

REVIEW PLAN

Marmet Lock, Kanawha River, West Virginia
Dam Rehabilitation Component
of the Lock Replacement Project
Marmet, West Virginia

Major Rehabilitation Report

Huntington District

MSC Approval Date: 4 November 2010

Last Revision Date: 3 November 2010



**US Army Corps
of Engineers ®**

REVIEW PLAN

**Marmet Lock, Kanawha River, West Virginia
Dam Rehabilitation Component of the Lock Replacement Project
Marmet, West Virginia**

Major Rehabilitation Report

TABLE OF CONTENTS

1. PURPOSE AND REQUIREMENTS 1

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION 1

3. STUDY INFORMATION 2

4. DISTRICT QUALITY CONTROL (DQC) 4

5. AGENCY TECHNICAL REVIEW (ATR) 4

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR) 9

7. POLICY AND LEGAL COMPLIANCE REVIEW 12

8. COST ENGINEERING DIRECTORY OF EXPERTISE (DX) REVIEW AND CERTIFICATION 12

9. MODEL CERTIFICATION AND APPROVAL 12

10. REVIEW SCHEDULES AND COSTS 13

11. PUBLIC PARTICIPATION 14

12. REVIEW PLAN APPROVAL AND UPDATES 14

13. REVIEW PLAN POINTS OF CONTACT 14

ATTACHMENT 1: TEAM ROSTERS 16

ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS 17

ATTACHMENT 3: REVIEW PLAN REVISIONS 18

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS 19

1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for the Dam Component of the Marmet Lock and Dam Project, Marmet, West Virginia, Major Rehabilitation Report.

b. References

- (1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010
- (2) EC 1105-2-407, Planning Models Improvement Program: Model Certification, 31 May 2005
- (3) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
- (4) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
- (5) EC 1105-2-412, "Assuring Quality of Planning Models" pre-publication, 31 March 2010
- (6) Marmet L&D Project Management Plan

c. **Requirements.** This review plan was developed in accordance with EC 1165-2-209, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). The EC outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. In addition to these levels of review, decision documents are subject to cost engineering review and certification (per EC 1165-2-209) and planning model certification/approval (per EC 1105-2-407).

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for decision documents is typically either a Planning Center of Expertise (PCX) or the Risk Management Center (RMC), depending on the primary purpose of the decision document. The RMO for the peer review effort described in this Review Plan is the PCX for Inland Navigation (PCXIN).

The RMO will coordinate with the Cost Engineering Directory of Expertise (DX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies.

3. STUDY INFORMATION

- a. Decision Document. The authorized name of the subject project is Marmet Lock, Kanawha River, West Virginia. This review plan covers the Major Rehabilitation Report, which is the official Decision Document, for the Dam Component of the Marmet Lock and Dam Project. Per the minutes of the 09 Aug 2009 In Progress Review (IPR), approval authority for the decision document rests with HQ USACE. There is no additional congressional authorization needed. The decision document will be approved by the Huntington District Commander, and will require no additional congressional authorization.

The planning effort identified and evaluated the environmental impacts in an integrated Environmental Assessment (EA).

- b. **Study/Project Description.** The Marmet Lock and Dam structure is located on the Kanawha River (River Mile 67.7) approximately five miles southeast of Charleston in Kanawha County, West Virginia. It is a single-purpose project to provide for navigation of the Kanawha River. The Kanawha River provides access to the coal fields of central and southern West Virginia. Coal accounts for 94% of the tonnage at Marmet. The original project, built in 1934, consisted of twin lock chambers each measuring 360 feet by 56 feet. These chambers at the Marmet project were too small to efficiently handle today's increased traffic and barge sizes resulting in lockage times exceeding four hours per five-barge tow. Consequently, significant delays in river traffic often occurred. To address this deficiency, LRH constructed a new 110 feet by 800 feet lock landward of the existing locks which became operational in January 2008.

The dam is a non-navigable gated dam with a gated length of approximately 557 feet. The dam includes five roller gates spanning approximately 100 feet between concrete piers. One roller gate is equipped with a flap gate for passing debris. A three-unit hydroelectric power plant with a generating capacity of 14,400 KW is situated on the left descending abutment of the dam. The hydropower plant is privately owned and operated by American Electric Power.

The Huntington District completed and submitted the Marmet Lock Replacement Feasibility Report on 1 July 1994. The report considered alternative plans that included relocation of the entire lock and dam facility to other locations. In order to accurately compare the alternatives at the existing site against alternatives at the other locations (which included the cost of a new dam), the cost to leave the dam in its current location had to be examined. While the cost analysis was undertaken at a venture level with high contingencies and low precision, the analysis demonstrated clear cost savings for providing improved navigation lock capacity at the current Marmet site in spite of estimated dam rehabilitation costs.

In the Feasibility plan formulation, any alternative which left the dam in its current location, the cost to rehabilitate the dam was included in that alternative. This cost was also included in the estimate for the "without project" condition. The Feasibility Report found that continued use of the dam in its present location would potentially require anchoring the dam piers, replacing deteriorated concrete, and repairing or replacing components of the service bridge, bulkhead crane, roller gates, gate hoist machinery chain, and the locomotive crane. The USACE proposed the Marmet lock improvements with recognition of the rehabilitation requirements; finding the complete project with rehabilitation to be feasible.

Water Resources Development Act of 1996 (P.L. 104-303), Section 101(a)(31), as amended by the Energy and Water Development Appropriations Act of 2006 (P.L. 109-103), Section 112 authorized construction of the project. The lock construction contract was awarded in May 2002. The project consisted of construction of a new 110 feet by 800 feet lock landward of the existing locks. The total project cost is \$405.8 million, excluding the rehabilitation of the dam. The new lock became operational on January 22, 2008. Contract completion for the lock construction component and mitigation is scheduled in FY 2010.

The dam is now over 75 years old, has never been rehabilitated or updated to current design criteria, and has been experiencing accelerated maintenance requirements in recent years. The Dam Rehabilitation Component of the Marmet Lock Replacement Project, WV MRR/EA integrated document evaluates an array of alternatives to ensure the Dam continues to function and the Lock Replacement Project is able to provide the level of service for which it was approved. The recommended plan will provide the optimal schedule for repairing, replacing, or improving the critical components of the dam.

- c. **Factors Affecting the Scope and Level of Review.** EC 1165-2-209 outlines the requirements of the three technical review approaches: District Quality Control (DCQ), Agency Technical Review (ATR) and Independent External Peer Review (IEPR). The scope and level of review for the ATR and IEPR are dependent upon project specific factors that affect the risk informed decision making during the project formulation process. The following is a discussion of factors which contribute to the size and scope of the ATR and IEPR which will be performed for this projected.

Challenges associated with the study include estimating the probability of the various failure scenarios, capturing the financial impacts of the various failure scenarios, determining the optimal timing for the rehabilitation strategies, and packaging the rehabilitation strategies into study alternatives for comparison. However, analysis of these factors will be undertaken via standard engineering, environmental and economic analyses and information, and is not expected to be based on novel methods, involve the use of innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices.

Risks associated with the study are the possibility of either over-rehabilitating and spending funds that could better be used elsewhere in the nation or under-rehabilitating and suffering a significant project failure that has serious impact to the nation and the region. The costs and duration of these failures might be in the magnitude of hundreds of thousands of dollars a day for a period of 45 days or more. The project will not be justified by life safety as it involves no significant threat to human life. As previously mentioned the authorized project purpose is inland navigation, and as such the project is not used to mitigate risk to human life due to flood events.

There has been no request by the Governor of West Virginia for a review by independent experts. Likewise, the project is not likely to involve significant public dispute as to the size, nature, effects or cost of the project. Given the project's history, as well as the economic benefit provided to the region and nation, it is expected that the public would view the project favorably.

Finally, the project design is not anticipated to require redundancy, resiliency and/or robustness, unique construction sequencing, or a reduced or overlapping design construction schedule.

- d. **In-Kind Contributions.** Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR, however no in-kind contributions are expected to be prepared as part of this study.

4. DISTRICT QUALITY CONTROL (DQC)

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP), to which this review plan will ultimately be amended. The home district shall manage DQC according to functional element ISO 9001 quality procedures both local and regional.

Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC.

- a. Documentation of DQC. All products to date are contract produced. The contractor provided technical products to independent contractor staff, not involved in the study, for quality checks. PDT reviews were conducted by in-house Corps staff involved in the study for contracted work products. For contracted items, basic quality control tools include a Quality Management Plan (QMP) providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. Additionally, the PDT is responsible for a complete reading of the report to assure the overall integrity of the report, technical appendices and the recommendations before transmittal to HQ USACE for approval. For the Dam Component of the Marmet Lock Replacement MRR, PDT members and/or supervisory staff will conduct reviews for the major draft and final products. Formal DQC reviews took place from January 11, 2010 through February 12, 2010. Ongoing reviewer/PDT interaction has documented formal deliberations as follows:

Discipline	Comments	Comments Closed	Comments Pending	Comments Open
Engineering/Design	87	51	35	1
HTRW	2	2	0	0
Geotechnical Eng	10	0	10	0
Planning/Policy/NEPA	22	12	4	6
Economics	20	0	15	5
Project Mgt/Prgms	18	13	0	5

(as of September 23, 2010)

DQC comment/responses were recorded in Dr. Checks and are available for review at ATR, IEPR or by MSC QA reviewers as requested. The Quality Management Plan (QMP) is included in the PMP for the subject study and addresses DQC by the District; DQC is not addressed further in this Review Plan. DQC is required for this study and will continue throughout the study and during the implementation phase in accordance with QA/QC Quality Process for Design/Study Phases Doc #2644.

5. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all decision documents (including supporting data, analyses, environmental compliance documents, etc.). The objective of ATR is to ensure consistency with established criteria,

guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by the designated RMO (in this case the PCXIN) and is conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. ATR teams will be comprised of senior USACE personnel and may be supplemented by outside experts as appropriate. The ATR team lead will be from outside the home MSC.

a. Products to Undergo ATR.

Study Phase

The ATR process will be conducted throughout the study process. The specific products to undergo ATR during the study phase include the Draft Report (including NEPA and supporting documentation), as well as the Final Report (including NEPA and supporting documentation). Additionally, upon approval of the RP for the Dam Component of the Marmet Lock Replacement MRR/EA, an ATR team will be formed to perform periodic reviews of the study efforts, including the project assumptions, analyses, and calculations, as needed through the study process.

The ATR team will meet with PDT members on a quarterly basis or as needed. These quarterly meetings will be documented. Coordination throughout the study process will be accomplished through individual contact between the PDT and the ATR team.

Implementation Phase

The specific products to undergo ATR during the implantation phase include the DDR and Plans & Specifications.

ATR will be managed and performed outside of the Huntington District. EC 1165-2-209 requires the Great Lakes & Ohio River Division to serve as the RMO for the DDR & P&S phases of the project. There shall be appropriate coordination and processing through the MSC, CoPs; and other relevant offices to ensure that a review team with appropriate independence and expertise is assembled and a cohesive and comprehensive review is accomplished. The ATR shall ensure that the product is consistent with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and the results in a reasonably clear manner for the public and decision makers. Members of the ATR team will be from outside the Huntington District. The ATR lead will be from outside the Great Lakes & Ohio River Division (LRD).

b. Required ATR Team Expertise.

Study Phase

The ATR for the study phase will focus on the following:

- Review of the study planning process ,
- Review of the methods of analysis and design of the alternatives and recommended plan,
- Review of construction methods,
- Review of environmental assumptions and data analysis,
- Compliance with program and NEPA requirements, and
- Completeness of study and support documentation

Given the focus on the ATR, the expertise required is summarized in the following table.

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc).
Planning/Economics	The Planning/Economics reviewer should be a senior water resources planner with experience in current Administration Policy, Executive Orders and guidance related to planning studies, and alternative optimization. The reviewer should have a strong understanding of economic models or studies relative to inland navigation, including simulation of engineering reliability data and the development of life-cycle costs.
Environmental Resources	The Environmental Resources reviewer should have a strong background in riverine ecosystems (e.g. riparian, aquatic), NEPA and other State and Federal environmental laws and regulations.
Electrical Engineering	The reviewer should either be a subject matter expert or a regional technical specialist with extensive knowledge of electrical work on locks and dams. The reviewer should be a registered professional engineer.
Structural Engineering	The reviewer should have extensive knowledge including a minimum of 10 years design experience for hydraulic steel structures, roller gated dams, and risk based analysis of inland navigation studies. The reviewer should be registered as a professional engineer. The structural engineer should serve as the lead for the ATR team.
Mechanical Engineering	The reviewer should have extensive knowledge including a minimum of 10 years design experience for mechanical equipment and gate operating machinery, and experience with risk based analysis of dam operating machinery. The reviewer should be registered as a professional engineer.

Implementation Phase

ATR teams will comprise senior USACE personnel (Regional Technical Specialists (RTS), etc.), and may be supplemented by outside experts as appropriate. The disciplines represented on the ATR team will reflect the significant disciplines involved in the planning, engineering, design, and construction effort. These disciplines include civil, geotechnical, structural, hydraulics and hydrology, electrical, mechanical, cost engineering, environmental, and operations. The chief criterion for being a member of the ATR team is knowledge of the technical discipline and relevant experience.

c. Documentation of ATR.

DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process for the study phase. Comments should be

limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

- (1) The review concern – identify the product’s information deficiency or incorrect application of policy, guidance, or procedures;
- (2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not been properly followed;
- (3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and
- (4) The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist.

The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, MSC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in either ER 1110-1-12 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecks with a notation that the concern has been elevated to the vertical team for resolution.

At the conclusion of each ATR effort, the ATR team will prepare a Review Report summarizing the review. Review Reports will be considered an integral part of the ATR documentation and shall:

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); and
- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

ATR will be certified when all ATR concerns are either resolved or referred to the vertical team for resolution and the ATR documentation is complete. The ATR Lead will prepare a Statement of Technical Review certifying that the issues raised by the ATR team have been resolved (or elevated to the vertical team). A Statement of Technical Review should be completed, based on work reviewed to date, for the AFB, draft report, and final report. A sample Statement of Technical Review is included in Attachment 2.

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

IEPR may be required for decision documents under certain circumstances. IEPR is the most independent level of review, 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 outside of USACE is warranted. A risk-informed decision, as described in EC 1165-2-209, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR:

- **Type I IEPR.** Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-209.
 - **Type II IEPR.** Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare.
- a. Decision on IEPR.** An initial review plan was drafted in the summer of 2009 following guidance available at that time. District quality reviews and agency technical (independent) reviews were prescribed in the 2009 RP for the MRR/EA. The cost threshold requirement to send the MRR/EA to independent experts outside of the Corps of Engineers, referred to as Independent External Peer Review (IEPR) in the guidance, was not met at the time. Therefore an IEPR was not provided for in the review plan. Subsequently, the cost estimates for the rehabilitation project have grown to exceed cost thresholds found in the guidance for the Type I IEPR. Given the straightforward nature of the project, the District elected to pursue an exclusion or waiver from the requirement for IEPR from HQUSACE. Ultimately, the District's request for an exclusion from IEPR has not been granted. Therefore the District is anticipating IEPR (Type I) for this project.

As stated in EC 1165-2-209 Type I IEPR is mandatory if any of the following are true:

- where is a significant threat to human life,
- where the estimated total cost of the project, including mitigation costs, is greater than \$45 million based on a reasonable estimate at the end of the reconnaissance phase.
- where the Governor of an affected State requests a peer review by independent experts, and

- where the DCW or the Chief of Engineers determines that the project study is controversial due to significant public dispute over either the size, nature, or effects of the project or the economic or environmental costs or benefits of the project.

As previously stated in Section 3 of this RP, there is no significant threat the human life stemming from this project, the Governor of the State of West Virginia is not expected to request an independent review by experts, and the project study is not considered to be controversial. However, the current estimated project cost exceeds the \$45 million threshold set forth by the EC. Therefore, Type I IEPR is anticipated for this project.

The criteria for conducting a Type II IEPR described in EC 1165-2-209 includes the following:

- if the Federal action is justified by life safety or failure of the project would pose a significant threat to human life;
- if the project involves the use of innovative materials or techniques where 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;
- if the project design requires redundancy, resiliency, and/or robustness; and/or
- if the project has unique construction sequencing or a reduced or overlapping design construction schedule.

As none of the above are true for the Dam Component of the Marmet Lock and Dam Project a Type II IEPR (SAR) will not be conducted on this project. The project only involves the rehabilitation of existing dam features such as structural concrete, roller gates, service bridge, roller gate chain, gate hoist machinery, and electrical within the same footprint and for the same purpose as the existing project. The rehabilitation of the Marmet Dam does not pose a significant threat to human life. The project does not include the use of innovative materials or techniques; unique construction sequencing or a reduced or overlapping design construction schedule.

- b. Products to Undergo Type I IEPR.** The product that will undergo Type I IEPR include the draft decision document and supporting documentation (technical appendices).
- c. Required Type I IEPR Panel Expertise.** IEPR panel representation is not yet standard as the guidance and practice is developing within the USACE. However, many recent IEPR panels have detailed representation as follows: Plan Formulation (Policy), NEPA and Biology/Ecology, Hydrology and Hydraulics Engineering, Economics, Soils Engineering and Structural Engineering. For projects harboring public safety concerns, significant controversy, a high level of complexity, or significant economic, environmental and social effects to the nation this level of functional detail is essential. In the case of the Marmet Dam MRR, the lack of novel methods, complex challenges for interpretation, precedent-setting methods or models, or conclusions that change prevailing practices makes such specialization among the panel membership unnecessary. Rather, the risks for this project lie mainly in the application of established practice. A strong DQC and ATR are designed to address these decision support risks.

However, due to their inherent ambiguity, some concerns remain for the application of economic methods and environmental planning procedures. Some inherent complexity in the rehabilitation of large scale navigation infrastructure also remains. While the IEPR panel is expected to evaluate all

aspects of the decision support analysis and interpretation, focus on the following disciplines in the IEPR panel provides needed expertise within an appropriately scaled panel, which is detailed in the following table.

IEPR Panel Members/Disciplines	Expertise Required
Economics	The Panel Member should have a degree in economics or a related field and should be able to evaluate the appropriateness cost/benefit analysis used. The Panel Member should also be familiar with risk and uncertainty analysis (i.e. Monte Carlo type simulation). The Panel Member should also have experience with National Economic Development analysis procedures, particularly as they relate to inland navigation projects. At least 5 years experience directly working for or with USACE is highly recommended.
Engineering	The Panel Member should be a Professional Engineer and have experience with engineering analysis related to inland navigation and major rehabilitation projects. The Panel member will hold at minimum, a B.S. degree in Civil Engineering and be registered as a Professional Engineer. At least 15 years experience working with hydraulic steel structures and operating equipment is required. The Panel Member should be familiar with marine operations and construction techniques in the context of large scale water resources projects such as Locks & Dam and/or reservoir rehabilitation.
Plan Formulation	The Panel Member should have a degree in planning, sciences, engineering or a related field and should have extensive experience in the application of Administration planning policy, Executive Orders and the statutory planning process under the National Environmental Policy Act (NEPA). The member should have familiarity with the Corps' 6 step planning process and experience evaluating alternative plans for inland navigation projects. Familiarity with USACE guidance is required.

d. Documentation of Type I IEPR. The Type I IEPR will be managed by the Planning Center of Expertise (PCX) for Inland Navigation, which is the Review Managing Organization (RMO). The IEPR panel will be selected and managed by an Outside Eligible Organization (OEO) per EC 1165-2-209, Appendix D. Panel comments will be compiled by the OEO and should address the adequacy and acceptability of the economic, engineering and environmental methods, models, and analyses used. The comments will be submitted via DrChecks, where they will be addressed by the team and back checked by the IEPR panel. IEPR comments should generally include the same four key parts as described for ATR comments in Section 4.d above. The OEO will prepare a final Review Report that will accompany the publication of the final decision document and shall:

- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions; and

- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

The final Review Report will be submitted by the OEO no later than 60 days following the close of the public comment period for the draft decision document. USACE shall consider all recommendations contained in the Review Report and prepare a written response for all recommendations adopted or not adopted. The final decision document will summarize the Review Report and USACE response. The Review Report and USACE response will be made available to the public, including through electronic means on the internet.

7. POLICY AND LEGAL COMPLIANCE REVIEW

All decision documents will be reviewed throughout the study process for their compliance with law and policy. Guidance for policy and legal compliance reviews is addressed in Appendix H, ER 1105-2-100. These reviews culminate in determinations that the recommendations in the reports and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the home MSC Commander. DQC and ATR 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 decision documents. Legal reviews will be conducted concurrent with ATR of the preliminary, draft, and final feasibility report/NEPA document.

8. COST ENGINEERING DIRECTORY OF EXPERTISE (DX) REVIEW AND CERTIFICATION

All decision documents shall be coordinated with the Cost Engineering DX, located in the Walla Walla District. The DX will assist in determining the expertise needed on the ATR team and Type I IEPR team (if required) and in the development of the review charge(s). The DX will also provide the Cost Engineering DX certification. The RMO is responsible for coordination with the Cost Engineering DX.

9. MODEL CERTIFICATION AND APPROVAL

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models, for the purposes of the EC, are defined as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The use of a certified/approved planning model does not constitute technical review of the planning product. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. As part of the USACE Scientific and Engineering Technology (SET) Initiative, many engineering models have been identified as preferred or acceptable for use on Corps studies and these models should be used

whenever appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

- a. **Planning Models.** Per HQUSACE memorandum thru LRD to LRH, dated October 19, 2009, the economic model(s) developed by the contractor for the Dam Rehabilitation Component of the Marmet Lock Replacement MRR/EA, referred to as the “FMSM/INCA EXCEL @RISK Life Cycle Cost Model (LCCM)”, can be treated as a model “approved for use” and does not require EC 1105-2-412 planning model certification. The Huntington District Commander will certify that the quality control process for each document is complete and that all identified ATR technical issues are resolved.

Per the above referenced October 19, 2009 In-Progress Review memo from Headquarters staff, the LCCM economic model used to calculate the benefits for the Marmet dam rehabilitation can be treated as a model approved for use and subject only to rigorous ATR. Given DQC comments necessitating re-running the model, the contractor requested that the model be reviewed prior to the re-analysis and prior to the report ATR. As a result the Planning Community of Practice (PCoP) was queried for available reviewers with EXCEL and @RISK experience. A reviewer from CENAE with Coastal and Storm Damage PCX model review experience was selected (Edmund J O'Leary, CENAE-EP-VC). The model and outputs from initial runs were provided. The model review is now complete and comments are in DrChecks. It is intended that the model review will be incorporated into the ATR documentation.

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
FMSM/INCA EXCEL @RISK Life Cycle Cost Model (LCCM)	The @Risk life cycle model is used to calculate the consequences of various sets of events sequences to arrive at the total risk for a project. This in turn allows for the calculation of net benefits and the benefit to cost ratio.	Review on-going

- b. **Engineering Models.** All engineering models used during the analysis are standard, commercially available software, with no additional model certification required.

10. REVIEW SCHEDULES AND COSTS

- a. **ATR Schedule and Cost.**

TASK	Proposed Start Date
Update of Project Review Plan	October 2010
Coordinate with MSC and post on website	November 2010
PCX identifies ATR team and appropriate RMO	November 2010
Review of Models	Not required.
ATR of Draft Report	8-21 January 2011
Public Review of Draft Report	5 February - 4 March 2011
ATR Certification of Final Report	March 2011

The estimated cost for the ATR is \$25,000.

b. Type I IEPR Schedule and Cost.

<u>Task</u>	<u>Proposed Start Date</u>
RMO (PCXIN) contracts with OEO	TBD
IEPR (Concurrent with Public Review)	TBD

Currently the district is not funded to complete the Type IEPR. Type I IEPR was not anticipated at the time completion funds were budgeted for the MRR. Completion of this activity is contingent upon the receipt of adequate funding.

c. Model Certification/Approval Schedule and Cost. See section 9.a for a description and status of the FMSM/INCA EXCEL @RISK Life Cycle Cost Model (LCCM). No additional funding needs are anticipated.

11. PUBLIC PARTICIPATION. As part of the peer review, opportunities have been and will continue to be provided for the public to comment on the study and decision documents that are to be reviewed. Several public scoping meetings were held during the feasibility study conducted for the lock replacement project and input from the public received. Information obtained during public meetings was used to assist in plan formulation and to complete the draft environmental documents necessary to meet both Federal and State requirements. This included State and Federal agency reviews as well. The Huntington District will make the draft Dam Rehabilitation Component of the Marmet Lock Replacement MRR/EA document available to the public for comment when completed and sponsor public meetings and workshops, if needed.

Significant and relevant comments will be provided to the review panels along with the product(s) for review. At this time it is not anticipated that the public, including scientific or professional societies, will be asked to nominate potential peer reviewers. The final decision document, associated review reports and USACE responses to IEPR comments will be made available to the public via the Huntington District web site.

12. REVIEW PLAN APPROVAL AND UPDATES

The Great Lakes the Ohio River Division Commander is responsible for approving this Review Plan. The Commander’s approval reflects vertical team input (involving district, MSC, RMO, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, the Review Plan is a living document and may change as the study progresses. The home district is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval are documented in Attachment 3. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders’ approval memorandum, should be posted on the Home District’s webpage. The latest Review Plan should also be provided to the RMO and home MSC.

13. REVIEW PLAN POINTS OF CONTACT

Public questions and/or comments on this review plan can be directed to the following points of contact:

- Mr. Peter K. Dodgion, Chief of Plan Formulation. 304.399.5873
- Ms. Rebecca Moyer, Senior Economist, LRD. 514.684.3598
- Mr. Dave Weekly, Chief, PCXIN. 304.399.6955

ATTACHMENT 1: TEAM ROSTERS

Nearly all the work done in support of this study was performed by contractors. The analysis was a joint effort between Inca Engineers Inc. and FMSM Engineers, Inc.

The technical point of contact for the contractors is:

John Plump
Project Manager
INCA Engineers
425.943.3106

The Huntington District team assigned to the project is listed in the table below.

Team Member	Areas of Expertise
Michael Keathley, Project Manager	Project Management
Nancy McIntosh, Lead Engineer	Electrical Engineer
Andy Cremeans	Mechanical Engineer
Jeff Maynard	Structural Engineer
Terry Shilley	Civil Engineer
Domenico Chianesi	Operations and Maintenance
Virgil Langdon	Economist
Peter Dodgion	Plan Formulation
David Rieger	Environmental Analysis
Dianne Hall	Contract Specialist

The ATR team for the Dam Component of the Marmet Lock and Dam Project has not yet been identified. The review plan will be revised once this information is available.

The vertical team and their contact information is found above in Section 13.

The IEPR process for this project has not yet been initiated. The Review Plan will be updated once an OEO point of contact has been identified.

ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the Major Rehabilitation Report for the Dam Component of the Marmet Lock and Dam, Marmet, West Virginia. The ATR was conducted as defined in the project’s Review Plan to comply with the requirements of EC 1165-2-209. 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 US Army Corps of Engineers 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 been resolved and the comments have been closed in DrCheckssm.

SIGNATURE

TBD
ATR Team Leader
TBD

Date

SIGNATURE

Michael Keathley
Project Manager
CELRH-PM-PP-P

Date

SIGNATURE

David Weekly
Review Management Office Representative
CELRH-NC

Date

CERTIFICATION OF AGENCY TECHNICAL REVIEW

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

As noted above, all concerns resulting from the ATR of the project have been fully resolved.

SIGNATURE

John Jaeger
Chief, Engineering Division
CELRH-EC

Date

SIGNATURE

Amy K. Frantz
Chief, Planning Division
CELRH-PM-PD

Date

¹ Only needed if some portion of the ATR was contracted

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

Term	Definition	Term	Definition
AFB	Alternative Formulation Briefing	NED	National Economic Development
ASA(CW)	Assistant Secretary of the Army for Civil Works	NER	National Ecosystem Restoration
ATR	Agency Technical Review	NEPA	National Environmental Policy Act
CSDR	Coastal Storm Damage Reduction	O&M	Operation and maintenance
DPR	Detailed Project Report	OMB	Office and Management and Budget
DQC	District Quality Control/Quality Assurance	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DX	Directory of Expertise	OEO	Outside Eligible Organization
EA	Environmental Assessment	OSE	Other Social Effects
EC	Engineer Circular	PCX	Planning Center of Expertise
EIS	Environmental Impact Statement	PDT	Project Delivery Team
EO	Executive Order	PAC	Post Authorization Change
ER	Ecosystem Restoration	PMP	Project Management Plan
FDR	Flood Damage Reduction	PL	Public Law
FEMA	Federal Emergency Management Agency	QMP	Quality Management Plan
FRM	Flood Risk Management	QA	Quality Assurance
FSM	Feasibility Scoping Meeting	QC	Quality Control
GRR	General Reevaluation Report	RED	Regional Economic Development
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMC	Risk Management Center
IEPR	Independent External Peer Review	RMO	Review Management Organization
ITR	Independent Technical Review	RTS	Regional Technical Specialist
LRR	Limited Reevaluation Report	SAR	Safety Assurance Review
MSC	Major Subordinate Command	USACE	U.S. Army Corps of Engineers
		WRDA	Water Resources Development Act