

CECW

Regulation
No. 1165-2-217

1 May 2021

Water Resource Policies and Authorities
CIVIL WORKS REVIEW POLICY

1. Purpose. This Engineer Regulation (ER) establishes policy and procedures for a comprehensive accountable review strategy for Civil Works by providing a seamless process for review of all projects throughout the lifecycle. This ER will ensure the quality and credibility of U.S. Army Corps of Engineers (USACE) decision, implementation, and other work products. It reinforces quality and comprehensive review are equal to cost and schedule compliance. This ER presents a framework for establishing the appropriate level of review, including the level of independence from production and the detailed requirements to accomplish this, including documentation and dissemination. It addresses the Office of Management and Budget (OMB) peer review requirements in “Information Quality Act” (Public Law [P.L.] 106-554) and the “Final Information Quality Bulletin for Peer Review by the Office of Management and Budget.”

3. Applicability. This ER applies to all Headquarters USACE (HQUSACE) elements, Major Subordinate Commands (MSCs), Districts, Laboratories, Centers of Expertise (CX), and Field Operating Activities with Civil Works planning, engineering, construction, and operations & maintenance (O&M) responsibilities.

4. Distribution Statement. Approved for public release; distribution is unlimited.

FOR THE COMMANDER:

5 Appendixes:
A: References
B: Roles and Responsibilities
C: Charge Guidelines and
Considerations/Questions
D: Templates
E: Transparency in Decision Documents

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CECW

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Water Resource Policies and
Authorities CIVIL WORKS REVIEW
POLICY

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Glossary

Chapter 1 Introduction

1.1. Purpose. This ER establishes policy and procedures for a comprehensive accountable review strategy for Civil Works by providing a seamless process for review of all projects throughout the lifecycle. This ER will ensure the quality and credibility of USACE decision, implementation, and other work products. It reinforces quality and comprehensive review are equal to cost and schedule compliance. This ER presents a framework for establishing the appropriate level of review, including the level of independence from production and the detailed requirements to accomplish this, including documentation and dissemination. It addresses OMB peer review requirements in the “Information Quality Act” (P.L. 106-554) and the “Final Information Quality Bulletin for Peer Review by the Office of Management and Budget.”

1.2. Applicability. This ER applies to all HQUSACE elements, MSCs, Districts, Laboratories, CX, and Field Operating Activities with Civil Works planning, engineering, construction, and O&M responsibilities.

1.3. Distribution Statement. Approved for public release; distribution is unlimited.

1.4. References. References are in Appendix A.

1.5. Records Management. The records management requirement for all record numbers, associated forms, and reports required by this regulation are addressed in the Army’s Records Retention Schedule—Army (RRS-A). Detailed information for all related record numbers are located in the Army Records Information Management System (ARIMS)/RRS-A at <https://www.arims.army.mil>. If any record numbers, forms, and reports are not current, addressed, and/or published correctly in ARIMS/RRS-A, see Department of the Army Pamphlet 25-403: Guide to Recordkeeping in the Army.

1.6. Background. The mission of the USACE Civil Works program is to serve the public by providing the Nation with quality and responsive management of the Nation’s water resources. The Civil Works program encompasses water resource development activities including navigation, flood risk management (FRM), coastal storm risk management (CSR), hydropower, recreation, watershed planning aquatic ecosystem restoration, and environmental stewardship. The USACE mission also includes emergency response. USACE review processes are essential to confirming the planning analyses, validating the design, and ensuring project safety, reliability, and quality of the decisions and products USACE provides to the Nation.

1.7. Policy.

1.7.1. Civil Works Products Review. Civil Works products will undergo an open, dynamic, and rigorous review process. Technical, scientific, engineering, and other information used to support recommendations in decision documents or form the basis of design (at any scale) must undergo review. Reviews of specifications, O&M requirements, or other assessments help ensure technical quality and practical application. See Figure 1.1 for a broad overview of Civil Works stages of development and review requirements. For additional roles and responsibilities for quality management activities, see ER 5-1-11 and the USACE Project Delivery Business Process (PDBP) Manual. For special cases, see Chapter 9.

1.7.2. Plan-Do-Check-Act (PDCA) Cycle.

1.7.2.1. PDCA. The PDCA cycle is the guiding quality management procedure for USACE business processes and an important part of the self-improvement process. The PDCA cycle is illustrated in Figure 1.2 and detailed in ER 5-1-11. The key items for each PDCA step related to this ER are summarized below.

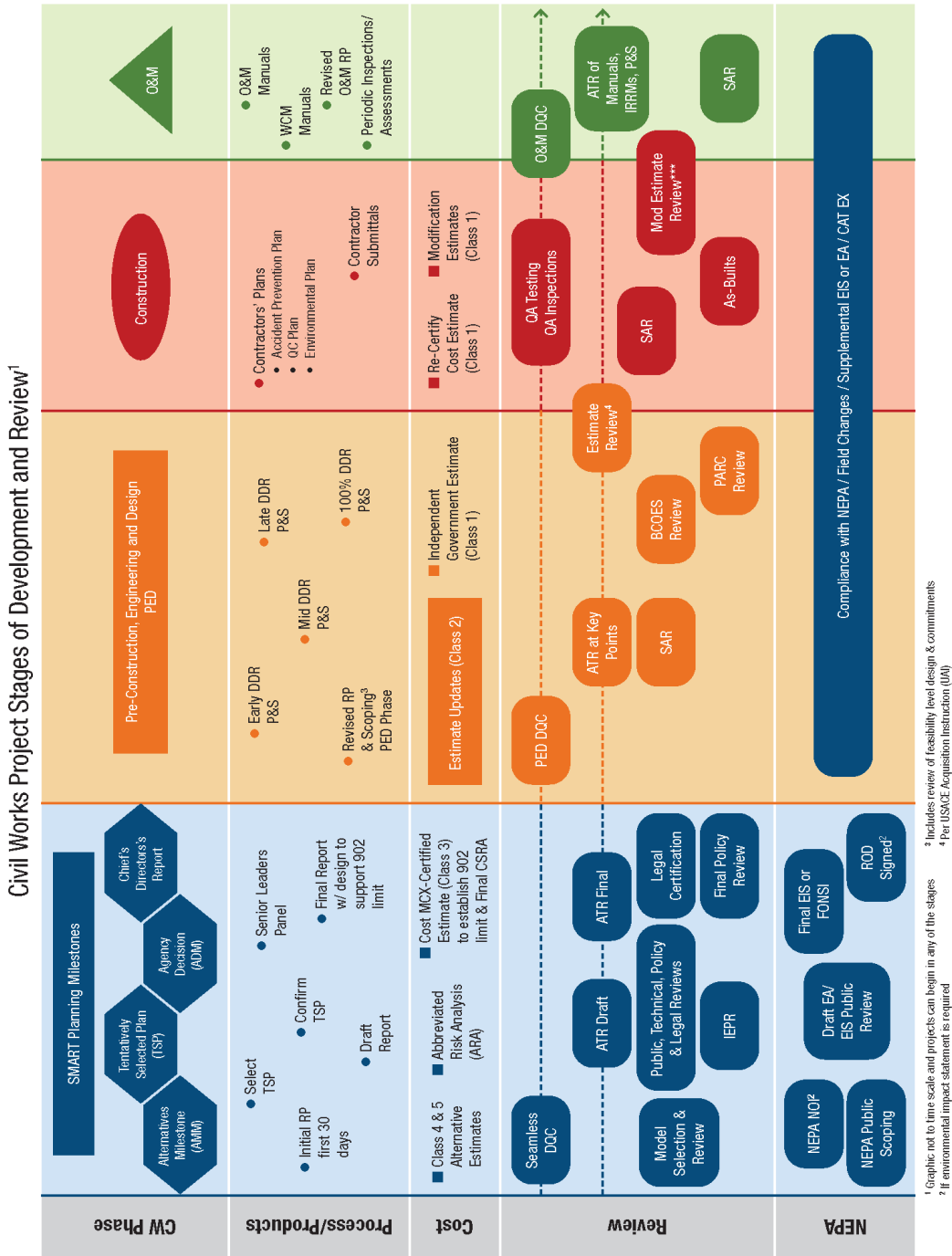
1.7.2.1.1. Plan: Develop the Project Management Plan (PMP) and Review Plan (RP) to document project requirements and enable high-quality products and services.

1.7.2.1.2. Do: Implement the portions of the PMP and RP, including Quality Control (QC) procedures.

1.7.2.1.3. Check: Implement portions of the PMP and RP, including QA procedures, and evaluate the project results.

1.7.2.1.4. Act: Identify and implement process changes for continual, real-time improvement.

1.7.2.2. Nested PDCA Cycle. Each project as a whole has a PDCA cycle, but “nested” PDCA cycles also apply to each project phase and each major deliverable. The Quality Management Process is an ongoing process applied at each phase or deliverable of the project, and the results at each step inform the process going forward, in real time. Figure 1.3 provides an example of the nested PDCA cycle for the design process.



¹ Graphic not to time scale and projects can begin in any of the stages
² If environmental impact statement is required
³ Includes review of feasibility, level design & commitments
⁴ Per USAOE Acquisition Instruction (UAI)

Figure 1.1. Civil Works Stages of Development and Review

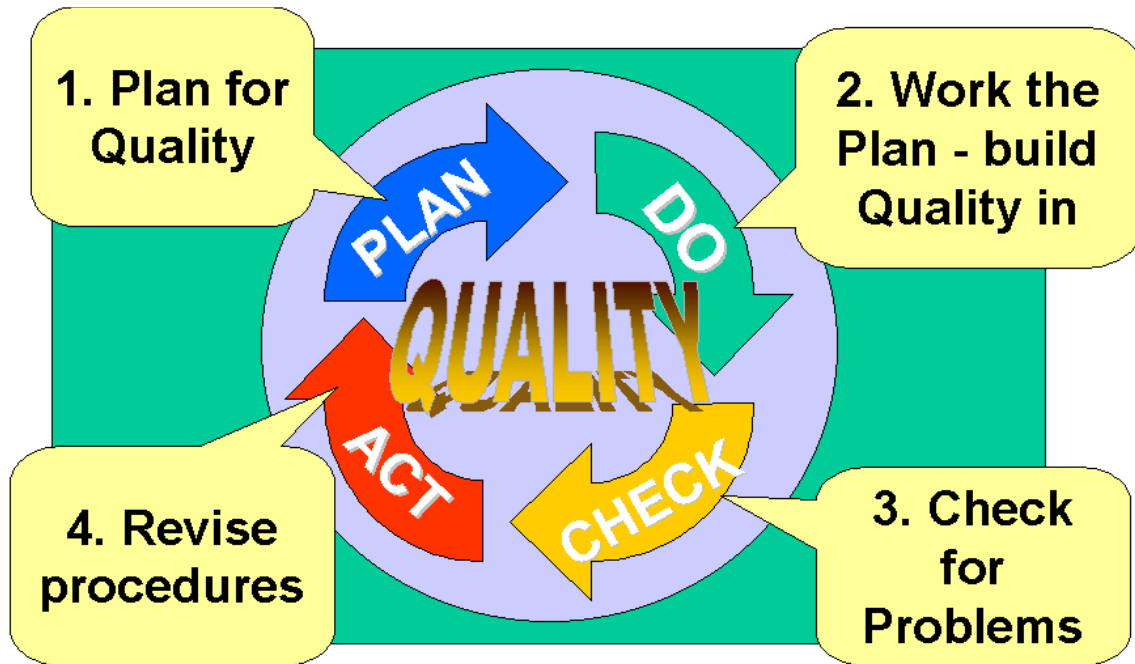


Figure 1.2. PDCA Cycle

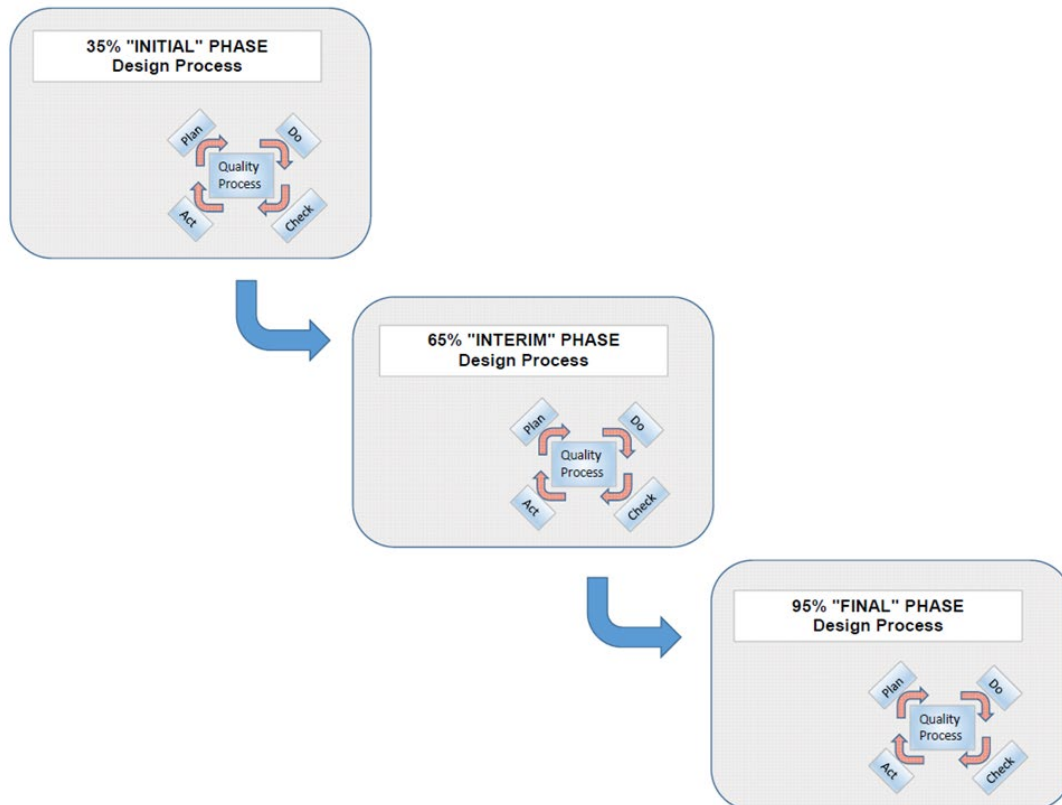


Figure 1.3. Nested PDCA Cycle for the Design Process

1.7.3. Overseeing Reviews.

1.7.3.1. MSC Commanders are responsible for performing QA, assuring that Districts have adequate resources to produce products that comply with law and policy, and document technical, policy, and legal compliance. District Commanders must be actively involved in establishing effective review approaches for all work products. Each MSC and District's quality management processes, as contained in their QMS per Army Regulation (AR) 702-11 or subsequent guidance, must comply with the principles of this ER. A Review Management Organization (RMO) oversees all reviews within USACE. Table 1.1 identifies the major quality components.

1.7.3.2. Oversight of QC, Agency Technical Review (ATR), Biddability, Constructability, Operability, Environmental, and Sustainability (BCOES) Review, and policy and legal compliance reviews (P&LCRs) are inherently governmental responsibilities and will not be accepted as in-kind contributions/services.

Table 1.1
Major Quality Components

Quality Component	Definition	Means & Methods	Examples
Quality Management	A governance structure that establishes quality requirements and provides the means and resources to achieve those requirements.	<ul style="list-style-type: none"> • ARs, policies, and guidance • Metrics • RMOs 	<ul style="list-style-type: none"> • This ER
Quality Assurance	Processes employed to assure that QC activities are being accomplished in line with planned activities and that those QC activities are effective in producing a product that meets the desired end quality. Focuses on providing confidence that quality requirements of a project, product, service, or process will be fulfilled.	<ul style="list-style-type: none"> • Standards • Processes/procedures • Guidelines • ATR focused on the DQC process 	<ul style="list-style-type: none"> • RPs • Reviewer qualifications • Review certification • Verification audits • DrChecksSM • Standard operating procedures (SOPs) • Templates
Quality Control	Processes used to ensure performance meets agreed-upon customer requirements that are consistent with law, regulations, policies, sound technical criteria, schedules, and budget. Focuses on fulfilling quality requirements of a project, product, service, or process.	<ul style="list-style-type: none"> • PDT Reviews • DQC • ATRs • IEPRs • SARs • BCOES reviews • P&LCRs • Quality Checks • Public Reviews 	<ul style="list-style-type: none"> • Checking • Reviewing • Inspecting • Comparing • Compliance testing

1.7.4. Risk-Informed Decision on Levels of Review.

1.7.4.1. Risk-informed decision making (RIDM) is an important consideration in all phases of work, and product development and planning for review is no exception. Review approaches will be scalable and customized for each effort and commensurate with the level of risk, complexity, and importance of the outcome or decision. Scalability includes the disciplines required for review and the level of independence for work product reviews. Decisions on the types and scopes of review required on a particular product will be risk-informed and documented in the RP. RPs and their contents are covered in Chapter 3. When considering appropriate levels of review for Civil Works products, it is important for the Project Delivery Team (PDT), RMO, and District and MSC leadership to base decisions on the most current understanding of a program, project, or work product, including assessments of risk.

1.7.4.2. RIDM is used when establishing the appropriate level of review by considering the areas of instrumental uncertainty and associated risks. Instrumental uncertainties are those that could change the outcome or decision. These uncertainties are usually identified and documented in the applicable risk tools (e.g., project's risk register (RR), decision management plan, risk management plan [RMP]). The highest levels of review must be considered for instrumental uncertainties, especially if they cannot or will not be reduced by further study or action. The RP for all work products must include documentation of the risk-informed decisions for all levels of review, including the decisions not to conduct higher level reviews. Updates to the RP, including changes to the level of review, should also be reflected in changes to the RR, when appropriate.

1.8. Guiding Principles. The USACE Civil Works review process is based on the following guiding principles:

1.8.1. Independent review is essential.

1.8.2. Consistent review policy must be applied across all Civil Works phases.

1.8.3. The PDT self-checks its work with the goal that subsequent reviews produce minimal comments.

1.8.4. Peer review contributes to improved quality of work and ultimately saves time and additional cost by lessening rework and other undesired outcomes.

1.8.5. Reviews must be risk-informed, scaled, and deliberate, occur throughout the lifecycle of the project, and be concurrent with normal business processes.

1.8.6. Robust DQC is the foundation for quality.

1.8.7. Ultimate responsibility for the quality of a work product resides with the District, including when the District uses Architect-Engineers (A-Es), other USACE entities, other government agencies, or sponsors to provide services or produce deliverables.

1.8.8. Reviews must ensure transparency of the analysis so that the methods used to develop analyses and conclusions are clearly and fully presented. Appendix E provides additional requirements on transparency for decision documents.

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Chapter 2 Review Management Organization

2.1. Overview and Objective. The RMO is the designated USACE organization overseeing quality reviews by reviewing and endorsing the RP. In addition, the RMO manages the review efforts for ATR, IEPR, or SAR. All review team members, except for DQC, BCOES Review (per ER 415-1-11), and certain special cases in Chapter 9, will be conducted by experts outside the District who are not associated with the work being reviewed. This helps ensure independent review as required by law or USACE policy. The designated RMO will consult with appropriate allied functional offices (e.g., engineering and real estate), relevant CXs, and other offices, as needed, to help ensure that review teams with appropriate independence and expertise are assembled to accomplish cohesive and comprehensive reviews.

2.2. Roles and Responsibilities. The RMO roles and responsibilities vary based on the work product being reviewed and the review effort being managed. A summary of the RMO roles and responsibilities is provided in Appendix B. RMO specific activities are detailed in Chapters 3 through 9.

2.3. Determining the RMO. The RMO is primarily designated based on the type of project and the phase of work (e.g., planning, implementation, or O&M). A single project may have different RMOs for different phases of work; however, there will only be a single RMO for each phase of work to maintain consistency in work product review efforts. RMOs are encouraged to coordinate with each other as a project moves through the phases. Table 2.1 identifies the prospective RMO based on the work product and project purpose. PDTs determine a prospective RMO by consulting Table 2.1 and must consult with the prospective RMO and MSC to confirm the appropriate RMO based on the specific project circumstances.

Table 2.1
Prospective RMO Designation

Work Product	Project Purpose	RMO
Decision Documents	FRM and CSRMs projects requiring specific project authorization	FRM Planning Center of Expertise (FRM-PCX) or CSRMs Center of Expertise (CSRMs-PCX)
	Modification of a dam or levee that does not require specific project authorization	Risk Management Center (RMC)
	Inland navigation	Planning Center of Expertise for Inland Navigation (PCXIN-RED)
	Deep draft navigation	Deep Draft Navigation Planning Center of Expertise (DDN-PCX)
	Small boat harbor	Small Boat Harbor Planning Center of Expertise (SBH-PCX)
	Water supply/reallocation	Planning Center of Expertise for Water Management and Reallocation Studies (WMRS-PCX)
	Ecosystem restoration	Ecosystem Restoration Planning Center of Expertise (ECO-PCX)
	Multiple project purposes	MSC designates the Lead PCX
	Continuing Authorities Program (CAP) expected to require a SAR during the implementation phase	RMC
	CAP not expected to require an IEPR or SAR during the implementation phase	MSC unless delegated to District
	All other including planning assistance to states, watershed plans, CAP requiring an IEPR	MSC unless the MSC requests a PCX or RMC to act as RMO
Implementation Documents or Other Work Products	FRM or coastal storm management requiring a SAR	RMC
	FRM or coastal storm management not requiring a SAR	MSC
	Inland navigation	Inland Navigation Design Center (INDC)
	CAP requiring a SAR	RMC
	CAP not requiring a SAR	MSC unless delegated to a District
	All other not specified, including O&M, Interagency and International Services (IIS), work for others, additional projects requiring a SAR (e.g., public bridge, school relocation)	MSC

Chapter 3 Review Plan

3.1. Overview. The RP, the foundational document to help ensure quality for the project, presents the endorsed and approved documentation of accountability. The RP identifies the review steps to produce a credible work product consistent with this ER. As a part of the PMP, the RP is a living document evolving with the project to reflect risk-informed decisions about the proper scale and scope of anticipated reviews.

3.2. Guiding Principles. RPs are based on the following guiding principles:

3.2.1. Early implementation of the RP is essential for timely reviews and effective product development.

3.2.2. To the extent practical, reviews are an embedded, continual process throughout the lifecycle of the product with formal reviews at critical decision points, saving time and money, limiting unproductive effort and rework.

3.3. Applicability.

3.3.1. In general, all work products or activities will be covered by an approved RP. For large projects, whether in planning, implementation, or an operating project, a single RP covering all the various work associated with the project should be developed. However, when a product generally covered under such an overarching RP involves complexities, controversy, or other attributes that would require review beyond that envisioned in the overall RP, a separate RP is required for that activity. For example, at an operational USACE reservoir, most routine activities and their associated products, such as inspection reports, would be covered under an overarching or programmatic RP while other products such as major rehabilitation studies, dam safety modification reports, activities requiring a separate environmental impact statement (EIS) would require project-specific RPs.

3.3.2. Similarly, to ensure consistency, MSCs should consider developing programmatic RPs for the CAP and other low risk programs that are similar in nature to describe the regional review process and additionally describe cases when an individual RP must be developed. Programmatic RPs may be appropriate in other cases, such as work performed under regional environmental infrastructure assistance authorities. Programmatic RPs will not be used for projects that require a SAR. In addition, once a programmatic RP is developed, care must be taken to ensure the programmatic RP is only applied within the intended scope, and when required, separate project-specific RPs are developed. Approval of regional programmatic RPs rests with the MSC Commanders; approval of national programmatic RPs rests with the Director of Civil Works (DCW), HQUSACE.

3.3.3. MSCs/Districts will implement a QMS that documents regional requirements for documentation and accountability processes for all reviews that are in compliance with this ER (see Paragraphs 4.6 and 8.3.3.1). The RP meets the specific project requirements for the quality management plan (QMP), including the quality control plan (QCP) and quality assurance plan (QAP), RMP, and change management plan (CMP); therefore, separate QMPs, QCPs, QAPs, RMPs, and CMPs for each project are not required.

3.4. Roles and Responsibilities.

3.4.1. The PDT, led by the Project Manager (PM), is generally responsible for developing the RP, in coordination with the RMO. The PDT is responsible for recommending the necessary types of reviews and the particular disciplines/expertise required. The PM is responsible for implementing the RP and validating the execution and appropriate documentation of each step. In addition, the PM ensures the project P2 schedule identifies required review activities and milestones for the RP, DQC, ATR, IEPR, and SAR, if applicable, as outlined in ER 5-1-11 and the PDBP Manual. The level of MSC involvement throughout all phases of the review process must be defined in the MSC QMS (see Paragraph 3.3.3).

3.4.2. Regardless of the project phase, the P2 schedule must include initial RP development and RP updates to ensure all work products have an up-to-date RP reflecting the proper scale and scope of the anticipated reviews. In addition, the PM will ensure the P2 schedule includes key meetings held with the PDT, DQC Review Team, ATR Team, the IEPR or SAR Panels, and required resources from various organizations involved in the review process (RMO and IEPR or SAR contractors).

3.5. General.

3.5.1. Development. On receipt of study/project funds, PDTs will prepare a draft RP and begin coordination with the appropriate RMO.

3.5.1.1. For projects initiated in the planning phase, an initial RP will be developed within the first 30 calendar days after executing a Feasibility Cost-Sharing Agreement (FCSA). If the study is funded by contributed funds or 100% federally funded, the initial RP will be developed within the first 30 calendar days of receiving funds. As the scope of the study is developed, the draft RP will be updated and endorsed by the RMO before the Alternatives Milestone meeting for a single-phase planning study. The RP will then be sent to the MSC for approval within 2 weeks after the Alternatives Milestone meeting. The RP will be updated throughout the study, as needed, and revised prior to the completion of the planning phase to detail the reviews in subsequent phases.

3.5.1.2. As the project moves through implementation (preconstruction engineering and design [PED], construction, to the O&M phase), the PDT must submit an up-to-date RP for each new phase to the MSC for approval within 30 calendar days of receiving funds.

3.5.1.3. For projects not initiated in the planning phase, RPs must be coordinated and endorsed by the RMO and sent to the MSC for approval within 30 calendar days after receiving federal funding and be updated as appropriate through the lifecycle of the project.

3.5.1.4. The PDT must allow adequate time for RP review and approval. The PDT should schedule a minimum of 14 calendar days for the RMO to review each RP submittal to provide comments or endorse the RP once project funding is provided to the RMO as appropriate. The MSC should approve or return the RP for revisions within 30 calendar days of receipt.

3.5.2. Reviews. The RP must list all review requirements, costs, and schedules as integrated features of the overall project execution. The following guidance is essential to executing timely reviews.

3.5.2.1. The project budget must include adequate funding for completion of all necessary reviews, (except for draft or final P&LCR, which are not project funded).

3.5.2.2. The project schedule must provide sufficient time for completion of all reviews at the appropriate points in the schedule.

3.5.2.3. Policy and Legal Reviews.

3.5.2.3.1. Each work product prepared will be legally sufficient and compliant with existing laws, federal regulations, and USACE policies. Some work products may require formal vertical team/counsel review and those reviews should be detailed in the project RP including the names of the assigned reviewers. These reviews culminate in determinations that the recommendations in the work products and any supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority. Exceptions and waivers to policy will also be reviewed accordingly.

3.5.2.3.2. Technical review efforts addressed in this ER (i.e., DQC and ATR) are to augment and complement the policy review processes by addressing compliance with pertinent published Army policies, particularly policies on analytical methods and the presentation of findings. In addition, all decision documents will be reviewed throughout the study process for their compliance with law and policy. Guidance for P&LCR of decision documents is addressed in Appendix H, ER 1105-2-100, or subsequent guidance.

3.5.2.3.3. All required reviews, except for the final P&LCR, will be completed before the District Commander signs the report. The District Office of Counsel will also sign a certification of legal sufficiency before the District Commander signs and submits the report for final approval. The final P&LCR of the District Commander's report will be completed before report approval by the appropriate HQUSACE office or delegated MSC. P&LCR team members will be identified at study initiation and listed in the initial RP.

3.6. Content. The RP must describe the scope of review for the current or upcoming phase of work (feasibility, PED, construction) and is a component of the PMP or Program Management Plan (PgMP). The RP must include all appropriate levels of review (DQC, ATR, IEPR, SAR, Policy and Legal Compliance, and BCOES). Any levels not included will require documentation in the RP of the risk-informed decision not to undertake that level of review. The PDT and RMO are jointly responsible for ensuring the reviews are appropriately documented in the RP.

3.6.1. The RP provides the first opportunity to use and document RIDM to scale reviews appropriate to project size, level of complexity, and level of uncertainty and risk throughout the project lifecycle. The RP must be detailed enough to assess the necessary level and focus of review, including potential challenges, models, and data to be used, model certification needs, A-Es, Design-Build (D-B), or unprecedented techniques. The RP must anticipate and define the appropriate level of review from the very start of the effort, based upon a preliminary assessment of the magnitude of project risks.

3.6.2. The RP must include the following (as appropriate for project phase):

3.6.2.1. Overview. The overview must include the following:

3.6.2.1.1. Project title, purpose of the work product, and goals and objectives.

3.6.2.1.2. Designated points of contact (titles only) in the District, MSC, and RMO to whom inquiries about the RP may be directed.

3.6.2.1.3. Basic background information on the study/project area or project (e.g., description, maps, satellite images, and plan and cross-section views). These items should provide an overview for the PDT, RMO, review teams, and vertical team.

3.6.2.1.4. Actions, timing of construction, and estimated cost (or range of cost) for proposed projects or specific construction features for the portion of the project under review.

3.6.2.1.5. For studies/reports only, a brief description of the future with and without project conditions. Special emphasis should be given to measures and alternatives to be considered to address the inherent risks involved.

3.6.2.1.6. Indicate whether existing conditions, failure of the project, or future conditions would pose a significant threat to human life or the environment. If so, it must identify the population at risk and the problems the study/project is addressing, including information uncertainty.

3.6.2.2. Documentation of Risks and Issues. Include a section documenting risks and related issues, including key assumptions and any constraints, in enough detail to support the decisions on the appropriate level of review and types of expertise to be represented on the various review teams. The PDT and RMO must appropriately protect any project sensitive or security-related information, such as detailed drawings or information revealing infrastructure vulnerabilities, by placing these items in RP appendices, if appropriate. These appendices must be removed prior to posting the RP on the District's website if required per Paragraph 3.8.1. The RP risks and issues information must include:

3.6.2.2.1. Documentation of the risk-informed decisions on which levels of review are appropriate for the product.

3.6.2.2.2. The District Chief of Engineering's assessment as to whether there is a significant threat to human life associated with aspects of the study or failure of the project or proposed projects. In cases in which the District Chief of Engineering does not serve as the Dam Safety Officer (DSO)/Levee Safety Officer (LSO), the District Chief of Engineering must consult with the DSO/LSO on dam or levee safety projects prior to making the final assessment. A project is determined to have a significant threat to human life if at any time during the construction or operation, failure could result in a substantial life safety concern.

3.6.2.2.3. Discussion of the risks during construction, which is especially important when modifying an existing project; discussion of whether the level of service is compromised during project modifications; discussion of risk for cofferdams, overtopping risk, and other inherent risks during construction.

3.6.2.3. A list of the anticipated deliverables/work products that are expected to be technically evaluated during study/project development and the schedule for their delivery. The timing and sequence of the reviews (including deferrals) and anticipated costs.

3.6.2.4. The objective of the reviews.

3.6.2.5. How and when there will be opportunities for the public to comment on the study or project to be reviewed and when significant and relevant public comments will be provided to the reviewers (if applicable).

3.6.2.6. A list of the primary reviewer disciplines along with a succinct description of the expertise needed in the reviews. When describing the type of expertise needed, consideration should be given to complexity of the project or work activity and how this correlates with the specific qualifications of reviewers to include education and direct work experience. For ATR, an attachment providing a team roster listing each discipline should be provided and, if available, the team member's name with a brief resume is encouraged to confirm reviewer's qualifications. Paragraph 5.5 discusses qualifications for ATR reviewers and the final team roster will be documented in the ATR Report per Paragraph 5.10.

3.6.2.7. The anticipated number of reviews and schedule for each review. Tables are encouraged to show different disciplines, phases/products, and any required site visits.

3.6.2.8. A list of the models expected to be used in developing recommendations, the version of the models to be used (where applicable), and the model certification/acceptance status of those models, following the latest USACE guidance.

3.6.2.9. A list of expected in-kind contributions/services to be provided by the sponsor.

3.6.2.10. Whether a site visit will be required for members of the ATR Team, IEPR Panel, or SAR Panel. Projects with significant life safety risks must be thoroughly evaluated to determine the necessity of the site visits. In these cases, site visits are highly encouraged, especially for the disciplines assessing this risk (e.g., geotechnical, structural, or hydraulic engineers).

3.6.2.11. Disclaimer. Information distributed for external review must include the following disclaimer: “This information is distributed solely for the purpose of pre-dissemination review under applicable information quality guidelines. It does not represent and may not be construed to represent any agency determination or policy.”

3.7. Developing and Approving Process. RMO endorsement and MSC approval of the RP are the essential first steps in product accountability and are required to ensure that the RP complies with the principles of this ER and the MSC’s/District’s QMS and that all elements of the Command have agreed to the review strategy.

3.7.1. Developing RPs. The District will develop the RP (see Paragraph 9.1.2 for brokered work) in coordination with the appropriate RMO. The District may submit the RP to the MSC and the RMO for concurrent review. Upon completion of the MSC and RMO review and incorporation of comments, the RMO will endorse the RP. Once the RMO has endorsed the RP the MSC will approve the RP as described in Paragraph 3.7.2.

3.7.2. Approving RPs.

3.7.2.1. The MSC Commander that oversees the District is responsible for approving the RP. The MSC Commander may delegate signature authority for RPs to either the MSC Regional Programs Director or the MSC Regional Business Director, but no further, except for CAP projects not requiring a SAR. An MSC Approval Memorandum (see Appendix D) is required. The approved RP will be an enclosure to this memorandum. RPs for CAP projects not requiring a SAR may be delegated to the District Commander and would not require an MSC Approval memorandum. If there is disagreement over the scope, content, or other aspects of the RP, the MSC should coordinate resolution between the District and the RMO.

3.7.2.2. For decision and implementation products the MSC Commander's approval should: reflect vertical team input; indicate whether the covered subject matter (including data, use of models, assumptions, and other scientific and engineering information) has life safety concerns, is novel, is controversial, is precedent setting, has significant interagency interest, or has significant economic, environmental and social effects to the Nation; and indicate whether specific requests for IEPR or SAR are likely.

3.7.2.3. Upon MSC approval of each RP, the MSC will provide a copy of the signed MSC Approval Memorandum to the District and its respective HQUSACE Regional Integration Team (RIT). An approved RP does not supersede or waive regulatory requirements. RPs should be approved prior to the start of any reviews. The PM will share the approved RP with the PDT, ATR Team, IEPR Panel, SAR Panel, and RMO.

3.7.3. Maintaining RPs.

3.7.3.1. The RP is a living document and must be kept up to date by the District, in coordination with the MSC and RMO, to reflect the proper scale and scope of the anticipated reviews. The PDT will update the RP to reflect minor changes and provide it to the RMO and MSC for information without the need for re-approval. Minor changes will be documented in the RP record of revisions. RMO re-endorsement and MSC re-approval of updated RPs will be required after 3 years or if there are significant changes, such as in the level of review (i.e., if IEPR or SAR is added or deleted). Other situations requiring RMO re-endorsement and MSC re-approval should be very limited but could include significant changes in study/project scope (e.g., adding or subtracting a purpose). For re-approval, the District will follow the same process for initially approving the RP. To maintain RPs:

3.7.3.1.1. The District must ensure that the next phase of work (i.e., planning phase into the implementation phase) is covered by a RP that outlines the upcoming reviews and milestones. This may be an update to an existing RP or a newly issued RP.

3.7.3.1.2. A RP update is required when the PDT, RMO, and vertical team jointly recommend whether a study that requires IEPR (total project cost greater than \$200 million) and has an approved exclusion should undertake IEPR. The update will document the reassessment of the specific conditions and circumstances that supported the exclusion and the changed condition now requiring IEPR be conducted.

3.7.3.1.3. The District, MSC, and RMO should examine older RPs annually to confirm the content is up to date. The District should update the RPs, if needed.

3.8. Documentation and Records. Documentation and records must be maintained and filed by the PDT following the MSC/District QMS processes and USACE guidance. RP documentation must include the RP, the District memorandum requesting approval, including the RMO endorsement, and the MSC Approval Memorandum.

3.8.1. For decision documents, each District will maintain an internet (i.e., publicly accessible) website with electronic versions of the RP documentation. Due to Privacy Act concerns, the internet-posted RP must use titles in lieu of names. All names and contact information (e.g., phone numbers, email addresses) of USACE individuals must be redacted before posting. Internet-posted references to the RPs by the respective Planning Center of Expertise (PCX), the respective MSC, and HQUSACE Civil Works Planning Community of Practice (CECW-CP) will link to the District's website.

3.8.2. For decision documents, each District will establish a mechanism on their internet website for allowing the public to comment on the adequacy of the RPs. This is not a formal comment period, and there is no set timeframe for the opportunity for public comment. If comments are received, the PDT should consider the comments and decide if RP revisions are necessary, following the update procedures specified in Paragraph 3.7.3.

Chapter 4 District Quality Control

4.1. Overview. DQC is the foundation of the USACE quality process. All work products undergo robust, and appropriate DQC. DQC focuses on the internal review process of basic science and engineering to fulfill the project quality requirements as defined in the PMP and RP. DQC is a mechanism to identify key risk-informed decisions and timing of reviews for high risk items and features that warrant additional evaluation by the ATR Team. DQC includes Quality Checks, a detailed peer review/checking of the documents, computations, and graphics, and PDT Reviews. Cross-checking among the narrative documentation (the “write-up”), computations, and Plans & Specifications (P&S) is critical for the DQC process.

4.2. Guiding Principles. DQC is based on the following guiding principles:

4.2.1. The PDT is responsible for project success and to deliver quality products consistent with ER 5-1-11 and USACE formal guidance.

4.2.2. DQC is an integrated review approach providing for seamless review; therefore, the DQC Review Team should be kept informed throughout work product development and must be involved in key decision points to provide an independent perspective.

4.2.3. The PDT should consider a work product that has completed DQC as a final document acceptable for release; therefore, reliance on subsequent levels of review by external teams is not an acceptable substitute for DQC.

4.2.4. Each Commander is responsible for ensuring that work products comply with all applicable statutory and policy requirements, have been read thoroughly, and have been reviewed for consistency.

4.3. Applicability. DQC applies to all Civil Works products including decision, implementation, and other work products. DQC also covers National Environmental Policy Act (NEPA) documents, other environmental compliance products, any in-kind contributions/ services provided by local sponsors or their A-Es, and other supporting documents. For special cases (e.g., brokered work, A-E work, other government agency work, sponsor work), also see Chapter 9. For these special cases, DQC may be referred to as QC.

4.4. Review Team. The DQC Review Team includes reviewers responsible for conducting Quality Checks and reviewers responsible for conducting peer reviews. Quality Checks and peer reviews are performed by staff responsible for the work product, such as supervisors, work leaders, team leaders, designated individuals from the senior staff, or other qualified personnel. However, Quality Checks or peer reviews must not be performed by the same people who produced the original work product or who managed/reviewed the work in the case of contracted or brokered efforts.

4.4.1. Reviewer Expertise. DQC will include peer reviewers with the necessary expertise to address compliance with current USACE policies and procedures. The MSC QA responsibility includes an assessment of the capability of the DQC Review Team. If Districts do not have the required expertise for the DQC Review Team, they must coordinate with the MSC to consider qualified personnel from other Districts or A-E firms to supplement District resources. Reviewers performing computation Quality Checks, per Paragraph 4.7.1.3 and 4.7.1.4, must be qualified with experience and have a thorough understanding of the computation to ensure all calculations, assumptions, and models used are correct. Reviewers performing graphic/plan Quality Checks, per Paragraph 4.7.1.5, must be qualified with experience and have a thorough understanding of the design intent to ensure all graphical information is correct.

4.4.2. DQC Review Lead.

4.4.2.1. Districts are required to assign a DQC Review Lead responsible for ensuring that a formal DQC is performed by all reviewers assigned to the DQC Review Team. The DQC Review Lead is recommended to be a qualified senior staff member (e.g., supervisor, Regional Technical Specialist, Lead Planner, Technical Lead [TL]) who has no production role in the work product. The DQC Review Lead can also serve as a discipline reviewer for the DQC Review Team.

4.4.2.2. The DQC Review Lead may assist the PDT in areas such as developing and reviewing the RP based on the current phase of work, ensuring adequate schedule and budget are available, serving on the DQC Review Team, leading and focusing the DQC, identifying and assessing risk with District management and the vertical team, coordinating issues with ATR, and documenting commitments where changes are to be incorporated into the next phase of work. The DQC Review Lead is responsible for ensuring the QC is certified, including any items certified complete early in the design process (see Paragraph 4.7.5.3), and to work with the ATR team to validate these decisions.

4.5. Document Requirements. All documents produced by the PDT will present information in a manner that takes into account assumptions, analyses, and rationale for achieving the final conclusion. Documents include Feasibility Reports and all integrated and supporting appendices, General Reevaluation Reports (GRRs), Validation Reports, NEPA documents/environmental compliance products, Design Documentation Reports (DDR), Engineering Documentation Reports (EDRs), P&S, in-kind contributions/services, Engineering Considerations and Instructions for Field Personnel (ECIFPs). The documents must be prepared consistent with applicable policies, such as ER 1105-2-100 and ER 1110-2-1150. In addition, decision documents must follow the best practices for transparency. Appendix E provides additional decision document requirements to support transparency.

4.5.1. Documents must contain a full record of decisions, assumptions, and methods.

4.5.2. Documents must be sufficiently clear so that a reviewer or other individual not familiar with the project could review the documents and understand how the project/analysis evolved into its final recommendation/configuration, and why each key decision was made.

4.5.3. Documents must be sufficiently detailed for each technical specialty, so that the criteria that were used, the critical assumptions that were made, and the analytical methods that were used is evident for purposes of review and historical documentation.

4.5.4. Documents must contain summaries of important model/calculation results and selected example calculations for all critical elements of the study or design.

4.5.5. Documents should be clear enough to support execution of the review process by reviewers without reference to other records, except for confirming that all supporting documents/computations have been checked.

4.5.6. The use of a technical editor is highly encouraged for documents.

4.6. District QMS. The District will implement a QMS, compliant with AR 702-11, or subsequent guidance, and this ER. The District QMS will include the following key processes: selecting the DQC Review Team, conducting DQC, certifying DQC, and documenting DQC, including comments and responses. DQC may feature the use of checklists, templates, and other standardized DQC tools, which must be documented in the District QMS processes. In addition, the MSC will implement a QMS compliant with AR 702-11, or subsequent guidance, per Paragraph 8.3.3.1.

4.7. Conducting District Quality Control. DQC will be conducted as directed in the MSC/District QMS processes.

4.7.1. DQC Reviews. DQC reviews are rigorous independent Quality Checks and peer reviews that occur during the work product development process and are carried out seamlessly as a routine management practice. The DQC review will include a complete reading of any reports and accompanying appendices. All DQC Review Team members will be knowledgeable about the critical project requirements of all DQC counterparts, understand how their own particular project elements and work relates to and affects those requirements, and conduct their reviews to ensure consistency and effective coordination across all project disciplines. The DQC review must include a comprehensive evaluation of correct application of methods, validity of assumptions, adequacy of basic data, correctness of calculations (error-free), completeness of documentation, compliance with guidance and standards, and BCOES considerations.

4.7.1.1. Questions for Consideration. At a minimum, the DQC Review Team must consider the following questions (as applicable):

4.7.1.1.1. Is the identified problem well understood and are the risks and uncertainties properly characterized?

4.7.1.1.2. Has an appropriate array of alternatives been considered that could solve the problem?

4.7.1.1.3. Does the Tentatively Selected Plan (TSP) solve the problem needs and have implementation risks been appropriately considered?

- 4.7.1.1.4. Are the proposed construction methods appropriate?
- 4.7.1.1.5. Are the schedules and cost estimates reliable (comprehensive, well-documented, accurate, and credible)?
- 4.7.1.1.6. What is the risk of potential cost and schedule growth?
- 4.7.1.1.7. Are there lessons learned that need to be considered?
- 4.7.1.1.8. Does the product comply with USACE criteria and policy requirements including environmental compliance requirements?
- 4.7.1.1.9. Have life-safety risks been appropriately assessed?
- 4.7.1.1.10. Are the methods used to develop analyses and conclusions clearly and fully presented to ensure transparency in line with Paragraph 1.8.8 and Appendix E, if applicable?
- 4.7.1.2. Items for Verification. At a minimum, the DQC Review Team must verify the following items (as applicable):
 - 4.7.1.2.1. Appropriateness of assumptions, methods, procedures, computations (including quantities), and materials used in the analyses consistent with the project purpose or decisions being made.
 - 4.7.1.2.2. Correctness of calculations in line with Paragraphs 4.7.1.3 and 4.7.1.4.
 - 4.7.1.2.3. Comprehensiveness of the array of alternatives considered.
 - 4.7.1.2.4. Effectiveness in implementing the concept of transparency in line with Paragraph 1.8.8 and Appendix E, if applicable.
 - 4.7.1.2.5. Appropriateness of data, level of data, assumptions, and safety risk based on deterministic criteria and RIDM information.
 - 4.7.1.2.6. Correctness, accuracy, and clarity of graphic/plan presentation in line with Paragraph 4.7.1.5.
 - 4.7.1.2.7. Reasonableness of results compared to project purpose in compliance with applicable laws and USACE policies.
- 4.7.1.3. Quality Checks on Computations.

4.7.1.3.1. All computations will undergo a rigorous, independent check during DQC as directed in the MSC/District QMS processes. Sufficient time will be allocated in the project schedule to allow for thorough Quality Checks. The reviewer assumes the same level of responsibility as the author of the computations (planner/designer/economist/architect/geologist) for determining that the conclusions from the computations are valid and used for the intended purpose.

4.7.1.3.2. Districts are required to check computations by having the reviewer place a highlight (e.g., place a “red dot”) on each annotation and number on a computation sheet indicating concurrence with the correctness of the information shown and then initial and date each and every computation sheet being reviewed/checked. Since this is for verification of agreement by the reviewer, typed initials are not allowed on the computations; however, an electronic portable document format (PDF) signature is encouraged.

4.7.1.4. Quality Checks on Computer Computations. For computations using computer models (identify software name and version, if applicable) and other complex methods of analysis, including numerical methods or parametric studies, the reviewer must perform a review, hand check, or other independent verification of the critical loading case or results to demonstrate the conclusions from the model being used are appropriate. Districts are required to check computer model computations by having the reviewer place a highlight (e.g., place a “red dot”) on these computations/annotations and the model input parameters. Authors must lay out spreadsheets with sufficient clarity so that a reviewer unfamiliar with the project can review the computational thought process.

4.7.1.5. Quality Checks on Graphics and Plans. All graphics and plans will undergo a rigorous independent check during DQC as directed in the MSC/District QMS processes. Sufficient time will be allocated in the project schedule to allow for thorough Quality Checks. Districts are required to check graphics/plans by having the reviewer place a highlight (e.g., place a “red dot”) on critical graphic/plan elements (e.g., dimension/elevation, note, or reference) showing concurrence with the correctness of the information shown and then initial and date each and every graphic/plan being reviewed/checked. Since this is for verification of agreement by the reviewer, typed initials are not allowed on the graphics/plans; however, an electronic PDF signature is encouraged.

4.7.2. Project Delivery Team Reviews. PDT Reviews are in addition to the independent DQC Reviews described in Paragraph 4.7.1. The PDT Reviews are to ensure consistency and effective coordination across all project disciplines for the work product. For example, the PDT will perform a complete reading of any reports and accompanying appendices prepared by the PDT to ensure the overall coherence and integrity of the report, technical appendices, and for final feasibility reports the recommendations before approval by the District Commander. The PDT will normally include a variety of stakeholders, each with his/her own important project requirements and a different, but interlocking, review responsibility. The PDT Review may also include a plans-in-hand review at the end of development. PDT Reviews will be conducted as directed in the MSC/District QMS processes.

4.7.3. Issue Resolution. Districts will work to resolve issues between the PDT and DQC Review Team and involve the District chain of command, as appropriate. If formal policy or legal concerns are not readily and mutually resolved, then the PM will try to resolve and seek support from the MSC, RMO, or HQUSACE, as needed, according to the procedures outlined in ER 1105-2-100, Appendix H, ER 1110-2-1150, and other appropriate guidance. Issues identified during DQC should be resolved prior to the final ATR, IEPR, or SAR. In cases where a mutually agreed-upon risk-informed decision leads to deferral of some design details or analysis to a later project phase, this must be clearly and specifically documented in the project RR.

4.7.4. Review Documentation and Records. The PDT and DQC Review Team are jointly responsible for ensuring DQC is appropriately documented. Documentation and records must be maintained and filed by the PDT as directed in the MSC/District QMS processes. DQC documentation must include traceability of the independent check on computations, graphics, and plans (e.g., “red-dot” check documentation), all comments, PDT responses, associated resolutions, and DQC certifications to provide assurance that a robust and thorough DQC was performed. The District is encouraged to use DrChecksSM to document DQC throughout the review process. All DQC documentation available at the time of ATR will be made available to the ATR Team.

4.7.4.1. Reviewers are encouraged to use electronic files for documentation whenever possible. If documents are checked via hardcopy, reviewers are encouraged to convert the information to an electronic format, such as PDF or equally accessible format, for documentation purposes.

4.7.4.2. Districts should use established file directories or set up appropriate shareable file directories for maintaining easily retrievable documentation of seamless DQC efforts.

4.7.4.3. Appropriate measures must be taken to protect the confidentiality of project cost estimates compliant with ER 1110-2-1302.

4.7.5. DQC Certification. The PDT and DQC Review Team will sign the DQC certification sheet for the deliverable work product as directed in the MSC/District QMS processes. DQC certification confirms the DQC activities were sufficient and documented on completed items. The lead author of the work product, the DQC Review Team, the DQC Review Lead (if applicable), and the supervisor of the author will sign the DQC certification approving the product (see example template in Appendix D). Based on risk-informed decisions, the supervisor may grant exceptions from the DQC certification requirement for low-risk work products or for design or computations that do not involve life safety, operational adequacy, or large economic consequences.

4.7.5.1. Within large PDTs, several authors or work group leaders may guide, within their span of control, the development of a component or sub-component of work products. The authors or work group leaders may be team leaders, and may have the role of a designer, economist, architect, geologist, or other specialty. The authors or work group leaders support the PM, Lead Planner, or TL. The DQC certification indicates ownership and accountability for the work product.

4.7.5.2. Large projects or work products may require multiple DQC certification sheets (e.g., separate sheets for components or sub-components of the reviewed work product), while smaller work products may require only a single DQC certification sheet. Before PDT decisions are released and before follow-on work is started, the District will complete the DQC process, including certification. Throughout the life of a project, there are key decisions/milestones (e.g., hydraulic and geotechnical parameters, technical memorandums, technical appendixes, or other standalone products) that are determined early in the design process that will be certified complete before follow-on work is started.

4.7.5.3. DQC certifications will only be provided for completed components or sub-components. For example, in a preliminary submittal the QC documentation should only provide DQC certifications for completed components and work products. The final DQC certification will include an assessment from the PM/Lead Planner/TL and Chief of Planning/Engineering/A-E as applicable, stating the overall QC process for the entire project or work product is complete. The draft documents for concurrent review in a planning study are considered a final work product and must have DQC certifications.

Chapter 5 Agency Technical Review

5.1. Overview. ATR is undertaken to ensure the quality and credibility of USACE scientific and technical information is consistent with this ER and the responsible MSC's/District's QMS. Work products will undergo appropriate ATR, as defined in Paragraph 5.3. ATR will also cover a comprehensive review of the PDT conclusions to ensure that the results and decisions are clearly supported by the information presented and in compliance with current USACE policy and procedures.

5.2. Guiding Principles. ATR is based on the following guiding principles:

5.2.1. ATR is conducted outside the District with an ATR Team Lead from outside the MSC to remove unintended bias of the District/Division.

5.2.2. The role of ATR is to assess adequacy of DQC, validate key PDT decisions, and bring up important issues, concerns, and lessons learned. Work products that are of poor quality or appear to have inadequate DQC may be returned with no action.

5.2.3. The ATR Team is to perform an independent review of the PDT work and is not to make project decisions. The PDT is responsible for the work product/design.

5.2.4. The corporate intent is for the ATR process to ensure overall technical analyses and approaches are correct and compliant with all pertinent USACE guidance to achieve high quality work products and facilitate vertical alignment early in work product development.

5.2.5. An ATR Team will be involved throughout the project lifecycle, especially early on when key decisions are made at an appropriate, scalable level, based on the complexity, size, and level of risk associated with the project, see Figure 1.1.

5.2.6. The level of review should be commensurate with the significance of the information being reviewed, which should be determined using RIDM.

5.3. Applicability. ATR is mandatory for all draft and final decision documents and most implementation products. For other work products, answering a series of questions will aid the PDT, in coordination with the RMO, in recommending whether undertaking ATR is appropriate for work products other than decision or implementation documents. A "yes" answer does not necessarily indicate ATR is required; rather, it indicates an area where RIDM should be applied and documented in the RP recommendation. The following questions, and any appropriate additional questions, must be explicitly considered:

5.3.1. Does it include any design (structural, mechanical, hydraulic)?

5.3.2. Does it evaluate alternatives?

5.3.3. Does it include a recommendation?

- 5.3.4. Does it have a formal cost estimate?
- 5.3.5. Does it have or will it require a NEPA document?
- 5.3.6. Does it impact a structure or feature of a structure whose performance involves potential life safety risks?
- 5.3.7. What are the consequences of non-performance?
- 5.3.8. Does it support a significant investment of public funding?
- 5.3.9. Does it support a budget request?
- 5.3.10. Does it change the operation of the project?
- 5.3.11. Does it involve excavation, subsurface investigations (drilling or sampling or both), or placement of soil?
- 5.3.12. Does it affect any special features, such as cultural resources, historic properties, and survey markers that should be protected or avoided?
- 5.3.13. Does it involve activities that trigger regulatory permitting; for example: activities covered by Section 404 of the Clean Water Act or stormwater-related actions requiring a National Pollution Discharge Elimination System permit?
- 5.3.14. Does it involve activities that could potentially generate hazardous wastes or disposal of materials such as lead based paints or asbestos?
- 5.3.15. Does it reference use of or reliance on manufacturers' engineers and specifications for items such as prefabricated buildings or playground equipment?
- 5.3.16. Does it reference reliance on local authorities for inspection/certification of utility systems like wastewater, stormwater, or electrical?
- 5.3.17. Is there currently or is there expected to be any controversy surrounding the federal action associated with the work product?

5.4. Additional Guidance.

5.4.1. Refer to ER 1105-2-100, Appendix H, and other appropriate Planning guidance for further procedures on ATR for feasibility studies and reports. Refer to ER 1110-2-1302 for further procedures on ATR requirements for cost work products. The ATR of products and reports will also cover any necessary NEPA documents, other environmental compliance products including deferred environmental commitments during implementation, any in-kind contributions/services provided by local sponsors or their A-Es, and other supporting documents. Refer to ER 1110-2-1156 for further procedures on ATR for dam safety.

5.4.2. For reviews of CX products when there are a lack of qualified USACE reviewers, reviewers from inside the Center may be used; however, care must be taken to ensure their comments are independent, and it must be justified and approved in the RP. For special cases (e.g., brokered work, A-E work, other government agency work, sponsor work, Public-Private Partnerships), also see Chapter 9.

5.5. Review Team.

5.5.1. ATR will be conducted by a qualified team of professionals. The ATR Team, including the ATR Team Lead, will be senior, highly experienced experts in the type of work being reviewed who are from outside the District and are not involved in day-to-day production of the project/product. To ensure independence, the ATR Team Lead will be from outside the MSC. The ATR Team will be selected by the RMO with recommendations from the MSC, as needed. Exceptions to the ATR Team requirements (e.g., location, expertise, certification) must be justified in the RP, endorsed by the RMO, and approved by the MSC. In most cases, the ATR Team will be established early in the project. For the planning phase, an ATR Team Lead will be established after the scope of the study is better defined, generally before the Alternatives Milestone, with the complete ATR Team selected around the scheduled TSP Milestone.

5.5.2. Reviewer Expertise. The ATR Team will include the necessary expertise to address compliance with applicable published policy and technical requirements for the project. The disciplines represented on the ATR Team should generally mirror the significant disciplines involved in accomplishing the work. A description of the primary disciplines or expertise for ATR must be documented in the RP per Paragraph 3.6.2.7.

5.5.3. Reviewer Certification. ATR Teams will be comprised of senior USACE personnel who have been vetted and certified by their respective Community of Practice (CoP) for their specific areas of expertise. The goal of ATR Team selections is to find the most experienced subject matter experts (SMEs) available whose qualifications are commensurate with the complexity of the work products being reviewed. ATR Teams may be supplemented by or composed of experts outside USACE, such as qualified personnel from A-E firms, as long as the experts are endorsed by the respective technical sub-CoP Leader. For several major disciplines, the following paragraphs identify the CoP or sub-CoP that maintains a list of experts approved as ATR reviewers.

5.5.3.1. The Planning CoP utilizes a certification process for planning disciplines that include Plan Formulation, Environmental, Economic, and Cultural Resources. ATR reviewers in these disciplines must be certified by their respective Planning sub-CoP and listed in the Planners Database, which can be accessed at <http://sme.planusace.us/>.

5.5.3.2. The Engineering and Construction (E&C) CoP utilizes the Corps of Engineers Reviewer Certification and Access Program (CERCAP) as the process for the nomination, review, and certification of ATR reviewers. To serve as an E&C reviewer on an ATR Team, USACE personnel must be listed in CERCAP, which after July 2021 can be accessed at <https://maps.crrel.usace.army.mil/apexcrrel/f?p=121>.

5.5.3.3. The Cost Engineering CX in Walla Walla District trains and maintains a list of qualified cost ATR reviewers. The Cost Engineering CX ATR coordinator will assign a qualified reviewer for decision documents who is knowledgeable in the types of applied E&C solutions.

5.5.3.4. For studies involving inland hydrology or coastal sea level change, at least one member of an ATR Team must be certified by the Climate Preparedness and Resilience CoP.

5.5.3.5. The Real Estate CoP maintains a list of approved ATR reviewers certified by project purpose.

5.5.3.6. For decision documents involving hydrologic, hydraulic, or coastal related risk management measures, the ATR Team will include a multi-discipline flood risk analysis SME to ensure consistent and appropriate identification, analysis, and written communication of risk and uncertainty compliant with ER 1105-2-101.

5.6. Conducting the ATR.

5.6.1. Managing ATR. The RMO, as determined in Paragraph 2.3, is responsible for the overall management of the ATR effort with PDT support. The District will assign an individual (e.g., Lead Planner, TL, DQC Review Lead, PM) to coordinate with the ATR Team Lead to ensure successful completion of the ATR. If the ATR Team is asked to review any work products for which the DQC activities do not appear to be appropriate and effective, the ATR Team Lead will work through the RMO to return those products to the PDT “with no action” and provide general guidance for quality improvements. The ATR efforts should be integrated into the work product development schedule to avoid or minimize impacts on the schedule as much as possible, and to avoid rework and delays that would likely occur if reviews were deferred to the end of the effort. ATR of interim products does not eliminate the requirement for ATR of the complete draft and final reports.

5.6.2. Team Involvement. The ATR Team will furnish the PDT written feedback at critical points during the project lifecycle and will conduct formal reviews as work products are completed. ATR Team members will be available, knowledgeable, and willing to offer suggestions to address ATR concerns. The PDT in consultation with the RMO may also engage national CXs, other identified SMEs, or the ATR Team as major issues arise to save time and money and minimize unproductive design effort and rework. However, care must be taken to ensure independence of the ATR Team from the DQC Review Team and the PDT. Formal ATR of products by the entire ATR Team occurs when a holistic, comprehensive review of the overall products is performed. The ATR Team Lead will prepare an ATR Report per Paragraph 5.10.

5.6.3. Iterations. Each ATR should build upon all prior cycles of review for any work product. Each ATR iteration should address only incremental changes and additions to documents and analyses addressed in prior ATR reviews, unless the ATR Team determines that certain subjects or aspects warrant revisiting due to other changes or a need to adequately understand a larger portion of the work product or project. The RIDM process should help guide whether ATR should be applied at different times in the project development process.

5.6.4. Schedule. The ATR schedule must be presented as part of the RP. ATR will occur during key stages or significant decision points in the development of the project and be discussed at milestone meetings, briefings, and in-progress reviews (IPRs). All formal iterations and portions of the deliverable work product submittal will have undergone ATR as documented in the RP, including any revisions that impact cost, schedule, technical quality, or scope. An ATR Report is required for each formal ATR. A Statement of Technical Review and ATR Certification is required for the final deliverable work product and cannot be completed until the DQC is certified; for decision documents see Paragraph 5.6.4.1. At all project phases, the designated RMO will coordinate the ATR schedules with the Cost Engineering CX, which will provide the cost engineering review and resulting certification for the project cost estimate.

5.6.4.1. Planning Phase. Decision documents adhere to review requirements in ER 1105-2-100. A Statement of Technical Review and ATR Certification will be completed for the draft and final decision documents and supporting analyses. The schedule for ATR, including review durations, will be prepared jointly by the PDT and ATR Team Lead with review of the draft report concurrent with public and P&LCR; final report ATR after completion of review by the DQC Review Team, though possibly concurrent with the District legal certification review; and the review of any interim products as determined necessary, after DQC Review Team review of those interim products. Any PDT requests for adjustments to the ATR schedule will be provided formally to the ATR Team Lead for consideration by the ATR Team and included as an update to the District schedule and RP after a new schedule is endorsed by the ATR Team.

5.6.4.2. Design Phase. During the design phase, regardless of delivery method (in-house, A-E contract, or D-B), the timing of ATR will be dependent on the risks and complexity of the project. ATR should be involved throughout the design phase, especially early on, to validate key decisions, such as proposed solutions, material selection, design criteria, parameters, methodology, models, load cases, and significant Scopes of Work.

5.6.4.3. Construction Phase. During the construction phase, the timing of ATR will be dependent on the risks and complexity of the project. The ATR Team should make several site visits for complex projects as shown in the RP per Paragraph 3.6.2.10. For most construction projects, the ATR Team should be engaged to assess implementation of critical features of the project construction, any pertinent field changes, contractor proposals, or other key issues affecting the design intent and quality of the project. When the procurement method is D-B, the ATR will require more involvement from the ATR Team, similar to the design phase.

5.6.4.4. O&M Phase. During the O&M phase (for work not covered by an overarching or programmatic RP), the timing of ATR will be dependent on the risks and complexity of the project.

5.7. Objective, Scope, and Review Criteria.

5.7.1. Objective. The ATR will ensure that proper and effective DQC has been conducted by reviewing the work products, DQC documentation, and the signed DQC certification, if available at the time of review. In addition, the ATR will ensure that the product is consistent with established criteria, guidance, procedures, and policies. To support comprehensively addressing potential issues and problems, the ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and whether the documentation explains the analyses and results in a reasonably clear manner for the public and decision makers.

5.7.2. Scope. The ATR will examine the materials submitted to ensure the adequacy of the presented methods, assumptions, criteria, decision factors, applications, and explanations. Policy compliance is explicitly within the scope of ATR. The corporate intent is for ATR to identify and, through participation of the vertical team when necessary, resolve common policy concerns early. The scope, extent, and type of subsequent policy compliance review comments may be considered a measure of the efficacy of the DQC and ATR efforts.

5.7.3. Review Criteria. The ATR review criteria will be based on the Charge prepared by the RMO, with support from the PDT and MSC, as needed. ATR Charge guidance and considerations/questions are provided in Appendix C.

5.8. DrChecksSM Review.

5.8.1. The formal ATR process will be conducted using DrChecksSM setup by the District. Once a DrChecksSM review is opened for reviewers' comments (for one or more work product components), a reasonable time will be established for identifying and resolving issues consistent with the ATR schedule in the RP. Each reviewer should enter their own comments directly to provide traceability in the ATR documentation. Each reviewer is required to add at least one comment to document that the reviewer participated in or was aware of the review. If the reviewer has no comments, the comment must identify that the reviewer had no comments and the circumstances leading to this result.

5.8.2. DrChecksSM reviews will not be left open for indefinite periods, and all comments must be backchecked by the reviewer prior to closing a review (see Paragraph 5.9 for comments involving disagreement). If due to extenuating circumstances, the reviewer is unavailable, after coordinating with the RMO, an individual experienced in that discipline area may backcheck the comments with an explanation added to the ATR Report. The ATR documentation in DrChecksSM will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points from discussions, including any vertical coordination, and the agreed-upon resolution.

5.8.3. ATR Comments. Each ATR comment must be succinct and enable timely resolution of the concern. Comments should be limited to those that are required to ensure product adequacy and adherence to guidance. The ATR Team Lead must ensure ATR comments are appropriate and adhere to the quality review comment structure. The four key parts of a quality review comment include:

5.8.3.1. The Review Concern. Identify the work product's information deficiency or incorrect application of policy, guidance, or procedures.

5.8.3.2. The Basis for the Concern. Cite the appropriate law, Assistant Secretary of the Army for Civil Works (ASA(CW))/USACE policy, guidance or procedure that has not been properly followed. It is also acceptable to cite engineering judgment, professional opinion, or best practices as the basis for concerns.

5.8.3.3. The Significance of the Concern. Assign a level of severity of the concern, whether low, medium, high, or critical, and explain the importance of the concern with regard to its potential impact, such as plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation risks and uncertainties, implementation responsibilities, safety, federal interest, or public acceptability.

5.8.3.4. The Probable Specific Action Needed to Resolve the Concern. Identify the actions that must be taken to resolve the concern. In some situations, especially addressing incomplete or unclear information, comments may seek clarification to then assess whether further specific concerns may exist.

5.8.4. Lessons Learned. The ATR Team may provide value added lessons learned for PDT consideration as comments. Significant lessons learned will be documented in the ATR Report per Paragraph 5.10 and shared with the PDT.

5.8.5. Preferential Comments. ATR comments will generally not be directive or include attempts to enforce personal preferences over otherwise acceptable practices (i.e., alternate solutions or analysis/design methods). If the authors have already used appropriate methods to develop an adequate solution, then the comment should not be provided unless it adds value toward the work product decisions and recommendations or makes the work product more safe, functional, or economical.

5.8.6. Grammar, Spelling, and Punctuation. ATR comments should not include grammar, spelling, or punctuation items unless these items detract from the overall work product. Any editorial comments should be provided separately for PDT consideration.

5.8.7. PDT Comment Responses. Upon receiving the ATR comments, the PDT will develop responses to the specific concerns and coordinate those responses with the ATR Team using DrChecksSM. PDTs and respective ATR Team members are encouraged to seek resolution to comments prior to entering formal responses into DrChecksSM. Technical responses will be made by the author or an individual experienced in that discipline area. The PDT must assess each ATR comment and either implement the comment or provide a logical, well-thought-out response as to why not to implement the comment. The dispute resolution process (see Paragraph 5.9.1) is available when an impasse develops. All PDT comment responses will be issued in a three-part structure:

5.8.7.1. Concur/Non-Concur.

5.8.7.2. A statement that specifically addresses how the comment will be resolved or why there is non-concurrence.

5.8.7.3. A statement that indicates all locations in the document where the change was made, and other features of the report that were impacted by the change.

5.9. ATR Team Concerns. The ATR Team will identify significant issues, unresolved comments, or comments that they consider are unsatisfactorily resolved and will note these concerns in the ATR Report and the Statement of Technical Review and ATR Certification documentation per Paragraphs 5.10 and 5.11.

5.9.1. Issue Resolution. PDT responses and the ensuing discussion are to seek resolution of the ATR concerns to the mutual satisfaction of the PDT and the ATR Team. The RMO will be engaged by the ATR Team Lead if issues arise between the ATR Team and the PDT that cannot be fully resolved. Appropriate District leadership will be engaged by the PM with the goal to have the RMO and the District leadership facilitate resolution.

5.9.1.1. When resolution is not readily achievable, the RMO will engage SMEs from the PCX/RMC and MSC to help facilitate resolution, and they in turn may choose to engage SMEs from HQUSACE. When policy or legal concerns arise during ATR efforts that are not readily and mutually resolved among the PDT members and the ATR Team, the District will seek issue resolution support from the MSC and HQUSACE consistent with the appropriate guidance. For planning products, resolution will follow the procedures outlined in ER 1105-2-100.

5.9.1.2. Unresolved comments involving disagreement between the ATR Team and the PDT will be closed in DrChecksSM with the notation that the comment has been elevated for resolution.

5.9.1.3. Any such issues will be explicitly documented in the Statement of Technical Review and ATR Certification form prior to being routed for signature per Paragraph 5.11.

5.10. Review Documentation and Records. The PDT and ATR Team are jointly responsible for ensuring ATR is appropriately documented. ATR documentation will consist of an ATR Report prepared by the ATR Team Lead at the conclusion of all formal ATRs as identified in the RP. This report must include an assessment of the effectiveness of the DQC, a brief summary of the review including any significant or unresolved issues, summary of written feedback, lessons learned, future commitments, the Charge questions, a brief resume of ATR reviewers, a printout of all DrChecksSM comments with resolution, and any significant correspondence between the PDT, RMO, and ATR Team. In addition, the ATR Report must include the Statement of Technical Review and ATR Certification, if applicable. Documentation and records must be maintained and filed by the PDT following the MSC/District QMS processes.

5.11. Statement of Technical Review and ATR Certification.

5.11.1. The ATR Team Lead must complete a Statement of Technical Review and ATR Certification only for the final deliverable work product ATR, except for decision documents per Paragraph 5.6.4.1, as identified in the RP. The Statement of Technical Review must include a summary of each unresolved issue and an examination of DQC adequacy. For each formal ATR event, the ATR Team will examine relevant DQC records and will provide written comment as to the apparent adequacy of the DQC effort for the associated work product or service. The ATR Team Lead, PM, RMO, and District leadership (e.g., Chief, Engineering and Planning Divisions) will certify that the issues raised by the ATR Team have been resolved or have been elevated for resolution. The PDT must allow adequate time for completing the Statement of Technical Review. The PDT should schedule a minimum of 14 calendar days for the RMO to review and certify the Statement of Technical Review.

5.11.2. By signing the ATR Certification, the District leadership (i.e., Chief, Engineering and Planning Divisions) certifies policy compliance of the work product and that the ATR activities were sufficient and documented. Before the ATR Certification is completed, the PDT will ensure that all agreed-upon changes have been incorporated into the final work product. For those cases where commitments are made to incorporate changes in the next phase of work (e.g., advancing from planning into implementation), agreed-upon deferrals will be documented in the ATR Certification.

5.11.3. A sample Statement of Technical Review and ATR Certification is included in Appendix D. The statement must always include signatures from the ATR Team Lead, RMO, and PM and senior level staff as indicated in the sample. When an A-E firm performs the design or ATR, the appropriate principal of the firm will sign the statement. Any notable changes to the work products after certification require recertification from the ATR Team.

Chapter 6 Independent External Peer Review

6.1. Authority. Section 2034 of the Water Resources Development Act (WRDA) of 2007 (P.L. 10-114), as amended (33 U.S.C. 2343) (Section 2034), includes requirements for review by external experts. Section 2034 requires independent peer review, known as IEPR, of project decision documents under certain conditions. This section provides guidance for the implementation of Section 2034 of WRDA 2007 (P.L. 110-114), as amended by Section 1044 of the Water Resources Reform and Development Act (WRRDA) of 2014 (P.L. 113-121), and Section 1141 of WRDA of 2018 (P.L. 115-270).

6.2. Guiding Principles. IEPR is based on the following guiding principles:

6.2.1. IEPR is the most independent level of review.

6.2.2. This review is applied in cases that meet certain criteria where the uncertainties, risk, and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted.

6.2.3. IEPR remains an important aspect of USACE's overall quality management strategy for producing sound federal investment decisions and projects. Through statutory requirements and application of RIDM, USACE must focus IEPR implementation on the most complex, highest cost projects, as well as those that pose a high risk to public safety and the economy.

6.2.4. IEPR costs, excluding panel contract costs, are shared in the same manner as other costs. IEPR Panels' contract costs are a federal expense. For studies conducted by non-federal interests, IEPR costs will initially be borne by the non-federal sponsor, and if the project is implemented at a later date, these costs may be eligible for credit toward the non-federal share of the cost of construction of the project.

6.3. Applicability. IEPR is conducted on project studies. Project studies result in feasibility or reevaluation reports and include any other study associated with the modification of a water resources project that result in decision documents. IEPR is of critical importance for those project study reports, including supporting work products, where there is a significant federal investment, significant controversy, or due to a request by the Governor of an affected State. However, studies will also undergo IEPR where a risk-informed decision shows the study would significantly benefit from an external peer review. IEPRs are exempt by law from the Federal Advisory Committee Act (FACA). For special cases (e.g., brokered work, A-E work, other government agency work, sponsor work), also see Chapter 9.

6.4. Mandatory Decision on Conducting IEPR. The criteria for when to conduct IEPR is described in these sub-paragraphs and graphically in the flowchart shown in Figure 6.1. The three mandatory conditions determining whether IEPR is undertaken are as follows:

Projects may be subject to an Independent External Peer Review (IEPR), to determine, review the following 3 questions. ALL questions must be answered.

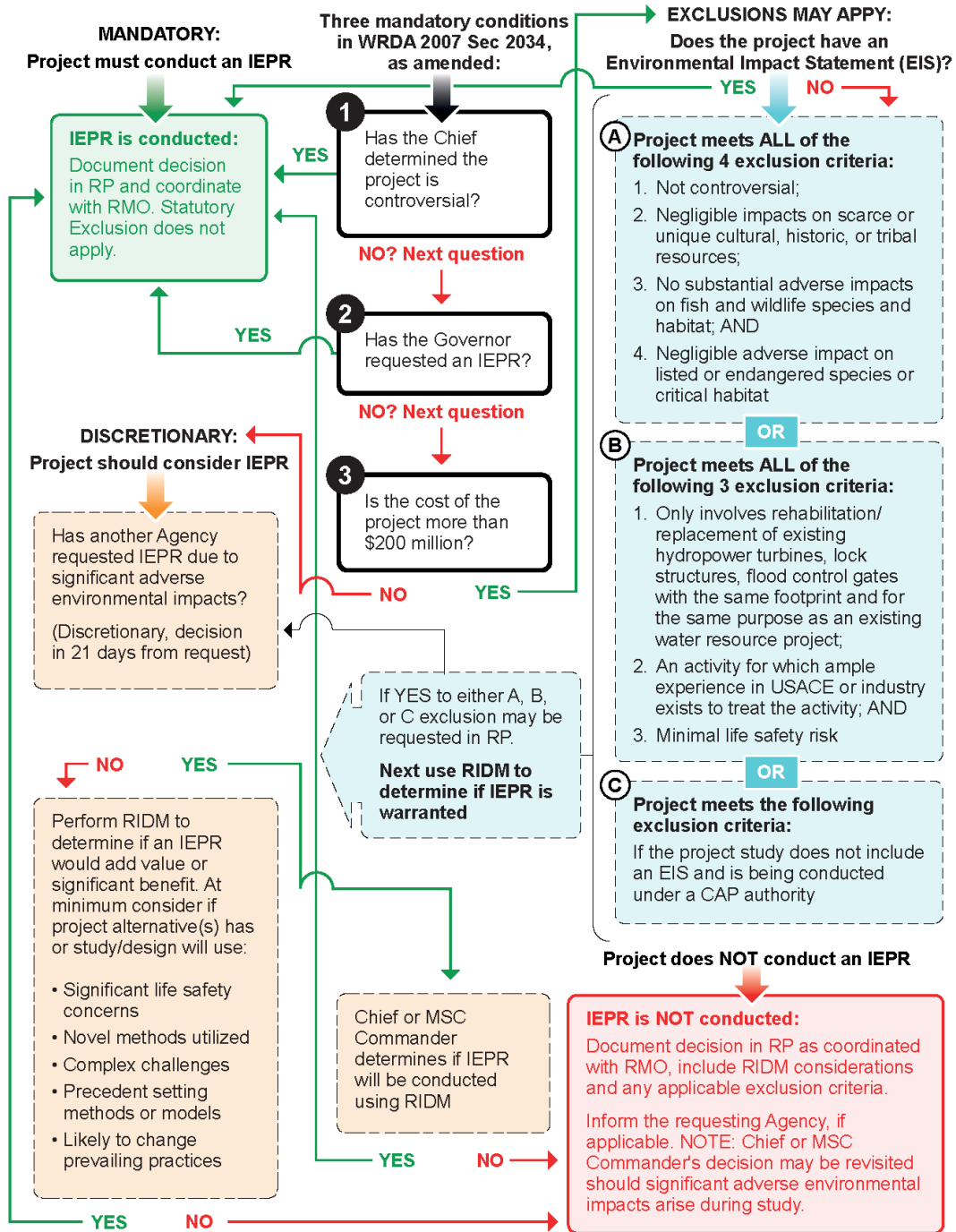


Figure 6.1. Flowchart for Decision on Conducting IEPR

6.4.1. When the estimated total cost of the project, including mitigation costs, is greater than \$200 million.

6.4.1.1. In considering the \$200 million cost trigger, the term “total cost” means the cost of construction (including designing) of the project and includes lands, easements, rights of way, relocations, and disposal areas.

6.4.1.2. In the case of a project for hurricane and storm risk management or flood risk management that includes periodic nourishment over the life of the project, the “total cost” term includes the total cost of the renourishment cycles.

6.4.1.3. If a project has a cost estimate of less than \$200 million at initial RP development, but the estimated costs subsequently increase to more than \$200 million during the course of the study, the determination of whether IEPR is required must be revisited.

6.4.2. When the Governor of an affected State requests a peer review by independent experts.

6.4.3. When the Chief of Engineers determines the project study is controversial due to significant public dispute over the size, nature, or effects of the project or the economic or environmental costs or benefits of the project.

6.5. Discretionary/Risk-Informed Assessment. When none of the three mandatory triggers for IEPR are met, MSC Commanders have the discretion to conduct IEPR based on a risk-informed assessment of the expected contribution of IEPR to the project.

6.5.1. Discretionary Decision.

6.5.1.1. Section 2034 outlines the requirements for considering whether to subject a study to peer review where IEPR is discretionary. IEPR is discretionary when the head of a federal or state agency charged with reviewing the project study determines that the project is likely to have a significant adverse impact on environmental, cultural, or other resources under the jurisdiction of the agency after implementation of proposed mitigation plans and he/she requests an IEPR.

6.5.1.2. When such requests are received, the MSC Commander is encouraged to collaborate with the head of the federal or state agency to resolve the agency’s concerns. The MSC Commander may decide to conduct IEPR based on this collaboration. Disputes regarding this provision can be appealed to the Chairman of the Council on Environmental Quality for adjudication. If the MSC Commander determines that IEPR is not warranted, and the head of the federal or state agency continues to request IEPR, the decision to not conduct IEPR will be made by the Chief of Engineers. The special requirements for this discretionary authority include a deadline for decision making, public disclosure of a decision not to conduct the requested IEPR, and an appeals process afforded to the head of the agency. The guidance for this condition includes:

6.5.1.2.1. A decision whether to conduct IEPR must be made within 21 calendar days of the date of receipt of the request by the head of the federal or state agency.

6.5.1.2.2. If the MSC Commander decides not to conduct an IEPR following such a request, the reasons for not conducting the IEPR will be made publicly available. The decision will be documented in the project's RP, which must be posted to the District's website.

6.5.1.2.3. If the MSC Commander decides not to conduct an IEPR after such a request, the head of the federal or state agency may appeal the decision to the Chairman of the Council on Environmental Quality within 30 calendar days of the decision. The Chairman will decide the appeal within 30 calendar days of the date of the appeal.

6.5.2. Risk-Informed Decision. Beyond the mandatory and discretionary requirements in Section 2034, PDTs must make a recommendation based on a risk-informed assessment of whether or not conducting IEPR would substantially benefit or add value to the project study and provide the rationale for the recommendation in the RP. This assessment and documentation in the RP will consider a variety of factors to indicate whether the covered subject matter (including data, use of models, assumptions, and other scientific and engineering information) has life safety concerns, is novel, is controversial, is precedent setting, has significant interagency interest, or has significant economic, environmental and social effects to the Nation.

6.6. IEPR Exclusion Considerations. Section 2034 permits project studies, otherwise requiring an IEPR, to be excluded from this type of review under certain circumstances. The MSC Commander makes a decision on District requests for exclusions from IEPR, as delegated by the Chief of Engineers. An MSC Commander can proceed with an IEPR exclusion if a risk-informed decision can be made regarding the potential for public controversy. Because the determination of controversy will be largely informed by the public review of the draft decision document, it is possible that IEPR, if previously excluded, could be subsequently required following the public review process. A project study subject to peer review because total costs are greater than \$200M (see Paragraph 6.4.1) may be excluded from IEPR if any of the following three sets of conditions apply:

6.6.1. If the project study does not include an EIS and the Chief of Engineers determines that it:

6.6.1.1. Is not controversial;

6.6.1.2. Has no more than negligible adverse impacts on scarce or unique tribal, cultural, or historic resources;

6.6.1.3. Has no substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures; and

6.6.1.4. Has, before implementation of mitigation measures, no more than a negligible adverse impact on a species listed as endangered or threatened species under the Endangered Species Act of 1973 (16 U.S.C. § 1531 et seq.) or the critical habitat of such species designated under such Act; OR

6.6.2. If the project study:

6.6.2.1. Involves only the rehabilitation or replacement of existing hydropower turbines, lock structures, or flood control gates within the same footprint and for the same purpose as an existing water resources project; or

6.6.2.2. Is for an activity for which there is ample experience within USACE and the industry to treat the activity as being routine; and

6.6.2.3. Has minimal life safety risk; OR

6.6.3. If the project study does not include an EIS and is being conducted under the general continuing authorities of the CAP.

6.7. MSC Commander Determination. If none of the legally required mandatory triggers set forth in Paragraph 6.4 are met, the MSC Commander determines whether IEPR is required when approving the project's RMO endorsed RP. An additional action to exclude such a study from IEPR is not necessary; however, the RP must fully document the RIDM regarding the appropriate levels of review. If the project exceeds the cost threshold of \$200 million but meets the exclusion criteria, the MSC Commander will approve the RMO endorsed exclusion request and associated RP. The MSC memorandum approving the RP will include the determination of whether or not to conduct an IEPR.

6.8. Outside Eligible Organization and IEPR Panel.

6.8.1. IEPR reviews are managed outside USACE; panel members will be selected by an Outside Eligible Organization (OEO) using the National Academy of Sciences (NAS) policy for selecting reviewers. Although the NAS is frequently cited for the IEPR process USACE should follow, actual reviews by the NAS are expected to be rare. Decisions to approach NAS must be made by the DCW based on the recommendation of the appropriate RIT at HQUSACE in coordination with the appropriate functional office, generally Planning and Policy.

6.8.2. IEPR Panels will be made up of independent, recognized experts from outside USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. Selection of review panel members for IEPR efforts will adhere to the NAS Policy on selecting reviewers, which sets the standard for "independence" in review processes and for complexity in a national context.

6.8.3. IEPR Panels are not expected to be knowledgeable of Army and Administration policies, nor are they expected to address such concerns.

6.8.4. The OEO should be knowledgeable about the USACE mission, its statutory authorities and related administrative regulations, and other evaluation procedures.

6.8.5. The OEO must have the following qualifications:

6.8.5.1. Is described in Section 501(c)(3) and exempt from federal tax under Section 501(a) of the Internal Revenue Code of 1986 or with the NAS.

6.8.5.2. Is independent.

6.8.5.3. Is free from conflicts of interest.

6.8.5.4. Does not carry out or advocate for or against federal water resources projects.

6.8.5.5. Has experience in establishing and administering independent review panels.

6.8.5.6. Has proven ability to deliver on time as agreed, in spite of significant time constraints.

6.9. Conducting the IEPR. IEPR Panels will evaluate whether the interpretations of analysis and conclusions based on analysis are reasonable. To provide effective review, in terms of both usefulness of results and credibility, IEPR Panels should be given the flexibility to bring important issues to the attention of decision makers. However, IEPR Panels should be instructed to not make a recommendation on implementation of a particular alternative, as the Chief of Engineers is responsible for the final decision on a planning study. IEPR Panels may offer their opinions as to whether there are sufficient analyses upon which to base a recommendation. IEPR Panels will accomplish a concurrent review that covers the entire decision document or action and will address all the underlying engineering, economics, and environmental work, not just one aspect of the project. IEPR Charge guidance and considerations/questions are provided in Appendix C.

6.10. Establishment of Panels. The OEO selects IEPR reviewers according to the guidance in Paragraph 6.10.4.

6.10.1. OEO. IEPR Panels will be established by the RMO through contract with an independent scientific and technical advisory organization.

6.10.2. The highest degree of credibility of external reviews will be achieved if the responsibility for coordinating the external review process is granted to an organization independent of USACE. Such an independent OEO must be in charge of selecting reviewers, all of whom must be independent of USACE and free of conflicts of interests. The OEO will also be assessed for potential organizational conflict of interest on a task order basis.

6.10.3. IEPR is more effective if the review panel maintains communication with USACE during the review. This communication does not compromise the reviewers' independence and may help the IEPR Panel understand USACE assumptions, methods, and the practical implications of the IEPR Panel's findings and recommendations. The OEO coordinates this communication among the PDT, RMO, and IEPR Panel, as well as communication among the panel and relevant federal agencies, interest groups, and the public in coordination with the RMO.

6.10.4. Guidelines for Selection. Important considerations to select reviewers include reviewer credentials (which include affiliations and expertise), the absence of conflict of interest, and the independence from the OEO who selects the reviewers. The OEO selects the reviewers and structures the review such that good science, sound engineering, and public welfare are the most important factors for producing a sound review.

6.10.4.1. Potential reviewers carry professional and personal biases, and it is important the reviewers disclose biases during the interview and selection process. The OEO leads the interview to determine which biases, if any, will disqualify prospective reviewers.

6.10.4.2. The OEO develops criteria to determine if review panels are properly balanced, in terms of both professional expertise and points of view on the study or project at hand.

6.10.4.3. The necessity for reviewers to have adequate knowledge of USACE analytical methods, which are often highly complex, increases the challenge to select credible and balanced review panel members.

6.10.5. Panel Responsibilities. IEPR Charge guidance and considerations/questions are provided in Appendix C. In addition, the panel of experts established for a review must:

6.10.5.1. Conduct reviews in a timely manner consistent with the study and schedule.

6.10.5.2. Receive and consider public written and oral comments provided by USACE on the proposed project.

6.10.5.3. Provide timely written and oral comments as specified in the scope of work with the OEO.

6.11. Review Documentation and Records.

6.11.1. Panel Findings. The panel submits a Final IEPR Report to USACE through the OEO containing the panel's economic, engineering, and environmental analysis of the project study, including the panel's assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used by USACE.

6.11.2. The PDT will work with the appropriate RMO to award a contract with the OEO so that the Final IEPR Report is received prior to the Agency Decision Milestone to minimize overall impacts or conflicts to the study schedule. The OEO submits a Final IEPR Report, no more than 60 calendar days following the close of the public comment period for the draft project decision document, enabling the District to address all necessary actions before the final report is signed by the District Commander. All comments in the Final IEPR Report are finalized by the OEO prior to release to USACE. If the panel does not complete its review in this period, the processing of the decision document will continue without delay.

6.11.3. After receiving a Final IEPR Report on a project from a panel of experts, USACE considers panel recommendations contained in the report and prepares initial written responses for all findings, those adopted and not adopted, with assistance from the RMO. These initial PDT responses form the basis for the formal Agency Response. HQUSACE determines the appropriate command level for issuing the Agency Response to the Final IEPR Report consistent with the delegated approval authority.

6.11.4. When the Agency Response is issued, HQUSACE will post the Agency Response and all other materials related to the review on its website and include them in the applicable decision document. Chief of Engineers' Reports for decision documents that undergo IEPR will summarize the Final IEPR Report. The Final IEPR Report and the Agency Response must also accompany the publication of any Report of the Chief of Engineers for the project. In cases where there is no Chief's Report, the DCW will certify the Agency Response. The IEPR documentation will become a critical part of the review record and will be addressed in recommendations made by the Chief of Engineers.

6.11.5. Publishing comments and responses to IEPR. Regardless of whether or not the views expressed in the Final IEPR Report are adopted, the District will prepare a written USACE proposed Agency Response to the report, detailing any actions undertaken or to be undertaken in response to the report, and the reasons those actions are believed to satisfy the key concerns stated in the review report (if applicable). All issues in the IEPR must be addressed. The District will coordinate the proposed Agency Response with the MSC District Support Teams and HQUSACE to ensure consistency with law, policy, project guidance, ongoing P&LCR, and other USACE or National considerations.

6.12. Reviewers' Privacy. The OEO will discuss disclosure of peer reviewer's personal information (name, credentials, and affiliation) with them prior to initiating reviews. USACE will comply with the requirements of the Privacy Act of 1974 (P.L. 93-579) and the following Privacy Act Statement should be included in all external peer review contracts:

6.12.1. "Authority: Section 2034 of the Water Resources Development Act (WRDA) of 2007 (P.L. 110-114), as amended by Section 1044 of the WRRDA of 2014 (P.L. 113-121), and WRDA 2018 (P.L. 115-270) (33 U.S.C. 2343).

6.12.2. Purpose: To notify potential peer reviewers of the requirement to make public the review reports and the names and qualifications of panel members.

6.12.3. Routine Uses: Peer reviewer's information will be shared with Congress and posted on the internet, as required by law.

6.12.4. Effects of nondisclosure: Disclosure of the information sought is voluntary; however, failure to agree will not allow reviewers to participate in reviews.”

6.13. Confidentiality. Reviews will be conducted in a manner such that confidential business information and intellectual property are protected. Contracts for IEPRs will include requirements for reviewers to sign non-disclosure agreements.

6.14. Reviewers' Access to Information. The RMO will ensure reviewers are provided with sufficient information, including background information about key studies or models, to enable them to understand the data, analytic procedures, and assumptions used to support the key findings or conclusions. Reviewers will be informed of applicable access, objectivity, and other quality standards under the federal laws governing information access and quality. Sensitive material must be handled in a manner that provides reasonable assurance that unauthorized persons do not gain access.

6.15. Public Participation on Products. The District will provide the RMO and the IEPR Panel with the public comments received during public review of the product. The RMO ensures reviewers are aware of scheduled public participation activities related to the review schedule.

6.16. Transparency. USACE will notify reviewers in advance regarding the extent of disclosure and attribution of their comments planned by USACE.

6.17. Reporting Requirements.

6.17.1. IEPR Decision and Congressional Notification. Section 2034 applies to project studies initiated prior to the end of the statutory requirement currently set at 8 November 2024.

6.17.2. Upon MSC approval of any RP that includes performing IEPR, the MSC Commander will immediately transmit the approved RP and the MSC Commander's Approval Memorandum to the responsible RIT. The responsible RIT will prepare and transmit a letter, signed by the HQUSACE Chief of Planning and Policy, to the Committee on Environment and Public Works of the Senate (EPW) and the Committee on Transportation and Infrastructure of the House of Representatives (T&I) with a copy to the ASA(CW). The letter will notify Congress of the intent to conduct IEPR and will be transmitted within 7 calendar days of RP approval. The decision to conduct IEPR will be made available to the public by the District posting the RP on the USACE public website within 7 calendar days of MSC approval of the RP. The RP will include documentation of the IEPR decision.

6.17.3. Decision to Exclude from IEPR. Upon MSC approval of a RP containing an exclusion from conducting IEPR for a study as delegated where the estimated project cost meets or exceeds \$200 million and does not include an EIS (detailed in Paragraph 6.6), the responsible RIT will prepare and transmit a letter, signed by the HQUSACE Chief of Planning and Policy, to the Senate EPW and House T&I Committees with a copy to the ASA(CW). The letter will notify Congress of the Chief of Engineers' or their delegate's decision not to conduct IEPR and will be transmitted within 7 calendar days of approval of the IEPR exclusion. The decision not to conduct IEPR will be made available to the public by the District posting the RP on their USACE public website within 7 calendar days of approval of the IEPR exclusion. The RP will include documentation of the IEPR exclusion decision.

6.17.4. Changes in Decision to Conduct IEPR. Information developed as part of the study process may cause the MSC Commander as delegated, to revisit the decision whether or not IEPR will be conducted. Any change in the decision to conduct or not conduct IEPR on a study will require re-notification of Congress and the public following the procedures described above.

6.17.5. Public Availability of IEPR Information.

6.17.5.1. Information regarding IEPR will be posted on the USACE public website. Following award of a task order to conduct IEPR, the responsible RMO provides the responsible RIT with the scheduled dates for the beginning and end of review and the name of the OEO with the task order for the review. The beginning of review is the date the panel of experts initiates the review and the end of the review is the date the OEO submits the Final IEPR Report to USACE. The information will be made available to the public by the responsible RIT posting the information on the USACE public website no later than 7 calendar days after the task order is awarded.

6.17.5.2. When the OEO completes subcontracts with the panel of experts, the responsible RMO will provide the names and qualifications of the panel of experts to the responsible RIT. The information will be made available to the public by the responsible RIT posting the names and qualifications of the panel of experts on the USACE public website no later than 7 calendar days after the subcontracts with the panel are completed.

6.17.6. IEPR Report and Agency Response. A copy of the Final IEPR Report documenting the comments and recommendations of the IEPR Panel and a copy of the responses to the panel comments and recommendations by the Chief of Engineers will be promptly submitted to Congress and will be made available to the public on the USACE public website.

6.17.6.1. Upon acceptance of the Final IEPR Report from the OEO by the RMO, the responsible RMO will transmit the report to the responsible RIT. The responsible RIT will prepare and transmit a letter, signed by the DCW, to the Senate EPW and House T&I Committees with a copy to the ASA(CW) and USACE Commanding General (CG) within 7 calendar days of receipt from the RMO. The letter will submit the Final IEPR Report to the Congressional committees. In order to make the tight timeline, the letter will be transmitted electronically and will include a PDF of the Final IEPR Report. The responsible RIT will post the Final IEPR Report on the USACE public website within 7 calendar days of receipt from the RMO.

6.17.6.2. Upon completion of the Agency Response, the responsible RIT will prepare and transmit a letter for signature by the DCW to the Senate EPW and House T&I Committees with a copy to the ASA(CW) and CG within three calendar days of completion of the Agency Response. The letter will submit the Agency Response to the Congressional committees. In order to make the tight timeline, the letter will be transmitted electronically and will include a PDF of the Agency Response. The Agency Response will be posted to the USACE public website within three calendar days of completion of the Agency Response.

6.17.7. IEPR Information in the Final Decision Document. For project studies undergoing an IEPR, the Final IEPR Report and Agency Response will be included in an appendix of the final decision document. For project studies subject to peer review that are excluded from IEPR, as described in Paragraph 6.6, the exclusion decision and rationale will be included in the decision document for the project study.

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Chapter 7 Safety Assurance Review

7.1. Overview.

7.1.1. Comparable to IEPR, SAR is the most independent level of review for implementation documents or other work products, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team of experts outside USACE is warranted. The purpose of SAR is to have external panels assess the critical decisions and criteria of the PED or construction activities (e.g., investigations, design, analysis, assumptions per Appendix C) prior to initiating physical construction and periodically thereafter until construction activities are completed as required in the RP.

7.1.2. Conducting a SAR helps ensure that probable failure modes were properly assessed and effectively mitigated. The reviews should consider the adequacy, appropriateness, and acceptability of the PED and construction activities in ensuring public health, safety, and welfare. When used as a “Board of Consultants,” the SAR Panel can provide expert opinions on project issues and industry best practices for consideration by the PDT, see Paragraph 7.5.3.7.

7.2. Guiding Principles. SAR is based on the following guiding principles:

7.2.1. SAR is an industry best practice and the requirement is based upon American Society of Civil Engineers (ASCE) Policy Statement 351: Peer Review, the OMB Peer Review Bulletin, and other USACE policy considerations.

7.2.2. SAR is an important aspect of the USACE overall quality management strategy for producing sound federal investment decisions and projects.

7.2.3. SAR is a higher-level review and is an extension, not a replacement, of ATR. SAR is intended to complement ATR and to avoid impacts to project schedules and costs. SAR is a strategic level review and reasonable effort should be made to avoid having SAR duplicate ATR.

7.2.4. All costs associated with SAR, will be shared with the non-federal sponsor according to the project purpose and the phase of work. In planning for a SAR, estimates will need to include the cost for the RMO to administer and manage the SAR and the cost of the SAR Panel. The cost of a SAR through completion of construction should be reasonable, scalable and a function of the risk, complexity, and duration of the project.

7.3. Applicability. SAR is conducted on PED and construction activities for projects where potential hazards pose a significant threat to human life (public safety), see Paragraph 7.4. Implementation documents and other work products that undergo ATR may also be required to undergo SAR. This applies to new projects and to the major repair, rehabilitation, replacement, or modification of existing facilities. USACE has extended SARs to all projects with life safety issues. For special cases (e.g., brokered work, A-E work, other government agency work, sponsor work), also see Chapter 9.

7.4. Decision on Conducting SAR. The District Chief of Engineering, as the Engineer-In-Responsible-Charge, will consider life safety implications to make a risk-informed decision whether the project would benefit from a SAR and document the rationale to conduct or not conduct a SAR in the RP, see Paragraph 3.6.2.2.

7.4.1. RIDM on Conducting a SAR.

7.4.1.1. Decisions concerning what is “significant” loss of life are a combination of the likelihood of failure and the consequences. The risk and consequence of failure including the population at risk are paramount for the SAR determination. This decision will consider a variety of factors such as a significant threat to human life, use of innovative materials or techniques, and if the engineering is based on novel methods, presents complex challenges for interpretations, contains precedent setting methods or models, or presents conclusions that are likely to change prevailing practices.

7.4.1.2. For dam and levee safety projects, Tolerable Risk Guidelines (TRG), as defined by Chapter 5 of ER 1110-2-1156 will be used as the principle to judge if there is a significant threat to human life. Existing risk information, including risk assessments, should be used to facilitate and inform the SAR determination by applying RIDM guidance. For example, by following the TRG it is likely most implementation phase projects as a result of an approved dam/levee safety modification study would need a SAR. If there is not a completed risk assessment with TRG, other rigorous analysis of incremental risk may be used.

7.4.2. Milestones to Consider.

7.4.2.1. At a minimum, the SAR Panel will perform reviews and site visits consistent with milestones identified in the RP that align with critical features of the project PED and construction. These milestones and number of panel members are scalable to the project risk and based on the project benefits from conducting a SAR determined in Paragraph 7.4.1. Higher risk projects will need more reviews, while lower risk projects may only need one review by a SAR Panel during design (i.e., a mid-level risk levee alteration project may have a design phase milestone with only a Geotechnical panel member but no milestones during construction if the construction is routine). The effectiveness of ATR during construction should be considered, see Paragraph 5.6.4.3., and documented in the RP when assessing the benefit to the project on the need and number of SAR milestones and number of panel members required during construction.

7.4.2.2. Milestones to consider for a SAR are around the 35% and 65% and final design in the DDR; at near completion of the P&S; at the midpoint of construction for a particular contract; prior to final inspection; or at any critical design or construction decision milestones. SARs must be on a regular schedule depending on the risk and must be sufficient to USACE on the adequacy, appropriateness, and acceptability of the PED and construction activities for the purpose of ensuring that good science, sound engineering, and public health, safety, and welfare are the most important factors that determine a project's outcome. The SAR Panel may recommend to the RMO alternate or additional milestones. The MSC should approve these recommendations when they are warranted and reasonable.

7.5. SAR Panel. The RMO is responsible for establishing panels. The number of panel members will be based on project risk. The RMO will define the required competencies for each panel member and ensuring a balance of perspectives. This must be documented in the RP per Paragraph 3.6.2.6. The RMO may recommend candidates for consideration. SAR Panels must meet the following requirements:

7.5.1. Panels may be led by and composed of other government employees (i.e., non-USACE).

7.5.2. Panels may be led by and composed of contractors.

7.5.2.1. A contractor may be used to carry out panels, including selecting panel members. Competition for SAR contractors is not limited to OEOs. The solicitation for such a contract must include the minimum professional requirements for panel members but should not be so narrowly written that only specific persons may be selected.

7.5.2.2. Due to potential organizational conflicts of interest and the potential for contractors to have access to other contractors' information, Contracting Officers must be particularly aware of potential conflicts of interest and avoid or mitigate them according to the Federal Acquisition Regulations, Part 9 when procuring SAR Panel services. Solicitations must include nondisclosure language analogous to that found in the Army Source Selection Supplement (AS3) for contractors who assist in evaluations of proposals and to ensure that sensitive government and contractor information is protected from disclosure by reviewing contractors.

7.5.2.3. If an existing contract is considered for use, the Contracting Officer must determine that this work would be in contract scope and determine, if non-disclosure and organizational conflict of interest language is not included in the contract, whether such clauses could be added to the contract as an in-scope modification before the existing contract may be used for a SAR Panel.

7.5.3. Establishing SAR Panels.

7.5.3.1. The RMO and other USACE representatives may approve the panel members selected by the contractor but must not participate in vetting or selecting members. Moreover, USACE must not veto or disapprove a selected panel member unless the selected panel member does not meet the objective selection criteria for panel members provided to the contractor.

7.5.3.2. The contractor will be required to apply the NAS policy for selecting reviewers in the solicitation and instructions to ensure the panel members have no conflict of interest with the project being reviewed. The following website provides academy guidance for assessing composition and the appropriate forms for prospective panel members in General Scientific and Technical Studies: <http://www.nationalacademies.org/coi/index.html>. Whoever selected the panel needs to sign the form showing that the selection was independent following the NAS policy.

7.5.3.3. The contractor will use criteria for determining if SAR Panels are properly balanced, as defined by criteria in the contract, both in terms of professional expertise and in points of view on the project at hand. The contractor will be responsible for adjusting the panel membership to maintain the skill set necessary as the project progresses, the need for different expertise arises, or if a conflict arises the contractor will remove and replace panel members.

7.5.3.4. In developing a solicitation package for SAR services, USACE should consider the following from “Review Procedures for Water Resources Project Planning (NRC et al, 2002).” All potential panel members carry professional and personal biases, and it is important that these biases be disclosed when panel members are considered and selected. The contractor leading the SAR will determine which biases, if any, will disqualify prospective panel members. There is a challenge of selecting panels that are viewed as credible and balanced, but that also have adequate knowledge of the USACE often highly complex guidance and analytical methods. The most important considerations in selecting panel members are the credentials of the panel members (which include affiliations and expertise) and the absence of conflict of interest. Panel members must be distinguished experts in engineering, hydrology, or other appropriate disciplines.

7.5.3.5. SARs are not exempted by statute from FACA, see Paragraph 10.1. To help ensure this Act is not violated, the SAR Panel should set the agenda, control the meetings, and will not be required to provide a consensus report. It is acceptable to compile all reviewers' comments and assessments into one report, as long as they are not required to be consensus views for the group. USACE may attend panel meetings but may not participate in the management or control of the group, be a voting member of the group, and will not direct activities at the meetings.

7.5.3.6. USACE will not participate in the development of any reports or final work product of the panel.

7.5.3.7. The panel can take the form of a “Board of Consultants”; however, care must be taken to ensure consultants are independent of the activities being reviewed (e.g., must not review or comment on their own work products). The SAR may be concurrent with ongoing work, be interactive as needed, and provide real-time over-the-shoulder input. Timely input on the appropriateness of hazard analyses, models and methods of analysis used, and the assumptions made is critical to maintaining project schedules.

7.5.3.8. At a minimum, one panel member is required, but the number of panel members will be appropriate for the risk, size, and complexity of the project. Composition of the panel may change depending on the need of the particular phase of review.

7.5.3.9. Panel members will be paid labor and any necessary travel and per diem expenses.

7.6. Conducting the Review.

7.6.1. Managing and Planning the SAR. The District Chief of Engineering, as the Engineer-In-Responsible-Charge, will ensure the SAR is conducted consistent with this ER and will fully coordinate with the Chiefs of Construction and Operations, and the PM through the PED and construction phases. The PM will coordinate with the RMO to develop the SAR requirements and include them in the RP. SARs will be coordinated through the RMC, whether it is performed through contract acquisition or by another government agency.

7.6.1.1. Projects that utilize D-B contracts will generally follow the process in this ER, except that the first SAR Panel action will be to review and provide comments before the contract is advertised on the schedule, deliverables, and requirements for design as shown in the project Scope of Work. Depending on the project risk and complexity, an additional review of the contractor’s proposal may also be required. The RP will document the process to incorporate SAR into the D-B contract. See Paragraph 9.2 for additional requirements.

7.6.1.2. SAR Comments. Each SAR comment must be succinct and enable timely resolution of the concern. Comments should be limited to those that are required to ensure product adequacy and adherence to guidance. Comments will include the four key parts as described in Paragraph 5.8.3.

7.6.2. Objective, Scope, and Review Criteria.

7.6.2.1. Objective. The main objective of a SAR is to address basic Charge considerations/questions like those provided in Appendix C. A SAR should complement ATR and focus on unique features and changes from the assumptions made and conditions that formed the basis for the design during the planning phase. SAR Panels should be able to evaluate whether the interpretations of analysis and conclusions based on the analysis are reasonable.

7.6.2.2. Scope. Since SAR is a strategic level review, not all documents will be evaluated/reviewed in their entirety. Only the portions of the documents that address the design criteria/assumptions related to life safety should be evaluated/reviewed and commented upon. The SAR Panel must be able to quickly focus on the details that are critical for the successful performance of the project and focus their review on the Charge.

7.6.2.3. Review Criteria. The SAR review criteria will be based on the Charge prepared by the RMO, with support from the PDT. SAR Charge guidance and considerations/questions are provided in Appendix C.

7.6.3. SAR Panel Responsibilities. The SAR Panel must do all of the following:

7.6.3.1. Conduct the SAR for the subject project in a timely manner, according to the schedule.

7.6.3.2. Follow the Charge, and if deemed appropriate by the SAR Team Lead, request other products relevant to the project and purpose of the SAR. Reviewers must consider the Charge questions and the adequacy and acceptability of the engineering, models, and analyses used.

7.6.3.3. Receive and consider any public written and oral comments provided on the project from USACE.

7.6.3.4. Provide timely written and oral comments throughout the development of the project, as requested.

7.6.3.5. Focus on the questions in the Charge.

7.6.3.6. Offer any lessons learned to improve the design or review process.

7.6.3.7. Submit a SAR Milestone Review Summary consistent with the RP milestones.

7.6.3.8. The SAR Team Lead will be responsible for ensuring that all individual panel member comments are entered into the SAR Milestone Review Summary. The comments do not need to reach consensus with the rest of the panel.

7.6.4. SAR Milestone Review Summary. A suggested report outline includes: an introduction; the SAR Panel composition; a summary of the review; any lessons learned in both the SAR process or PED and construction; comments to include any appendices for supporting analyses; and assessments of the adequacy and acceptability of the methods, models, and analyses used. This report is not a consensus summary but represents the views of the individual SAR Panel members; therefore, it is possible some comments may conflict due to differing expert opinions. The comments may include observations beyond the scope of the Charge to bring important issues to the attention of decision makers. All comments in the report will be finalized by the SAR Panel prior to their release to USACE for each RP milestone.

7.6.5. District Responsibilities to Complete the SAR Milestone Review Summary.

7.6.5.1. The District Chief of Engineering is responsible for coordinating with the RMO, attending review meetings (or qualified representative) with the SAR Panel, communicating with the agency or contractor selecting the SAR Panel members, and coordinating the approval of the District's written response to the final SAR Milestone Review Summary with the RMO and MSC Chief of E&C Division.

7.6.5.2. After receiving a Milestone Review Summary from the SAR Panel, the District Chief of Engineering, with coordination with the District Chiefs of Construction and Operations, will consider all comments contained in the report and prepare a written response for all comments noting concurrence and subsequent action or non-concurrence with an explanation. Responses should be clear and must demonstrate a specific response for each specific comment. Controversial responses, as determined by the District Chief of Engineering in consultation with the RMO, must have vertical team agreement; USACE does not have to satisfy the panel, but must give satisfactory explanation of the coordinated response.

7.6.5.3. Responses should "concur" or "non-concur" for each of the SAR Panel Comments, along with a short explanation of why the PDT does or does not concur. Where practical, cite the action to be taken and where USACE will change the document. SAR Panel comments and District responses must not contain personal information, such as names and contact information.

7.6.5.4. The District Chief of Engineering will submit each SAR Review Summary and the District's responses to the RMO and the MSC Chief of E&C Division for review and concurrence. The PDT must allow adequate time for reviewing and concurring to each SAR Milestone Review Summary. The PDT should schedule a minimum of 14 calendar days for the RMO and MSC Chief of E&C Division to review and concur for each SAR Milestone Review Summary. The District must include a SAR Completion signed by the Chief of Engineering, the RMO and the MSC Chief of E&C Division. A sample Completion of Review and Certification of SAR is included in Appendix D.

7.6.5.5. For the last milestone, the SAR Panel will prepare a final phase SAR Milestone Review Summary that also includes all previous milestone SAR reviews and Milestone Review Summary documents. In addition, the District's written response to the final phase SAR Milestone Review Summary with RMO certification must be presented to the MSC Commander or their delegate for approval via memorandum.

7.7. Review Documentation and Records. The PDT is responsible for ensuring the SAR process is appropriately documented. SAR documentation must include each the SAR Panel's published SAR Milestone Review Summary with the District's responses to each SAR Milestone Review Summary and corresponding SAR Certification, and the MSC Commander's approval of the District's written response to the final phase SAR Milestone Review Summary. Documentation and records must be maintained and filed by the PDT following the MSC/District QMS processes.

Chapter 8
Quality Assurance and Oversight.

8.1. QA and Oversight.

8.1.1. QA is that part of quality management focused on providing confidence that quality requirements of a project, product, service, or process will be fulfilled. QA includes those processes employed to ensure that QC activities are being accomplished in line with planned activities and that those QC activities are effective in producing a product that meets the desired end quality. QA occurs at the District, RMO, MSC, and HQUSACE.

8.1.2. Audits are recommended at all QA levels. The organization conducting the audits is encouraged to bring in auditors from outside of their organization. An MSC audit of a District may include auditors from another MSC or an external RMO. The organization should issue an audit report documenting the results and submit the report through the chain of command, upon request. The USACE entity (e.g., District, MSC) being audited should be transparent throughout the process by providing documentation in advanced, answering questions directly. Transparency leads to a more effective and efficient audit. These audits are important to allow for more delegation of centralized decision making. Audits may be desk audits (without a site visit), but at a minimum, the audit should sample review efforts in areas such as:

8.1.2.1. Compliance with the QMS.

8.1.2.2. Early implementation and execution of RPs including Programmatic RPs.

8.1.2.3. Decision documentation, policy compliance, and timeliness including decisions on ATR, IEPR, or SAR exclusions.

8.1.2.4. Appropriate scale of review teams in scope, size, schedule, budget, adequacy, and capability.

8.1.2.5. DQC efforts with certifications.

8.1.2.6. Quality and value of ATR, IEPR, and SAR.

8.1.2.7. How special cases in Chapter 9 were reviewed.

8.1.2.8. How quality metrics are utilized.

8.1.2.9. Continual improvement functions including the PDCA cycle was used to implement lessons learned and corrective actions.

8.2. District QA.

8.2.1. District QA activities include reviewing work performed by the PDT (including ensuring that QC was performed by the work product authors) and supervisors. The District QA also includes verifying that QC from brokered USACE, A-E (including D-B contracts), or Sponsor work is effective in producing a work product that meets the desired end quality ensuring that the product authors are able to plan, design, and deliver quality projects on schedule, within budget, and acceptable to the customer and the federal government.

8.2.2. For verifying compliance and continuous QC monitoring, Districts must conduct internal audits on the District QMS processes and maintain appropriate quality metrics supporting this ER. District quality review record maintenance is critical in supporting future RMO, MSC, and HQUSACE audits to verify proper implementation of this ER, including DQC.

8.2.3. Prior to sending documents for the final BCOES, the District Chief of Engineering is required to certify reviews. The certifications must be included in the documentation submitted for final BCOES.

8.3. RMO and MSC QA.

8.3.1. The RMO and MSC QA includes verifying that the overall project QC activities are effective in producing a work product that meets the desired end quality ensuring that the Districts are able to plan, design, and deliver quality projects on schedule, within budget, and acceptable to the customer and the federal government. RMO QA activities include reviewing work performed by the District (including implementation of the ATR, IEPR, and SAR processes), the ATR Team, and the RMO. MSC QA activities include reviewing work performed by the District (including implementation of the ATR, IEPR, and SAR processes) and the MSC.

8.3.2. For verifying compliance and continuous QC monitoring, RMOs and MSCs may conduct audits on the District and maintain appropriate quality metrics supporting this ER. Districts routinely falling behind in executing schedule, budget, and technical requirements should trigger an RMO or MSC audit. RMOs and MSCs should share audit reports between organizations.

8.3.3. MSC Additional Responsibilities.

8.3.3.1. The MSC will implement a QMS compliant with AR 702-11, or subsequent guidance, that complies with the principles of this ER. In addition, the MSC will evaluate and recommend changes to subordinate Districts' QMS.

8.3.3.2. The MSC is responsible for ensuring vertical and lateral integration of organizational capabilities, to include resource sharing, technical expertise, project management, and project delivery. This integration helps to broaden and enhance the range of services and quality within the region. In addition to their oversight role in ensuring the PDT is technically qualified, the MSC is responsible for QA to ensure the adequacy and capability of the DQC Review Teams and supplementing the team members from outside the District, when necessary.

8.3.3.3. The MSC will conduct audits as described in their MSC QMS process of all subordinate Districts at least every 3 years as established in this ER. The MSC will track findings identified during MSC audits or other oversight to ensure that Districts have implemented appropriate corrective or preventive actions to address the findings.

8.3.3.4. The MSC will ensure that the District considers transparency during DQC reviews following the MSC/District QMS processes, Paragraph 4.7.1.1, and Paragraph 4.7.1.2.

8.3.3.5. The MSC will develop and share lessons learned throughout the region.

8.3.4. RMO Additional Responsibilities. Each RMO will conduct audits for at least two supporting Districts, at a minimum, every 3 years as established in this ER. RMOs should notify the applicable MSC when scheduling and conducting audits. Participation in audits described in Paragraph 8.1.2 will count toward this requirement.

8.4. HQUSACE QA.

8.4.1. The primary HQUSACE QA includes designating a HQUSACE proponent to oversee the execution of this ER and monitor progress. HQUSACE may elect to lead audits on this ER, which will be coordinated through appropriate MSC and District Commanders resulting in an audit report submitted to the DCW. Districts/RMOs/MSCs routinely falling behind in executing schedule, budget, and technical requirements should trigger a HQUSACE audit.

8.4.2. If the audit results demonstrate Districts, RMOs, or MSCs are substantially out of compliance with this ER, HQUSACE may determine the organization should lose approval authority and future oversight decisions should be elevated through the chain of command until corrective actions are implemented.

8.5. Continual Improvement.

8.5.1. General. Continual improvement is a performance imperative for every command and is achieved through the review of project results, identification of non-conformities and systemic problems, tools for root cause analysis, and implementation of appropriate corrective actions. The process of continual quality improvement leads to the refinement of the overall QMS.

8.5.2. Processes and tools for continual improvement include quality management review as described in this ER and other guidance, formal after-action reviews (AARs), documenting lessons learned, sharing best practices, and applying quality metrics. Project RRs should be used as a resource for continual improvement including AARs and lessons learned. Per the PDBP Manual, formal AARs and Lessons Learned are scheduled and resourced in the PMP and facilitated by the PM (or designee). In addition, the PM is responsible for ensuring that all appropriate information on project AARs and lessons learned is documented and communicated.

8.5.3. After-Action Review. ER 5-1-11 and the PDBP Manual require the PDT to conduct AARs. An AAR is a professional discussion of an event focused on improving the performance of the organization or team. The focus of the AAR is analyzing what was supposed to happen, what actually happened, and why it happened. Through the AAR process, the team compares the actual outcome with the expected outcome of a program, project, event, activity or service, identifies gaps and corrective actions, and develops lessons learned. As a learning organization, each District should annually have an AAR for at least three of their most challenging projects. These assessments should be done by a team from outside the MSC or contractor to seek the root cause of non-conformities. The AAR process is described in Headquarters, Department of the Army Training Circular 25-20, A Leader's Guide to After-Action Reviews.

8.5.4. Lessons Learned. ER 5-1-11 and the PDBP Manual require the PDT to document lessons learned. ER 5-1-11 establishes a general process for the PDT to capture project-related lessons learned. Districts will document formal lessons learned processes within the District QMS compliant with AR 702-11, or subsequent guidance. At project initiation, each PDT will review lessons learned repositories for information pertinent to the project.

8.5.5. Best Practices. ER 5-1-11 and the PDBP Manual requires the PDT to use best practices. A best practice is a process, technique, or innovative use of technology, equipment, or resources that has a proven record of success in providing significant improvement in cost, schedule, quality, performance, safety, environment or other measurable factors which impact an organization. Identifying and sharing best practices is another effective method for improving processes, products, and customer satisfaction. Districts should implement a process to identify, document, and share best practices.

8.5.6. Quality Metrics. Districts will develop quality metrics to measure and track progress with established quality objectives. Examples of quality metrics include, but are not limited to:

8.5.6.1. Customer, end user, and construction contractor surveys.

8.5.6.2. Controllable cost growth.

8.5.6.3. Comparison of the Fair and Reasonable Estimate vs. the Baseline Estimate.

- 8.5.6.4. Cost Estimate and schedule changes during project development.
- 8.5.6.5. Number of scope revisions.
- 8.5.6.6. Number of significant review comments.
- 8.5.6.7. AARs completed for the project.
- 8.5.6.8. Number of lessons learned generated by the project.

Chapter 9 Special Cases

9.1. Brokered Work.

9.1.1. The geographic District or MSC may broker work to other USACE Districts, laboratories, or CXs (e.g., USACE entity) by arranging a formal agreement for the entity to provide services, deliverables, or complete work products. The geographic District or MSC may broker a USACE entity to provide services, such as completing one or more tasks (e.g., geotechnical, mechanical) to jointly prepare work products, or to provide complete deliverables (e.g., studies, designs, P&S). To ensure that the geographic District is in alignment and positioned to continue the project in the subsequent phases of work, the geographic District will maintain oversight and perform QA throughout the development of all brokered work products. The level of oversight and QA will be risk-informed depending on the consequences and complexities of the work product.

9.1.2. When brokering work, the specific roles and responsibilities, including quality oversight, of the Districts, MSCs, and USACE entities involved must be outlined in the formal agreement, based on the project circumstances, before the work is accepted. Each brokered work situation will require MSC and vertical team involvement to ensure expectations and responsibilities are clearly understood and executed. The formal agreement for the brokered work will be an attachment to the RP. ATR for brokered work will avoid ATR Team members from the geographic District and the other USACE entity unless there are valid reasons, such as a lack of qualified reviewers. This exception must be justified in the RP, endorsed by the RMO, and approved by the MSC.

9.1.3. Jointly Prepared Products. When a USACE entity provides services for jointly prepared work products, the District performing the work is responsible for the quality of their work products, including DQC per Chapter 4. The geographic District will perform QA on the work products from the brokered District as outlined in the formal agreement.

9.1.4. Complete Deliverables. If the geographic District or MSC brokers to a USACE entity to provide a complete study or work product, then the brokered entity and corresponding MSC may assume the tasks to complete the study or work product. This includes tasks such as writing the RP, obtaining RP approval from the brokered MSC, and performing and certifying DQC and ATR (as well as IEPR and SAR when applicable), as described in the formal agreement.

9.1.4.1. Quality Oversight. The geographic District will be engaged during the work and will perform QA on the brokered District's work products. These roles and responsibilities for the study or work product will be addressed in the formal agreement to ensure the geographic District is in alignment and positioned to continue the project in the subsequent phase of work.

9.1.4.2. Review Plan Posting. For decision documents, the RP will be posted on the brokered District website and linked on the geographic District website (see Paragraph 3.8.2).

9.1.4.3. SAR Determination. The geographic District Chief of Engineering will determine if a SAR is required (see Paragraph 7.4.1).

9.2. Architect-Engineer, Other Government Agency, or Sponsor Work.

9.2.1. A-Es, including D-B contracts, other government agencies, and sponsors producing deliverables for USACE (e.g., studies, designs) are responsible for the quality of those deliverables. The A-E, other government agency, or sponsor plan to manage quality must meet the requirements in Chapter 4 and be documented in the QCP for the work product. The A-E, other Government agency, or sponsor QCP briefly describes the methods for producing the deliverables, the step-by-step approach for ensuring the independent peer review with certification of QC of the engineering and design services, and the products derived from those services. The detail in the QCP should be at an appropriate, scalable level based on the complexity, size, and level of risk associated with the project.

9.2.2. The District should engage the A-E, other Government agency, or sponsor to ensure a common understanding on the QCP expectations to avoid an unnecessary level of detail (e.g., adding general project management items, attaching reference documents) in the document. The A-E, other Government agency, or sponsor must submit the QCP to the District for approval. The District QA process must ensure reasonable adherence to the approved QCP. The A-E, other Government agency, or sponsor must submit the QC documentation, including documentation of Quality Checks, QC certification sheets for each component or sub-component of work products as described in Paragraph 4.7.5 to USACE for a QA review. The District will conduct and document an independent QA review on the work product development process. Formal review by a USACE ATR Team outside the District is required for A-E, other Government agency, and sponsor work products following the requirements in Chapter 5.

9.2.3. Oversight of the formal ATR of the work product will be the responsibility of the RMO. The A-E, other Government agency, or sponsor will be accountable for resolving issues with the work products identified during the ATR. If IEPR or SAR is required, A-E, other Government agency, or sponsor work products will be treated in the same manner as any other USACE work product, with the exception that issue resolution will be a dual responsibility between the A-E, other Government agency, or sponsor and USACE, with USACE having the final authority, see Chapter 10 of ER 1110-1-8152. The requirements of sponsor work for alterations to existing USACE projects per 33 U.S.C. 408 (Section 408) are detailed in Paragraph 9.4.

9.3. Continuing Authorities Program. CAP is a group of legislative authorities under which USACE can plan, design, and implement certain types of water resources projects without additional project-specific congressional authorization.

9.3.1. The individual authorities known collectively as the CAP are:

9.3.1.1. Emergency Streambank and Shoreline Protection (Section 14), Flood Control Act of 1946 (P.L. 79-526), as amended, for emergency streambank and shoreline erosion protection for public facilities and services.

9.3.1.2. Hurricane and Storm Damage Reduction Projects (Section 103), River and Harbor Act of 1962 (P.L. 87-874), as amended, amends P.L. 79-727, an Act approved August 13, 1946 which authorized federal participation in the cost of protecting the shores of publicly owned property from hurricane and storm damage.

9.3.1.3. Small Navigation Project Study (Section 107), River and Harbor Act of 1960 (P.L. 86-645), as amended, for navigation.

9.3.1.4. Shore Damage Prevention or Mitigation of Damages Caused by Federal Navigation Projects (Section 111), River and Harbor Act of 1968 (P.L. 90-483), as amended, for mitigation of shoreline erosion damage caused by federal navigation projects.

9.3.1.5. Ecosystem Restoration in Connection Dredging (Section 204), Water Resources Development Act of 1992 (P.L. 102-580), as amended, for beneficial uses of dredged material.

9.3.1.6. Flood Damage Reduction Projects (Section 205), Flood Control Act of 1948 (P.L. 80-858), as amended, for flood control.

9.3.1.7. Aquatic Ecosystem Restoration Projects (Section 206), Water Resources Development Act of 1996 (P.L. 104-303), as amended, for aquatic ecosystem restoration.

9.3.1.8. Clearing and Snagging Projects (Section 208), Flood Control Act of 1954 (P.L. 83-780), as amended, originally Section 2, Flood Control Act of August 28, 1937 (P.L. 75-406) for snagging and clearing for flood control.

9.3.1.9. Environmental Restoration (Section 1135), Water Resources Development Act of 1986 (P.L. 99-662), as amended, project modifications for improvement of the environment.

9.3.2. Requirements for CAP Projects.

9.3.2.1. CAP projects require a RP. CAP Programmatic RPs may be developed and approved by the MSC Commander. Approval of project-specific CAP RPs not requiring an IEPR or SAR may be delegated for approval by the District Commander. Project-specific CAP RPs requiring an IEPR or a SAR are approved by the MSC Commander or their delegate.

9.3.2.2. CAP projects are excluded from IEPR except those with decision documents that include an EIS.

9.3.2.3. SAR is required for CAP projects where life safety risk is significant as documented in the approved RP.

9.3.2.4. For CAP projects, ATR of the decision document cost estimate will be conducted by a qualified reviewer approved by the Cost Engineering CX. The RMO is responsible for coordinating with the Cost Engineering CX for ATR review assignments and ATR of cost products. The final cost certification and associated documentation of CAP projects may be delegated to the ATR cost engineering team member.

9.4. Non-Federal Activities. Non-federal interests may undertake the planning or implementation of a USACE authorized project or modification to an existing USACE project. Authorities for such actions include, but are not limited to, 33 U.S.C. 408 (Section 408), Sections 203 and 204 of WRDA 1986, and Public-Private Partnerships. Non-federal activities must meet USACE PED and construction standards as outlined in the corresponding authority and relevant guidance. USACE will review the activities to define review policy requirements following this ER to obtain USACE approval for the non-federal activity. For the USACE work products delivered under these authorities, the requirements in this ER must be followed unless superseded by the specific authority. For alterations to existing USACE projects per Section 408, RMO responsibilities are provided in this ER and other applicable USACE guidance.

9.5. Work for Other Entities. When USACE performs planning or implementation work for other entities (e.g., local, state, other agencies, or foreign governments), the requirements in this ER must be followed, except the need for a SAR should be determined on an individual basis in consultation with the requesting entity. The RP will be developed by the District and the appropriate RMO and then approved by the MSC Commander.

Chapter 10 Administration

10.1. Federal Advisory Committee Act. FACA imposes requirements on groups established by statute or established or utilized by the President or an agency that provide advice or recommendations to the President or an agency pertaining to Executive policy.

10.1.1. Under Section 2034(j) of WRDA 2007, FACA does not apply to IEPR. SARs are not specifically exempt from FACA.

10.1.2. If the PDT is uncertain whether FACA applies to a particular review, it should consider the following characteristics of groups that may be required to comply with FACA:

10.1.2.1. The group includes a member that is not a federal employee, or state, local or Tribal government employee.

10.1.2.2. The group is established, controlled, or managed by the USACE.

10.1.2.3. The group has a fixed membership, established purpose, and an agenda set by the USACE.

10.1.2.4. The group strives to produce group, rather than individual, advice to the USACE.

10.1.3. A SAR performed solely by federal employees or state, local, and Tribal government employees does not trigger FACA. To ensure independence, USACE employees should not be involved in performing the review. Questions regarding the applicability of FACA to SAR should be addressed to the District Office of Counsel.

10.2. Judicial Review. This ER is intended to improve the internal management of the USACE Civil Works program, and is not intended to, and does not create any right or benefit, substantive or procedural, enforceable at law or in equity, against the United States, its agencies or other entities, its officers or employees, or any other person.

10.3. Applicability. This regulation does not apply to information which is:

10.3.1. Related to certain national security, foreign affairs, or negotiations involving international trade or treaties where compliance with this ER interferes with the need for secrecy or promptness.

10.3.2. Disseminated in the course of an individual agency adjudication or permit proceeding (including a registration, approval, and licensing, site-specific determination), unless USACE determines the review is: practical and appropriate and that, the influential dissemination is scientifically or technically novel, or is likely to have precedent setting influence on future adjudications or permit proceedings.

10.3.3. A health or safety dissemination where USACE determines that the dissemination is time sensitive. For emergency operations where time is of the essence, the District Division Chief, typically Operations, Engineering, or Construction, may waive all or part of the review requirements in this ER where there is not sufficient time to allow for review and implementation measures needed to avoid catastrophic failure.

10.3.4. A USACE regulatory impact analysis or regulatory flexibility analysis subject to interagency review under Executive Order 12866, except for underlying data and analytical models used.

10.3.5. Routine statistical information released by federal statistical agencies (e.g., periodic demographic and economic statistics) and analyses of these data to compute standard indicators and trends (e.g., unemployment and poverty rates).

10.3.6. Accounting, budget, actuarial, and financial information, including that which is generated or used by agencies that focus on interest rates, banking, currency, securities, commodities, futures, or taxes.

10.3.7. Information disseminated in connection with routine rules that materially alter entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients thereof.

10.3.8. Responses to letters of inquiry, responses to Freedom of Information Act requests, and internal disseminations.

Appendix A References

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Appendix B
Roles and Responsibilities

DISTRICT:

- Prepare RP, as part of PMP, to include scope of review based on risk-informed decisions, necessary data, and models.
- Maintain RP as a living document with appropriate updates, such as adding the review strategy for the implementation phase.
- Post/publish decision document RP on internet website with RMO endorsement and MSC Approval Memorandum.
- Implement a QMS that complies with AR 702-11, or subsequent guidance, and the principles of this ER.
 - Conduct and document DQC seamlessly.
 - Complete all peer reviews prior to approval from District Commander.
 - Assist RMO to prepare the Charge questions for ATR, IEPR, and SAR.
 - Support RMO in providing necessary effort to manage and coordinate review efforts, including preparing draft documents.
 - Obtain ATR Team agreement on key decisions at critical points during project planning and implementation.
 - Draft proposed response to IEPR Review Reports and SAR Milestone Review Summaries and coordinate with RMO.
 - Post/publish Final IEPR Report, Agency Response, and other materials on internet website and include in decision document.
 - Seek issue resolution support from RMO/MSC.
 - Prepare a formal brokering agreement when sharing work with other USACE entities.

MSC:

- Implement a QMS that complies with AR 702-11, or subsequent guidance, and the principles of this ER.
- Conduct QA, including audits, to verify the overall project QC activities are effective in producing a work product.
- Review and approve all RPs (and applicable updates), ensuring RMO endorsement and vertical team concurrence.
- Notify the respective HQUSACE RIT on decision to perform or exclude from a project IEPR.
- Approve the District's final written response to SAR Milestone Review Summaries.
- Support the District for issue resolution.

RMO (applicability varies by work product under review):

- Conduct QA, including audits, to verify the overall project QC activities are effective in producing a work product.
- Coordinate all RPs, including reaching agreement on scope and details of effort.
- Endorse RPs (and applicable updates).
- Help prepare Charge questions for ATR, IEPR, and SAR.
- Manage and coordinate review efforts, including preparing draft documents.
- Assign ATR Team outside geographic District and ATR Team Lead outside geographic

MSC.

- Contract with OEO for IEPR.
- Contract with A-E contractor or arrange with another government agency for SAR.
- Assist District with preparing written responses to IEPR and SAR Milestone Review Summaries.
- Participate in all decision document milestone and IPR meetings relevant to developing and reviewing the work product development.
- Develop and maintain SOPs for the conduct of model reviews, ATR, IEPR, and SAR.

POLICY AND LEGAL COMPLIANCE REVIEW TEAM:

- Team of HQUSACE, MSC, or PCX staff.
- Participate in in-progress reviews, milestones, and issue resolution.
- Complete policy reviews.
- Consider the District's proposed Agency Response to IEPR Report.

HQUSACE:

- Release proposed Chief's Report and decision documents for State and Agency Review as required by the 1944 Flood Control Act, as amended, and final NEPA review.
- Review requests to use NAS for IEPR.
- Determine appropriate command level for issuing formal Agency Response to IEPR Report (DCW or CG).
- Complete Congressional notification requirements.
- Participate in issue resolution.

ALL:

- Ensure the quality and credibility of USACE work products.
- Conduct QA.
- Uphold professional standards.
- Communicate well and often.
- Learn from prior reviews.
- Use PDCA for continuous improvement.
- Share lessons learned with CoPs.

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Appendix C Charge Guidelines and Considerations/Questions

C.1. General Charge Information. The Charge to reviewers for ATR Teams, IEPR Panels, and SAR Panels contains the instructions regarding the objective of the review and the specific advice sought. Review is conducted to identify, examine, and comment upon assumptions that underlie analyses (e.g., public safety, economic, engineering, environmental, cultural, real estate, and other types of assumptions) appropriate to the Charge and to evaluate the soundness of models and analytic methods. The RMO, with project-specific input from the PDT and MSC, will prepare the Charge considerations/questions. Reviewers should be able to quickly focus on the details that are critical for the successful performance of the project and focus their review on the Charge considerations/questions.

C.2. ATR Charge Guidelines. The ATR Team will review the work products against published guidance, including Engineer Regulations, Engineer Circulars, Engineer Manuals, Engineer Technical Letters, Planning Bulletins, Engineering and Construction Bulletins, Policy Guidance Letters, implementation guidance, project guidance memoranda, Director's Policy Memoranda, and other formal guidance memoranda issued by HQUSACE. Any justified and approved exemptions for any deviations from USACE guidance should be obtained from HQUSACE before the start of ATR.

C.2.1. For any work product undergoing ATR, key considerations include the following:

C.2.1.1. The project meets the scope, intent, authorizing language (if applicable), and quality objectives as defined in the PMP.

C.2.1.2. Formulation and evaluation of alternatives are consistent with applicable regulations and guidance.

C.2.1.3. Concepts and projected project costs are valid.

C.2.1.4. The non-federal sponsor is aware of their requirements and has been made aware of the proposed recommendations.

C.2.1.5. The project is technically correct, feasible, and will be safe, functional, constructible, environmentally sustainable, within the federal interest, and economically justified according to policy while considering the potential for robustness, redundancy, and resiliency.

C.2.1.6. All relevant engineering and scientific disciplines have been effectively integrated.

C.2.1.7. Appropriate computer models and methods of analysis were used, and basic assumptions are valid and used for the intended purpose.

C.2.1.8. The source, amount, and level of detail of the data used in the analysis are appropriate for the complexity of the project.

C.2.1.9. The project complies with accepted practice within USACE.

C.2.1.10. Content is sufficiently complete for the current project phase and provides an adequate basis for future development effort while considering the areas of instrumental uncertainty and associated risks.

C.2.1.11. Project documentation is appropriate and adequate for the project phase.

C.2.1.12. Where appropriate, TRG have been adequately addressed and a risk assessment was conducted on the design.

C.2.2. Additional Planning Phase ATR Charge Considerations/Questions.

C.2.2.1. Recognizing that the quality of each decision document has a direct and immediate impact on the credibility of USACE and the Department of the Army, ATR on decision documents must address the basic communication aspects of the documents. Quality decision documents allow the public and stakeholders to understand the planning effort and its results, and enable decision makers to reach the same conclusions as the reporting officers (i.e., quality decision documents are not a simple reporting of PDT findings or a record repository of PDT activities).

C.2.2.2. The main decision document and appendices must form an integrated and consistent product.

C.2.2.3. As an initial guide, the ATR Team must consider the Project Study Issue Checklist in ER 1105-2-100, which includes many of the more frequent and sensitive policy areas encountered in studies.

C.2.2.4. Other key considerations include:

C.2.2.4.1. Are the existing and future without-project conditions reasonable and appropriate, and presented over the project lifecycle?

C.2.2.4.2. Are the planning objectives, constraints, and assumptions consistent with the without-project conditions?

C.2.2.4.3. Do the alternative plans provide a reasonably complete array of solutions, make sense relative to the planning objectives and the without-project conditions, and are they complete, effective, efficient, and acceptable over the project lifecycle?

C.2.2.4.4. Are sufficient alternatives formulated to determine the appropriate combination of measures and a reasonable scale for the selected plan such as the National Economic Development (NED), National Ecosystem Restoration (NER) or NED/NER Plan?

C.2.2.4.5. Are the required plans included, such as the no action, a plan that maximizes net total benefits across all benefit categories, a plan that maximizes net benefits consistent with the study purpose, and a nonstructural flood risk management plan?

C.2.2.4.6. Are alternatives technically correct, safe, functional, constructible, economical, reasonable, and sustainable?

C.2.2.4.7. Are calculations and results of analyses essentially correct? There should be documentation in the DQC record on this issue.

C.2.2.4.8. Are the methods used to develop analyses and conclusions clearly and fully presented to assurance transparency, if applicable (ER 1165-2-217)?

C.2.2.4.9. For final report ATR, is the engineering content at a feasibility level-of-detail and is it sufficiently complete to provide an adequate basis for the baseline cost estimate (ER 1110-2-1150)?

C.2.2.4.10. For final report ATR, is the real estate content at a feasibility level-of-detail and is it sufficiently complete to provide an adequate basis for the baseline cost estimate (ER 1110-2-1150)?

C.2.2.4.11. For final report ATR, is the environmental mitigation content at a feasibility level-of-detail and is it sufficiently complete to provide an adequate basis for the baseline cost estimate (ER 1110-2-1150)?

C.2.2.4.12. Are comparable cost products used to compare, screen, and select alternative plans? For final ATR does the baseline cost estimate include a construction schedule and studied risk-based contingency? Are the cost products and supporting products up to date?

C.2.2.4.13. For final report ATR, are analyses for the engineering, economic, environmental, real estate, and other disciplines fully described, technically correct, and do they comply with established policy requirements and accepted practices within USACE?

C.2.2.4.14. Is the appropriate plan selected based on the National Objectives and evaluation criteria expressed in Principles and Guidelines and USACE policy?

C.2.2.4.15. Does the implementation plan have an appropriate division of responsibilities?

C.3. IEPR and SAR Charge Guidelines. The IEPR and SAR Charge should be determined in advance of selecting the reviewers. It must include specific technical questions while also directing reviewers to offer a broad evaluation of the overall document. Reviewers must be able to evaluate and provide comment on whether the information presented supports the conclusions.

C.3.1. For any work product undergoing IEPR or SAR, key considerations include the following:

C.3.1.1. To provide effective review, in usefulness and credibility of results, the Charge must give reviewers the flexibility to bring important issues to the attention of decision makers. However, reviewers must be explicitly instructed in the Charge to not make a recommendation or present a final judgment on whether a particular alternative should be implemented, as the District Chief of Engineering is ultimately responsible for the final decision on USACE work products. Reviewers may, however, offer their opinions as to whether there are sufficient analyses upon which to base a recommendation.

C.3.1.2. IEPRs and SARs must not be expected to resolve fundamental disagreements and controversies. Reviewers should aim to draw distinctions between criticisms of the regulations and guidelines and criticisms of how well USACE conformed to the guidance. Reviewers must focus on assumptions, data, methods, and models.

C.3.1.3. IEPRs and SARs will assist USACE in making decisions, but reviewers must not be asked to make decisions. Reviewers must avoid findings that become “directives” calling for items such as modifications or additional studies or suggesting new conclusions or recommendations. In such circumstances, the reviewers may have assumed the role of advisors and reviewers, thus introducing bias and potential conflict in their ability to provide objective review later in the project. Reviewers engaged in the review processes must be selected based upon their independence and professional expertise and must not be “stakeholders.”

C.3.1.4. Defining a review panel’s boundaries of inquiry is an issue that frequently arises in review and is not always easily agreed upon. It is not uncommon for an agency or other administrative group to try to limit a review panel’s deliberation. However, the line between technical and policy issues is often blurred, and it is often difficult to clearly separate them. USACE should accept comments but make a distinction in responses when comments pertain to policy which is beyond the scope of the review and have been elevated to HQUSACE for consideration under a non-project-specific policy review. It is important that panelists focus on their review and not become defenders of their findings.

C.3.2. IEPR and SAR Charge Considerations/Questions.

C.3.2.1. Basic Charge Considerations/Questions. All IEPRs and SARs must cover these basic Charge considerations/questions:

C.3.2.1.1. Is the overall direction of the project appropriate?

C.3.2.1.2. Is there anything the panel would like USACE to consider?

C.3.2.2. Additional Planning Phase IEPR Charge Considerations/Questions. For the planning phase, at a minimum, the IEPR will address the following considerations/questions:

C.3.2.2.1. Assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analyses, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in evaluation of economic or environmental impacts, and any biological opinions.

C.3.2.2.2. For those decision documents that will require a SAR:

- Is the quality and quantity of the surveys, investigations, and engineering sufficient for the proposed design (ER 1110-2-1150)?

- Are the models used to assess hazards appropriate?

- Are the assumptions made for the hazards appropriate?

- Does the analysis adequately address the uncertainty and residual risk given the consequences associated with the potential for loss of life for this type of project?

C.3.2.2.3. Assess the considered and recommended alternatives from the perspective of systems. This includes (but is not limited to) aspects such as the hydraulic and hydrologic effects throughout a watershed; the impact on competing ports within an area of influence; the impacts on resources used by transiting migratory species; and the systemic aspects considered from a temporal perspective, including the potential effects of climate change.

C.3.2.3. Basic SAR Charge Considerations/Questions. All SARs must cover these basic Charge considerations/questions:

C.3.2.3.1. Assess the adequacy, appropriateness, and acceptability of the PED and construction activities in ensuring public health, safety, and welfare.

C.3.2.3.2. Were the site investigations adequate?

C.3.2.3.3. Do the designs and analyses follow the current state of the practice methodology?

C.3.2.3.4. Are the life safety design features robust, redundant, and resilient?

C.3.2.3.5. Are there any critical design considerations missing?

C.3.2.4. Additional PED Phase SAR Charge Considerations/Questions. For the PED phase, at a minimum, the SAR will address the following considerations/questions:

C.3.2.4.1. Do the assumptions made in the implementation phase for hazards remain valid through the completion of PED as more knowledge is gained and the state of the art evolves?

C.3.2.4.2. Do the project features and components effectively work as a system?

C.3.2.4.3. Is the QC/QA effort appropriate?

C.3.2.4.4. For those unique projects authorized and appropriated or approved without a decision document and in the PED phase, the SAR will address the review requirements defined in ER 1105-2-100.

C.3.2.5. Construction Phase SAR Charge Considerations/Questions. For the construction phase, at a minimum, the SAR will address the following considerations/questions:

C.3.2.5.1. Do the assumptions made during PED remain valid through construction as additional knowledge is gained and the state of the art evolves?

C.3.2.5.2. Has the construction team made adequate adjustments to ensure critical life safety requirements have not been compromised by changes in the field?

C.3.2.5.3. For O&M manuals, will requirements listed in the manual adequately maintain the conditions assumed during PED and validated during construction and will the project monitoring adequately reveal any deviations from assumptions made for performance?

Appendix D
Templates

*** Instructions for all Templates: <[Input]> – Information in blue brackets and text is required. Once the input is provided, text should be formatted in black and the brackets should be deleted.*

1, SAMPLE MSC COMMANDER’S RP APPROVAL MEMORANDUM

Date:

Subject: Review Plan approval for <Work Product Name>

The attached Review Plan for the <Work Product Name> dated xx xxx xx has been prepared consistent with ER 1165-2-217.

The Review Plan has been coordinated with the <RMO Name> which is the lead office to execute this plan. For further information, contact the RMO at <RMO Telephone Number>. The Review Plan <includes/does not include> Independent External Peer Review or Safety Assurance Review.

I hereby approve this Review Plan, which is subject to change as circumstances require, consistent with work product development under the Project Delivery Business Process. Subsequent revisions to this Review Plan or its execution due to significant changes in the study/scope or level of review will require new written approval from this office.

[MSC Commander Signature Block]

Cc RMO

2. SAMPLE DQC CERTIFICATION FORM

<p><Project and Document Name> 100% Review</p> <p>DQC CERTIFICATION OF <Product/Feature Name> <Project Team></p> <p>As the <lead planner/designer/economist/architect/geologist> for the <product/feature name>, I certify the following work shown herein was completed using the appropriate USACE guidance or industry standard if applicable. I certify the work is based on:</p> <ul style="list-style-type: none">• Appropriateness of assumptions, methods, procedures, computations (including quantities), and materials used in the analyses consistent with the project purpose or decision being made.• Comprehensiveness of the array of alternatives considered, if applicable .• Correctness of calculations and clarity of graphic/plan presentation.• Appropriateness of data and level of data, assumptions, and safety risk based on deterministic criteria and risk-informed decision-making information.• Reasonableness of results compared to project purpose in compliance with applicable laws and USACE policy. <p>I certify that the write-up <page 1-xx>, computations <page 1-xx>, drawings <page 1-xx> and specifications <section no.> meet the customer requirements shown herein. For items previously designed by others and included as the design basis shown herein, I certify that I have verified the work for adequacy, completeness, and accuracy.</p> <p><i>SIGNATURE</i></p> <hr/> <p>[Name] [Lead Planner/Designer/Economist/Architect/Geologist] _____ Date _____ [Office Symbol] _____ Add appropriate additional signatures (team members, SMEs) and modify to accommodate local organizational structure.</p> <p>As the Reviewer/Checker, I have performed DQC and concur with the findings of the <lead planner/designer/economist/architect/geologist> for the <product/feature name>.</p> <p><i>SIGNATURE</i></p> <hr/> <p>[Name] DQC Reviewer(s)/Checker(s) _____ Date _____ [Office Symbol] _____</p> <p><i>SIGNATURE</i></p> <hr/> <p>[Name] [DQC Review Lead/Project Manager/Lead Planner/Technical Lead] _____ Date _____ [Office Symbol] _____</p> <p><i>SIGNATURE OF APPROVER</i></p> <hr/> <p>[Name] [Supervisor (For Author/Section Where the Product is Produced)] _____ Date _____ [Office Symbol] _____</p> <p style="text-align: right;">1 of 1</p>	
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3. SAMPLE ATR COMPLETION/CERTIFICATION FORM

COMPLETION OF AGENCY TECHNICAL REVIEW

This Statement of Technical Review has been completed by the ATR Team for the *<product type & short description of item>* for *<project name and location>*, see the ATR Report, which includes a brief summary of the review including any significant and unresolved issues, future commitments, the Charge questions, a brief resume of ATR reviewers, a printout of all DrChecksSM comments with resolution, and any significant correspondence between the PDT, RMO, and ATR Team. The ATR was conducted as defined in the project’s RP to comply with the requirements of ER 1165-2-217. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer’s needs consistent with law and existing USACE policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have either been resolved or have been elevated and are attached. All comments in DrChecksSM are closed.

SIGNATURE

[Name]

ATR Team Lead

[Office Symbol or Name of A-E Firm]

Date

SIGNATURE

[Name]

Project Manager (District)

[Office Symbol]

Date

SIGNATURE

[Name]

Architect Engineer Project Manager¹

[Company, location]

Date

SIGNATURE

[Name]

Review Management Office Representative

[Office Symbol]

Date

¹ only needed if some portion of the ATR was contracted

CERTIFICATION OF AGENCY TECHNICAL REVIEW

SUBJECT: Agency Technical Review (ATR) of *<product type & short description of item>* for *<project name and location>*

Significant concerns and the explanation of the resolution are as follows:

[Describe the major technical concerns and their resolution and specifically list any agreed-upon deferrals to be completed in the next phase of work or state “There are no significant concerns or any unresolved comments”.]

As noted above, all concerns resulting from the ATR of the project have been fully resolved or have been elevated and documented with this certification.

SIGNATURE

[Name]

Date

Chief, Engineering Division (District)

[Office Symbol]

SIGNATURE

[Name]

Date

Chief, Planning Division² (District)

[Office Symbol]

Add appropriate additional signatures (Operations, Construction, A-E principal for ATR solely conducted by A-E) and modify to accommodate local organizational structure.

SIGNATURE

[Name]

Date

[as appropriate]

[as appropriate]

SIGNATURE

[Name]

Date

[as appropriate]

[as appropriate]

2 Only needed for Decision Documents

4. SAMPLE SAR COMPLETION/CERTIFICATION FORM

COMPLETION OF SAFETY ASSURANCE REVIEW

The <Design Phase><Construction Phase> *[select one or if multiple reviews for a phase specify which level of review it is]* Safety Assurance Review (SAR) has been completed for the <type of product> for <project name and location>. The SAR was conducted as defined in the project's Review Plan to comply with the requirements of ER 1165-2-217. During the SAR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results. The SAR Panel reviewed the adequacy, appropriateness, and acceptability of the <Design>, <Construction Activities>. All comments resulting from the SAR have been submitted in DrChecksSM. A written response has been provided to the SAR Panel for all comments noting concurrence and subsequent action or non-concurrence with an explanation. Significant concerns and the explanation of the resolution are as follows: *[Describe the major technical concerns and their resolution. May also include as reference to the final report.]* As noted above, all concerns resulting from the SAR of the project have been fully resolved.

SIGNATURE

[Name]

Chief, Engineering Division (District)

[Office Symbol or Company]

Date

CONCUR

SIGNATURE

[Name]

Review Management Organization Representative

[Office Symbol]

Date

SIGNATURE

[Name]

Chief, Engineering and Construction Division (MSC)

[Office Symbol]

Date

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Appendix E Transparency in Decision Documents

E.1. Best Practices. Since the information in Feasibility Report economic analyses can be complex and technical, following best practices for transparency helps ensure that the methods used to develop analyses and conclusions are clearly and fully presented. In addition, this ensures that decision makers and stakeholders are clearly and fully informed about the potential economic effects associated with projects. Transparency is supported through:

E.1.1. Adequately describing and justifying the analytical choices, assumptions, and data used.

E.1.2. Reporting how plausible adjustments to each important analytical choice and assumption affect the estimates of the economic results and the comparison of alternatives.

E.1.3. Explaining the implications of the key limitations in the data used.

E.1.4. Quantifying the statistical variability of the key data elements underlying the estimates and impacts and the results of comparing alternatives.

E.2. Document Requirements. Decision documents must follow the best practices for transparency. The following decision document requirements support transparency and must be summarized in the executive summary and detailed more fully in the main report and corresponding appendices.

E.2.1. The report must adequately describe and justify the models, analytical choices, assumptions, and data used. The report must assess how plausible adjustments to each key analytical choice variable and assumption affects the estimate of the economic results and the comparison of alternatives. The report must also explain the implications of the limitations in the data used. For numerical analysis, the report must show the statistical variability of the key data elements underlying the estimates of the economic quantities and the resulting uncertainty in the estimated economic values. The report should display the variability and uncertainty with distributions and ranges.

E.2.2. Uncertain values should, at a minimum, be reported by reasonable upper and lower limit estimates. When quantitative data are available, the five-number summary (i.e., minimum, first quartile, median, third quartile, and maximum values) should be displayed and explained as necessary. In addition, statistical confidence intervals should be shown and likelihood statements about critical decision values, such as net NED benefits greater than zero, benefit-cost ratios greater than 2, and the like, should be provided.

E.2.3. The report must show the effects of this uncertainty on the comparison of alternatives. To ensure understanding, a narrative description of the combination of things that must happen for the upper end of the range of a decision criterion to be realized should be provided. Likewise, a description of the combination of things that must happen for the lower end of the range to be realized should be provided.

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Glossary
Abbreviations and Terms

AAR	After-Action Review
A-E	Architect-Engineer
AS3	Army Source Selection Supplement
ASA(CW)	Assistant Secretary of the Army for Civil Works
ASCE	American Society of Civil Engineers
ATR	Agency Technical Review
BCOES	Biddability, Constructability, Operability, Environmental, and Sustainability
CAP	Continuing Authorities Program
CERCAP	Corps of Engineers Reviewer Certification and Access Program
CG	Commanding General
CMP	Change Management Plan
CoP	Community of Practice
CSRM	Coastal Storm Risk Management
CX	Center of Expertise
D-B	Design-Build
DCW	Director of Civil Works
DDN-PCX	Deep Draft Navigation Planning Center of Expertise
DDR	Design Documentation Report
DQC	District Quality Control
DSO	Dam Safety Officer
E&C	Engineering and Construction
EC	Engineer Circular
ER	Engineer Regulation
ECIFP	Engineering Considerations and Instructions for Field Personnel
ECO-PCX	Ecosystem Restoration Planning Center of Expertise
EDR	Engineering Documentation Report
EIS	Environmental Impact Statement
EP	Engineer Pamphlet

EPW	U.S. Senate Committee on Environment and Public Works
ER	Engineer Regulation
FACA	Federal Advisory Committee Act
FCSA	Feasibility Cost Sharing Agreement
FRM	Flood Risk Management
FRM-PCX	Flood Risk Management Planning Center of Expertise
HQUSACE	Headquarters, U.S. Army Corps of Engineers
IEPR	Independent External Peer Review
INDC	Inland Navigation Design Center
IPR	In-Progress Review
LSO	Levee Safety Officer
MSC	Major Subordinate Command
NAS	National Academy of Sciences
NED	National Economic Development
NEPA	National Environmental Policy Act
NER	National Ecosystem Restoration
NRC	National Research Council
OEO	Outside Eligible Organization
O&M	Operations and Maintenance
OMB	Office of Management and Budget
P&S	Plans and Specifications
PCX	Planning Center of Expertise
PCXIN-RED	Planning Center of Expertise for Inland Navigation
PDBP	Project Delivery Business Process
PDT	Project Delivery Team
PED	Preconstruction Engineering and Design
PgMP	Program Management Plan
P&LCR	Policy and Legal Compliance Review
P.L.	Public Law
PM	Project Manager
PMP	Project Management Plan

QA	Quality Assurance
QAP	Quality Assurance Plan
QC	Quality Control
QCP	Quality Control Plan
QMP	Quality Management Plan
QMS	Quality Management System
RIDM	Risk-Informed Decision Making
RIT	Regional Integration Team (HQUSACE)
RMC	Risk Management Center
RMO	Review Management Organization
RMP	Risk Management Plan
RP	Review Plan
RR	Risk Register
SAR	Safety Assurance Review
SBH-PCX	Small Boat Harbor Planning Center of Expertise
SME	Subject Matter Expert
T&I	House Committee on Transportation & Infrastructure
TL	Technical Lead
TRG	Tolerable Risk Guidelines
USACE	United States Army Corps of Engineers
WMRS-PCX	Planning Center of Expertise for Water Management and Reallocation Studies
WRDA	Water Resources Development Act
WRRDA	Water Resources Reform and Development Act

After-Action Review: An AAR is a professional discussion of an event focused on improving the performance of the organization or team. The focus of the AAR is analyzing what was supposed to happen, what actually happened, and why it happened.

Agency Technical Review: An ATR is a seamless independent review by a qualified person or team not involved in the day-to-day production of a project/product, confirming quality control; confirming the technical correctness, competency, and RIDM for proper application of clearly established criteria, models, regulations, laws, codes, principles and professional practices; confirming that appropriate solutions and implementation risks are considered; and ensuring the

quality and credibility of the government's scientific and budgetary information. ATR is verified through a certification process.

Conflict of Interest: NAS defines "conflict of interest" as any financial or other interest that conflicts with the service of an individual on the review panel because it could impair the individual's objectivity or could create an unfair competitive advantage for a person or organization.

Decision Document: As used in this ER, a "decision document" is any planning work product that provides analysis and recommendations for an Agency decision to obtain project authorization to commit funds for project implementation or project modification. A decision document is the basis for approval to send/receive funds as a result of entering into agreements with other agencies or organizations including those to obtain Congressional authorization. Feasibility studies and GRRs are examples of decision documents.

District Quality Control: DQC is an integrated review approach providing for seamless review including Quality Checks requiring a detailed peer review of the documents, computations, graphics/plans, and PDT Reviews. DQC is one trigger to identify both the key risk-informed decisions and timing of reviews for high risk items/features that warrant additional evaluation by the ATR Team. DQC is verified through a certification process after completing review of the final work product.

Environmental Impact Statement: An EIS is a standalone or integrated into a feasibility report addressing the potential effects on the environment of a proposed federal government project. EISs are required under United States environmental law by the 1969 National Environmental Policy Act for certain actions "significantly affecting the quality of the human environment". An EIS is a tool for decision making and describes the positive and negative environmental effects of a proposed action, and it usually also lists one or more alternative actions that may be chosen instead of the action described in the EIS.

Geographic District: The geographic District is the District responsible for the geographic region where the project is authorized.

Implementation Document: As used in this ER, an "implementation document" is defined as a document, generally prepared subsequent to the decision document, which supports project implementation or project modification consistent with the decision document and its authorization. EDRs, DDRs, P&S packages, ECIFPs, and major construction contract modifications are examples of implementation documents.

Independence: In its narrowest sense, independence in a reviewer means that the reviewer was not involved in producing the draft or final document to be reviewed. Peer reviewers must not have participated in development of the work product. However, for the IEPR and SAR, a broader view of independence is necessary to ensure credibility of the process. IEPR and SAR reviewers are generally not employed by the Agency or Office producing the document. NAS has stated, “external experts often can be more open, frank, and challenging to the status quo than internal reviewers, who may feel constrained by organizational concerns.”

Information Quality Act: Congress directed the OMB to issue guidelines to “provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information” disseminated by federal agencies. P.L. No. 106-554, § 515(a).

Instrumental Uncertainties: Uncertainty that could affect the kind of decision that is made or the outcome of a decision once it is made.

Lead Planner: The Lead Planner serves as the proponent for planning studies in project development on the Project Delivery Team (PDT). This role includes facilitating and guiding formulation, ensuring utilization and application of RIDM, and ensuring policy and statutory compliance.

Other Work Product: As used in this ER, an “other work product” is defined as a document that includes technical, scientific, engineering, or other information used to support decisions and assessments, but is neither a decision nor implementation document. Semi-quantitative risk assessments, issue evaluation studies, operation and maintenance manuals, water control plans, water control manuals, and periodic inspection reports are some examples of other work products.

Outside Eligible Organization (OEO): An OEO is an organization that:

- (1) Is described in Section 501(c)(3), and exempt from federal tax under Section 501(a), of the Internal Revenue Code of 1986;
- (2) Is independent;
- (3) Is free from conflicts of interest;
- (4) Does not carry out or advocate for or against federal water resources projects; and
- (5) Has experience in establishing and administering peer review panels.

Peer Review: One of the important procedures used to ensure that the quality of published information meets the standards of the scientific and technical community. It is a form of deliberation involving an exchange of judgments about the appropriateness of methods and the strength of the author’s inferences. Peer review involves the review of a draft work product for quality by specialists in the field who were not involved in producing the draft.

Plans-In-Hand Review: An on-site review by the PDT to verify all quality and customer objectives have been met. This review is conducted at the project site to verify the correct application of methods, validity of assumptions, adequacy of basic data, correctness of calculations (error-free), and completeness of documentation, compliance with guidance and standards, and BCOES considerations based on existing site conditions.

Project Study: As defined in Section 2034 of WRDA 2007, a project study is a feasibility study or reevaluation study for a water resources project, including the EIS prepared for the study and any other study associated with a modification of a water resources project that includes an EIS, including the environmental impact statement prepared for the study. Project studies do not include standalone EISs, Economic Re-evaluation Reports that have no new formulation, or other planning products that do not include formulation.

Quality: The USACE PDBP defines *quality* as “the totality of features and characteristics of a product or service that bear on its ability to meet the stated or implied needs and expectations of the customer as well as address applicable laws, regulations, and professional standards.” ER 1180-1-6: Construction Quality Management defines *quality* as “conformance to properly developed requirements.” ER 5-1-11: USACE Business Process defines *quality* as “the degree to which a set of inherent characteristics fulfills requirements.”

Quality Assurance: That part of quality management focused on providing confidence that quality requirements of a project, product, service, or process will be fulfilled. QA includes those processes employed to ensure that Quality Control (QC) activities are being accomplished in line with planned activities and that those QC activities are effective in producing a product that meets the desired end quality.

Quality Control: That part of quality management focused on fulfilling quality requirements of a project, product, service, or process. It includes those processes used to ensure performance meets agreed-upon customer requirements that are consistent with law, regulations, policies, sound technical criteria, schedules, and budget.

Quality Management: A governance structure that establishes quality requirements and provides the means and resources to achieve those requirements.

Quality Management System – A QMS is a set of policies, processes, and procedures required for planning and execution in core business areas (i.e., areas that can impact the organization’s ability to meet customer requirements).

Redundancy: Redundancy is the duplication of critical components of a system with the intention of increasing reliability of the system, usually in the case of a backup or fail-safe.

Resiliency: Resiliency is the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions. To help organize resilience activities and describe how resilience measures can be applied, USACE has divided resilience into four key principles: prepare, absorb, recover, and adapt.

Risk-Informed Decision Making: RIDM is the process of using qualitative, semi-quantitative or quantitative risk information in conjunction with other considerations to lead to more complete, transparent, and informed decisions. The three tasks of risk analysis (risk assessment, risk management, and risk communication) comprise the basis for RIDM.

Risk Register: The RR, an important risk management tool, is a log in which the PDT records the relevant details of the risks that could result from actions taken or not taken during each stage of a project's lifecycle. The PDT and all levels of the vertical team have input and joint ownership of the RR. The RR should be used as a guide for decision making in a timely manner and making and accepting decisions based on information available to the PDT at that time.

Robustness: Robustness is the ability of a system to continue to operate correctly across a wide range of operational conditions (the wider the range of conditions, the more robust the system), with minimal damage, alteration, or loss of functionality and to fail in a predictable manner outside of that range.

Scientific Information: Factual inputs, data, models, analyses, technical information, or scientific assessments based on the behavioral and social sciences, public health and medical sciences, life and earth sciences, engineering, or physical sciences. This includes any communication or representation of knowledge such as facts or data, in any medium or form, including textual, numerical, graphic, cartographic, narrative, or audiovisual forms.

Technical Lead: The Technical Lead (TL), formerly called Lead Engineer/Architect or Engineer-in-Charge, serves as the proponent for the project's technical quality on the PDT. While the TL serves as the proponent for technical quality on all E&C deliverables, each member of the PDT retains their responsibility for technical quality.

Technical Review: Technical review is the process that confirms the proper selection and application of established criteria, regulations, laws, codes, principles, and professional procedures to ensure a quality product. Technical review also confirms the constructability and effectiveness of the product and the utilization of clearly justified and valid assumptions and methodologies.

Transparency: Transparency is an operating best practice allowing others to easily understand the actions performed and methods used when developing analyses and conclusions. Transparency helps ensure important assumptions and limitations are consistently, clearly, and fully presented and indicates the solidity of the choices. In addition, transparency provides perspective on how much a result hinges on the specific choices made by the authors. An important benefit of transparency is that the public can assess the structure of analyses and conclusions, the implication of these choices, and the related risks and uncertainties.

Uncertainty: Uncertainty is the lack of certainty, a state of limited knowledge where it is impossible to exactly describe the existing state, a future outcome, or more than one possible outcome. Uncertainty is inherent in science, and many individual studies do not produce conclusive evidence. Thus, when an agency generates a scientific assessment, it is presenting its scientific judgment about the accumulated evidence rather than scientific fact. Specialists attempt to reach a consensus by weighing the accumulated evidence. Peer reviewers can make an important contribution by distinguishing scientific facts from professional judgments. Furthermore, where appropriate, reviewers should be asked to provide advice on the reasonableness of their judgments made from the scientific evidence.