



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DIVISION, GREAT LAKES AND OHIO RIVER
CORPS OF ENGINEERS
550 MAIN STREET
CINCINNATI, OH 45202-3222

CELRD-PDS-O

13 Jan 2013

MEMORANDUM FOR Commander, U.S. Army Engineer District, Huntington, Attention, Amy Jo Riffe (CELRH-EC-Q), Huntington District, Corps of Engineers, 502 Eighth Street, Huntington, WV 25701

SUBJECT: Review Plan for the Ohio River Navigation Dams Rehabilitation Prioritization Study

1. The attached Review Plan (RP) for Ohio River Navigation Dams Rehabilitation Prioritization Study was presented to the Great Lakes and Ohio River Division for approval in accordance with EC 1165-2-214 "Civil Works Review" dated 15 December 2012.
2. The project navigation dams rehabilitation prioritization study area is located on the Ohio River dams located in Ohio, Pennsylvania, West Virginia, Kentucky, Indiana, and Illinois. The study area encompasses all 961 miles of the mainstem Ohio River, the 18 navigation dams operating in those reaches of the mainstem and their navigation pools. The PCXIN staff reviewed the RP for technical sufficiency and policy compliance. Since this is a system-based reconnaissance level assessment, IEPR is not required and no planning models will be used.
3. The RP defines the scope and level of peer review for the activities to be performed for the subject project. The USACE LRD Review Management Organization (RMO) has reviewed the attached RP and concurs that it describes the scope of review for work phases and addresses all appropriate levels of review consistent with the requirements described in EC 1165-2-209.
4. I concur with the recommendations of the RMO and approve the enclosed RP for the Ohio River Navigation Dams Rehabilitation Prioritization Study.
5. The District is requested to post the RP to its website. Prior to posting, the names of all individuals identified in the RP should be removed.
6. If you have any questions please contact Dr. Hank Jarboe, CELRD-PDS-P, at (513) 684-6050.

Margaret W. Burcham
MARGARET W. BURCHAM
Brigadier General, USA
Commanding

Encls

1. CELRH-NC Memo dated 28 November 2012
2. Review Plan



REPLY TO
ATTENTION OF
CELRH-NC

DEPARTMENT OF THE ARMY
HUNTINGTON DISTRICT, CORPS OF ENGINEERS
502 EIGHT STREET
HUNTINGTON, WEST VIRGINIA 25701-2035

28 November 2012

MEMORANDUM FOR Commander, Huntington District

SUBJECT: Review Plan for the Ohio River Navigation Dams Rehabilitation Prioritization Study

1. The enclosed Review Plan (RP) has been presented to the Planning Center of Expertise for Inland Navigation (PCXIN) for its review and endorsement in accordance with EC1165-2-209 "Civil Works Review" dated 31 January 2010. This is an update of the previously approved Review Plan dated 08 November 2007.
2. The Ohio River Navigation Dams Rehabilitation Prioritization Study is being conducted under the original project authorities for navigation projects in Huntington, Pittsburgh and Louisville Districts. The primary goal and purpose of the Ohio River Navigation Dams Rehabilitation Prioritization Study (ORNDRRS) will be to identify and document a prioritization of follow-on feasibility-level dam rehabilitation studies that addresses the risks of a structural or mechanical failure(s) at the 18 high-lift navigation dams that would threaten the stability of the navigation pool elevation and the sustainability of authorized project purposes.
3. PCXIN staff has reviewed the plan for technical sufficiency and policy compliance. Since this is a systems-based reconnaissance level assessment, IEPR is not required. No planning models will be used.
4. I concur with the findings of the PCXIN technical staff and endorse the enclosed review plan for the ORNDRRS. Following approval by the Great Lakes and Ohio River Division, the Huntington District is requested to post the RP to its web site and provide the link to the PCXIN for their use. Prior to posting, the names of the individuals in the RP should be removed.
5. If you have any questions or need additional information, please contact Ms. Beth Cade of my staff at (304) 399-5848.

Encl

WESLEY W. WALKER
Co-Technical Director
PCX for Inland Navigation

OTHER WORK PRODUCT REVIEW PLAN

Ohio River Navigation Dams Rehabilitation Prioritization Study

Ohio, Pennsylvania, West Virginia, Kentucky, Indiana, and Illinois

JANUARY 2012

MSC Approval Date: Pending

Last Revision Date: 10 January 2013



**US Army Corps
of Engineers** ®

OTHER PRODUCT REVIEW PLAN

**Ohio River Navigation Dams Rehabilitation Prioritization Study
Ohio, Pennsylvania, West Virginia, Kentucky, Indiana, Illinois**

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1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for the Ohio River Navigation Dams Rehabilitation Prioritization Study, Ohio, Pennsylvania, West Virginia, Kentucky, Indiana and Illinois.

b. References

- (1) Engineering Circular (EC) 1165-2-214, Civil Works Review Policy, 15 Dec 2012
- (2) EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2011
- (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) ISO Process; Document ID: 4282, Great Lakes and Ohio River Division, Preparation and Approval of Civil Works Review Plans, 12 December 2011.
- (6) Project Management Plan (PMP) for Ohio River Navigation Dams Rehabilitation Prioritization Study, February 2013.

c. **Requirements.** This review plan, a component of the quality control plan (QCP) of the project management plan (PMP) was developed in accordance with EC 1165-2-214, 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 1165-2-214) and planning model certification/approval (per EC 1105-2-412).

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 Inland Navigation Center of Expertise (Huntington District). The NAV-PCX will also coordinate review with the Inland Navigation Center of Expertise. A representative from the Inland Navigation PCX will also be an ATR member.

No feasibility level cost estimates for construction are included in this reconnaissance-level rehabilitation prioritization study. The RMO will not need to coordinate with the Cost Engineering Directory of Expertise (DX) to conduct ATR of cost estimates, construction schedules and contingencies.

3. STUDY INFORMATION

a. **Decision Document.** The Ohio River Navigation Dams Rehabilitation Prioritization Study, Ohio, Pennsylvania, West Virginia, Kentucky, Indiana and Illinois is not a decision document under the strictest definition of that word found within Corps of Engineers regulations or policies. No recommendations for future construction or changes in project operation will be included in this document and no actions will be undertaken as a result of this study that require documentation of impacts through the National Environmental Policy Act (NEPA) process.

This study is being conducted under the original project authorities for navigation projects in the following Districts: Huntington District (LRH) - River and Harbor Acts of 1909 (P.L. 60-317) and 1935 (P.L. 74-409); Pittsburgh District (LRP) - Rivers and Harbors Act dated 1909 and 1918; 1909 Act (P.L. 60-317), and Louisville District (LRL) - and Rivers & Harbor Appropriation Action of 1910 (P.L. 61-264). These authorities enable the US Army Corps of Engineers (USACE) to conduct such studies as are necessary to determine the need for and extent of rehabilitation activities at the projects that are needed to sustain the authorized mission(s) of the project(s).

This document will contain the results of planning and technical analyses that identify priorities for initiating and completing feasibility level rehabilitation reports for navigation dams along the mainstem Ohio River. The study will not contain recommendations for authorization or funding for rehabilitation construction, but may recommend further studies conducted at the feasibility level. Approval of this prioritization study will be at the MSC level and no Congressional approval is required for the study or its recommendations.

Due to the scope and intent of the study, no NEPA documents will be required. This planning study will be considered as having a categorical exclusion from NEPA according to ER200-2-2 (9.c). Likewise there will be no recommendations in the study for real estate acquisitions nor the need for any gross estimates for additional real estate to be purchased around the existing navigation dams, therefore there is no need for technical review of such estimates.

The primary goal and purpose of the Ohio River Navigation Dams Rehabilitation Prioritization Study (ORNDRPS) will be to identify and document a prioritization of follow-on feasibility-level dam rehabilitation studies that addresses the risks of a structural or mechanical failure(s) at the 18 high-lift navigation dams that would threaten the stability of the navigation pool elevation and the sustainability of authorized project purposes. The study will consider economic impacts (consequences) of dam failure, present and future commodity flows and the values of those commodities that would be impacted by dam failure and other social, environmental and economic consequences.

This study will not directly lead to changes in operation at the navigation dam projects. Based on the recommendations of this study, further feasibility level studies may identify operational changes at the navigation dams.

b. Study/Project Description. The ORNDRPS will be a systems-based reconnaissance level assessment of the needs for rehabilitation of the 18 high-lift navigation dams on the Ohio River that results in a prioritization list for funding of future feasibility level rehabilitation studies for each of the dams. The study will consider the risks of major failures to the structural and mechanical systems of the dams using available structural information (condition assessment reports, asset management reports, dam safety reports, etc.) and other agency information sources.

Added to this assessment will be data from the Inland Navigation Center of Expertise (USACE national resource located in LRH) regarding the present and future anticipated commodity flows within the system that may be jeopardized by loss of a navigation pool as well as impacts to other significant water users in the reaches such as Municipal & Industrial (M&I) water supply, hydropower, recreation, aquatic species, and commercial fishing.

The study area encompasses all 961 miles of the mainstem Ohio River, the 18 navigation dams operating in those reaches of the mainstem and their navigation pools extending into the tributary streams. States bordering the Ohio River include Pennsylvania, Ohio, West Virginia, Kentucky, Indiana and Illinois. Generally speaking the primary and sole purpose of each of the navigation dams is navigation. Other

services are provided by the stable pools as a by-product of the primary navigation purpose including M&I water supply, recreation, aquatic species habitat, hydropower, and commercial fishing.

This study will not be identifying any measures or formulating any alternatives that address navigation or rehabilitation of the dams for any other purposes and will contain no costs for such measures or alternatives. The study will estimate preliminary costs for the feasibility level studies at each dam (or multiple dams) to support funding requests in the annual budgeting process. It is likely that this study will be updated in the future to account for changed conditions at each dam and fiscal realities. In accordance with current regulations addressing studies of navigation projects, the costs of this reconnaissance study and any following feasibility level rehabilitation studies identified by this study will be borne 100% by the Federal Government. Therefore there is no need for contributed funds for this study.

c. Factors Affecting the Scope and Level of Review. The ORNDRPS will be a reconnaissance level study of the current conditions of the structural and mechanical systems of the Ohio River mainstem navigation dams, risks of failure and the impacts (consequences) of failures on authorized purposes and other water users – each of which (conditions, risks and impacts) will be used to establish priorities for funding and initiation of feasibility level dam rehabilitation studies. Rather than addressing each of the 18 navigation dams in separate studies to justify funding for rehabilitation studies, a regional systems approach is being taken that addresses the critical interaction between the navigation pools with regard to commodity flows and customers in one study and by its expediency supports the new smart planning model.

The study addresses project structures and operations and maintenance of structures that are common features of Corps water resources projects. The navigation dams and their structural components and mechanical systems are well understood by Corps engineering and operations personnel. Characterization of each dam's condition will be provided by the appropriate operating District (LRH, LRP and LRL) so that the best knowledge of each dam's past condition and maintenance issues will be incorporated into the study.

Commodity flow data and commodity values based on information from the Waterborne Commerce Data are collected on a monthly basis by the Inland Navigation Center. The quality and reliability of that data is continually monitored and is accepted by the industry and the Corps as being of the highest quality. In addition, impacts from navigation disruptions (lock outages) and navigation pool losses are well documented from previous episodes within the Ohio River mainstem (i.e. Belleville Dam – January 2005). These documented impacts will inform the study team as to anticipated consequences of dam failure and pool loss at other facilities on the mainstem.

The current conditions baseline will be based entirely upon existing available Periodic Inspection data developed by Corps of Engineers operations and maintenance and engineering staff members. Several sources of Corps data will be used in the study including Lock Performance Monitoring System (LPMS) condition assessment reports, Screening Portfolio Risk Assessment (SPRA) Dam Safety reports, LRD Operation Condition Assessments (OCA) Asset Management reports, Annual Assessment reports and other sources of operations and maintenance data and engineering data. The study recommendations are expected to lead to funding and preparation of feasibility level studies for rehabilitation of the navigation dams.

The risks of significant loss of life due to failure of one of the navigation dam components are unlikely given the sporadic public use immediately downstream of the dams and the likelihood of long warning times preceding a potential failure. There are no direct human life/safety issues that would be affected by the recommendations of the study regarding prioritization of funding future navigation dam rehabilitation studies. There has been no formal or informal request by any of the governors of bordering states to

conduct any detailed reviews of the results of this prioritization study and there hasn't been any significant outpouring of public concern over the initiation of the study or its intended results.

The anticipated funding prioritization methods to be used in the study are not expected to require any novel methods, precedent-setting methods, innovative techniques or require use of any uncertified analysis models. Issues of climate change regarding the navigation dams and their pools will be addressed in a concurrent study sponsored by IWR and should not affect this prioritization study or its recommendations. Since no project design is being developed within this study, there is no need to incorporate redundancy or robustness into the study methodology.

Since the recommendations of this study may result in further USACE study and/or planning activities, an ATR will be conducted.

d. In-Kind Contributions. Not applicable - this study and the follow-on feasibility studies are conducted at 100% Federal funding.

4. DISTRICT QUALITY CONTROL (DQC)

All documents associated with the study (including supporting data and analyses, etc.) shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the study quality requirements defined in the Quality Management Plan (QMP) completed as an Appendix to the Project Management Plan. The Huntington District shall manage DQC effort. Documentation of DQC activities is required and should be in accordance with the Huntington District Quality Manual for Planning Documents found as Document ID 4282 "03500 – LRH Planning Documents Quality Control". This process is based upon a risk analysis of the Corps policies involved in the study, the technical aspects of the investigations and the project parameters.

- a. Documentation of DQC.** DQC is documented in a Quality Control Plan (QCP), which summarizes the reviewed product, review process, and major issues and their resolution. This QCP, signed by the PDT and DQC team, will be provided to the ATR team. The DQC process is outlined in the Quality Management Plan as an Appendix in the PMP. Each member of the Project Delivery Team (PDT) will ensure a quality product in their functional area through internal design checks, seamless reviews, and interaction with the ATR. Only quality products will be released for use by other PDT members.
- b. Products to Undergo DQC.** The products developed during the Ohio River Navigation Dams Rehabilitation Prioritization Study including, the navigation dams funding prioritization document with supporting information gleaned from condition assessment reports, dam safety reports, various appendices and other engineering data and the PMP, will all undergo DQC. These products also shall be subject to comprehensive Project Delivery Team (PDT) Review. Products will not be released to the public before this review is complete and the Chief of Planning and Policy and the Chief of Operations and Readiness, Lakes & Rivers Division both verify release of the document prior to Division report certification.

5. AGENCY TECHNICAL REVIEW (ATR)

Although the ORNDRPS is being conducted at a reconnaissance level and is not considered a decision document per se, an ATR will be conducted on the document, its supporting data and its recommendations. This prioritization document will be the foundation for Districts' and Division-level, short-term (0-5 yrs) annual budget requests to support feasibility-level rehabilitation reports for the 18

Ohio River mainstem navigation dams. It is reasonable to expect that changed conditions at the dams after an additional 5-10 years of continual operations or national budgetary conditions would necessitate a review of the prioritization recommendations made by this study. However, identification of those dams whose structural or mechanical conditions demand earlier rehabilitation to avoid significant failure leading to loss of a navigation pool requires more in-depth review of data and analysis at the ATR level. The sequencing of requests based upon facility condition and risks will be critical to the Division's long-term ability to deliver reliable navigation services on the Ohio River, to provide reliable water supply to 5 million plus users along the river, to maintain adequate flows for hydropower plants and to sustain the rich aquatic resources of the river system.

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 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. The ORNDRPS and its supporting data will be subject to ATR. Due to the planning nature and scope of the study, no NEPA documentation will be required, as outlined in the requirements for a categorical exclusion under ER200-2-2 (9.c.).

b. Required ATR Team Expertise.

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be an engineering professional with experience in operations and maintenance and rehabilitation of navigation dams and conducting an 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 engineering analyses, structural engineering, geotechnical engineering, mechanical engineering or economics).
Planning - Navigation	The Planning reviewer should be a senior water resources planner with experience in inland navigation plan formulation and water supply issues. Although the study will not include formulation of alternatives for navigation purposes or water supply, the basis for prioritizing future expenditures for feasibility level rehabilitation studies will be based upon sustaining those benefits into the future. This reviewer should be well versed in commodity flow information, navigation impacts, modal shifts and navigation dam operations.
Engineering/Structural	The Engineering reviewer should be experienced in the operation and maintenance of navigation dams including structural and mechanical components, potential failures at navigation structures and knowledge of failure modes and risks of failure at these structures.
Economics	The Economics reviewer should be experienced with inland navigation economics concepts and commodity flows through Corps projects on the Ohio River.
Operations/Mechanical	The Operations reviewer should be familiar with operations and specific maintenance requirements for structural members and mechanical systems of Corps locks and dams on the Ohio River that support navigation purposes.
Environmental	The Environmental reviewer should be experienced in aquatic species populations within large rivers such as the Ohio River having stable pool elevations due to the operation of navigation dams. This reviewer should also have knowledge and experience in addressing aquatic populations covered under the Endangered Species Act.

c. Documentation of ATR. DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. 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 be 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 may 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. Team members and expertise are identified in attachment 1.

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 1165-2-214, 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 1165-2-214.
 - **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. Type II IEPR is not required for this study.
- a. Decision on IEPR.** The Ohio River Navigation Dams Rehabilitation Prioritization Study document is being prepared in advance of any decision document (feasibility level study) that would require a decision on the applicability of an IEPR. Therefore no review of this study's applicability is warranted and no further justification is required to exclude the ORNDRPS from a Type I or Type II IEPR.
- b. Products to Undergo Type I IEPR.** Not-Applicable.
- c. Required Type I IEPR Panel Expertise.** Not-Applicable.
- d. Documentation of Type I IEPR.** Not-Applicable.

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.

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

Cost Engineering is not required for review of the ORNDRPS.

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.** No planning models are to be used in the performance of this study. Study findings are based on currently available engineering and operations data, best professional judgment, and industry consultation.
- b. **Navigation System Models.** No navigation systems models are planned to be used during the study at this time.
- c. **Engineering Models.** The use of engineering models (certified or not) is not anticipated for the rehabilitation prioritization plan.

10. REVIEW SCHEDULES AND COSTS

- a. **DQC Schedule and Costs.** The DQC process is currently scheduled to occur in October 2013 (see study schedule in Attachment 4). The costs for the DQC are not yet determined but are budgeted at \$25,000.
- b. **ATR Schedule and Cost.** ATR will be completed prior to submission of documentation to the MSC. The ATR process is currently scheduled to occur in November 2013 (see study schedule in Attachment 4). ATR costs for the rehabilitation prioritization plan are not yet determined but have been budgeted at \$36,000. ATR costs are 100% federally funded. ATR will be completed on the prioritization study document itself and any appendices.
- c. **Type I IEPR Schedule and Cost.** Not-Applicable.
- d. **Model Certification/Approval Schedule and Cost.** Not-Applicable.

11. PUBLIC PARTICIPATION

Generally the Ohio River Navigation Dam Rehabilitation Prioritization Study will be an internal Corps of Engineers document used to prioritize annual budget requests at the District and MSC levels for initiation of feasibility level studies that will support future dam rehabilitation. However, the study process will require coordination among three Corps Districts, and collaboration with several Federal and state agencies, the bordering states along the Ohio River and representatives of the National Waterways Trust Fund.

12. REVIEW PLAN APPROVAL AND UPDATES

The Great Lakes and 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 can change (if necessary) 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 will be 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:

- Mark Kessinger, Project Manager, Huntington District
- Richard G. Drum, Lead Planner, Huntington District
- Wesley Walker, Chief, Inland Navigation Planning Center of Expertise

ATTACHMENT 1: TEAM ROSTERS

Project Delivery Team				
Name	Role	Office Symbol	Telephone	Email
Mark Kessinger	Project Manager	LRH-PM-PM	304-399-5083	mark.d.kessinger@usace.army.mil
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Christopher Bouquot	Economist – Navigation Impacts	LRH-NC	304-399-5697	christopher.d.bouquot@usace.army.mil
V. Buddy Langdon	Navigation System Modeling	LRH-NC	304-399-6957	virgil.l.langdon@usace.army.mil
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	Engineer – Dam Failure/Risk Assessment	LRH-EC		
	Structural Engineer	LRH-EC		
	Mechanical Engineer	LRH-EC		
	Geotech Engineer	LRH-EC		
Dominico Chianesi	Operations & Maintenance Engineer - LRH	LRH-OR-OKL	304-399-5652	dominico.chianesi@usace.army.mil
Jason Price	Operations & Maintenance Engineer - LRP	LRP-OP-MS	412-395-7241	jason.p.prince@usace.army.mil
Ross Woodbury	Operations & Maintenance Engineer - LRL	LRL-OP-TM	502-315-6706	ross.w.woodbury@usace.army.mil
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Agency Technical Review Team				
Name	Role	Office	Telephone	Email
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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 Final Watershed Assessment for the Monongahela River Watershed Section 729 Analysis, Pennsylvania, West Virginia, and Maryland. The ATR was conducted as defined in the project’s Review Plan to comply with the requirements of EC 1165-2-214. 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

Name
ATR Team Leader
Office Symbol/Company

Date

SIGNATURE

Name
Project Manager
Office Symbol

Date

SIGNATURE

Name
Review Management Office Representative
Office Symbol

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

Name
Chief, Engineering Division
Office Symbol

Date

SIGNATURE

Name
Chief, Planning Division
Office Symbol

Date

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number

ATTACHMENT 4: DRAFT PROJECT/STUDY SCHEDULE

Activity ID	Activity Name	Original Duration	Remaining Duration	Physical % Complete	Start	Finish
333506 OHIO RIVER NAV DAM REHAB		393.0d	393.0d		01-Oct-12 A	2-Jun-14
333506.60122 Dam Rehab Study		78.0d	78.0d		5-Nov-12	28-Feb-13
333506.60122.00500 Project Management Plan (PMP)		49.0d	49.0d		3-Dec-12	12-Feb-13
PMP0020	Start PMP	0.0d	0.0d	0%	03-Dec-12*	
PMP0030	Complete Draft PMP	44.0d	44.0d	0%	3-Dec-12	5-Feb-13
PMP0010	Conduct Program and Project Management	49.0d	49.0d	0%	3-Dec-12	12-Feb-13
PMP0040	Review PMP	5.0d	5.0d	0%	6-Feb-13	12-Feb-13
PMP0050	Approve PMP	0.0d	0.0d	0%		12-Feb-13
333506.60122.1 Review Plan		78.0d	78.0d		5-Nov-12	28-Feb-13
C16200	Develop Draft Review Plan	18.0d	18.0d	0%	05-Nov-12*	30-Nov-12
C16400MSC	LRD Review RP	41.0d	41.0d	0%	3-Dec-12	31-Jan-13
C16500	Revise RP based on LRD Comments	10.0d	10.0d	0%	1-Feb-13	14-Feb-13
C16600	LRD approve revised RP	8.0d	8.0d	0%	15-Feb-13	27-Feb-13
C16300	Review Plan Complete	0.0d	0.0d	0%		28-Feb-13
333506.21000 Recon/Sec 905(b) Studies		393.0d	315.0d		01-Oct-12 A	2-Jun-14
333506.21000.21T00 Recon Prog & Proj Mgmt		393.0d	315.0d		01-Oct-12 A	2-Jun-14
REC1020	Receive Fed Funds	0.0d	0.0d	100%	01-Oct-12 A	06-Oct-12 A
REC1050	Start Recon	0.0d	0.0d	0%	1-Mar-13	
REC1030	Project Coord Docs	0.0d	0.0d	0%	05-Nov-12 A	2-Jun-14
REC1040	Budgetary Documents	0.0d	0.0d	0%	05-Nov-12	2-Jun-14

					A	
333506.21000.21Q00 Management Documents		0.0d	0.0d		05-Nov-12	2-Jun-14
REC1070	Upward Reports	0.0d	0.0d	0%	05-Nov-12 A	2-Jun-14
REC1080	Fact Sheets	0.0d	0.0d	0%	05-Nov-12 A	2-Jun-14
REC1090	Funds Control Docs	0.0d	0.0d	0%	05-Nov-12 A	2-Jun-14
REC1100	Coordination Docs	0.0d	0.0d	0%	05-Nov-12 A	2-Jun-14
333506.21000.21P00 Engineering & Design /Cost Estimates		170.0d	170.0d		1-Mar-13	30-Oct-13
REC1160	Geotechnical Studies	129.0d	129.0d	0%	1-Mar-13	30-Aug-13
REC1170	Eng. & Design Analysis	129.0d	129.0d	0%	1-Mar-13	30-Aug-13
REC1220	Risk Analysis	129.0d	129.0d	0%	1-Mar-13	30-Aug-13
REC1210	Feasibility Cost Estimate	41.0d	41.0d	0%	3-Sep-13	30-Oct-13
333506.21000.21G00 Socio/Economics		129.0d	129.0d		1-Mar-13	30-Aug-13
REC1260	Economic Studies	129.0d	129.0d	0%	1-Mar-13	30-Aug-13
REC1270	Social Studies	129.0d	129.0d	0%	1-Mar-13	30-Aug-13
333506.21000.21E00 Environmental		129.0d	129.0d		1-Mar-13	30-Aug-13
REC1340	All Other Env. Docs	129.0d	129.0d	0%	1-Mar-13	30-Aug-13
333506.21000.21F00 Fish & Wildlife		107.0d	107.0d		2-Apr-13	30-Aug-13
REC1350	F&W Plan Aid Rpt	107.0d	107.0d	0%	2-Apr-13	30-Aug-13
333506.21000.21D00 Cultural Resources		107.0d	107.0d		2-Apr-13	30-Aug-13
REC1380	Cult. Res. Impact	107.0d	107.0d	0%	2-Apr-13	30-Aug-13
333506.21000.21A00 Public Involvement		107.0d	107.0d		2-Apr-13	30-Aug-13
REC1400	Notice of Public Mtg	107.0d	107.0d	0%	2-Apr-13	30-Aug-13
REC1410	Min. of Public Mtg	107.0d	107.0d	0%	2-Apr-13	30-Aug-13
333506.21000.21R00 Plan Formulation & Eval.		107.0d	107.0d		2-Apr-13	30-Aug-13
REC1450	Plan Formulation & Eval.	107.0d	107.0d	0%	2-Apr-13	30-Aug-13

333506.21000.21500 Recon Report/Sec 905(b)		293.0d	293.0d		2-Apr-13	30-May-14
REC1460	Prepare Draft Recon Report	127.0d	127.0d	0%	2-Apr-13	30-Sep-13
REC1470	DQC	22.0d	22.0d	0%	1-Oct-13	31-Oct-13
REC1480	ATR	19.0d	19.0d	0%	1-Nov-13	29-Nov-13
REC1490	Revise Report per ATR	21.0d	21.0d	0%	2-Dec-13	31-Dec-13
REC1510	Submit Draft Recon Rpt	3.0d	3.0d	0%	2-Jan-14	6-Jan-14
REC1520	MSC/HQ Review	42.0d	42.0d	0%	7-Jan-14	7-Mar-14
REC1555	HQ Policy Review	42.0d	42.0d	0%	7-Jan-14	7-Mar-14
REC1550	Revise Per MSC/HQ Review	22.0d	22.0d	0%	10-Mar-14	8-Apr-14
REC1560	HQ Guid/Apprv Memo	15.0d	15.0d	0%	9-Apr-14	29-Apr-14
REC1620HQM	Recon Report Approval	0.0d	0.0d	0%		30-Apr-14
REC1625	Recon Study Termination	20.0d	20.0d	0%	2-May-14	30-May-14

ATTACHMENT 5: ACRONYMS AND ABBREVIATIONS

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