See Section 4.1.3 for a more detailed discussion of LCCE requirements at CD-1. The considerations identified in Section 4.1.3 are applicable irrespective of whether PM performs an ICR or an ICE.

5.3.2 ICE at CD-2

DOE O 413.3B and Public Law 2055⁶ require that an ICE be prepared at CD-2 for projects with a TPC greater than or equal to \$100 million. Depending on the maturity of the project design at CD-2 and other factors, the ICE would typically fall into the range of a Class 2 to Class 3 estimate (see Tables 4-2 and 4-3 below from the *DOE G 413.3-21A, Cost Estimating Guide*). DOE O 413.3B, Section C.4, Design Maturity, discusses the appropriate maturity depending on various project factors. Section 5.2 and Appendix B of this SOP provide further guidance on ICE methodologies to be utilized. The specific methods to be used will be determined and documented in the Estimate Plan.

⁶ See Section 1.

Table 4-2. Cost Estimate Classification for Process Industries¹⁰

ESTIMATE CLASS	Primary Characteristic	Secondary Characteristic		
	MATURITY LEVEL OF PROJECT DEFINITION DELIVERABLES Expressed as % of complete definition	END USAGE Typical purpose of estimate	METHODOLOGY Typical estimating method	EXPECTED ACCURACY RANGE Typical variation in low and high ranges
Class 5	0% to 2%	Concept screening	Capacity factored, parametric models, judgment, or analogy	L: -20% to -50% H: +30% to +100%
Class 4	1% to 15%	Study or feasibility	Equipment factored or parametric models	L: -15% to -30% H: +20% to +50%
Class 3	10% to 40%	Budget authorization or control	Semi-detailed unit costs with assembly level line items	L: -10% to -20% H: +10% to +30%
Class 2	30% to 75%	Control or bid/tender	Detailed unit cost with forced detailed take-off	L: -5% to -15% H: +5% to +20%
Class 1	65% to 100%	Check estimate or bid/tender	Detailed unit cost with detailed take-off	L: -3% to -10% H: +3% to +15%

Table 4-3. Generic Anticipated Types of Estimates for DOE Critical Decisions

Critical Decision	Suggested Estimate	Recommended Minimum AACE International Estimate Classification
CD-0	Cost estimate range	Class 5
	Estimate of costs to be incurred prior to CD-1	Class 3
CD-1	TPC Range	Class 4
	Estimate of near term preliminary design cost	Class 3
CD-2	Single point estimate representing entire project:	
	– Low risk projects	Class 3
	– High risk projects	Class 2
CD-3	Cost estimate based on Final Design [or sufficiently mature to start construction]:	
	– Low risk projects	Class 2
	– High risk projects	Class 2
CD-4		N/A

DOE O 413.3B also requires that an EIR be performed at CD-2 for any project with a TPC \geq \$100M. Although there may be efficiencies in performing an EIR and an ICE in sequence under a single task award, separate ICE and EIR reports should be produced. The ICE team is separate from the EIR team (though some members may overlap on occasion), not so much because the EIR team must be “independent” of the ICE team⁷, but because an EIR and an ICE require different skill sets. The ICE should

⁷ There is no legal requirement or DOE policy that requires an EIR team and an ICE team to be separate or to work in isolation from each other.

be completed before the EIR team begins its review. This allows the EIR team to utilize the ICE report in its assessment of the sufficiency and reasonableness of the TPC and schedule proposed by the project team.

5.3.3 ICE at CD-3

It should be noted that it is common to conduct an ICE for a combined CD-2/3 rather than for individual CD-2 and CD-3 approvals. For a combined CD-2/3 ICE, the CD-3 guidance outlined below shall apply.

Public Law 2055⁸ requires that an ICE be prepared at CD-3 for projects with a TPC greater than or equal to \$100 million. At CD-3, the project design should be complete enough to allow a Class 2 estimate to be performed. However, a Class 2 estimate is usually the most detailed type, and consequently the most time-consuming and expensive to prepare. Thus, while information is available at the necessary detail to facilitate the preparation a Class 2 estimate, it is prudent to ask whether there is sufficient “added value” in doing so. Available time and budget frequently factor into the decision-making process. Sections 5.2 and Appendix B of this SOP identify some of the factors to consider in determining CD-3 ICE requirements. In all cases, actual post-CD-2 performance should be weighed heavily. If a project already appears to be “off-track” by the time it requests CD-3, then the CD-3 ICE assumes greater importance than it might otherwise have.

A project’s acquisition strategy is an important consideration in determining what type of ICE is most appropriate at CD-3. At one extreme is the case in which a CD-3 approval request is based on a competitively bid, firm fixed-price proposal. Assuming that multiple bids have been received and they have been assessed as being reasonable offers, an actual bid price can be considered the “gold standard” for cost estimates because it represents a price to which a contractor is willing to commit. It’s difficult to justify the need for and the utility of an additional Class 2 estimate prepared by PM under these circumstances. If the ICE team is given access to all the bid information as well as to the project team’s cost estimate⁹, then it is reasonable to perform a Class 3 or 4 estimate. At the other extreme is the case where all or most construction phase work will be performed under a cost-reimbursable contract that was not competitively awarded, and there have been substantial post-CD-2 technical scope or funding changes. In this scenario, a Class 4 estimate would be inappropriate, but at the same time, Class 2 might not be needed, if an ICE was prepared at CD-2. There are many scenarios that fall in between these two extremes.

The level of design maturity at which the cost estimates at CD-2 were based is another important consideration in determining what type of ICE to conduct at CD-3. Failing to achieve a sufficient level of design maturity prior to CD-2 has been identified as a “root cause” of cost overruns for many projects. Consequently, if the TPC and CD-4 date

⁸ See Section 1.

⁹ It is assumed that the project team will have updated the cost estimate that it prepared at CD-2 based on the bid results and any post-CD-2 technical scope or funding changes.

approved at CD-2 were not based on a completed or nearly completed design, then a more rigorous ICE may be needed at CD-3.

On the other hand, there may be no additional design or other information available at CD-3 than was available at CD-2, in which case a Class 4 estimate may be appropriate. In some cases, technical considerations that have no significant cost implications preclude a PME from simultaneously approving CD-2 and CD-3. For example, a final safety or environmental permit approval may be a precondition for CD-3, but not for CD-2. In such a case, CD-3 approval might lag CD-2 approval by months or even a year or more. However, full design information was available at CD-2, and there may have been no significant changes to scope, execution strategy or funding since CD-2. Under such circumstances, the assumptions on which the approved CD-2 baseline was based should be verified that they remain valid. This can potentially be done through a Class 4 estimate and, perhaps, even a Class 5 estimate.

An ICE may be requested in between critical decisions. The most likely circumstance under which this occurs is when a project runs over budget or changes scope and submits a baseline change proposal (BCP) for PME approval. An ICE, if required, should be scoped using the guidance in Appendix B, as well as the information in this Section 5.2.3. An ICE under these circumstances may be highly tailored to “fit” the ICE to the need or use. Typically, such an ICE focuses only on the cost to complete the remainder of the work, and many risks that existed in earlier stages of the project will either have been realized or “retired” because it is clear that they will not be realized.

5.3.4 ICE at CD-3A

Public Law 2055¹⁰ requires that an ICE be prepared at CD-3 for projects with a TPC greater than or equal to \$100 million. Since CD-3A, *Long Lead Procurement*, is part of CD-3, an ICE must therefore also be accomplished when the CD-3A estimate is greater than \$100M. The CD-3A ICE processes and expectations are the same as those outlined for CD-2 and CD-3 within this document. The type of ICE should be commensurate with the scope of the CD-3A, and the ICE processes should be tailored to provide information to the PME while being efficient with government resources. An ICE will be conducted for any additional CD-3A requests (CD-3A, 3B, 3C, etc.) where the estimated cost of the CD-3x scope is greater than \$100M. Since many CD-3X packages may be rolled into the CD-2 baseline, specific emphasis should be placed on providing the PME with discussion of risks (technical, cost and schedule) of the CD-3X, but also the direct risk posed on the impending CD-2 performance baseline.

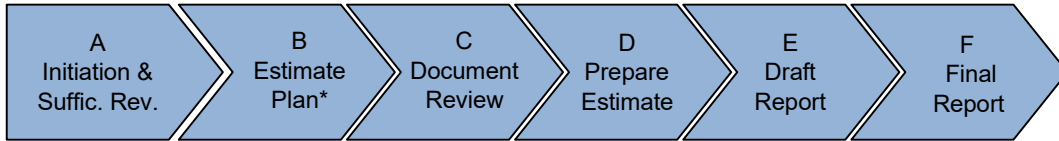
5.4 ICE Schedule

Figure 2 summarizes the ICE process, breaking it into six phases. Table 3 identifies work activities associated with each phase and cross-references them with activities in the GAO 12-Step Cost Estimating Development Process. The time to conduct an ICE

¹⁰ See Section 1.

varies widely and depends on many factors to include the scope of the estimate and size and complexity of the project, with durations typically ranging from 8 to 16 weeks. The ICE timeline should be tailored to accommodate the situation unique to each project.

Figure 2. Simplified ICE Process Timeline

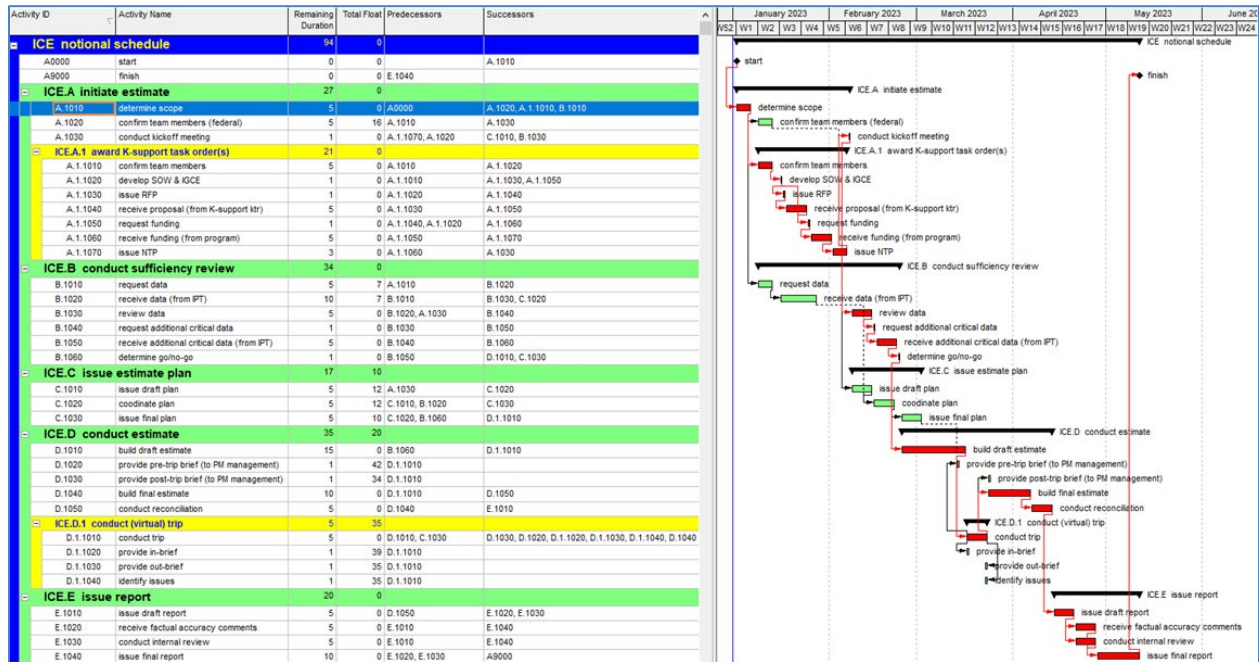


* Target date of Estimate Plan approval by PM-20 is three weeks before onsite visit.

Table 3. ICE Phases and Work Activities.		
Phase	Activities	GAO 12-Step Process
A	Initiation—activities including scoping meeting, task assignment to SME support team, kickoff meeting.	Step 1-Document purpose
B	Sufficiency Review and Estimating Plan— Draft & Final.	Step 2-Develop Estimate Plan
C	Documentation Review—review project documents, develop questions/issues On- site review – data collection and clarifying interviews with project.	Step 3-Define program characteristics Step 4-Determine estimating structure Step 5-Identify ground rules and assumptions, Step 6-Obtain data
D	Prepare Estimate—Estimate preparation and review – includes estimate and risk/uncertainty analysis. Reconcile ICE with project team estimate.	Step 7-Develop point estimate and compare to project estimate Step 8-Conduct sensitivity analysis Step 9-Review/conduct risk and uncertainty analysis
E	Draft Report—draft estimate document, including project team review; PM review of draft.	Step 10-Document the estimate

F	Final Report— comment resolution process; Briefings—PM management and Program Office; PMRC; Final estimate document to reflect reconciliation and PM/Project team comments.	Step 11-Present estimate to management for approval Step 12-Update estimate (Note: reconciliation is a process for an independent estimate and not an initial estimate as covered in the GAO guide)
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Below is a Gantt chart derived from a P6 schedule for a notional ICE. PM analysts are encouraged to reference this as a starting point for planning an ICE. It shows the assumed logic ties between activities and can consequently be used to easily evaluate various schedule scenarios. Alternatively, analysts may utilize the [planning schedule template](#) in PM-Max, which is a simple spreadsheet that can be populated with proposed dates. For additional details on contract support timing, see the Contracting Officer's Representative (COR) SOP.



While the ICR process is similar in many respects, an ICE, unlike an ICR, results in an independently derived cost estimate, which is reconciled with the project team's estimate. The reconciliation process documents the discussion explaining any differences between the two estimates and in most cases, there will continue to be differences between an ICE and a project team estimate even following reconciliation. Section 5.5.6 provides additional information on the ICE reconciliation process.

5.5 ICE Activities and Deliverables

The sections below describe key ICE activities and deliverables.

5.5.1 ICE Scope

The PM team lead should define the scope, bounds, and objectives of an ICE, and roles/responsibilities of all team members. They should also identify the subject matter expertise and skills required of the team members.

Appendix E identifies documents that the ICE team will normally need to prepare its estimate. The availability of the project documentation is a critical item in the planning; incomplete or late information will jeopardize the ICE schedule, which in turn may impact the project team’s critical decision schedule. The required documentation should be one of the principal topics discussed at the scoping meeting.

Include a descriptive scope statement written in a plain language narrative in the estimate plan. The same scope statement should appear in the final report (executive summary and main body). Although PM will need the WBS to complete the estimate, it does not need the WBS to prepare an estimate plan.

5.5.2 SOW for Contractor/SME Support

Contractor support is almost always required when conducting an ICE. The PM lead should facilitate the PSO funding commitment, prepare the statement of work (see [SOW template](#) in PM-Max) and cost estimate for contractor support (See [IGCE worksheet](#) in PM-Max) and evaluate resulting contractor proposals. The SOW should include a requirement for the contractor to post to Max.gov all relevant ICE/ICR back-up information to support an audit of the estimate. For more information, see the “PM Support Contracts & USACE Technical Support” learning session available on max.gov: <https://community.max.gov/x/Lbu2gw>) In some instances, the entire estimate is performed by a single contractor on a “turnkey” basis. In this context, another government agency such as the U. S. Army Corps of Engineers (USACE), which prepares an ICE on behalf of PM, is considered a contractor.

The following table should be used as general planning guidance to allow sufficient time to get contract support resources in place to support the review. However, there is flexibility in the process, so analysts should coordinate closely with the COR and the funds provider to have contract support in place when needed. In every case, PM must have funds in hand before task order award.

Task	Weeks From Prior Step	Weeks From Start
• SOW & IGCE to COR. SOW to contractor for cost proposal	-	-
• Cost proposal received from contractor • PM analyst submits funding request memorandum in workflow	2*	2

• PM-2 issues funding request memorandum	1	3
• Funding memorandum received & provided to PM (COR/Funds)	3	6
• Funds placed on task order (contracting office process) • COR issues contractor NTP w/ NTE cost (task start)	2	8

**Assumes PM analyst has pre-coordinated SME availability. If not, allow additional 2 weeks.*

5.5.3 Estimate Plan

Per GAO best practices, a detailed estimate plan is required (see [estimate plan example](#) in PM-Max). Team leads will develop a written estimate plan as soon as possible after required project documentation is available. It should include ICE stakeholders and the FPD’s formal agreement (i.e., signature). Any unknown details, such as the escalation rate or the date for finalizing the review methodology, will be listed as “to be determined.” The plan will be updated as this information becomes available. The estimate plan, as well as updates to this plan, will be provided to PM-20 for review prior to finalizing. In rare cases, where the ICE may be prepared entirely by a contractor, it is appropriate to have the contractor lead prepare the estimate plan for review and approval by the PM lead.

The Estimate Plan is required to be reviewed and approved by PM-20, with a target date of approval no later than three weeks before the onsite review.

A suggested general outline for an estimate plan is as follows:

- Purpose and Scope
- Project Description
- Estimate Process – Describe the type of estimate; the estimate approach, including QA/QC steps; provide list of documents required for the review; describe roles and responsibilities; estimate assumptions and constraints, proposed escalation rates, etc.
- Schedule – Provide an overall schedule showing, as a minimum, major activities, and milestones.
- Logistics – dates of site visit; detailed site visit schedule (agenda); report format, report review process and distribution; on-site support requirements
- Team members, stakeholders, and assignments – include team member biographies
- Concurrence – the Estimate Plan should be formally (in writing) concurred with by the review team lead and the FPD. Upon finalization, it should be posted to the associated Max.gov ICE/ICR review page (linked on home page).

5.5.4 Estimate

The process for conducting an ICE is like that for an ICR insofar as it begins with the collection of necessary documents and a subsequent sufficiency review to determine if any further information is required to complete the work. Upon completion of the sufficiency review, the PM ICE team lead would notify PM leadership if the documentation provided is insufficient and warrants delaying or postponing the ICE. This determination should be made as soon as possible given the potential impact to the program and project team.

Interaction with the project team is necessary so that the ICE team can develop an adequate understanding of the scope of the project and of any limitations on how it will be executed. In this regard, it is required for the ICE team to be provided with the project team's WBS. ***It is strongly recommended that the ICE be developed and presented using the same WBS as the project team's estimate.*** This makes direct comparison, and eventual reconciliation, of the two estimates much simpler.

Similarly, it is acceptable for the ICE team to utilize the same schedule activities and logic (if deemed reasonable) as the project team. Again, this makes subsequent comparison and reconciliation far easier. Provided the ICE team independently develops its own resource and duration estimates for all work activities, the ICE can be considered to be independent of the project team's schedule. The ICE team must also perform its own risk analysis.

The ICE team may consider the WBS and/or schedule logic proposed by the project team to be unworkable or undesirable. If so, the PM lead will make a determination as to how to proceed. To preserve the independence of the estimate, it is preferable to allow the ICE team to make any adjustments to the WBS or schedule logic it considers necessary to execute the work in the most efficient manner possible.

The project team should shield cost data from the ICE team until after the team has completed its cost estimate. The specific cost data to be shielded/redacted varies by project; this should be addressed early in the planning process. The ICE team may only access project team cost data in support of the reconciliation process, which is after the ICE team leader has determined the ICE development process is completed (i.e., "pencils down"). Actual redacting of the cost data for an ICE should be done by the project team prior to submission to the ICE collaboration page.

The ICE should be prepared assuming that adequate funding is available without constraints, or on the funding profile proposed by the project team.

Escalation. Ensure that economic escalation is properly and realistically reflected in the cost estimate. Escalation is schedule driven, and scheduling assumptions need to be clearly noted. Project teams may use specific rates relative to the site when available. In any case, the source of escalation information used should be identified and the applicability of the rates should be explained/justified. (See DOE G 413.3-

21A, Section 6.4.4 for more information.) Additionally, a standard ground rule should be to define the base year dollars that the estimate will be presented in and the inflation index that will be used to convert the base year costs into then-year dollars that include inflation. At a minimum, the inflation index, source, and approval authority should be clearly explained in the estimate documentation. For additional information, see the PM-30 escalation model in Microsoft Teams under the [Escalation Channel](#).

Confidence Level. PM ICEs should be developed using standard confidence levels consistent with the IPT (usually P80 or P85, except for BCPs that typically use P95). Other confidence levels may be used with appropriate justification, but note that for CD-2, a confidence level of P70 to P90 is required.

Cross Checks. The credibility of the ICE is strengthened by performing cross-checks on cost estimating methodologies. The ICE report should include a cross-checks section that applies different methods to estimate high-value cost elements and determine if they produce similar results.

Status Date. The ICE should establish and clearly annotate the status date for the estimate. All costs prior to this date are considered sunk costs and all costs after this date are considered “to-go” costs. It’s recommended that the ICE use the same status date as the IPT estimate to better facilitate reconciliation activities.

GAO Best Practices.

Cost. For all ICEs, the ICE team should evaluate the project team’s cost estimate following GAO’s Twelve Steps of a High-Quality Cost Estimating Process. This helps ensure the estimate meets the four characteristics of a high-quality, reliable estimate (well-documented, comprehensive, accurate, and credible). The ICE report should include a narrative that describes the estimate’s general compliance with each of the four characteristics and is supported by the more detailed GAO checklist appendix.

Schedule. For all ICEs, the ICE team should evaluate the project team’s schedule following GAO’s Ten Steps of a High-Quality Schedule Process. This helps ensure the schedule meets the four characteristics of a high-quality, reliable schedule (comprehensive, well-constructed, credible, and controlled). The ICE report should include a narrative that describes the schedule’s general compliance with each of the four characteristics and is supported by the more detailed GAO checklist appendix.

GAO checklists for both cost and schedule should be completed and documented in a table within the appropriate ICE report appendices. IPT self-assessments, ICE team assessments of the IPT’s estimate or schedule, and ICE team self-assessments should be completed as required by the specific ICE report GAO checklist template.

Shelf Life. The “shelf life” indicates the period for which the estimate may be considered valid. In most cases, this period should be no more than one year, but should be determined by each ICE/ICE team, given the uniqueness of the estimate.

All ICRs and ICEs will have a discussion in the report’s executive summary and accompanying transmittal memorandum that identifies an appropriate shelf life of the estimate. The following is an example of text that may be used to identify the shelf life:

Due to continuing supply chain disruptions and inflationary pressure on construction commodities and labor (if/as applicable) in the <(i.e., San Francisco Bay Area)>, this estimate is valid until < July 20xx >. Beyond < July 20xx >, the estimate will be refreshed by PM and an updated PB validation memorandum issued (if applicable). All costs associated with an estimate refresh are the responsibility of the Program/Project team.

PM leadership should be informed of the ICE team’s progress and supportive of proposed results. As such, the below briefings are required:

Brief Description	When Required	Attendees	Content
Pre-Onsite Trip Brief	≥ 3 days prior to trip	PM-1 (as available), PM-2, PM-20	Project description, estimate/review methodology summary, timeline, ICE team members, logistics, special issues, etc. Verify if a pre-onsite summary brief (see below) is required. PowerPoint or Outline format.
Onsite In-brief	Start of On-site	FPD/IPT, ICE Team	Summary of how the ICE team will conduct the review that week, to include special areas of focus, schedule, additional required documentation, etc. [PowerPoint]
Onsite Summary Brief Draft Review	Prior to onsite Out-brief	PM-1 (as available), PM-2, PM-20	Review of proposed on-site summary brief as prepared by the ICE team leader. Email draft slide deck to PM leadership with sufficient time to review and allow for phone call follow-up, if needed.
On-site Summary Brief	End of the On-site	FPD/IPT, ICE Team	Areas of concern, documentation still required, follow-on interviews, tentative recommendations, timeline going forward. Preliminary results (i.e., cost range, TPC, CD-4 range, CD-4) will <u>not</u> be provided. [PowerPoint]
Post-Onsite Trip Brief (per PM-1 discretion)	≤ 3 days after return from trip	PM-1 (as available), PM-2, PM-20	Preliminary review results, recommendations, timeline going forward, special issues. Use of on-site summary brief is acceptable, with editorial mark-ups as appropriate.

5.5.5 Report

At the end of the estimate preparation, the ICE team prepares a report to document the ICE process and results (see [ICE report template](#) in Max.gov). A draft report is

prepared initially, followed by a factual accuracy review, and a final report, which addresses all comments received.

FPDs and PMEs should receive draft and final ICE reports in a timely manner. The timeline for report submission (post onsite visit) are as follows:

- Submission of draft report for factual accuracy should be accomplished within 30 days of the onsite visit.
- PM's internal review should be accomplished concurrently with or within 7 days of factual accuracy review from the FPD.
- Submission of the final report should be completed within the 30 days of receipt of factual accuracy comments.

Nominal Contents for the ICE Report:

- Executive Summary (include scope statement, funding profile, key recommendations, shelf life)
- Introduction (project background, scope statement, status)
- Independent Cost Estimate
 - Information available to the ICE team
 - Ground rules & assumptions
 - Funding profile
 - ICE development (approach, methodology, escalation, results)
 - Cross-checks
 - GAO best practices assessment (cost)
- Independent Schedule Analysis
 - IPT schedule assessment
 - GAO best practices assessment (schedule)
 - ICE schedule
- Independent Risk Analysis
 - Risk analysis methods and results
 - Cost results
 - Schedule results
 - TPC cash flow analysis
 - Sensitivity analysis
- Reconciliation
- Conclusions (Specific Results of the ICE)
- Recommendations (Actions that the IPT should take going forward)
- Appendices (assignments and bios of team members, GAO best practices assessment, and others as needed)

The following GAO best practices assessments will be documented in tabular form in

appendices to the ICE report:

GAO Best Practices Assessment (For CD-2/3/BCP ICEs). <i>Refer to Section 4.3.6 for CD-1 ICE</i>	IPT Self-Assessment	ICE Team Assessment of IPT	ICE Team Self-Assessment
Cost Estimating (12-Steps)	X	X	X
Scheduling (10-Steps)	X	X	N/A

If an ICE is performed in conjunction with an EIR, separate ICE and EIR reports should be prepared, and the ICE report should either be incorporated into the EIR report by reference or included as an annex (preferred).

Formal transmittal of the final ICE report will be from the Director, Office of Project Management (PM-1) to the appropriate PME.

For archival purposes, the final ICE report and transmittal memorandum should be uploaded to both the PARS document management system (DMS) and the “Final Reports” tab of the PM-Max ICE/ICR page (<https://community.max.gov/x/9YTIRw>).

5.5.6 Reconciliation

Any substantial differences between an ICE and a project’s cost estimate should be formally reconciled. These differences should be documented sufficiently for the reader to understand what is driving the delta. This pertains both to the TPC and to individual elements of the estimates. Although PM’s primary focus is on the TPC, any significant difference in sub-elements of the estimate should also be addressed. DOE has no standard definition of what constitutes a substantial cost difference. However, as a rule of thumb, if the ICE TPC differs from the project team’s cost estimate by more than 10 percent, a formal reconciliation should be performed. If the ICE and project team TPCs are within 10 percent of each other, any differences should be identified and discussed, but formal reconciliation may be unnecessary. However, any differences that have a significant bearing on PM’s ability to validate a performance baseline must be adequately explained and understood.

To emphasize, reconciliation is not “negotiations” with an expectation to come to an agreement on the ICE with the project team. “Splitting the difference,” agreeing to change the ICE to accommodate the IPT’s desires or changing the ICE with no sound basis is inappropriate and should not be done.

Ideally, reconciliation includes direct discussions between the ICE team estimators and the project team estimators. Direct discussions are the optimum way to understand and clarify what assumptions each estimating team made when preparing its estimate. Each estimating team is charged with presenting its opinion of what the project should cost based on its understanding of the work, the expertise of its members, and its evaluation of project risks. Differences in approach, including fundamental issues such

as the type and size of the project organization, are normal, and neither estimating team is necessarily correct or incorrect.

One reconciliation “ground rule” is that estimates should be adjusted, as appropriate, to correct any errors or improper interpretations of project requirements. Any remaining differences should be identified and explained, but neither estimate should be changed. Such differences provide insight into the risk and uncertainty entailed in executing the project. The fact that two estimates differ does not necessarily mean that one is more credible than the other. The goal is to identify, assess and understand those differences, and to communicate them so that the Program Office and the PME can make an informed decision and commitment of budgetary and human resources.

When direct discussions are not possible, the ICE team should identify significant differences between the two estimates and present its analysis of the reasons for the differences. The level of detail in this estimate may be somewhat limited due to the likely need to make assumptions concerning certain aspects of the project team’s estimate.

The ICE team should keep the following points in mind when reconciling its estimate:

- The ICE and the project team estimate should be updated based on new information, clearer understanding, or to correct errors.
- The reconciliation should focus on possible differences due to:
 - Program definition and scope (including WBS definitions)
 - Estimating ground rules and assumptions
 - Consistency of the estimating methods relative to the project scope
 - Limitations of estimating methods
 - Inputs for estimating methods
 - Interpretation of the sources and impacts of risk
- Reconciliation can be done in stages – e. g. , ground rule assumptions, evaluation of baseline, completion of estimate
- Reconciliation does not necessarily mean consensus, and is certainly not a negotiation
- Reconciliations should be non-adversarial

The distinction between what a project *should cost* and what it *will cost* is often discussed when reconciling estimates. An ICE is not tied to a particular contractor’s approach, nor is it bound by any bias of the project team or of the sponsoring DOE Program Office. An ICE is supposed to provide an independent, external look at the project, and it typically provides an estimate of what the project *should cost*, if prevailing industry/market practices are followed.

However, this is not necessarily what the project *will cost*, if a particular contractor

performs the work using a different delivery method than that on which the ICE was based. For example, when an M&O contractor will be performing the work, it is not uncommon for the project team's cost estimate to be higher than the ICE. The ICE may assume that a considerable amount of subcontract work will be performed using competitively bid firm fixed-price subcontracts, whereas the project team's estimate may assume that the M&O contractor will self-perform most of the work. In such an instance, the project team's estimate is probably a more accurate reflection of what the work *will cost*, if the M&O contractor performs all the work.

There is no need for either estimate to be changed in an instance such as this. The reconciliation should note the differences in contracting methods and the estimated cost differences attributable to those methods. If the ICE team considers the proposed TPC to be unreasonably high, and PM shares that view, it should so notify the FPD, the Program Office, and the PME. However, PM would probably, at the same time, validate the adequacy of the TPC. The PME may approve the TPC despite PM's views concerning its unreasonableness or may direct the project team to find a more cost-effective delivery method. In either case, PM would have met its obligation to ensure that the PME was properly informed regarding project costs.

When there are significantly different assumptions regarding staff levels and productivity, the ICE team should ensure that these differences are adequately addressed in both the ICE team and project team's risk assessments. It is not prudent for either team to assume that its approach is more credible without identifying an off-setting risk or opportunity, as applicable, in the risk assessment.

It is important to understand that both estimates may be well-prepared and credible yet differ considerably. Interpreting the differences between an ICE and a project team's cost estimate is much the same as analyzing competitive bids. It is not uncommon for there to be significant differences in the cost estimates submitted by various contractors submitting competitive proposals for a project. The challenge in evaluating those proposals is to understand the factors that led to the differences between the various estimates, and to carefully consider how those factors are likely to impact actual project costs. There is often no practical way to force all the estimates to "agree", nor is it necessarily appropriate to assign a higher level of credibility to any particular estimate. It is generally accepted that actual project costs will fall within a certain range, and the degree to which two or more cost estimates differ provides insight into how wide or narrow that range is likely to be, and therefore the degree of risk and uncertainty that is inherent in undertaking the project.

5.5.7 Post-ICE Data Collection

Upon finalization of the ICE report, PM analysts should ensure their support contractors post to Max.gov all relevant ICE/ICR back-up information to support an audit of the estimate (to be included as a requirement in the SOW). Intent is that individual Max.gov review collaboration sites will serve as a repository where all base "raw" documents can

be stored to facilitate any future audit questions related to the ICE. This would include, among others, the P6 schedule in its appropriate level of detail, rates used, risk analysis documentation, any cost data from the EVMS that should be under development, Mii documents, etc.

6. LESSONS LEARNED FROM PREVIOUS ICEs and ICRs

Several useful lessons that PM has learned in the past several years are presented below:

- A. Provide adequate time for the sufficiency review to ensure the project is prepared for the ICE/ICR.
- B. Escalation. Neither PM nor DOE prescribes the use of a particular escalation rate. Generally, the best available information at the time for the type of work and project location(s) should be used.
 - (1) However, the ICE team should review the PM-30 escalation model in Microsoft Teams under the [Escalation Channel](#) for the latest recommended escalation rates. For each project, the specific escalation rate should be analyzed and applied as is appropriate for that location and type of work.
 - (2) The estimate should be presented in base year dollars as well as budget-year (escalated) dollars. The estimate should facilitate isolating the dollars associated with escalation. The application of escalation should facilitate comparison between two estimates and further analysis, if needed by other entities.
- C. Risk assessments and resulting calculations of DOE contingency and management reserve (MR) allowances (both cost and schedule) may fail to properly distinguish between DOE risk and contractor risk.
- D. A risk register may include risks that more properly lie outside the project. A cost estimate should identify “bounding assumptions” which represents elements not included in the estimate. If risk outside the bounding assumptions is realized, a baseline change may be required since this type of risk is not intended to be covered by MR or contingency.
- E. A project’s “*hotel load*” may not be clearly identified and consequently, may not be adequately understood and appreciated by the project team. Particularly on cost reimbursable projects, unrecoverable schedule delays lead directly to cost increases that are roughly equal to the hotel load during the delay period. It is important to ensure that the costs associated with schedule delays are recognized in the risk register, and a solid estimate of a project’s hotel load is well documented to accurately predict those costs. Also, it is noted that the hotel load may vary significantly based on the given phase of the project (e.g., design

vs. construction).

- F. A TPC should include the cost of all work that is “in scope”, regardless of which organization performs the work or how it is funded.
- (1) Project interfaces are often inadequately defined. This has a direct bearing on a cost estimator’s understanding of the project scope. The accuracy of a cost estimate relies on having a fully defined scope. In this respect, it is essential to know what is “in” a project, and what is “out”. There are often significant *physical* and *organizational* interfaces or limits.
 - (2) Physical limits. In the chemical processing field, the term “battery limits” is used to describe one or more geographic boundaries, imaginary or real, enclosing a plant or unit being engineered and/or erected, established for the purpose of providing a means of specifically identifying certain portions of the plant, related groups of equipment, or associated facilities. All work scope within the “battery limits” of a project is part of the project; work scope outside the battery limits is not. The concept of battery limits should be applied to all types of capital asset projects, and its “battery limits” should be clearly defined. This is typically done on the project drawings, but it is also useful to include a narrative in the PEP that defines the physical limits of the work to be performed.
 - (3) Organizational limits. The transition between when construction ends and when facility operations start should be clearly defined. Conceptually, a project (or subproject) should be “complete and usable” when construction has been completed, which implies that commissioning has been completed. In addition, on a nuclear project, the project should have successfully completed its operational readiness review (ORR) and cold commissioning (if appropriate) prior to CD-4. These rules are not necessarily inviolate, and some discretion in defining project completion is appropriate. However, any such discretion exercised should be unequivocally documented prior to CD-2.
 - i. There can be genuine confusion about whether to classify certain activities and their associated cost as being part of a project. This is particularly true in an M&O contract environment, where services provided by the same employee may be part of a project under one set of circumstances and be oversight functions that are not project costs under slightly different circumstances. One common example are the costs to make physical tie-ins between new and existing infrastructure, which could reasonably be classified either as a project or a non-project cost, depending on where the “battery limits” of the project were initially drawn.
 - ii. The full extent of certain project activities is not always adequately understood. For example, one estimate included costs for the DOE portion of an Operational Readiness Review (ORR) but included no costs

for the contractor-led ORR that normally precedes the ORR.

- G. It may be impossible, practically speaking, to make a side-by-side comparison of two independent estimates that follow different WBS structures. For this reason, in almost all circumstances the ICE should be prepared using the same WBS structure as the project team's cost estimate.
- H. Failure to perform/provide a suitable Life Cycle Cost Estimate (LCCE) has also been a common problem at CD-1. The CD-1 documentation should include a thorough AoA process using GAO's 22-step best practices identified for selecting the preferred alternative. If the LCCE is a significant factor in the alternative selection recommendation, then the project team should have prepared LCCEs for all the alternatives as noted in OMB Circulars A-11 and A-94. As a minimum requirement, a LCCE is needed for the preferred alternative, and the LCCE should be of high enough quality to allow the Program Office and PME to make fully informed decisions regarding the project's affordability. They should be assessed as part of the CD-1 ICR or ICE.
- I. Funding profile. During an ICE, it is important that the IPT confirm and provide the assumed funding profile early in the review process. The assumed funding profile is a significant assumption which will impact the Performance Baseline, and specifically the Performance Measurement Baseline, generated during an ICE. If the funding profile changes "in-stride" during the review, it can result in re-work and delays. Furthermore, depending on when a given ICE is occurring in the larger DOE budget process, there can be some sensitivities to releasing and discussing the assumed funding profile with selected personnel (e.g., it may be embargoed).
- J. Required documents submission milestone. The submission of the required documents for an ICE/ICR is a critical milestone which allows the review to begin in earnest. The documents required for a given review (and especially an ICE), can require significant IPT effort and coordination, and IPT's often struggle to provide the required documents per the initial milestone. As a result, it is important that IPT's plan accordingly for this key milestone.
- K. IPT document updates "in stride" (i.e., after the IPT's initial posting the required documents). The IPT will often, understandably, want to provide document updates (e.g., .xer version of the schedule, PEP) after the initial posting based upon how the review is progressing. This can result in inefficiencies and delays. As a result, this practice is generally discouraged; instead, IPTs should consider ICE/ICR feedback and then update their key documents after the review is completed. If the IPT provides updates to documents, they should clearly identify what has changed in each document.
- L. Sunk costs. It is important to clearly identify the "cut off" (or "status") date and distribution (i.e., by WBS) of sunk costs, and the provided schedule should be

consistent with this established “cut-off.” This date should be clearly documented in the ICE report.

- M. ICE. Early in the planning process, it is important to clearly identify what the ICE team is independently estimating and the appropriate estimating techniques by WBS. This is related to the “redaction” lesson learned in the next paragraph.
- N. Redaction of selected costs during an ICE. During an ICE, in order to maintain independence of the ICE team and to ensure the ICE team generates an independent estimate (to the extent practicable), it is likely that the ICE team lead will ask that the IPT redact selected costs in their documents. It is important to clearly identify which costs and/or quantities should be redacted and how the two sets of documents (i.e., “with costs” and “redacted”) will be managed/controlled. Costs (e.g., labor unit rates) which are contractually mandated are generally accepted as a ground rule and not redacted.
- O. Evaluate Integrated Master Schedule (IMS) as early as possible. Must determine if IMS is adequate enough to perform an ICE. If IMS deemed inadequate, notify PM leadership and develop a recovery plan with the IPT as soon as possible.

APPENDIX A - ACRONYMS

Below is a list of commonly used acronyms used while conducting an ICE/ICR. For additional acronyms, please refer to DOE-PM-HBK-01-2014, [Acquisition and Project Management Glossary of Terms](#)

AACEI	Association for the Advancement of Cost Engineering International
AGC	Associated General Contractors of America
AOA	Analysis of Alternatives
AS	Acquisition Strategy
BCA	Benefit Cost Analysis
BCP	Baseline Change Proposal
CD	Critical Decision
CDR	Conceptual Design Report
CE	Chief Executive for Project Management
CER	Cost Estimating Relationship
CNS	Chief of Nuclear Safety
COR	Contracting Officer's Representative
DA	Deputy Administrator
D&D	Decontamination and Dismantlement
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U. S. Department of Energy
EIR	External Independent Review
EO	Executive Order
ESAAB	Energy Systems Acquisition Advisory Board
EVMS	Earned Value Management System
FAR	Federal Acquisition Regulation
FPD	Federal Project Director
FY	Fiscal Year
GAO	Government Accountability Office
GR&A	Ground Rules and Assumptions
ICE	Independent Cost Estimate
ICR	Independent Cost Review
IGCE	Independent Government Cost Estimate
IPR	Independent Project Review
IPT	Integrated Project team
KPP	Key Performance Parameter
LCCA	Life Cycle Cost Analysis
LCCE	Life Cycle Cost Estimate
LOI	Lines of Inquiry
MNS	Mission Need Statement
M&O	Management and Operating
MR	Management Reserve
NEPA	National Environmental Policy Act
NNSA	National Nuclear Security Administration
NQA	Nuclear Quality Assurance

NRC	Nuclear Regulatory Commission
OBS	Organizational Breakdown Structure
OMB	Office of Management and Budget
OPC	Other Project Costs
ORR	Operational Readiness Review
PARS	Project Assessment and Reporting System
PASEG	Planning & Scheduling Excellence Guide
PB	Performance Baseline
PDRI	Project Definition Rating Index
PDS	Project Data Sheet
PED	Project Engineering and Design
PEP	Project Execution Plan
PM	Office of Project Management
PMB	Performance Measurement Baseline
PME	Project Management Executive
PMP	Project Management Plan
PMRC	Project Management Risk Committee
PMSO	Project Management Support Office
PRD	Program Requirements Document
PSO	Program Secretarial Officer
PY	Prior Year
QA	Quality Assurance
QC	Quality Control
REA	Request for Equitable Adjustment
RLS	Resource Loaded Schedule
RMP	Risk Management Plan
ROM	Rough Order of Magnitude
SME	Subject Matter Expert
SOP	Standard Operating Procedure
SOW	Statement of Work
SRA	Schedule Risk Analysis
TEC	Total Estimated Cost
TIPR	Technical Independent Project Review
TPC	Total Project Cost
TMP	Technology Maturation Plan
TRA	Technology Readiness Assessment
TRL	Technology Readiness Level
USC	United States Code
VE	Value Engineering
WBS	Work Breakdown Structure

APPENDIX B - ICE/ICR DECISION-MAKING PROCESS

This appendix provides some considerations for deciding whether an ICR or ICE should be conducted, and, if an ICE is selected, what methods should be employed. An ICE usually combines several different estimating methodologies.

A. ICR or ICE DOE O 413.3B Requirement

CD	Total Project Cost	ICR	ICE
CD-0	>\$750M or PME	Y	N/A
CD-1	>\$100M (PM determines which to perform)	Default	Ad Hoc
CD-3x	>\$100M	N/A	Y
CD-2	>\$100M	--	Y
CD-3	>\$100M	--	Y
BCP	Any dollar value	Default (as part of an EIR)	Ad Hoc

B. Decision Method for selecting an ICR or ICE at CD-1.

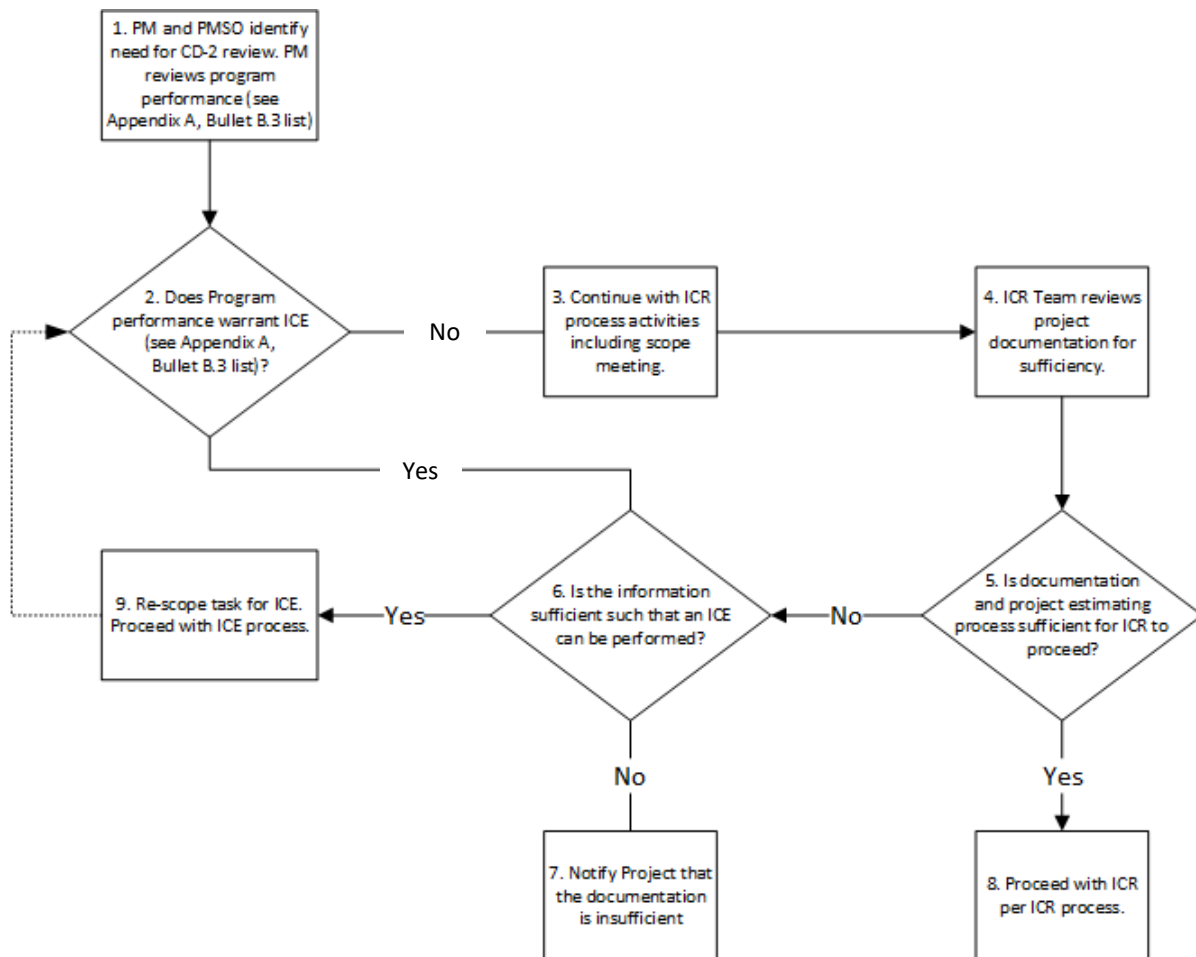
An ICR will normally be conducted on the CD-1 cost range unless an ICE is warranted, as discussed in #3 below.

1. Even if an ICR is initially prescribed during the scoping meeting, the ICR may be upgraded to an ICE during the review, such as after the documentation sufficiency review. The decision flow chart below shows the process that may be followed.
2. An ICE should be performed at CD-1 if the ICR team determines that there is significant uncertainty as to the quality of the range estimate or the ability of the project/program team to develop a reasonable estimate. (See Step 2 in the flow chart below.) Factors warranting an ICE instead of an ICR at CD-1:
 - a. Experience: The Program Office, Site Staff and/or project team do not have experience in developing and managing similar size projects within the last 10 years. For example, Program Office A has not developed and managed a similar project for more than 15 years.
 - b. Performance on Recent Projects: Program Office, Site Staff and/or project team have not developed and managed similar size projects successfully (within cost, schedule, and scope baseline). For example, Site Office B's most recent similar project just completed, required BCPs for double the cost,

and extended the schedule more than 1 year over the baseline approved at CD-2.

- c. Performance on Current Projects: Most similar sized, current projects are being performed poorly by the Site Office. For example, Site Office C's two current similar sized projects have both tracked RED in the quarterly reviews for the past year.
3. In any case, the PME may direct that an ICE be performed instead of an ICR.
 4. At CD-1, an ICE would typically be developed primarily through parametric methods (Class 4). A review of the project team's cost estimate would normally be conducted as part of the ICE.

Figure 3. CD-1 ICE/ICR Decision Flow Chart.



C. Decision method to select ICE estimating methodology (applicable to all project milestone stages).

In most cases, the ICE and the project team estimates are developed using different

methodologies. If the ICE team uses the same methodologies, then the team should develop independent information such as rates and quantities or use alternate models to prevent the ICE from only being a math check of the project estimate. The specific methodologies used to develop the ICE should be documented in the Estimate Plan and initial review of the project documentation. Tables 4-2 and 4-3 in DOE G 413.3-21, *Cost Estimating Guide* provide examples of typical estimating methodologies associated with various CDs and estimate classes. Additional AACEi guidance is available for standard (non-process industries) type projects.

Table 4-2. Cost Estimate Classification for Process Industries¹⁰

ESTIMATE CLASS	Primary Characteristic	Secondary Characteristic		
	MATURITY LEVEL OF PROJECT DEFINITION DELIVERABLES Expressed as % of complete definition	END USAGE Typical purpose of estimate	METHODOLOGY Typical estimating method	EXPECTED ACCURACY RANGE Typical variation in low and high ranges
Class 5	0% to 2%	Concept screening	Capacity factored, parametric models, judgment, or analogy	L: -20% to -50% H: +30% to +100%
Class 4	1% to 15%	Study or feasibility	Equipment factored or parametric models	L: -15% to -30% H: +20% to +50%
Class 3	10% to 40%	Budget authorization or control	Semi-detailed unit costs with assembly level line items	L: -10% to -20% H: +10% to +30%
Class 2	30% to 75%	Control or bid/tender	Detailed unit cost with forced detailed take-off	L: -5% to -15% H: +5% to +20%
Class 1	65% to 100%	Check estimate or bid/tender	Detailed unit cost with detailed take-off	L: -3% to -10% H: +3% to +15%

Table 4-3. Generic Anticipated Types of Estimates for DOE Critical Decisions

Critical Decision	Suggested Estimate	Recommended Minimum AACE International Estimate Classification
CD-0	Cost estimate range	Class 5
	Estimate of costs to be incurred prior to CD-1	Class 3
CD-1	TPC Range	Class 4
	Estimate of near term preliminary design cost	Class 3
CD-2	Single point estimate representing entire project:	
	– Low risk projects	Class 3
	– High risk projects	Class 2
CD-3	Cost estimate based on Final Design [or sufficiently mature to start construction]:	
	– Low risk projects	Class 2
	– High risk projects	Class 2
CD-4		N/A

APPENDIX C - ICR EXAMPLE LINES OF INQUIRY AND DOCUMENTATION

CD-0 – Mission Need Rough Order of Magnitude (ROM) Cost Range Review

For projects with a TPC > \$750M or if designated by the PME, PM¹¹ will conduct an ICR (DOE O 413.3B, Table 2.0).

Scope of Review:

Evaluate reasonableness of the cost and schedule ranges. Review basis of ROM cost range and provide an assessment of whether this range reasonably bounds the cost and schedule of alternatives to be analyzed in the next project phase. Review basis of schedule range and assess whether the schedule is consistent with strategic requirements for when this project is required. If appropriate, utilize historical information from completed projects with analogous scope and acquisition strategies to evaluate if the range is within the appropriate magnitude. Also, for projects closely linked to other projects, assess whether schedule accounts for appropriate integration.

Note: If this review is not done in conjunction with a Mission Validation Independent Review (MVIR), assess whether high-level requirements are sufficiently defined to identify potential alternatives (to be analyzed in the Conceptual Design phase) that are both applicable and capable of meeting project goals. Note that “reasonableness” is the judgment of the expert reviewers based on their experience.

Required Documentation:

The required documentation is prescribed by the review team as part of the Review Plan, as tailored to the specific project. The following is a suggested list (not all inclusive) to be included in the Review Plan as required documentation:

Documents (CD-0 ICR)
Mission Need Statement, latest draft
Program Requirements Document (PRD) or equivalent list of functional and program requirements (required for NNSA projects)
Description of legacy program(s)
Ground Rules & Assumptions of the estimate
Rough order of magnitude cost ranges and schedule
Basis of Estimate/Assumptions
Risk Evaluation (part of Mission Need Statement or separate)

¹¹ Starting October 1, 2019, NNSA’s Office of Cost Estimating and Program Evaluation (CEPE) will perform required ICEs/ICRs for NA programs at CD-0 and CD-1. PM will coordinate with CEPE, as needed.

Tailoring Strategy (if required)
Assumed Funding Profile to support the proposed CD-0 cost and schedule range

Example Lines of Inquiry:

The following are the typical elements and standard Lines of Inquiry (LOIs) that an ICR team should address. Elements may be added or deleted during the ICR scoping process, and LOIs should be further clarified and documented in the review plan. The most important LOIs are in **bold** text. This list assumes that the ICR is conducted independent of any other reviews. If this ICR is conducted with another review, the LOIs should be tailored, as applicable, so as not to duplicate LOIs with another review.

(1) Estimate Methods & Approach

- **Assess the method of estimation and the strengths/weaknesses of the estimates for each alternative considered. Ensure GAO's best practices in cost estimating have been implemented as appropriate.**
- **Verify that ground rules and assumptions (GR&A) are clearly identified including those related to programmatic, technical, cost and schedule basis, and economic factors.**
- Verify that the GR&A do not impose biases toward future alternative selection.
- Verify that credible and applicable tools and benchmarks, including historical data, have been used to develop the cost and schedule estimates (i.e., best practices such as those identified in the GAO Cost Estimating and Assessment Guide).

(2) Cost and Schedule Basis

- **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 alternative considered.**
- Identify whether the estimated costs and schedule for the project are reasonable based on professional expertise, parametric estimates, historical data, etc.
- Assess basis for escalation.

(3) Risk & Uncertainty Analysis

- **Verify that reasonable and credible risks and uncertainties have been identified and documented.**

- **Verify that a reasonable qualitative (or quantitative) risk assessment has been conducted.**
- If new technology or technology applied in a new application were identified, verify that associated risks have been identified and quantified.

(4) Mission and Functional Requirements

- **Verify that appropriate and credible mission and functional requirements have been identified and documented.**
- Verify that appropriate inputs from the requirements are used for the cost and schedule ranges.
- Verify that a mission need date (CD-4) and a path to achieve it have been clearly identified.

(5) Alternatives Considered

- **Verify that appropriate alternatives were considered to ensure that breadth and depth of possible solutions are encompassed in the cost and schedule range.**

(6) Overall Cost and Schedule Range Estimate – Summary

- **Verify that the overall cost and schedule ranges estimated track clearly to the bases of estimate and reflect risks and uncertainty.**
- Verify that the costs and schedule are identified by project phases (design, construction) and possible key milestones.
- Verify that costs to CD-0 are excluded from the CD-0 estimate and ensure that costs for conceptual design (next phase, ie, CD-0 to CD-1) have been identified. Assess the reasonableness of these costs.

CD-1 Conceptual Design Alternative Selection and Cost Range Review

For projects with a TPC > \$100M, PM¹² will conduct an ICR or an ICE as appropriate (DOE O 413.3B, Table 2.1). See Appendix B for the ICR-ICE decision process. These LOIs are for an ICR.

Scope of Review:

Preliminary cost and schedule estimates. Evaluate reasonableness of the cost and schedule ranges. Review basis of the cost range and provide an assessment of whether this range reasonably bounds the cost and schedule of alternatives. Assess whether the preliminary cost and schedule estimates include cost contingency and schedule contingency appropriate for the project. Since an IPR is optional at this stage (except for HazCat 1, 2, and 3 nuclear facilities), the ICR or ICE will need to include sufficient review of all alternatives considered to ensure the reasonableness of the cost and schedule ranges. Note that while the project should have selected the preferred alternative, the ICR should look at each alternative to give the PME the full assessment, if the recommended alternative is not selected.

Risk Management. Assess whether the key risks for the recommended alternative have been identified along with appropriate mitigation actions. Assess whether the preliminary cost and schedule estimates reflect cost contingency and schedule contingency needed. The acquisition strategy (AS) is also an integral part of the review since the cost and schedule should reflect the selected acquisition strategy.

Required Documentation:

The required documentation is prescribed by the review team as tailored to the specific project. A suggested list to be included in the Review Plan as required documentation is as follows:

Documents (CD-1 ICR)
CD-0 Documents (e. g. , Mission Need Statement, CD-0 Approval)
Conceptual Design Report (including Alternative Analysis, Hazard Analysis, site selection criteria, NEPA documentation, system functions and requirements, preliminary cost and schedule estimates)
Project Execution Plan
Cost and schedule basis documents, including assumptions
Project schedule/critical path schedule
Life-cycle cost analysis (for selected alternative; for all alternatives if significant to alternative recommendation)
Risk Management Assessment
Acquisition Strategy

¹² Starting October 1, 2019, NNSA's Office of Cost Estimating and Program Evaluation (CEPE) will perform required ICEs/ICRs for NA programs at CD-0 and CD-1. PM will coordinate with CEPE, as needed.

Lines of Inquiry:

The following are the typical elements and standard LOIs that an ICR team should address for CD-1. Elements may be added or deleted during the ICR scoping process, and LOIs should be further clarified and documented in the Review Plan. The most important LOIs are in **bold** text.

(1) Cost

- **Verify that the conceptual scope, cost, and schedule are firmly supported with sound underlying technical, economic, and programmatic basis, assumptions, and front-end planning.**
- Assess the project PDRI analysis (if performed) — a best practice — and verify that it is consistent with an evaluation by the ICR team and at an appropriate definition level (target score 600 for conceptual — see DOE Guide 413.3-12).
- Assess that credible cost and schedule ranges have been developed and supported by applicable tools and benchmarks (i.e., best practices as identified in the GAO Cost Estimating and Assessment Guide).
- Ensure that there is appropriate cost and schedule integration. Refer to the DOE Office of Project Management (PM) EVMS Compliance Review Standard Operating Procedure, when appropriate.
- **Verify that the conceptual design is mature enough to support definition and development of credible current TRL definition, WBS elements development and contingency/MR planning, and to support the resolution of constructability issues.**
- Assess the preliminary funding profile identifying funds for design and construction, including the possible use of PED funding.
- **Assess the method of estimation and the strengths/weaknesses of the estimates. Ensure GAO's best practices in cost estimating are followed.**
- Identify and assess 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.
- Assess the amount of and basis for escalation.
- Identify whether the estimated costs for the project are reasonable based on professional expertise, parametric estimates, historical data, etc.
- Verify that the cost value of schedule contingency is included in the cost range.

- Assess the basis and reasonableness of the LCCEs for the alternatives considered and the selected alternative. If available, complete **LCCE table (for preferred alternative),if available** below.

Table 4. Life Cycle Cost Estimate – Alternative X

Cost Element	CD-1 Low-End \$	CD-1 High-End \$
Design		
Construction		
Startup-Testing-Commissioning		
Operations (over ___ years)		
Shutdown, Dismantling, Decommissioning		
Total Life Cycle Cost		

Complete a table for the recommended alternative. Refer to Section 4.1.3 of this SOP for further guidance concerning LCCEs – in some instances, there will not be a LCCE for each alternative.

(2) Schedule

- **Assess the method of schedule estimation and the strengths/weaknesses.**
- **Ensure schedule health integrity. Refer to GAO Schedule Assessment Guide (GAO-16-89G) and the DOE Office of Project Management (PM) EVMS Compliance Review Standard Operating Procedure, as appropriate for schedule metrics and thresholds. Ensure constraints and other artifacts within schedule do not artificially impact the overall schedule range.**
- **Identify and assess the basis for and reasonableness (and consistency with cost estimate) of key programmatic, economic and project schedule assumptions as related to the quality of estimates and risk management planning and contingency requirements.**
- Identify whether the estimated schedule range for the project is reasonable based on professional expertise, parametric estimates, historical data, etc.

(3) Scope

- Assess if the new technology or technology applied in a new application is mature enough and validated through appropriate tools.
- Verify that design review comments, integration issues (with Operations and other projects) and constructability constraints have been sufficiently addressed.

- **Assess whether the conceptual 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 include a clear definition of responsibility for execution of each or the defined portions of work.**
- Assess if the WBS represents a reasonable breakdown of the project work scope and if it is effective for internal management control and reporting (i.e., is it product oriented?) Refer to the DOE Office of Project Management (PM) EVMS Compliance Review Standard Operating Procedure, as appropriate.
- **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.**
- Identify all underlying technical assumptions and assess whether they are sound and/or appropriately addressed within the Risk Management Plan and adequately supported with contingency, particularly for new technologies that have never been developed and/or prototyped within the proposed environment.
- Assess whether it is reasonable to divide the work scope presented into smaller, discrete (completed and useable) projects to reduce risk. If applicable, identify the basis for managing such discrete projects in an integrated program).
- Confirm that a Program Requirements Document (PRD) exists (required for NNSA) and that project planning reflects the PRD (or equivalent mission programmatic functional and technical requirements for non-NNSA projects).

(4) Risk Management

- Refer to DOE G 413.3-7A, Chg 2, *Risk Management Guide*, for risk management definitions, practices, etc.
- **Verify that risks have been identified for the selected alternative and that contingency analyses have been conducted and documented in Risk Management Plan(s) by DOE and its contractor.**
- **Assess adequacy and completeness of both DOE and contractor risk management planning including the method(s) used to identify threats and opportunities, and whether a reasonably complete list of potential threats and opportunities was developed for analysis.**
- Determine whether appropriate risk handling and mitigation actions, including accepted risks and residual risks, have been identified.

- Identify and assess management reserve (contractor) and contingency (DOE) for both cost and schedule.
- Ensure schedule margin, MR budget and contingency budget allowances are tied to risk assessments.
- Ensure a separate estimate uncertainty analysis is included in the determination of MR and contingency.
- Assess adequacy of the qualitative analysis and rating (high, medium, or low) of current threats and opportunities (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 (if applicable).
- Evaluate the adequacy of the EVMS management control process for risk status/updating.
- Ensure project team is aware of risk management tools.
- Ensure project team understands the distinction between MR and Contingency.

(5) Management Planning and Acquisition Strategy

- **Review the Acquisition Strategy/Plan to determine if a strategy/plan for successful execution of the project is established, if the project is being executed in accordance with the strategy/plan, and it is consistent with other project documentation.**
- Verify that an appropriate level of project management planning has been performed to ensure project team can complete the next phase of the project.
- Verify that the EVMS is used appropriately to plan, schedule, and budget the entire work scope to establish the initial PMB.
- Verify that a FPD has been assigned consistent with the requirements of DOE Order 361.1B.
- Assess the adequacy of a fully integrated (Government and contractor) IPT with appropriate disciplines to support the design activities.
- Assess that the methods and approach planned for project execution is appropriately documented in the PEP.
- **Verify that the selected alternative has been adequately justified based on**

cost, schedule, and scope.

- **Review the AoA to determine if GAO's best practices (GAO-16-22) were used.**

APPENDIX D - ICR CHECKLISTS

This appendix provides sample checklists for use during the ICR process to assist in:

- Sufficiency review of the estimate (initial acceptance review)
- Reasonableness review of the estimate (detailed review)

The checklists below are provided to help the ICR team focus on areas of weakness that need more detailed review and to communicate the review results with others. These checklists are not intended to be the total review activity, only part of it and should be tailored to fit the specific project and the review being conducted. The checklists are provided for CD-0 and CD-1. If an ICR is performed at other project stages, checklist should be tailored to suit the project and stage. A sample summary score sheet for the reasonableness review is provided at the end of the appendix. The summary score sheet should be used to highlight the status and communicate results.

CD-0 Sufficiency Review Checklist				
The sufficiency review is the initial acceptance review of the documentation received to allow the team to determine if sufficient information is available to perform the detailed review.				
The review team members should answer the questions as noted. Provide comments as appropriate to clarify the answer. Yes is good (complete, sufficient, etc.). No is not good (or incomplete).				
Questions	Yes	No	N/A	Comments
Documentation				
Was all the documentation received per the requested list?				
If documents are missing, are they insignificant to the estimate review or are equivalent documents available?				
Completeness				
Is a basis of estimate document or equivalent included?				
Are assumptions identified?				
Are mission need (functional and programmatic) requirements identified?				
Does the estimate approach appear logical?				
Is a range of potential alternatives described for purpose of defining the cost and schedule range?				
Is the overall rough order of magnitude construction cost and schedule identified encompassing the alternatives?				
Is the mission need date identified?				
Are risks and uncertainties described and qualified or quantified?				
Are costs for the next phase (conceptual design) and a funding source identified?				
Summary (Ready to go or not?)				

CD-0 Reasonableness Review Summary Checklist				
The reasonableness review summarizes the lines of inquiry and review of the documentation for the overall reasonableness of the estimate. Specific findings and recommendations are captured in the ICR report				
The review team members should answer the questions as noted. Provide comments as appropriate to clarify the answer. Yes is good (reasonable or acceptable). No is not good (or unacceptable).				
Questions	Yes	No	N/A	Comments
Documentation				
If additional documentation was requested, was it received in time to support the review?				
Is the documentation package complete and usable as a basis for the estimate?				
Relevance				
Are the approaches used in the estimate appropriate for the information available?				
Are the assumptions appropriate for the project?				
Are appropriate rationales documented for items like engineering judgment?				
Is historical information appropriately used for the estimate?				
Are the mathematical calculations correct?				
Consistency				
Is the estimate consistent with the technology maturity?				
Completeness				
Is a full range of possible alternatives identified?				
Are funding needs and sources identified?				
Risk and Uncertainty				
Are risks and uncertainties appropriately identified?				
Are risks and uncertainties analyzed?				
Are both cost and schedule risk impacts identified?				
Reasonableness				
Is the overall cost range estimate reasonable?				
Is the overall schedule duration range estimate reasonable?				

CD-1 Sufficiency Review Checklist				
The sufficiency review is the initial acceptance review of the documentation received to allow the team to determine if sufficient information is available to perform the detailed review.				
The review team members should answer the questions as noted. Provide comments as appropriate to clarify the answer. Yes is good (complete, sufficient, etc.). No is not good (or incomplete).				
Questions	Yes	No	N/A	Comments
Documentation				
Was all the documentation received per the requested list?				
If documents are missing, are they insignificant to the estimate review or are equivalent documents available?				
Completeness				
Is a basis of estimate document or equivalent included?				
Are assumptions identified?				
Are functional and programmatic requirements identified?				
Does the estimate approach appear logical?				
Is a range of potential alternatives described for purpose of defining the cost and schedule range?				
Is the overall construction cost and schedule range identified for the proposed alternative?				
Is there a life-cycle cost analysis for the selected alternative?				
Are there life-cycle cost estimates for all alternatives, if cost is a significant factor in determining the selected alternative?				
Are risks and uncertainties described and qualified or quantified?				
Are costs for the next phase (preliminary design) and a funding source identified?				

Note: If the sufficiency review is unsatisfactory and improved documentation is not readily available (or if the methods and approach are questionable), the ICR may be changed to an ICE with approval of the PM lead. See Appendix D for the ICR-ICE decision process.

CD-1 Reasonableness Review Summary Checklist

The reasonableness review summarizes the lines of inquiry and review of the documentation for the overall reasonableness of the estimate. Specific findings and recommendations are captured in the ICR report.

The review team members should answer the questions as noted. Provide comments as appropriate to clarify the answer. Yes is good (reasonable or acceptable). No is not good (or unacceptable).

Questions	Yes	No	N/A	Comments
Documentation				
If additional documentation was requested, was it received in time to support the review?				
Is the documentation package complete and usable as a basis for the estimate?				
Relevance				
Are the approaches used in the estimate appropriate for the information available?				
Are the assumptions appropriate for the project?				
Are appropriate rationales documented for items like engineering judgment?				
Is historical information appropriately used for the estimate?				
Are the mathematical calculations correct?				
Consistency				
Are the methods used for evaluating each alternative appropriate and consistent?				
Is the estimate consistent with the technology maturity?				
Completeness				
Was an appropriate range of possible alternatives identified?				
Does the estimate (cost & schedule) include the various alternatives?				
Are funding needs and sources identified?				
Are life cycle costs evaluated for each alternative (if cost is a significant factor in the alternative selection)?				
Is the backup information (estimate basis) complete for each alternative?				
Risk and Uncertainty				
Are risks and uncertainties appropriately identified?				
Are risks and uncertainties analyzed using appropriate qualitative techniques?				
Are both cost and schedule risk impacts identified?				
Reasonableness				
Is the overall cost range estimate for the recommended alternative reasonable?				
Is the overall schedule duration range estimate reasonable?				

APPENDIX E - ICE DOCUMENTATION REQUIREMENTS

The estimating methodologies used to develop the ICE determine which documents are required. The table below lists documents that may be used to support an ICE. In every case, the list of required documents tailored to your specific review.

Document Description
All site overhead rates, G&A, and other markups
Acquisition Strategy
Basis of Estimate/ Assumptions
Complete set of construction and equipment specifications
Conceptual Design Report
Construction contract
Construction Management Plan
Construction schedule
Contingency and management reserve analysis
Costs to date by WBS
Critical path schedule
Design review comments
Detailed project schedule (.xer and .pdf)
Engineering studies
Equipment list and specs
Escalation rates and associated rationale and analysis
Facility design descriptions
Funding Profile
Hazard Analysis
Historical information – unique security issues, local construction climate
Interface Analysis
Life Cycle Cost Estimate
Material Takeoffs (unless to be developed as part of ICE)
Mission Need Statement
Most recent detailed capital cost estimate and associated basis
Piping schedules and specifications
Piping and instrumentation drawings (P & IDs)
Preliminary design information
Process flow diagrams
Procurement lists
Project Data Sheets
Project Execution Plan
Regulatory requirements
Resource loaded schedule

Risk Management Plan including risk analysis results
Risk register
Sales tax rate
Site labor rates
Site productivity factors
Staffing plans for project management and administration
Start-up Testing and Turnover Planning documents and other operations readiness plans (as appropriate)
System design descriptions
Title I drawing package (half-size drawings)
Title II drawing package (half-size drawings)
Unique models/tools used to prepare most recent cost estimate
Value Management/ Engineering Report
Vendor lists for major equipment
Vendor quotes for all major equipment/material procurements
Work Breakdown Structure (WBS)
WBS dictionary

APPENDIX F – TEMPLATES AND EXAMPLES

The templates below are available on PM-Max at: <https://community.max.gov/x/5KY3i>

1. Estimate Plan (ICE)
2. Review Plan (ICR)
3. Funds Request Memorandum
4. Contract Support SOW
5. Contract Support IGCE
6. Pre-Trip Brief (to PM)
7. On-site In brief (to IPT)
8. On-site Out brief (to IPT)
9. ICE Report Executive Summary Template
10. ICR Report Executive Summary Template
11. GAO Cost Estimating Checklist
12. GAO Scheduling Checklist
13. GAO AoA Checklist

APPENDIX G – ICE/ICR REPORT STYLE GUIDE

- **General.** In reports, “Conclusions” are the results of the ICE/ICR and the “Recommendations” are specific recommendations being made by the ICE/ICR Team. Ensure the two sections are mutually exclusive.
- **Active/Past Tense.** Reports should be written in active, past tense voice.
- **Text Font/Size.** For consistency across all PM reports, recommend consistent use of the following formatting guidance:
 - Title Page. Month and year report is published (e.g., March 2020)
 - Report text should be Times New Roman font, size 12. Line spacing 1.15.
 - Tables should use Times New Roman font, size 9.
 - Labels for tables and figures. Times New Roman font, size 11.
- **Common/Preferred Terms.** For consistency across all PM reports, recommend consistent use of terms. Please refer to the *PARS Monthly Status Report (MSR) Guidelines and Instructions* document found here:
<https://community.max.gov/x/gHA3hw>