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

CELRD-PD-O

29 August 2013

MEMORANDUM FOR Pittsburgh District Commander, CELRP-DE/COL Bernard Lindstrom, 1000 Liberty Avenue Room 2200, Pittsburgh, PA 15222-4186

SUBJECT: Approval of Review Plan for Emsworth Locks and Dams Major Rehabilitation Project

1. The attached Review Plan for the Emsworth Locks and Dams Major Rehabilitation Project has been prepared in accordance with EC 1165-2-214, Civil Works Review and dated 15 December 2012 (enclosure).

2. The subject project is under construction and is 80% complete. The detailed design reports along with the plans and specifications were produced prior to the issuance of EC 1165-2-214. All engineering documents received an Independent Technical Review (ITR), now called an Agency Technical Review (ATR). No Type I IEPR was conducted since the project was awarded and well along in the construction phase prior to the issuance of EC 1165-2-214.

3. I approve the enclosed Review Plan for the Emsworth Locks and Dams Major Rehabilitation Project. Subsequent revisions to this review plan or its execution will require new written approval from this office and is subject to change as circumstances require, consistent with the Project Management Business Process.

4. The District is requested to post the review plan to its website. Prior to posting, the names of all individuals identified in the review plan should be removed.

5. The point of contact is Gary Mosteller, P.E., and can be reached at 513-684-3159.

FOR COL

MARGARET W. BURCHAM
Brigadier General, USA
Commanding

Encl

CF:
CECW-LRD (Prettyman-Beck)

IMPLEMENTATION REVIEW PLAN

EMSWORTH LOCKS AND DAMS MAJOR REHABILITATION PROJECT

Design and Construction Activities

Pittsburgh District

MSC Approval Date: *Pending*

Last Revision Date: *None*

REVIEW PLAN
EMSWORTH LOCKS AND DAMS MAJOR REHABILITATION PROJEC
Design and Construction Activities

TABLE OF CONTENTS

1. PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan (RP) defines the scope and level of review for the remaining design and construction activities to be performed for the Emsworth Locks and Dams Major Rehabilitation Project.

Emsworth Locks and Dams are located on the Ohio River immediately downstream of the City of Pittsburgh. The locks and dams were originally constructed between 1919 and 1922. The main channel dam and locks are located at river mile 6.2 and the back channel dam is located at river mile 6.4. The Emsworth locks consist of a 110 ft wide by 600 ft long main chamber and 56 feet wide by 360 feet long auxiliary chamber.

b. References

(1) Engineering Circular (EC) 1165-2-214, Civil Works Review Policy, 15 Dec 2012.
(2) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006.
(3) Emsworth Dams Major Rehabilitation, Project Management Plan, Mar 2011
(4) Emsworth Dams, Rehabilitation Evaluation Report, Dec 2001,

c. Requirements. This RP 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, operation, maintenance, repair, replacement and rehabilitation. The EC outlines four general levels of review: District Quality Control (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review.

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

The RMO is responsible for managing the overall peer review effort described in this RP. The RMO for the peer review effort described in this RP is the Great Lakes and Ohio River Division (LRD).

3. PROJECT INFORMATION

Prior to temporary, emergency repairs to the erosion protection downstream of the dams, there were 10 foot deep scour holes and 65 percent of the erosion protection was in a failed state. A temporary repair of the erosion protection was completed in February 2005 by infilling the scour holes with stone. Due to the temporary nature of the repair, soundings are required on an annual basis and following major flood events until a permanent repair is in place. Due to the extreme corroded state of the dam gates, failure of any one of the fourteen lift gates would most likely cause a portion of the stilling basin to fail and possibly undermine the dam due to lack of permanent scour protection. The loss of the dam could drain the 24 mile Pittsburgh Navigation Pool resulting in the isolation of all river activity and commerce in the Monongahela and Alleghany River Basins, as well as impact public utilities, industry, the aquatic ecosystem, water quality & supply, and riverside services in the Upper Ohio Valley.

4. DISTRICT QUALITY CONTROL (DQC)

All implementation documents 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). CELRP shall manage DQC. Documentation of DQC activities is required and shall be in accordance with the Quality Manual of the District and LRD as managed in Qualtrax.

DQC is completed in accordance with the LRD Regional Business Processes Manual (the Region's Quality Management Plan). The LRD Regional Business Processes Manual is an ISO 9001 certified Quality Management System. DQC includes Quality Production, Internal Quality Checks and Reviews, Design Checks, and Project Delivery Team (PDT) Reviews as described in procedure 08504 LRD - QC / QA Procedures for Civil Works.

a. Documentation of DQC. In accordance with 08504 LRD - QC / QA Procedures for Civil Works, all drawings, computations, quantity estimates, and analyses provided to the DQC team for review will be annotated to show the initials of the designer and the checker and the date of the action.

b. Products to Undergo DQC. Any Detailed Design Reports (DDRs) and Plans & Specifications (P&S) would undergo DQC in accordance with 08504 LRD - QC / QA Procedures for Civil Works.

c. Required DQC Expertise. In accordance with 08504 LRD - QC / QA Procedures for Civil Works, anyone conducting design checks and reviews will be qualified to originate the design that they are checking.

All engineering and design has been completed. In the event that any unanticipated design arises, DQC and ATR will be performed in accordance with this Review Plan and the requirements of EC 1165-2-214.

5. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all implementation documents per EC 1165-2-214. Note that DDRs and P&S were produced before the implementation of EC 1165-2-209/214 underwent Independent Technical Review (ITR) in accordance with the quality control requirements in effect at the time. See Table 2 of Attachment 1 for a list of 95% ITRs that have been conducted and completed under the Emsworth Locks and Dams Major Rehabilitation. The objective of ITR/ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ITR/ATR assesses whether the analyses presented are technically correct and comply with published U.S. Army Corps of Engineers (USACE) guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers.

All engineering and design has been completed. In the event that any unanticipated design arises, DQC and ATR will be performed in accordance with this Review Plan and the

requirements of EC 1165-2-214. The ATR team will be from outside the home District. The ATR Lead will be from outside the home MSC. The required ATR technical competencies will be defined as necessary and the Review Plan amended accordingly.

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

IEPR may be required for implementation 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 IEPRs 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 IEPRs, or Safety Assurance Reviews (SARs), 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**. No IEPR is recommended for the remaining components of the Emsworth Dam Project.

b. **Products to Undergo Type I IEPR**. Not applicable. The Emsworth Dams, Rehabilitation Evaluation Report, Dec 2001, was completed prior to the requirements of EC 1165-2-214.

c. **Products to Undergo Type II IEPR SAR**. Not Applicable per EC 1165-2-214. There are no potential hazards that pose a significant threat to human life.

7. POLICY AND LEGAL COMPLIANCE REVIEW

All decision documents have been reviewed throughout the study process for compliance with the 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

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 teams to assess the adequacy of cost estimates, construction schedules and contingencies. The DX has completed a risk analysis and cost review of the Emsworth Dams Major Rehabilitation Project and provided acceptance 17 Jul 2007. Any future work that may require cost certification will be coordinated with the Cost DX and the RMO (CELRD).

9. REVIEW SCHEDULES AND COSTS

a. ATR Schedule. At this time there are no established schedules for ATR because the design is complete and the project is fully in the construction phase. The Review Plan will be amended in the future to include the schedule for any necessary ATR including the Operation & Maintenance manual and post construction risk assessment.

b. ATR Cost. Since ATR is not required for the current construction phase of the project, no ATR costs have been calculated at this time. The Review Plan will be amended in the future to include the cost for any necessary ATR including the Operation & Maintenance manual and post construction risk assessment.

10. PUBLIC PARTICIPATION

This project fulfilled National Environmental Policy Act (NEPA) requirements which includes a public review component. Additional public meetings will be conducted, as necessary, throughout the project phases. Information will also be conveyed to the public through the use of press releases and media interviews as necessary and through the use of posting information to CELRP's internet web site. There is no formal public review for the construction phases. However, the Inland Navigation Industry serves as the cost share partner, and is provided periodic project updates. Upon MSC approval of this RP, the RP will be posted on the CELRP Internet for Public Review: (http://www.lrp.usace.army.mil/pm/review_plans.htm).

11. REVIEW PLAN APPROVAL AND UPDATES

The MSC Commander is responsible for approving this RP. 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 project. Like the PMP, the RP is a living document and may change as the study progresses. CELRP is responsible for keeping the RP up to date. Minor changes to the RP since the last MSC Commander approval will be documented in Attachment 2. Significant changes to the RP (such as changes to the scope and/or level of review) shall be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the RP, along with the Commanders' approval memorandum, will be posted on CELRP's webpage. The latest RP will also be provided to the RMO (MSC).

12. REVIEW PLAN POINTS OF CONTACT

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

Michael J. Rattay, CELRP, Project Manager, 412-395-7372
Stephen Frost, CELRP, Review Plan Writer, 412-395-7353
John Nites, CELRP, Lead Engineer, 412-395-7268
Michael R. Debes, CELRP, EC Quality Manager, 412-395-7372
Gary A. Mosteller, CELRD, MSC/RMO POC, 513-684-3159
Roger F. Zemba, CELRP, Senior Regional Engineer and Review Management Office (RMO) representative, 513-684-3018

ATTACHMENT 1: TEAM ROSTERS

TABLE 1: Product Delivery Team		
Functional Area	Name	CELRP Office Symbol
Project Manager	Mike Rattay	BR-P
Key Team Members		
Planning Branch	Conrad Weiser	BR-E
Real Estate Branch	Roger Wood	EC-R
Engineering and Construction Division	John Nites	EC-D
Engineering and Construction Division	Denise Polizzano	EC-CO
. Contracting Branch	Michelle Anderson	BR-C
Operations Division	Jason Prince	OP-MS

TABLE 2: Independent Technical Review/Agency Technical Review of Products Conducted/Completed		
Products Reviewed	Reviewers	Reviewer's Organization
Emsworth Main Channel/Back Channel Service Bridge Repairs 95% ITR QA Review Feb 2011 thru Apr 2011	Case Smeenk	Bergman Associates
	David Thurnherr	Bergman Associates
	Terry Tallo-West	CELRP
	Rodger Wood	CELRP
	Timothy O'Loughlin	CELRP
	Robert Tyszkiewicz	CELRP
	Thomas Andre	CELRP
	Dave Buccini	CELRP
	James Kosky	CELRP
	John Nites	CELRP
Emsworth Back Channel Scour Protection Plans & Specs 95% ITR Nov 2009 thru Dec 2009	Emily Calla	IWR-RMC
	Michael Debes	CELRP
	Beth Schneller	CELRP
	John Ayers	CELRP
	Jessica Corton	CELRP
	Stephen Stoltz	CELRP
Emsworth Back Channel Service Bridge Repairs, Plans and Specification 95% ITR May 2009	David Thurnherr	Bergman Associates
	Michael Debes	CELRP
	Morgan Hoge	CELRP
	Stephen Stoltz	CELRP
Emsworth Back Channel Abutment Stabilization , 95% ITR/BCOE Apr 2009 thru May 2009	Paula Boren	IWR-RMC
	Robert McTighe	CELRP
	Beth Schneller	CELRP
	Denise Polizzano	CELRP

	Maria Mignone	CELRP
	Donald Zeller	CELRP
	Conrad Weiser	CELRP
	Rodger Wood	CELRP
	Jessica Corton	CELRP
	Morgan Hoge	CELRP
	James Shibata	CELRP
	Stephen Stoltz	CELRP
	Robert Tyszkiewicz	CELRP
	Thomas Andre	CELRP
	Mark Zaitsoff	CELRP
Emsworth Main Channel Dam Rehabilitation, 95% ITR Jan 2008 thru Feb 2008	Henrik Dahl	Ben Gerwick
	Carl Mallow	Bergman Associates
	Gregory Johnson	Bergman Associates
	Tim Onstott	Dappolonia
	Paula Boren	IWR-RMC
	Michael Debes	CELRP
	Bruce Riley	CELRP
	Arlene Bigger	CELRP
	TJ Fichera	CELRP
	Stephen Stoltz	CELRP
	Thomas Andre	CELRP
	Dale Reisinger	CELRP
	Neil Schwanz	CEMVP
	Thomas Gambucci	CEMVR
Emsworth Main Channel Abutment Stabilization, 95% ITR Mar 2007 thru Apr 2007	Johnny Ng	DLZ
	Michael Debes	CELRP
	David Heidish	CELRP
	John Pontus	CELRP
	Andrew Bystry	CELRP
	Stephen Stoltz	CELRP
Emsworth Main Channel Apron Protection Contract, 95% ITR & BCOE Apr 2006 thru May 2006	Kathleen Bensko	IWR-RMC
	Paula Boren	CELRP
	David Carlson	IWR-RMC
	LeRoy Bosetti	CELRP
	Michael Debes	CELRP
	David Heidish	CELRP
	Glenn Bush	CELRP
	Andrew Bystry	CELRP
	David Turcsanyi	CELRP
	Conrad Weiser	CELRP
	Roger Wood	CELRP
	James Brown	CELRP
	Brian McFarland	CELRP
	Kirk McWilliams	CELRP
	Thomas Andre	CELRP
	James Kosky	CELRP
Emsworth Back Channel	Lisa Pierce	INCA Engineers

Apron Extension – Design/Plans & Specs 95% Nov 2005 thru Jan 2006	Dave Stensby	INCA Engineers
	Paula Boren	CELRP
	David Carlson	IWR-RMC
	David Margo	IWR-RMC
	Michael Debes	CELRP
	Barb Hopkins	CELRP
	Michael Rattay	CELRP
	Stephen Stoltz	CELRP
	Thomas Andre	CELRP

ATTACHMENT 2: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page/Paragraph Number