

Final Independent External Peer Review Report Olmsted Locks and Dam 52 and 53 Replacement Project Post Authorization Change Report

Prepared by
Battelle Memorial Institute

Prepared for
Department of the Army
U.S. Army Corps of Engineers
Inland Navigation Planning Center of Expertise
Huntington District

Contract No. W912HQ-10-D-0002
Task Order: 0005

November 15, 2010



**Final Independent External Peer Review Report
Olmsted Locks and Dam 52 and 53 Replacement Project
Post Authorization Change Report**

by

**Battelle
505 King Avenue
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FINAL
INDEPENDENT EXTERNAL PEER REVIEW REPORT
for the
Olmsted Locks and Dam 52 and 53 Replacement Project
Post Authorization Change Report

EXECUTIVE SUMMARY

The purpose of the Olmsted Locks and Dam 52 and 53 Replacement Project Post Authorization Change Report (Olmsted Locks and Dam PACR) is to recommend an increase in the maximum amount of funding that the U.S. Army Corps of Engineers (USACE) is authorized to spend on completion of the project, to document the reasons for the recommendation, and demonstrate continued feasibility of the overall project. The report is required because the current estimated cost of completing the project exceeds the maximum cost limit, as defined in Section 902 of the Water Resources Development Act (WRDA) of 1988 (“902 cost limit”). The Olmsted Locks and Dam project was authorized in the WRDA of 1988 (PL 100-676). Initial construction funding was provided by the Energy and Water Development Appropriations Act of 1991.

The Olmsted Locks and Dam project is economically justified based on projected commercial transportation savings derived from reduced processing and congestion time, and represents a reinvestment in the nation’s inland navigation infrastructure. The Olmsted Locks and Dam project provides for a structure near Ohio River Mile 964.4 that would replace the existing Locks and Dam 52 and 53. The structure will consist of twin 110-foot by 1,200-foot locks adjacent to the Illinois bank, five tainter gates, a 1,400-foot navigable pass, and a fixed weir extending to the Kentucky bank. During low flow conditions, an upper pool having an elevation 300 feet at the dam would extend upstream to the Smithland Locks and Dam, a distance of 47 miles. Open river conditions will exist from the dam site to the mouth of the Ohio River, a distance of approximately 17 miles. The first construction contract was awarded on November 19, 1992 to construct the access road and resident engineer’s office. Since then, several contracts have been awarded and completed including those for the locks cofferdam, the locks, the approach walls and the operating and maintenance bulkheads. The contract for the construction of the dam was awarded January 28, 2004 and construction work is ongoing. Other contracts to be awarded in the future include the operation buildings, demolition of Locks and Dam 52 and 53, and various equipment contracts.

The Olmsted Locks and Dam PACR was prepared in accordance with the Planning Guidance Notebook, ER-1105-2-100 dated June 2004. The original authorized cost of the project as reported in the Report of the Chief of Engineers dated August 20, 1986 and the Water Resources Development Act of 1988 was \$775,000,000. The authorized cost to construct the Olmsted Locks and Dam project was adjusted for inflation using the method described in ER 1105-2-100, Appendix G. The authorized cost at the October 2007 price level is \$1,337,959,000. The Section 902 maximum cost limit for the Olmsted Locks and Dam project is \$1,544,031,000. Based on cost increases described in the Olmsted Locks and Dam PACR, the revised estimated cost at the October 2007 price level is \$1,991,000,000. The current cost estimate with inflation applied to the remaining cost to complete, at the October 2007 price level, is \$2,067,000,000. The

increases in costs are not associated with changes in project purpose, local cooperation requirements, location of project, or because of modifications required by law. The changes in costs are a result of design changes, contract modifications, less than efficient funding, time extensions and other unanticipated increases in project first costs.

USACE is conducting an Independent External Peer Review (IEPR) of the Olmsted Locks and Dam 52 and 53 Replacement Project Post Authorization Change Report (hereinafter Olmsted Locks and Dam PACR). Battelle, as a 501(c)(3) non-profit science and technology organization with experience in establishing and administering peer review panels for USACE, was engaged to coordinate the IEPR of the Olmsted Locks and Dam PACR. Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analyses. The IEPR was external to the agency and conducted following USACE and Office of Management and Budget (OMB) guidance described in USACE (2010), USACE (2007), and OMB (2004). This final report describes the IEPR process, describes the panel members and their selection, and summarizes the Final Panel Comments of the IEPR Panel (the Panel).

Four panel members were selected for the IEPR from more than 31 identified candidates. Based on the technical content of the Olmsted Locks and Dam PACR and the overall scope of the project, the final panel members were selected for their technical expertise in the following key areas: economics (two experts) and cost engineering (two experts). Although the Panel was disclosed to USACE, Battelle made the final decision on selecting the Panel.

The Panel received electronic versions of the Olmsted Locks and Dam PACR documents, along with a charge that solicited comments on specific sections of the documents to be reviewed. Battelle did not develop the charge questions for this project. Charge questions were provided by USACE to guide the peer and were included in the draft and final Work Plans.

The USACE Project Delivery Team briefed the Panel and Battelle during a kick-off meeting held via teleconference prior to the start of the review. In addition to this teleconference, a teleconference with USACE, the Panel, and Battelle was held halfway through the review period to provide the Panel an opportunity to ask questions of USACE and clarify uncertainties regarding the project. The Panel produced more than 128 individual responses to the 33 charge questions and formulated 19 Preliminary Panel Comments.

IEPR panel members reviewed the Olmsted Locks and Dam PACR documents individually. The panel members then met via teleconference with Battelle to review individual technical comments and Preliminary Comments, and discuss charge questions for which there were conflicting responses. In this teleconference, the panel members also reached agreement on which Preliminary Panel Comments would be carried forward as Final Panel Comments. Each Final Panel Comment was documented using a four-part format consisting of: (1) a comment statement; (2) the basis for the comment; (3) the significance of the comment (high, medium, or low); and (4) recommendations on how to resolve the comment. Overall, eight Final Panel Comments were identified and documented. Of these, seven had medium significance, and one had low significance. There were no issues or comments identified with a high level of significance.

Table ES-1 summarizes the Final Panel Comments by level of significance. Detailed information on each comment is contained in Appendix A of this report.

Table ES-1. Overview of 9 Final Panel Comments Identified by the Olmsted Locks and Dam PACR IEPR Panel

Significance – Medium	
1	The contingency cost should expand existing line items to account for cash flow issues that may arise over the next 5 years.
2	The lock closure days assumptions and estimated lock closure costs used in calculating project benefits are not well supported in the report.
3	The PACR does not include an update on historical tonnages and traffic projections by commodity or sensitivity tests, nor does it consider the impact of potential environmental constraints on coal tonnage projections.
4	The transportation rate analysis in Appendix A does not clearly describe the rate analysis methodology and derivation of project benefits.
5	The cost risk analysis and contingency determination does not include remaining work or consider experience with the dam construction methods, changes in dam construction assumptions, or changes in the economic climate that have occurred in the nearly four years since it was completed.
6	The without project future condition is not properly specified and authorized changes since the 1990 update are not clearly described.
7	The PACR does not include a report section that identifies, describes, and analyzes areas of risk and uncertainty for the project.
Significance – Low	
8	National Economic Development (NED) costs may not accurately reflect project implementation costs.

The Panel agreed on its “assessment of the adequacy and acceptability of the economic and cost engineering methods, models, and analyses used” (USACE, 2010; p. D-4) in the Olmsted Locks and Dam PACR document. The Panel generally agreed that the project is well justified under a range of possible future scenarios, and that the assumptions that underlie the economic and cost engineering analyses are sound. Furthermore, it was apparent and appreciated that a great deal of effort went into the cost risk analysis for the remaining dam costs, the benefit analysis, and the determination of the benefit-cost ratio for the Olmsted Locks and Dam project. However, the Panel believes that the Olmsted Locks and Dam PACR should provide updated key cost and economic data, a better explanation of the derivation of the benefits of the project, a risk and uncertainty section, and greater detail on the application of contingencies for all portions of the remaining work. The Panel also notes that the Executive Summary does not provide a complete synopsis of the information and analyses contained in the PACR, including significant design changes, reasons for cost increases, changes in project benefits, determination of the benefit-cost ratio, and recommendations. Inclusion of those items in the Executive Summary would improve the overall understanding of the PACR.

The following statements summarize the Panel's findings, which are described in more detail in the Final Panel Comments (see Appendix A).

Economics:

The Panel agreed that the Olmsted Locks and Dam PACR economics analysis clearly demonstrated the economic justification for completing the project. The Panel was impressed by the detailed development of five alternative coal forecasts and with the detailed rate studies that support project benefits. However, the Panel has concerns that the commodity forecasts are dated. The Panel believes that the inclusion of historic traffic tonnages from 2006-2009 and the display of projections by commodity would provide further support for the project. Additional sensitivity testing should also be conducted to include potential uncertainties such as environmental issues, concerns, and other variables, such as carbon dioxide emissions. This additional testing will provide the needed accounting for potential uncertainties but will not change the economic justification of the project. The Panel also notes that the description of the rate studies in the PACR should be expanded to improve the report's understanding.

In addition, the PACR provides some risk and uncertainty evaluations but the analyses could be better supported by the inclusion of a risk and uncertainty section that discusses and analyzes all areas of risk and uncertainty associated with the project. Finally, the Panel had concerns regarding the uncertainty of the coal projections and the sensitivity of potential environmental constraints on coal tonnage projections, as well as the use of the "fix-as-fail" operation and maintenance scenario for the without project condition and the treatment of "foregone costs" as negative costs in the benefit cost analysis.

Cost Engineering:

The Olmsted Locks and Dam PACR provides a significant level of detail to support the cost increases and the remaining construction costs. The cost risk analysis performed on the remaining dam costs was thorough and developed appropriate contingency estimates for the remaining unconstructed dam features. The PACR makes it clear this contingency is largely due to the dam construction methods, contracting mechanism, and funding inefficiencies. However, the cost risk analysis was completed in 1997 and does not clearly incorporate changes in construction, improved understanding of construction techniques, funding assumptions, and the economic climate in the intervening years. The contingencies for remaining work beyond the dam should also be based on a cost risk analysis, taking into account the complexity of the project and the remaining schedule. The Panel notes that the level of technical support with regard to the lock closure estimates could be enhanced by including documentation to clarify the lock closure estimates that are critical to the cost-benefit analysis.

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LIST OF ACRONYMS

ATR	Agency Technical Review
CBO	Congressional Budget Office
COI	Conflict of Interest
CPM	Critical Path Method
CWWBS	Civil Works Work Breakdown Structure
DrChecks	Design Review and Checking System
EC	Engineering Circular
ERDC	Engineer Research and Development Center
IEPR	Independent External Peer Review
IWTF	Inland Waterways Trust Fund
MCACES	Microcomputer Aided Cost Engineering System
NED	National Economic Development
NTP	Notice to Proceed
OMB	Office of Management and Budget
ORNIM	Ohio River Navigation Investment Model
PACR	Post Authorization Change Report
P&G	Principles and Guidelines
PERT	Program Review and Evaluation Technique
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
TVA	Tennessee Valley Authority
WRDA	Water Resources Development Act

1. INTRODUCTION

The purpose of the Olmsted Locks and Dam 52 and 53 Replacement Project Post Authorization Change Report (Olmsted Locks and Dam PACR) is to recommend an increase in the maximum amount of funding that the U.S. Army Corps of Engineers (USACE) is authorized to spend on completion of the project, to document the reasons for the recommendation, and demonstrate continued feasibility of the overall project. The report is required because the current estimated cost of completing the project exceeds the maximum cost limit, as defined in Section 902 of the Water Resources Development Act (WRDA) of 1988 (“902 cost limit”). The Olmsted Locks and Dam project was authorized in the WRDA of 1988 (PL 100-676). Initial construction funding was provided by the Energy and Water Development Appropriations Act of 1991.

The Olmsted Locks and Dam project is economically justified based on projected commercial transportation savings derived from reduced processing and congestion time, and represents a reinvestment in the nation’s inland navigation infrastructure. The Olmsted Locks and Dam project provides for a structure near Ohio River Mile 964.4 that would replace the existing Locks and Dam 52 and 53. The structure will consist of twin 110-foot by 1,200-foot locks adjacent to the Illinois bank, five tainter gates, a 1,400-foot navigable pass, and a fixed weir extending to the Kentucky bank. During low flow conditions, an upper pool having an elevation 300 feet at the dam would extend upstream to the Smithland Locks and Dam, a distance of 47 miles. Open river conditions will exist from the dam site to the mouth of the Ohio River, a distance of approximately 17 miles. The first construction contract was awarded on November 19, 1992 to construct the access road and resident engineer’s office. Since then, several contracts have been awarded and completed including those for the locks cofferdam, the locks, the approach walls and the operating and maintenance bulkheads. The contract for the construction of the dam was awarded January 28, 2004 and construction work is ongoing. Other contracts to be awarded in the future include the operation buildings, demolition of Locks and Dam 52 and 53, and various equipment contracts.

The Olmsted Locks and Dam PACR was prepared in accordance with the Planning Guidance Notebook, ER-1105-2-100 dated June 2004. The Section 902 limit for the Olmsted Locks and Dam project is currently \$1,544,031,000, based on the authorized cost of \$775,000,000 as reported in the Report of the Chief of Engineers dated August 20, 1986 and the WRDA of 1988. The authorized cost to construct the Olmsted Locks and Dam project was adjusted for inflation using the method described in ER 1105-2-100, Appendix G. The fully funded cost was estimated at \$1,389,031,000. Based on cost increases described in the Olmsted Locks and Dam PACR, the revised estimated cost is \$2,067,000,000. The WRDA of 1988 authorized the Olmsted Locks and Dam project cost of \$775,000,000. These authorized costs, when brought to current price levels and inflated per Section 902 guidance, are \$1,337,959,000. The current cost estimate without inflation at the October 2007 price level is \$1,991,000,000. The current cost estimate with inflation applied to the remaining cost to complete, at the October 2007 price level, is \$2,067,000,000. The increases in costs are not associated with changes in project purpose, local cooperation requirements, location of project, or because of modifications required by law.

The changes in costs are a result of design changes, contract modifications, less than efficient funding, time extensions and other unanticipated increases in project first costs.

The objective of the work described here was to conduct an Independent External Peer Review (IEPR) of the Olmsted Locks and Dam PACR in accordance with procedures described in the Department of the Army, U.S. Army Corps of Engineers Engineer Circular *Civil Works Review Policy* (EC No. 1165-2-209) (USACE, 2010), USACE CECW-CP memorandum *Peer Review Process* (USACE, 2007), and Office of Management and Budget (OMB) bulletin *Final Information Quality Bulletin for Peer Review* (OMB, 2004). Battelle, as a 501(c)(3) non-profit science and technology organization with experience in establishing and administering peer review panels, was engaged to coordinate the IEPR of the Olmsted Locks and Dam PACR. Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analyses.

This final report details the IEPR process, describes the IEPR panel members and their selection, and summarizes the Final Panel Comments of the IEPR Panel on the existing environmental, economic, and engineering analyses contained in the Olmsted Locks and Dam PACR. Detailed information on the Final Panel Comments is provided in Appendix A.

2. PURPOSE OF THE IEPR

To ensure that USACE documents are supported by the best scientific and technical information, USACE has implemented a peer review process that uses IEPR to complement the Agency Technical Review (ATR), as described in USACE (2010) and USACE (2007).

In general, the purpose of peer review is to strengthen the quality and credibility of the USACE decision documents in support of its Civil Works program. IEPR provides an independent assessment of the economic, engineering, and environmental analysis of the project study. In particular, the IEPR addresses the technical soundness of the project study's assumptions, methods, analyses, and calculations and identifies the need for additional data or analyses to make a good decision regarding implementation of alternatives and recommendations.

In this case, the IEPR of the Olmsted Locks and Dam PACR was conducted and managed using contract support from Battelle, which is an Outside Eligible Organization under Section 501(c)(3) of the U.S. Internal Revenue Code with experience conducting IEPRs for USACE.

3. METHODS

This section describes the method followed in selecting the members for the IEPR Panel (the Panel) and in planning and conducting the IEPR. The IEPR was conducted following procedures described by USACE (2010) and in accordance with USACE (2007) and OMB (2004) guidance. Supplemental guidance on evaluation for conflicts of interest (COIs) was obtained from the *Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports* (The National Academies, 2003).

3.1 Planning and Schedule

At the beginning of the Period of Performance (POP), Battelle held a kick-off meeting with USACE to review the preliminary/suggested schedule, discuss the IEPR process, and address any questions regarding the scope (e.g., clarify expertise areas needed for panel members). Any revisions to the schedule were submitted as part of the final Work Plan.

Table 1 defines the schedule followed in executing the IEPR. Due dates for milestones and deliverables are based on the Notice to Proceed (NTP) date of September 10, 2010. Note that the work items listed in Task 6 occur after the submission of this report. Battelle will enter the eight Final Panel Comments developed by the Panel into USACE’s Design Review and Checking System (DrChecks), a Web-based software system for documenting and sharing comments on reports and design documents, so that USACE can review and respond to them. USACE will provide responses (Evaluator Responses) to the Final Panel Comments, and the Panel will respond (BackCheck Responses) to the Evaluator Responses. All USACE and Panel responses will be documented by Battelle.

Table 1. Olmsted Locks and Dam PACR IEPR Schedule

TASK	ACTION	DUE DATE
1	Notice to Proceed (NTP)^a	9/10/2010
	Review documents available	9/10/2010
	Battelle submits draft Work Plan ^b	9/21/2010
	USACE provides comments on draft Work Plan	9/28/2010
	Teleconference (if necessary)	9/28/2010
	Battelle submits final Work Plan ^b	10/5/2010
2	Battelle requests input from USACE on the conflict of interest (COI) questionnaire	9/15/2010
	USACE provides comments on COI questionnaire	9/16/2010
	Battelle submits list of selected panel members ^b	9/28/2010
	USACE provides comments on selected panel members	9/29/2010
	Battelle completes subcontracts for panel members	10/12/2010
3	USACE/Battelle kick-off meeting	9/15/2010
	Battelle sends review documents to panel members	10/13/2010
	USACE/Battelle/IEPR Panel kick-off meeting	10/14/2010
	Battelle convenes mid-review teleconference for Panel to ask clarifying questions of USACE	10/18/2010

TASK	ACTION	DUE DATE
4	Panel members complete their review and submit responses to charge questions and Preliminary Panel Comments to Battelle for review	10/21/2010
	Battelle provides comments on Preliminary Panel Comments to Panel/IEPR Final Panel Comments finalized (iterative process)	10/25/2010-11/5/2010
5	Battelle submits Final IEPR Report to USACE^b	11/15/2010
6 ^c	Battelle inputs IEPR Final Panel Comments to DrChecks; Battelle provides IEPR Final Panel Comment response template to USACE	11/17/2010
	USACE provides draft Evaluator responses and clarifying questions	11/22/2010
	Teleconference between Battelle, IEPR Panel, and USACE to discuss IEPR Final Panel Comments, draft Evaluator responses, and clarifying questions	12/6/2010
	USACE inputs final Evaluator responses in DrChecks	12/13/2010
	Battelle inputs the Panel's BackCheck responses in DrChecks	12/22/2010
	Battelle submits pdf printout of DrChecks project file and closes out DrChecks ^b	12/23/2010
	Project closeout/period of performance ends	3/3/2011

^a Requested to start on recruitment to meet the aggressive schedule

^b Deliverable

^c Task occurs after the submission of this report.

3.2 Identification and Selection of IEPR Panel Members

The candidates for the Panel were evaluated based on their technical expertise in the following key areas: economics (two experts) and cost engineering (two experts). These areas correspond to the technical content of the Olmsted Locks and Dam PACR and overall scope of the project.

To identify candidate panel members, Battelle reviewed experts in Battelle's Peer Reviewer Database, sought recommendations from colleagues, contacted former panel members, and conducted targeted Internet searches. Battelle initially identified more than 31 candidates for the Panel, evaluated their technical expertise, and inquired about potential COIs. Of these, Battelle chose six of the most qualified candidates and confirmed their interest and availability. Of the six candidates, four were proposed for the final Panel and two were proposed as backup reviewers (one expert for each area expertise). Information about the candidate panel members, including brief biographical information, highest level of education attained, and years of experience, was provided to USACE for feedback. Battelle made the final selection of panel members according to the selection criteria described in the Work Plan.

The four proposed primary reviewers constituted the final Panel. However, after the USACE/Battelle/IEPR Panel kick-off meeting, one of the cost engineering panel members requested to be removed from the Panel due to an unexpected illness. The back-up cost engineering candidate was then contacted and added to the Panel. The candidates were screened

for the following potential exclusion criteria or COIs.¹ These COI questions were intended to serve as a means of disclosure, and to better characterize a potential candidate's employment history and background. Providing a positive response to a COI screening question did not automatically preclude a candidate from serving on the Panel. For example, participation in previous USACE technical peer review committees and other technical review panel experience was included as a COI screening question. A positive response to this question could be considered a benefit.

- Involvement by you or your firm² in the Olmsted Lock and Dam PACR.
- Involvement by you or your firm² in flood control, navigation or ecosystem restoration projects in Ballard County (KY), Pulaski County (IL), or in the vicinity of Ohio River Mile 964. Including:
 - Smithland Locks and Dam
 - Olmsted Dam Design & Construction
 - Olmsted Locks and Dam Project- Locks Cofferdam,
 - Olmsted Locks and Dam Project - Locks,
 - Olmsted Locks and Dam Project - Approach Walls
 - Olmsted Locks and Dam Project - Operating & Maintenance Bulkheads
- Involvement by you or your firm² in the Olmsted Lock and Dam PACR, or related projects.
- Current employment by USACE.
- Involvement with paid or unpaid expert testimony related to Olmsted Lock and Dam PACR.
- Current or previous employment or affiliation with members of the cooperating agencies or local sponsors, including:
 - Kentucky Department of Fish and Wildlife Resources
 - City of Olmsted, IL
 - City of Paducah, KY
 - City of Cairo, IL
 - Illinois State Historic Preservation Agency
 - Kentucky State Historic Preservation Office
 - Inland Waterways Trust Fund(for pay or *pro bono*).

¹ Battelle evaluated whether scientists in universities and consulting firms that are receiving USACE-funding have sufficient independence from USACE to be appropriate peer reviewers. See OMB (2004, p. 18), "...when a scientist is awarded a government research grant through an investigator-initiated, peer-reviewed competition, there generally should be no question as to that scientist's ability to offer independent scientific advice to the agency on other projects. This contrasts, for example, to a situation in which a scientist has a consulting or contractual arrangement with the agency or office sponsoring a peer review. Likewise, when the agency and a researcher work together (e.g., through a cooperative agreement) to design or implement a study, there is less independence from the agency. Furthermore, if a scientist has repeatedly served as a reviewer for the same agency, some may question whether that scientist is sufficiently independent from the agency to be employed as a peer reviewer on agency-sponsored projects."

² Includes any joint ventures in which your firm is involved.

- Past, current or future interests or involvements (financial or otherwise) by you, your spouse or children related to Ballard County (KY), Pulaski County (IL), or in the Ohio River System in the vicinity of river mile 964.
- Current personal involvement with other USACE projects, including whether involvement was to author any manuals or guidance documents for USACE. If yes, provide titles of documents or description of project, dates, and location (USACE district, division, Headquarters, Engineer Development and Research Center (ERDC), etc.), and position/role. Please highlight and discuss in greater detail any projects that are specifically with the Louisville District.
- Current firm² involvement with other USACE projects, specifically those projects/contracts that are with the Louisville District. If yes, provide title/description, dates, and location (USACE district, division, Headquarters, ERDC, etc.), and position/role.
- Any previous employment by the USACE as a direct employee or contractor (either as an individual or through your firm²) within the last 10 years, notably if those projects/contracts are with the Louisville District. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.
- Previous experience conducting technical peer reviews. If yes, please highlight and discuss any technical reviews concerning flood risk management, navigation, or ecosystem review, and include the client/agency and duration of review (approximate dates).
- Pending, current or future financial interests in Olmsted Lock and Dam PACR, or related contracts/awards from USACE.
Including:
 - Smithland Locks and Dam
 - Olmsted Dam Design & Construction
 - Olmsted Locks and Dam Project- Locks Cofferdam
 - Olmsted Locks and Dam Project - Locks,
 - Olmsted Locks and Dam Project - Approach Walls
 - Olmsted Locks and Dam Project - Operating & Maintenance Bulkheads
- A significant portion (i.e., greater than 50%) of personal or firm² revenues within the last three years came from USACE contracts.
- Any publicly documented statement (including, for example, advocating for or discouraging against) related to Olmsted Lock and Dam PACR.
- Participation in relevant prior Federal studies relevant to this project and/or Olmsted Lock and Dam PACR including:
 - The Lower Ohio River Feasibility Study
 - Smithland Locks and Dam
 - Olmsted Dam Design & Construction
- Participation in prior non-Federal studies relevant to this project and/or Olmsted Lock and Dam PACR.

- Is there any past, present or future activity, relationship or interest (financial or otherwise) that could make it appear that you would be unable to provide unbiased services on this project? If so, please describe.

In selecting the final members of the Panel from the list of candidates, Battelle chose experts who best fit the expertise areas and had no COIs. The four final reviewers were either affiliated with academic institutions or consulting companies or were independent engineering consultants. Battelle established subcontracts with the panel members when they indicated their willingness to participate and confirmed the absence of COIs through a signed COI form. Although the Panel was disclosed to USACE, Battelle made the final decision on selecting the Panel. Section 4 of this report provides names and biographical information on the panel members.

Prior to beginning their review and within 1 day of their subcontracts being finalized, all members of the Panel attended a kick-off meeting via teleconference planned and facilitated by Battelle in order to review the IEPR process, the schedule, communication, and other pertinent information for the Panel. Once the need for the backup cost engineer was confirmed, a separate teleconference was held with the cost engineer experts, including the departing primary cost engineer, the second primary cost engineer, and the added (backup) cost engineer. This teleconference allowed the original primary cost engineers to brief the backup cost engineer on information on the PACR they had reviewed to date, the results of their review, and any other pieces of information to share on the IEPR process to ensure a seamless transition between the panel members.

3.3 Preparation of the Charge and Conduct of the IEPR

Charge questions were provided by USACE and included in the draft and final Work Plans. In addition to a list of 33 charge questions/discussion points, the final charge included general guidance for the Panel on the conduct of the peer review (provided in Appendix B of this final report).

Battelle planned and facilitated a final kick-off meeting via teleconference during which USACE presented project details to the Panel. Before the meeting, the IEPR Panel received an electronic version of the Olmsted Locks and Dam PACR documents and the final charge. A full list of the documents reviewed by the Panel is provided in Appendix B of this report. The Panel was instructed to address the charge questions/discussion points within a comment-response form provided by Battelle and to develop Preliminary Comments on the key technical issues.

3.4 Review of Individual Comments

Prior to completion of the review of the Olmsted Locks and Dam PACR documents, a teleconference with USACE, the Panel, and Battelle was held halfway through the review period to provide the Panel an opportunity to ask questions of USACE and clarify uncertainties regarding the project. At the end of the review period, the Panel produced approximately 128 individual comments and 19 Preliminary Panel Comments in response to the charge questions. Battelle reviewed the comments and provided discussion points and a summary of the concerns

not identified in the Preliminary Comments. Each panel member's individual comments and Preliminary Comments were shared with the full Panel.

3.5 IEPR Panel Teleconference

Battelle facilitated a 3-hour teleconference with the Panel so that the panel experts, many of whom are from diverse scientific backgrounds, could exchange technical information. The main goal of the teleconference was to identify which Preliminary Panel Comments should be carried forward as Final Panel Comments in the IEPR report and decide which panel member would serve as the lead author for the development of each Final Panel Comment. This information exchange ensured that the Final IEPR Report would accurately represent the Panel's assessment of the project, including any conflicting opinions. The Panel engaged in a thorough discussion of the overall positive and negative comments, added any missing issues of high-level importance to the findings, and merged any related individual comments. In addition, Battelle confirmed each Final Panel Comment's level of significance to the Panel.

The Panel also discussed responses to four specific charge questions where there appeared to be disagreement among panel members. The conflicting comments were resolved based on the professional judgment of the Panel, and all sets of comments were determined not to be conflicting. Each comment was either incorporated into a Final Panel Comment, determined to be consistent with other Final Panel Comments already developed, or determined to be a non-significant issue.

At the end of these discussions, the Panel identified eight comments and discussion points that should be brought forward as Final Panel Comments.

3.6 Preparation of Final Panel Comments

Following the teleconference, Battelle prepared a summary memorandum for the Panel documenting each Final Panel Comment (organized by level of significance). The memorandum provided the following detailed guidance on the approach and format to be used to develop the Final Panel Comments for the Olmsted Locks and Dam PACR:

- **Lead Responsibility:** For each Final Panel Comment, one Panel member was identified as the lead author responsible for coordinating the development of the Final Panel Comment and submitting it to Battelle. Battelle modified lead assignments at the direction of the Panel. To assist each lead in the development of the Final Panel Comments, Battelle distributed the merged individual comments table, a summary detailing each draft final comment statement, an example Final Panel Comment following the four-part structure described below, and templates for the preparation of each Final Panel Comment.
- **Directive to the Lead:** Each lead was encouraged to communicate directly with other IEPR panel members as needed and to contribute to a particular Final Panel Comment. If a significant comment was identified that was not covered by one of the original Final Panel Comments, the appropriate lead was instructed to draft a new Final Panel Comment.

- Format for Final Comments: Each Final Panel Comment was presented as part of a four-part structure:
 1. Comment Statement (succinct summary statement of concern)
 2. Basis for Comment (details regarding the concern)
 3. Significance (high, medium, low; see description below)
 4. Recommendation for Resolution (see description below).
- Criteria for Significance: The following were used as criteria for assigning a significance level to each Final Panel Comment:
 1. High: Describes a fundamental problem with the project that could affect the recommendation or justification of the project (e.g., “showstopper”)
 2. Medium: Affects the completeness or understanding of the reports/project
 3. Low: Affects the technical quality of the reports but will not affect the recommendation of the project.
- Guidance for Developing the Recommendation: The recommendation was to include specific actions that the USACE should consider to resolve the Final Panel Comment (e.g., suggestions on how and where to incorporate data into the analysis, how and where to address insufficiencies, areas where additional documentation is needed).

At the end of this process, eight Final Panel Comments were prepared and assembled. Battelle reviewed and edited the Final Panel Comments for clarity, consistency with the comment statement, and adherence to guidance on the Panel’s overall charge, which included ensuring that there were no comments regarding either the appropriateness of the selected alternative or USACE policy. There was no direct communication between the Panel and USACE during the preparation of the Final Panel Comments. The Final Panel Comments are presented in Appendix A of this report.

4. PANEL DESCRIPTION

Candidates for the Panel were identified using Battelle’s Peer Reviewer Database, targeted Internet searches using key words (e.g., technical area, geographic region), searches of websites of universities or other compiled expert sites, and referrals. Battelle prepared a draft list of primary and backup candidate panel members (who were screened for availability, technical background, and COIs), and provided it to USACE for feedback. Battelle made the final selection of panel members.

An overview of the credentials of the final four primary members of the Panel and their qualifications in relation to the technical evaluation criteria is presented in Table 2. More detailed biographical information regarding each panel member and his or her area of technical expertise is presented in the text that follows the table.

Table 2. Olmsted Locks and Dam PACR: IEPR Panel: Technical Criteria and Areas of Expertise

	Brown	Schlebusch	Burns	Shoudy
Cost Engineering (two experts needed)	X	X		
Minimum 10 years demonstrated experience in cost engineering analysis for public works projects	X	X		
Minimum 5 years experience with development of estimated construction costs and construction methods related to large civil works navigation projects	X			
Familiar with all applicable USACE regulations that require extensive knowledge of MCACES ^a 2 nd Generation (MII)	X ^b	X		
Familiar with all applicable USACE regulations that require extensive knowledge of CWWBS	X	X		
Familiar with all applicable USACE regulations that require extensive knowledge of critical path construction scheduling	X	X		
Licensed professional engineer, certified cost consultant/certified cost engineer, or certified estimating professional	X	X		
Minimum M.S. degree in appropriate field of study	X	X		
Economics (two experts needed)				
Minimum 10 years experience directly related to water resource economic evaluation or review			X	X
Minimum 5 years of experience dealing with USACE planning processes as outlined in ER-1105-2-100 Planning Guidance Notebook, specifically in regard to inland navigation studies, outlined in Appendix E			X	X
Minimum 2 years experience reviewing federal water resource economic documents justifying construction efforts			X	X
Minimum 5 years experience directly working for or with USACE is highly recommended			X	X
Minimum M.S. degree in economics			X	X

^a Microcomputer Aided Cost Engineering System (MCACES)

^b Panel member experienced with MCACES I only.

^c Civil Works Work Breakdown Structure (CWWBS)

Christopher Brown, P.E., Ph.D.

Role: This panel member was chosen primarily for his cost engineering experience and expertise.

Affiliation: University of North Florida

Dr. Christopher Brown is a professor at the University of North Florida teaching civil engineering, fluid mechanics, hydraulics, and engineering geology. He earned his Ph.D. in civil engineering in 2005 from the University of Florida and is a licensed professional engineer in FL and Pennsylvania. He has over 20 years of experience working on public works projects for the USACE (1991-2006) and as a private consultant focusing on geotechnical engineering, water resources planning, and civil engineering projects. He is experienced in developing estimated construction costs and construction methods related to large civil works navigation projects involving canals, ocean harbors, inland navigation, dredged material disposal, water borne construction, and subsurface barrier walls. Large Civil Works projects supported include C&D Canal Deeping Project in Maryland and Delaware and the Delaware Main Channel Deeping Project in Pennsylvania and New Jersey. Dr. Brown is familiar with all applicable USACE regulations that require an extensive knowledge of cost engineering applications. He is familiar with Microcomputer Aided Cost Engineering System (MCACES) I model estimates, and understands the assumptions and outputs associated with it. He has worked on a team developing the replacement of bridge sections along the Tamiami Trail in south Florida, a complex project costing over \$100 million and involving multiple contracts over a three year period. He is familiar with the basic Civil Works Work Breakdown Structure (CWWBS) and has utilized it on studies such as the Liquid Natural Gas tank foundation improvement in Martin County in 2009 as a part of a five part feasibility-level cost study. He has also utilized the CWWBS to develop feasibility-level cost estimates for the rehabilitation of embankments, outlets structures, and structures for the Iluka Mine, Green Cove, Florida. Dr. Brown is familiar with CPM scheduling, utilizing various software tools including Microsoft Project, Timeline, and self-programming inside Microsoft Excel. He developed PERT charts for the Iluka Mine project and has used Gantt charts for numerous projects including the New Jersey Coast Guard helicopter landing facility rehabilitation and replacement project.

Marc Schlebusch, P.E.

Role: This panel member was chosen primarily for his cost engineering experience and expertise.

Affiliation: CDM, Inc.

Marc Schlebusch is a cost engineer for CDM, Inc., specializing in cost estimates, construction schedules, and project controls for complex projects. He earned his M.S. in environmental engineering from the University of Iowa in 1997, has received formal training in MCACES, 2nd generation (MII), and is a licensed professional engineer in Kansas and Missouri. He has more than 10 years of demonstrated experience in civil cost engineering analysis, design, cost estimation, construction, and operations and maintenance. He is familiar with large, high visibility, complex, civil works projects, having provided cost estimating support for such projects as Louisiana Coastal Area Ecosystem Restoration and the Covent/Blind River Diversion Project, Louisiana and the Central City Project in Ft. Worth, Texas. Mr. Schlebusch is experienced with the development of estimated construction costs and construction methods

related to large civil works navigation projects including the Baptiste Collette Bayou Navigation Channel Deepening, Plaquemines Parish, Louisiana, an eight mile channel enlargement project; and the Central City Project in Ft. Worth, Texas, involving the relocation of a channel and installation of new dam structures. He is familiar with all applicable USACE regulations that require an extensive knowledge of cost engineering applications. He has extensive experience preparing MCACES MII cost estimates for USACE projects with values from \$1M to more than \$100M including feasibility, design, and construction level estimates for bypass channel/flood control, ecosystem restoration, floodwall demolition and construction, and hazardous site remediation. He is experienced in, and has completed cost estimates requiring, the use of CWWBS. Specific projects utilizing both MII and CWWBS include the Central City Project, Ft. Worth, Texas (estimated cost of \$681 million) and the Convent/Blind River Diversion Project, St. James Parish, Louisiana (estimated cost of \$123 million). Mr. Schlebusch is experienced in the use of CPP, and has prepared preliminary construction schedules for numerous projects including the Central City Project, Ft. Worth, Texas; and Hurricane Protection Projects, Jefferson Parish, Louisiana.

John Burns

Role: This panel member was chosen primarily for his economics experience and expertise.

Affiliation: CDM, Inc.

John Burns is a senior economist and program manager for CDM, Inc. specializing as a planner and economist. He earned his M.A. in Economics from Michigan State University in 1972. He has over 38 years of experience in the planning and economic analysis of multi-purpose water resources projects that provide navigation, flood damage reduction, water supply, water quality, and ecosystem restoration for USACE (1972-2000) and most recently in the private sector. He was the national manager for USACE's planning program for large-scale water resources projects, responsible for execution of USACE's \$140 million General Investigations Program, and for identifying areas requiring new policy direction. He provided expert assistance and policy direction to subordinate offices, helping them resolve complex issues and ensuring that engineering, economic, and environmental analyses guiding navigation, flood damage reduction, ecosystem restoration and other multi-purpose water resources investments and project operational changes were developed to meet the changing needs and priorities of the nation. Mr. Burns is recognized as one of the preeminent experts in federal water resources project policy, planning, and economics. He is experienced with high visibility, large, complex civil works projects as an economist, including his participation in the 2004 Economics Independent Technical Review Team for the Ohio River Mainstem System Study where he was the economics chairman. This study, conducted by the USACE Ohio River Division, was undertaken to develop a comprehensive plan for managing, maintaining, and improving the Ohio River navigation system. He is experienced in dealing with the USACE planning process as outlined in ER-1105-2-100 Planning Guidance Notebook, specifically in regard to inland navigation studies, outlined in Appendix E "Navigation". He has extensive experience analyzing navigation related projects, having applied his expertise to them as both a practitioner and a reviewer.

Harry Shoudy

Role: This panel member was chosen primarily for his economics experience and expertise.

Affiliation: Harry Shoudy Consulting

Harry Shoudy is the chief executive officer for Harry Shoudy Consulting in Henrico, NC. He earned a M.S. in water resources planning from Colorado State University in 1980 and has over 40 years of water resources planning, policy, and economics experience. Before forming his consulting firm in 2003, Mr. Shoudy worked for the USACE for more than 30 years. He performed and directed economic evaluations for the Buffalo District from 1972-1975 as the chief of economics. He served initially as a senior economist and ultimately as the chief economist for the South Atlantic Division, reviewing economic evaluations from 1975-1990. He served as a Senior Policy Advisor to the Board of Engineers for Rivers and Harbors from 1990-1992 as the Board economist and acted as study review manager performing economic and plan formulation reviews for the Board. He worked for USACE Headquarters from 1992-2003 providing project reviews, developing policy, issuing implementation guidance, and providing guidance and training, retiring as senior policy advisor and chief economist for USACE. Mr. Shoudy's USACE career was dedicated to water resources economic, planning, and policy areas and he has over 40 years experience applying Principles and Standards, Principles and Guidelines, and ER 1105-2-100 from its inception. He has participated in the planning and economic analysis of all types of water resources projects to include inland and deep draft navigation, hurricane/storm damage reduction, flood damage reduction, water supply, water quality, and ecosystem restoration. He has performed navigation studies for the Cleveland harbor navigation study, the Lake Erie/Lark Ontario Waterway study, and small boat harbor studies. His inland waterways experience includes Cross Florida Barge Canal, the Apalachicola River, and the Tennessee/Tom Bigbee Waterway. At the request of the U.S. State Department, Mr. Shoudy also provided technical planning, economic and plan formulation advice to the Commission for the Study of Alternatives to the Panama Canal, and assisted in the preparation of scopes of work as well as the review of the contractor reports.

5. SUMMARY OF FINAL PANEL COMMENTS

The Panel agreed on its "assessment of the adequacy and acceptability of the economic and cost engineering methods, models, and analyses used" (USACE, 2010; p. D-4) in the Olmsted Locks and Dam PACR document. The Panel generally agreed that the project is well justified under a range of possible future scenarios, and that the assumptions that underlie the economic and cost engineering analyses are sound. Furthermore, it was apparent and appreciated that a great deal of effort went into the cost risk analysis for the remaining dam costs, the benefit analysis, and the determination of the benefit-cost ratio for the Olmsted Locks and Dam project. However, the Panel believes that the Olmsted Locks and Dam PACR should provide updated key cost and economic data, a better explanation of the derivation of the benefits of the project, a risk and uncertainty section, and greater detail on the application of contingencies for all portions of the remaining work. The Panel also notes that the Executive Summary does not provide a complete synopsis of the information and analyses contained in the PACR, including significant design changes, reasons for cost increases, changes in project benefits, determination of the benefit-cost ratio, and recommendations. Inclusion of those items in the Executive Summary would improve the overall understanding of the PACR.

The following statements summarize the Panel's findings, which are described in more detail in the Final Panel Comments (see Appendix A).

Economics:

The Panel agreed that the Olmsted Locks and Dam PACR economics analysis clearly demonstrated the economic justification for completing the project. The Panel was impressed by the detailed development of five alternative coal forecasts and with the detailed rate studies that support project benefits. However, the Panel has concerns that the commodity forecasts are dated. The Panel believes that the inclusion of historic traffic tonnages from 2006-2009 and the display of projections by commodity would provide further support for the project. Additional sensitivity testing should also be conducted to include potential uncertainties such as environmental issues, concerns, and other variables, such as carbon dioxide emissions. This additional testing will provide the needed accounting for potential uncertainties but will not change the economic justification of the project. The Panel also notes that the description of the rate studies in the PACR should be expanded to improve the report's understanding.

In addition, the PACR provides some risk and uncertainty evaluations but the analyses could be better supported by the inclusion of a risk and uncertainty section that discusses and analyzes all areas of risk and uncertainty associated with the project. Finally, the Panel had concerns regarding the uncertainty of the coal projections and the sensitivity of potential environmental constraints on coal tonnage projections, as well as the use of the "fix-as-fail" operation and maintenance scenario for the without project condition and the treatment of "foregone costs" as negative costs in the benefit cost analysis.

Cost Engineering:

The Olmsted Locks and Dam PACR provides a significant level of detail to support the cost increases and the remaining construction costs. The cost risk analysis performed on the remaining dam costs was thorough and developed appropriate contingency estimates for the remaining unconstructed dam features. The PACR makes it clear this contingency is largely due to the dam construction methods, contracting mechanism, and funding inefficiencies. However, the cost risk analysis was completed in 1997 and does not clearly incorporate changes in construction, improved understanding of construction techniques, funding assumptions, and the economic climate in the intervening years. The contingencies for remaining work beyond the dam should also be based on a cost risk analysis, taking into account the complexity of the project and the remaining schedule. The Panel notes that the level of technical support with regard to the lock closure estimates could be enhanced by including documentation to clarify the lock closure estimates that are critical to the cost-benefit analysis.

Table 3 lists the eight Final Panel Comment statements by level of significance.

Table 3. Overview of 8 Final Panel Comments Identified by the Olmsted Locks and Dam PACR IEPR Panel

Significance – Medium	
1	The contingency cost should expand existing line items to account for cash flow issues that may arise over the next 5 years.
2	The lock closure days assumptions and estimated lock closure costs used in calculating project benefits are not well supported in the report.
3	The PACR does not include an update on historical tonnages and traffic projections by commodity or sensitivity tests, nor does it consider the impact of potential environmental constraints on coal tonnage projections.
4	The transportation rate analysis in Appendix A does not clearly describe the rate analysis methodology and derivation of project benefits.
5	The cost risk analysis and contingency determination does not include remaining work or consider experience with the dam construction methods, changes in dam construction assumptions, or changes in the economic climate that have occurred in the nearly four years since it was completed.
6	The without project future condition is not properly specified and authorized changes since the 1990 update are not clearly described.
7	The PACR does not include a report section that identifies, describes, and analyzes areas of risk and uncertainty for the project.
Significance – Low	
8	National Economic Development (NED) costs may not accurately reflect project implementation costs.

6. REFERENCES

Congressional Budget Office (CBO) (2010). October 2010 Monthly Budget Review. Accessed November 1, 2010. www.cbo.gov

Inland Waterways Trust Fund (IWTF) (2010). Inland Waterways Trust Fund Fact Sheet. <http://www.waterways.org/2010%20Website/IWTF/IWTF%20Fact%20Sheet.pdf>. November 2, 2010.

OMB (2004). Final Information Quality Bulletin for Peer Review. Executive Office of the President, Office of Management and Budget, Washington, DC. Memorandum M-05-03. December 16.

The National Academies (2003). Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports. The National Academies (National Academy of Science, National Academy of Engineering, Institute of Medicine, National Research Council). May 12.

USACE (2000b). Planning Guidance Notebook (ER 1105-2-100), April 22.

USACE (2007). Peer Review Process. Department of the Army, US Army Corps of Engineers, Washington, DC. CECW-CP Memorandum. March 30.

USACE (2010). Water Resources Policies and Authorities: Civil Works Review Policy. Department of the Army, US Army Corps of Engineers, Washington, DC. Engineer Circular (EC) No. 1165-2-209. January 31.

APPENDIX A
Final Panel Comments
on the
Olmsted Locks and Dam PACR IEPR

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Comment 1:

The contingency cost should expand existing line items to account for cash flow issues that may arise over the next 5 years.

Basis for Comment:

The Post Authorization Change Report (PACR) contains information on the construction cash flow (yearly work allowance) that the project has received over the last 15 years; this ranges from \$30,000,000 to \$110,000,000 and has fluctuated markedly as administration budgetary restrictions and focus areas change over time. The Crystal Ball software used by Walla Walla District to develop the Cost Risk Model has the capability of using the actual cash-flow distribution directly to create a customized variable distribution to forecast possible future trends. Using this option would more accurately model possible cost consequences from poor cash flow in the future.

If the cash flow is reduced year to year, the overall schedule is lengthened resulting in additional costs in design, construction management, labor, supplies, and possibly interest during construction.

Lastly, future federal budgets may be constrained significantly due to large structural budget deficits that currently exist (CBO, 2010). Matching funds from the Inland Waterways Trust Fund (IWTF) also may be similarly constrained. According to the IWTF 2010 fact sheet: "From its inception, the IWTF contained a surplus, with collections exceeding expenditures. In FY2009, for the first time, the Fund contained less than was needed. Collections are expected to be below need for the foreseeable future."

Significance – Medium:

The unknown contingency line items could increase the PACR cost estimate.

Recommendation(s) for Resolution:

1. Develop additional contingency scenarios with the risk model to determine if the contingency cost could be larger than currently forecast if the cash flow is less than assumed.
2. Use the past historical cash flow (work allowance) to define cash flow itself as a variable distribution in the primary new risk model scenario. Alternatively, reduce cash flow by 25% from currently assumed values.
3. Expand the discussion of funding inefficiencies to include a potential shortage in matching funds from the Inland Waterways Trust Fund.

Literature Cited:

Congressional Budget Office (CBO) (2010). www.cbo.gov website, October 2010 Monthly Budget Review, reviewed November 1, 2010.

Inland Waterways Trust Fund (IWTF) (2010). Inland Waterways Trust Fund Fact Sheet. <http://www.waterways.org/2010%20Website/IWTF/IWTF%20Fact%20Sheet.pdf>. November 2, 2010.

Comment 2:
The lock closure days assumptions and estimated lock closure costs used in calculating project benefits are not well supported in the report.
Basis for Comment:
<p>The PACR bases the lock closure estimates on engineering judgment with little to no discussion of underlying data (PACR, page 49). The Panel assumes that the needed information is contained within periodic inspection reports and annual inspection reports regarding the existing lock and dams developed by the U.S. Army Corps of Engineers (USACE) over the last 20 years. This information would better justify the underlying lock closure projections and project benefit assumptions by providing necessary supporting data. Since the actual lock closure assumptions are formulated based upon the supporting data, a firm understanding linking the assumptions to the data is critical.</p> <p>The PACR does not provide a discussion of how the repair construction costs for the existing Locks and Dam 52 and 53 were determined. There is no indication in the PACR whether these costs were solely based on engineering judgment tied to historic periodic inspections and annual inspections or if additional cost information (e.g., from other sources) was used to develop cost estimates used in the analysis.</p>
Significance – Medium:
Assumptions on lock closures drive the overall benefit calculations because the time savings in using the locks is a function of the number of closures.
Recommendation(s) for Resolution:
<ol style="list-style-type: none"> 1. Provide supporting data regarding lock closure estimates. The addition of excerpts from periodic/annual inspection reports or rehabilitation summaries in the main report would be very valuable supporting data. 2. Include full supporting data as an appendix to the PACR or as an attachment to Appendix A. 3. Provide a cross reference in Section 8.4 of Appendix A to the cost closure matrices in Attachment 1.

Comment 3:

The PACR does not include an update on historical tonnages and traffic projections by commodity or sensitivity tests, nor does it consider the impact of potential environmental constraints on coal tonnage projections.

Basis for Comment:

The historical tonnages displayed in the report are only up to the year 2005. Historical tonnages are available for lock and dam 52 and 53 by month, on an Excel spreadsheet supplied by the Nashville District during the Panel review, for years 2006 through 2009 and should be added to update the PACR. This information would provide a better foundation to support the waterborne traffic projections.

Projected waterborne tonnages are available by commodity from the Ohio River System forecasts published in April 2003. These projected tonnages were updated for the PACR and combined together as one total traffic tonnage. The projections should be shown by commodity in order to more fully understand the importance of each commodity relative to the total tonnage.

While the uncertainty of the coal projections is the primary concern regarding future tonnage projections, it is important to report the tonnages by commodity to demonstrate that the variations in coal projections will not impact the projections of the other commodities, with the exception of sorbent materials.

A no-growth sensitivity test was included in the PACR that held all traffic constant at the 2010 projection level of traffic. This sensitivity test does not address potential uncertainties related to the possible future environmental issues and concerns related to coal such as carbon dioxide emissions. Potential future coal-related environmental uncertainties should be identified and sensitivity analyses conducted to more fully capture the uncertainty of the coal projections and the impact on project justification.

Significance – Medium:

Reporting projections by commodity groups, updating existing tonnages, and focusing on additional coal sensitivity analysis will improve the understanding, completeness, and credibility of the economic analysis in the PACR report and more fully support the economic justification.

Recommendations for Resolution:

1. Update the recent historic traffic and include the historic traffic and traffic forecasts by commodity for Locks and Dam 52 and 53 in Appendix A.
2. Revise Appendix A to include a reporting of separate projections for coal.
3. Revise Appendix A to include a sensitivity analysis of future coal-related environmental uncertainties.

Comment 4:

The transportation rate analysis in Appendix A does not clearly describe the rate analysis methodology and derivation of project benefits.

Basis for Comment:

Rate data for the PACR were supplied by the Tennessee Valley Authority (TVA). A comparison of waterborne and land-based transportation rate data is essential in calculating the rate differential and the ultimate transportation savings of an inland navigation project. By adding a discussion of the TVA rate analysis methodology and an explanation of why the TVA rates are appropriate for use in the PACR analysis, the report would document USACE's consideration of the rates and the conclusion that the TVA rates were the best available for this analysis. The PACR should also provide further explanation of the Ohio River Navigation Investment Model (ORNIM) and how it relates to the derivation of the rate savings and transportation benefits. The resulting expanded discussion of the rate analysis methodology and the application of the rates in calculating the transportation savings would provide increased documentation and understanding and add credibility to the report.

The PACR identifies commodity rates; however, a total rate is shown for all commodities. The Panel assumed that the total rate is a result of the summation of individual commodity rates weighted by tonnage for each commodity. By providing a sample calculation to include the tonnage by commodity, the rate analysis evaluation would be better documented, supported, and understood.

Significance – Medium:

A more comprehensive discussion of the rate analysis methodology and benefit derivation will provide valuable documentation, increase the credibility, and provide an improved understanding of the total rate savings per ton and transportation savings estimates.

Recommendations for Resolution:

1. Expand the rate analysis methodology discussion (Appendix A) to include an explanation of why the rates are appropriate for this study and provide a sample calculation of the total rate.
2. Expand the discussion of the ORNIM in Appendix A, including how the ORNIM relates to the application of the rate savings and ultimate transportation benefit estimation.

Comment 5:

The cost risk analysis and contingency determination does not include remaining work or consider experience with the dam construction methods, changes in dam construction assumptions, or changes in the economic climate that have occurred in the nearly four years since it was completed.

Basis for Comment:

With the cost growth that has occurred on this project due to a variety of issues, some foreseen and some unforeseen, the contingency analysis should be revised to ensure that another PACR is not needed before the project is completed. The 2007 cost risk analysis was primarily performed to determine the level of contingency for the remaining work on the dam construction. However, a cost risk analysis was not conducted for the future work items. The cost risk analysis is a significant component of the current construction cost; however, it was not included as an appendix to the PACR.

The PACR does not give the reader a sense of the detailed cost risk analysis that was undertaken for the project. The remaining dam and future work costs and the associated contingencies are not well presented. The PACR does not provide the remaining dam construction costs associated with the contingency until Table 7 in Section 9, nor does the report present a schedule other than future funding allocations in Table 7. Contingency is presented as a single line item in Table 7 rather than being allocated by feature account. This makes it difficult to determine the level of contingency being applied for the various work items.

The 2007 cost risk analysis was thorough and considered issues that could impact the project related to the construction of the dam. The cost risk analysis resulted in a contingency of nearly 38% on the remaining dam work. However, nearly four years have passed since the cost risk analysis was initially prepared and in the intervening years the dam construction has progressed and the economic climate has changed. Items identified as risks in 2007 may no longer be project uncertainties (e.g., Item No. 1 - Sand Wave) and new risks may have been identified as construction has progressed (e.g., Item No. 61 – Spare Parts cited in the USACE presentation). Previous concerns relating to the dam construction techniques (e.g., Item No. 27 – Grout Mat Laying System) may now be diminished because of several years' worth of work experience. The economic downturn may have resulted in lower materials costs or resulted in a decrease in the shortage of skilled labor. Continuation of funding shortfalls may have resulted in additional project delays. Also, the cost-reimbursable contract vehicle itself may warrant higher contingencies on certain items based upon recent project experience with dam construction. It is important to revisit the cost risk analysis to ensure that the construction realities are adequately reflected in the contingencies and the 902 Cost Limit.

Considering the issues encountered on the project, including schedule delays due to design changes and an inadequate funding stream, the stated 5% contingency on remaining work may be low. It does not appear that the remaining work, valued at nearly

\$80 million before escalation, was subjected to a cost risk analysis to determine appropriate contingencies. While the future work is not as complex as the dam itself and may indeed have a low contingency, it may not be appropriate to apply a general 5% contingency to all categories.

Significance – Medium:

It is important to update the cost risk analysis to ensure that the PACR reflects the current project status and that the contingencies are adequately reflected in the 902 Cost Limit.

Recommendation(s) for Resolution:

1. Provide the cost risk analysis as an appendix to the PACR.
2. Expand the explanation of the development of the cost risk analysis and determination of contingencies in Section 8.2 of the PACR.
3. Provide a tabulation of the costs and contingencies to explain the project cost breakdown and the applicable contingencies by feature account.
4. Review and revise the contingency scenarios in the risk model to determine if the contingency cost needs to be increased or decreased from that currently forecast. Include new scenarios as needed.
5. Provide an explanation of how costs were escalated according to the remaining project schedule.
6. Conduct a cost risk analysis for future work to determine an appropriate contingency for individual feature accounts.

Comment 6:
The without project future condition is not properly specified and authorized changes since the 1990 update are not clearly described.
Basis for Comment:
<p>Paragraph 2.1 of the Economics Appendix states that “The without project condition used in the 1990 Benefit Update was essentially the same as that outlined in the November 1985 feasibility report, except for authorized changes that had occurred to the waterway system in the intervening years.” It is not clear what authorized changes are referred to in paragraph 2.1 of the Economics Appendix. Since “...impact assessment is the basis for plan evaluation, comparison and selection, clear definition and full documentation of the without-project condition are essential” (Page 2-3 of ER 1105-2-100).</p> <p>The without project condition assumes a “fix-as-fail” scenario. It is not clear that this assumption is consistent with ER 1105-2-100. The without project condition should assume normal operation and maintenance practices (Page 3-6 of ER 1105-2-100). Additionally, the without project condition should reflect rational economic behavior (Page 126 of the “Planning Manual”).</p>
Significance – Medium:
The assumption that the without project condition is based on the Federal government not efficiently funding Ohio River navigation operation and maintenance may overstate project benefits.
Recommendation(s) for Resolution:
<ol style="list-style-type: none"> 1. Compute the remaining benefits-remaining cost ratio assuming a least-cost without project future and include in the report. 2. Include, as part of the without project condition description, a list and description of the authorized changes referred to in paragraph 2.1 of the Economics Appendix.

Comment 7:
The PACR does not include a report section that identifies, describes, and analyzes areas of risk and uncertainty for the project.
Basis for Comment:
<p>The Principles and Guidelines (P&G) requires a risk-based approach to project analysis. The P&G requires that “planners shall identify areas of risk and uncertainty in their analysis and describe them clearly, so that decisions can be made with knowledge of the degree of reliability of the estimated benefits and costs and of the effectiveness of alternative plans.” (Page 1-3 of ER 1105-2-100).</p> <p>The Panel recognizes that several risk related areas were identified and analyzed in the PACR. Specifically, the Panel noted that the cost contingencies were determined using a risk-based approach, project benefits were computed using a “no growth” assumption, and alternative coal forecasts were considered in the analysis. However, a specific and more comprehensive “Risk and Uncertainty” section could be included in the report that identifies, describes, and analyzes these and other areas of risk and uncertainty for the project in order to be more responsive to the intent of P&G and provide a clearer understanding of the degree of reliability of the estimated benefits and costs.</p>
Significance – Medium:
A section on areas of risk and uncertainty for the whole project would aid the reader in more clearly understanding the reliability of the analysis.
Recommendation(s) for Resolution:
<ol style="list-style-type: none"> 1. Include a risk and uncertainty section in the PACR that discusses and analyzes all areas of risk and uncertainty associated with the project. Key areas to emphasize include engineering risks, environmental risks, institutional risks, and economic risks. (Page 1-3 of ER 1105-2-100) 2. At a minimum, incorporate the following variables required by ER 1105-2-100 (Page E-28): a) commodity forecasts, b) alternative mode costs, c) reliability of existing and proposed structures, and d) system delays associated with capacity constraints. 3. Include the following variables: a) cost and schedule risk, b) lock closure assumptions, and c) any other areas of risk and uncertainty identified by the Project Delivery Team.

Comment 8:

National Economic Development (NED) costs may not accurately reflect project implementation costs.

Basis for Comment:

National Economic Development (NED) costs should reflect the opportunity costs of direct or indirect resources consumed by project implementation. “In order to capture the opportunity costs of proposed plans, NED costs include three types of costs: implementation costs, other direct costs and associated costs” (Page 2-11 of ER 1105-2-100). Reducing project costs to reflect foregone costs results in the cost estimate no longer reflecting implementation costs.

The benefit-cost ratio has been calculated two different ways in the PACR. First, treating without-project condition costs foregone as a negative cost and, second, treating without-project condition costs foregone as a benefit. The discussion favors the calculation of costs foregone as a negative cost and only includes the calculation of costs foregone as benefits for informational purposes because it is required by Budget Engineering Circular (EC) guidance (Page 58 PACR). If costs foregone are treated as negative costs then NED costs may not reflect implementation costs.

Significance – Low:

In order to satisfy the requirements of ER 1105-2-100, the method for calculating NED costs should reflect implementation costs.

Recommendation(s) for Resolution:

1. Revise the report to state that costs foregone have been calculated as a benefit in accordance with the latest budget EC and that because costs foregone were calculated as a negative cost in the 1990 update that calculation is included for informational purposes.

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APPENDIX B

Final Charge to the Independent External Peer Review Panel

as

Submitted to USACE on October 5, 2010

on the

Olmsted Locks and Dam PACR

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APPENDIX B
Final Charge Questions and Guidance to the Peer Reviewers
for the
Olmsted Locks and Dam 52 and 53 Replacement Project Post Authorization Change
Report (Olmsted Locks and Dam PACR)

BACKGROUND

The purpose of Olmsted Locks and Dam 52 and 53 Replacement Project Post Authorization Change Report (Olmsted Locks and Dam PACR) is to recommend an increase in the maximum amount of funding that the U.S. Army Corps of Engineers (USACE) is authorized to spend on completion of the project, and to document the reasons for the recommendation. The report is required because the current estimated cost of completing the project exceeds the maximum cost limit, as defined in Section 902 of the Water Resources Development Act of 1988 (“902 cost limit”). The Olmsted Locks and Dam PACR project was authorized in the Water Resources Development Act of 1988 (PL 100-676). Initial construction funding was provided by the Energy and Water Development Appropriations Act of 1991.

The Olmsted Locks and Dam project is economically justified based on projected commercial transportation savings derived from reduced processing and congestion time, and represents a reinvestment in the nation’s inland navigation infrastructure. The Olmsted Locks and Dam project provides for a structure near Ohio River Mile 964.4 that would replace the existing Locks and Dam 52 and 53. The structure will consist of twin 110-foot by 1,200-foot locks adjacent to the Illinois bank, five tainter gates, a 1,400-foot navigable pass, and a fixed weir extending to the Kentucky bank. During low flow conditions, an upper pool having an elevation 300 feet at the dam would extend upstream to the Smithland Locks and Dam, a distance of 47 miles. Open river conditions will exist from the dam site to the mouth of the Ohio River, a distance of approximately 17 miles. The first construction contract was awarded on November 19, 1992 to construct the access road and resident engineer’s office. Since then, several contracts have been awarded and completed including those for the locks cofferdam, the locks, the approach walls and the operating and maintenance bulkheads. The contract for the construction of the dam was awarded January 28, 2004 and construction work is ongoing. Other contracts to be awarded in the future include the operation buildings, demolition of Locks and Dam 52 and 53, and various equipment contracts.

The Olmsted Locks and Dam PACR was prepared in accordance with the Planning Guidance Notebook, ER-1105-2-100, Appendix G dated June 2004. The Section 902 limit for the Olmsted Locks and Dam project is currently \$1,544,031,000, based on the authorized cost of \$775,000,000 as reported in the Report of the Chief of Engineers dated August 20, 1986 and the Water Resources Development Act of 1988. The authorized cost to construct the Olmsted Locks and Dam project was adjusted for inflation using the method described in ER 1105-2-100, Appendix G. The fully funded cost was estimated at \$1,389,031,000. Based on cost increases described in the Olmsted Locks and Dam PACR, the revised estimated cost is \$2,067,000,000. The Water Resources Development Act of 1988 authorized the Olmsted Locks and Dam project cost of \$775,000,000. These authorized costs, when brought to current price levels and inflated per Section 902 guidance, are \$1,337,959,000. The current cost estimate without inflation, at the

October 2007 price level, is \$1,991,000,000. The current cost estimate with inflation applied to the remaining cost to complete, at the October 2007 price level, is \$2,067,000,000. The increases in costs are not associated with changes in project purpose, local cooperation requirements, location of project, or because of modifications required by law. The changes in costs are a result of design changes, contract modifications, less than efficient funding, time extensions and other unanticipated increases in project first costs.

OBJECTIVES

The objective of this work is to conduct an independent external peer review (IEPR) of the Olmsted Locks and Dam 52 and 53 Replacement Project Post Authorization Change Report (Olmsted Locks and Dam PACR) in accordance with the Department of the Army, U.S. Army Corps of Engineers, Water Resources Policies and Authorities' *Civil Works Review Policy* (EC 1165-2-209) dated January 31, 2010, and the Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* released December 16, 2004.

Peer review is one of the important procedures used to ensure that the quality of published information meets the standards of the scientific and technical community. Peer review typically evaluates the clarity of hypotheses, validity of the research design, quality of data collection procedures, robustness of the methods employed, appropriateness of the methods for the hypotheses being tested, extent to which the conclusions follow from the analysis, and strengths and limitations of the overall product.

This purpose of the IEPR is to assess the “adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used” (EC 1165-2-209; p. D-4) for the Olmsted Locks and Dam PACR. The IEPR will be limited to technical review and will not involve policy review. The IEPR will be conducted by subject matter experts (i.e., IEPR panel members) with extensive experience in cost engineering and economics, and environmental issues relevant to the project. They should also have experience applying their subject matter expertise to inland navigation.

The IEPR Panel will be “charged” with responding to specific technical questions as well as providing a broad technical evaluation of the overall project. Per EC 1165-2-209, Appendix D, review panels should identify, explain, and comment upon assumptions that underlie all the analyses, as well as evaluate the soundness of models, surveys, investigations, and methods. Review panels should be able to evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable. Reviews should focus on assumptions, data, methods, and models. The panel members may offer their opinions as to whether there are sufficient analyses upon which to base a recommendation.

DOCUMENTS PROVIDED

The following is a list of documents and reference materials that will be provided for the review. **The documents and files presented in bold font are to be reviewed.** All other documents are provided for reference.

- **Olmsted Locks and Dam PACR Main Report**
- **Olmsted Locks and Dam PACR Appendices**
 - **Appendix A: Economics Update**
 - **Appendix B: Modifications During Construction**
 - **Appendix C: Section 902 Maximum Project Cost Computations, January 2008**
 - **Appendix D: Olmsted Locks and Dam FY08 Program Year (PY) PB-3**
 - **Appendix E: Certification of Independent Technical Review**
- Olmsted Locks and Dam Benefit Update, October 1990
- MCASES, 9 May 2007
- An Analytical Approach for Computing Lock Capacity, Technical Report H-78-25, December 1978
- Olmsted Dam Remaining Contract Contingency Analysis Quality Assurance Review, 8/21/2007
- Upper Ohio Navigation Study, Economics Appendix, Attachment 1, Ohio River Navigation Investment Model (ORNIM) Version 5.1, June 2010
- USACE guidance *Civil Works Review Policy* (EC 1165-2-209) dated January 31, 2010
- CECW-CP Memorandum dated March 31, 2007
- Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* released December 16, 2004.

SCHEDULE

Deliverables are noted with an asterisk (*)

TASK	ACTION	DUE DATE
Conduct Peer Review	Battelle sends review documents to panel members	10/13/2010
	Battelle/IEPR Panel kick-off meeting	10/13/2010
	USACE/Battelle/IEPR Panel kick-off meeting	10/14/2010
	Battelle convenes mid-review teleconference for Panel to ask clarifying questions of USACE	10/18/2010
	Panel members complete their review and submit responses to charge questions and Preliminary Panel Comments to Battelle for review	10/21/2010
Prepare Final Panel Comments and Final IEPR Report	Battelle provides comments on Preliminary Panel Comments to Panel	10/25/2010
	Battelle convenes panel review teleconference to discuss Preliminary Panel Comments	10/27/2010
	IEPR Final Panel Comments finalized	11/5/2010
	Battelle provides Final IEPR Report to Panel for review	11/9/2010
	Panel provides comments on Final IEPR Report	11/10/2010
	*Battelle submits Final IEPR Report to USACE	11/15/2010
Comment/ Response Process	Battelle inputs IEPR Final Panel Comments to DrChecks; Battelle provides IEPR Final Panel Comment response template to USACE	11/17/2010
	USACE provides draft Evaluator responses and clarifying questions	11/22/2010
	Battelle provides the Panel the draft Evaluator responses and clarifying questions	11/29/2010
	Panel provides Battelle with draft comments on draft Evaluator responses (i.e., draft BackCheck responses)	12/2/2010
	Teleconference with Battelle and Panel to discuss draft BackCheck responses	12/3/2010
	Teleconference between Battelle, IEPR Panel, and USACE to discuss IEPR Final Panel Comments, draft Evaluator responses, and clarifying questions	12/6/2010
	USACE inputs final Evaluator responses in DrChecks	12/13/2010
	Battelle provides Evaluator responses to Panel	12/14/2010
	Panel members provide Battelle with final BackCheck responses	12/20/2010
	Battelle inputs the Panel's BackCheck responses in DrChecks	12/22/2010
	*Battelle submits pdf printout of DrChecks project file and closes out DrChecks	12/23/2010

CHARGE FOR PEER REVIEW

Members of this IEPR Panel are asked to determine whether the technical approach and scientific rationale presented in the Olmsted Locks and Dam PACR are credible and whether the conclusions are valid. The panel members are asked to determine whether the technical work is adequate, competently performed, properly documented, satisfies established quality requirements, and yields scientifically credible conclusions. The IEPR Panel is being asked to provide feedback on the economics and cost-engineering analyses. The panel members are not being asked whether they would have conducted the work in a similar manner.

GENERAL CHARGE GUIDANCE

Please answer the scientific and technical questions listed below and conduct a broad overview of the Olmsted Locks and Dam PACR. Please focus on your areas of expertise and technical knowledge. Even though there are some sections with no questions associated with them, that does not mean that you cannot comment on them. Please feel free to make any relevant and appropriate comment on any of the sections and appendices you were asked to review.

In addition, please note the following guidance. Note that the IEPR Panel will be asked to provide an overall statement related to 1 and 2 below per USACE guidance (EC 1165-2-209; Appendix D).

1. Assess the adequacy and acceptability of the economics and cost-engineering methods, models, and analysis used.
2. If appropriate, offer opinions as to whether there are sufficient analyses upon which to base a recommendation for construction, authorization, or funding.
3. Identify, explain, and comment on assumptions that underlie economic and cost-engineering analyses.
4. Evaluate whether the interpretations of analysis and conclusions are reasonable.
5. Please focus the review on scientific information, including factual inputs, data, the use and soundness of models, analyses, assumptions, and other scientific and engineering matters that inform decision makers.

Please **do not** make recommendations on whether a particular alternative should be implemented, or whether you would have conducted the work in a similar manner. Also please **do not** comment on or make recommendations on policy issues and decision-making. Comments should be provided based on your professional judgment, **not** the legality of the document.

1. If desired, panel members can contact one other. However, panel members **should not** contact anyone who is or was involved in the project, prepared the subject documents, or was part of the USACE Independent Technical Review.
2. Please contact the Battelle deputy project manager (Lauren Baker-Hart, bakerhartl@battelle.org) or project manager (Karen Johnson-Young, johnson-youngk@battelle.org) for requests or additional information.

3. In case of media contact, notify the Battelle project manager immediately.
4. Your name will appear as one of the panel members in the peer review. Your comments will be included in the Final IEPR Report, but will remain anonymous.

Please submit your comments in electronic form to Lauren Baker-Hart, bakerhartl@battelle.org, no later than October 21, 2010, 10 pm EDT.

**Independent External Peer Review
Locks and Dam 52 and 53 Replacement Project Post Authorization Change Report
(Olmsted Locks and Dam PACR)**

Final Charge Questions

GENERAL QUESTIONS

1. Are the assumptions that underlie the economic and cost engineering analyses sound?
2. Please comment on the adequacy and acceptability of the economic and cost models and analyses used, as well as any assumptions made.
3. Are the interpretations of analysis and conclusions based on the analysis reasonable?

SECTION 1 – Description of Authorized Project

1.1 Relocations

No questions.

1.2 Reservoirs

No questions.

1.3 Dam

No questions

1.4 Locks

No questions.

1.5 Fish & Wildlife Facilities

No questions.

1.6 Roads, Railroads & Bridges

No questions.

1.7 Channels & Canals

No questions.

1.8 Bank Stabilization

No questions.

1.9 Cultural Resource Preservation

No questions.

1.10 Buildings, Grounds & Utilities

No questions.

1.11 Permanent Operating Equipment

No questions.

1.12 Construction Management

No questions.

1.13 Operation & Maintenance

No questions.

SECTION 2 – AUTHORIZATION

No questions.

SECTION 3 – FUNDING SINCE AUTHORIZATION

No questions.

SECTION 4 – CHANGES IN SCOPE OF AUTHORIZED PROJECT

No questions – section is blank

SECTION 5 – CHANGES IN PROJECT PURPOSE

No questions – section is blank

SECTION 6 – CHANGES IN LOCAL COOPERATION REQUIREMENTS

No questions – section is blank

SECTION 7 – CHANGE IN LOCATION OF PROJECT

No questions – section is blank

SECTION 8 – DESIGN CHANGES

8.1 Design Changes after Feasibility Report Plan (Authorization)

No questions.

8.2 Contingencies

4. In your opinion, considering the complexity of the project and the remaining schedule, are the proposed contingencies adequate?
5. Please comment on the adequacy of the risk assessment in determining the dam construction contingencies.
6. Please discuss the extent to which the Total Project Construction Cost Contingency Analysis is adequately described and justified.

SECTION 9 – CHANGES IN TOTAL PROJECT FIRST COSTS

7. Please discuss the extent to which the Total Project Cost Estimate adequately addresses all of the costs and is sufficient to complete the project.

9.1 Lands

No questions.

9.2 Cultural Resource Preservation

No questions.

9.3 Planning Engineering and Design

No questions.

9.4 Construction Management

No questions.

9.5 Operation & Maintenance

No questions.

9.6 Other Changes in First Costs

9.6.1 Increases due to Inflation

8. Please comment on the increases due to inflation.

9. Does the Civil Works Construction Cost Index System (CWCCIS) adequately address the cost increase due to inflation?

9.6.2.12 Future Construction Modifications

10. Does the estimate include sufficient contingencies for the future construction contracts? If not, what should be included?

9.6.6 Inefficient Funding

11. Are the impacts of inefficient funding adequately described? If not, what should be included?

9.7 Remaining project Costs

No questions.

SECTION 10 – CHANGES IN PROJECT BENEFITS

12. Please discuss the technical adequacy and credibility of the timeframe as well as the evaluated river rates.

10.1 Analysis History

Without Project Condition Average Annual Transportation Costs

13. Are the assumptions made regarding the future without project condition (Locks and Dams 52 and 53) reasonable and adequately justified? (reference Appendix A)

10.2 Analysis Models

14. Is the method used to account for system reliability with the Ohio River Navigation Investment Model (ORNIM) an accurate one? (reference Appendix A)

10.3 Input Assumption Updates

15. Is the selection of the Clear Skies alternative scenario for traffic demand forecasting a reasonable one? (reference Appendix A)
16. Are the reductions in without project capacity from the 1990 benefit update, owing to use of the Waterways Analysis Model, sufficiently justified? (reference Appendix A)

10.4 Benefit Update Comparison

Transportation Rate Savings

17. Please comment on the clarity of the alternative cost and benefit estimates presented.

18. Address the inclusion of fuel tax revenues in the recommended plan National Economic Development (NED) benefit. (reference Appendix A)

SECTION 11- BENEFIT-COST RATIO

11.1 Construction Cost Interest During Construction

19. Please review interest during construction and amortization calculations.

11.2 Benefit – Cost Ratio (Benefit to Remaining Cost Ratio)

No questions.

11.3 Total Benefit – Cost Ratio (Benefit to Total Cost Ratio)

20. Please comment on whether or not you are in agreement with how the benefits and costs (transportation and construction costs) were derived. Were all factors considered?
21. Are the tonnage estimates and forecasts thorough, reasonable, based on well-founded assumptions, and related to economic factors?
22. Address the extent to which the methods for performing benefit cost analysis, including use of discount rates, is adequately described and justified.
23. Does the sensitivity analysis adequately capture the economic uncertainty of the project?

SECTION 12- CHANGES IN COST ALLOCATION

No questions.

SECTION 13- CHANGES IN COST APPORTIONMENT

No questions.

SECTION 14- ENVIRONMENTAL CONSIDERATIONS IN RECOMMENDED CHANGES

No questions.

SECTION 15- PUBLIC INVOLVEMENT

No questions.

SECTION 16- HISTORY OF PROJECT

No questions.

SECTION 17- CONCLUSION

24. Comment on the adequacy and conclusions of the review regarding the potential impact during construction.
25. Please comment on the extent to which significant project construction costs have been adequately identified and described.

SECTION 18- RECOMMENDATION

26. The recommendation of this report is to reauthorize the Olmsted Locks and Dam project at \$2,067,000,000; comment on this conclusion.

APPENDIX A – ECONOMICS UPDATE

27. Should other factors have been included in the analysis?
28. Please review any significant alterations in assumptions or methodology between the 2007 economic update presented in this appendix and the 1990 Benefit Update. Are these reasonable and sufficiently explained and justified?
29. Are lock capacity, traffic/tonnage forecast, transportation rate, and cost/closure assumptions reasonable and sufficiently justified?
30. Please review the use of the Waterways Analysis Model as detailed in Appendix A.
31. Please comment on the technical adequacy and credibility of the projected net benefits.
32. Are there additional key assumptions that should be considered for the “without project” conditions?
33. Discuss the extent to which the no action/without project condition is clearly defined.

APPENDIX B – MODIFICATIONS DURING CONSTRUCTION

No questions.

Appendix C – Section 902 Maximum Project Cost Computation

No questions.

APPENDIX D – OLMSTED L&D FY08 PROGRAM YEAR PB-3

No questions.

APPENDIX E – CERTIFICATION OF INDEPENDENT TECHNICAL REVIEW

No questions.

Comment Report: All Comments

Project: OLMSTED L & D PACR IEPR

Review: PACR IEPR

Displaying 8 comments for the criteria specified in this report.

Id	Discipline	Section/Figure	Page Number	Line Number
3613415	Cost Engineering	n/a'	Comment 1	n/a

(Document Reference: [Significance - Medium](#))

The contingency cost should expand existing line items to account for cash flow issues that may arise over the next 5 years.

(Attachment: [Olmsted__IEPR_Comment_1.doc](#))

Submitted By: [Julian Digialleonardo](#) (561-656-6303). Submitted On: 16-Nov-10

Revised 16-Nov-10.

1-0 Evaluation Concurred

Concur. The PACR will be amended with additional explanation of the dam cost risk analysis, as well as expanded discussion of cash flow and consideration of funding scenarios. All 3 recommendations will be adopted (see attached).

Submitted By: [Rebecca Moyer](#) (251-690-2065) Submitted On: 13-Dec-10

(Attachment: [Comment_1_Olmsted_PACR_IEPR.docx](#))

1-1 Backcheck Recommendation Close Comment

Concur.

Submitted By: [Julian Digialleonardo](#) (561-656-6303) Submitted On: 22-Dec-10

Current Comment Status: **Comment Closed**

3613418	Cost Engineering	n/a'	Comment 2	n/a
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(Document Reference: [Significance - Medium](#))

The lock closure days assumptions and estimated lock closure costs used in calculating project benefits are not well supported in the report.

(Attachment: [Olmsted__IEPR_Comment_2.doc](#))

Submitted By: [Julian Digialleonardo](#) (561-656-6303). Submitted On: 16-Nov-10

Revised 16-Nov-10.

1-0 Evaluation Concurred

1. Adopt. The periodic/annual inspection reports and rehabilitation summaries were considered to be too voluminous to enclose in the PACR. A summary prepared by engineering Division will be included in the revised PACR. Excerpt from the engineering summary follows: The information was developed by reviewing historical records associated with the Corps of Engineers' Lock Performance Monitoring System (LPMS) data, Operations repair reports and field notes and historical notices to navigation. In general, the Operations repair reports coupled with historical navigation notices generally provided the most reliable set of historical data to draw from when developing the cost and closure information. 2. Adopt. The engineering summary document will be added to Appendix A Attachment 1. 3. Adopt.

Submitted By: [Rebecca Moyer](#) (251-690-2065) Submitted On: 13-Dec-10
(Attachment: [Comment_2_Cost_Closure_Engineering_Summary.docx](#))

1-1 Backcheck Recommendation Close Comment

Concur.

Submitted By: [Julian Digialleonardo](#) (561-656-6303) Submitted On: 22-Dec-10

Current Comment Status: **Comment Closed**

3613424 Economics n/a' Comment 3 n/a

(Document Reference: **Significance - Medium**)

The PACR does not include an update on historical tonnages and traffic projections by commodity or sensitivity tests, nor does it consider the impact of potential environmental constraints on coal tonnage projections.

(Attachment: [Olmsted__IEPR_Comment_3.doc](#))

Submitted By: [Julian Digialleonardo](#) (561-656-6303). Submitted On: 16-Nov-10

1-0 Evaluation Concurred

Concur. The PACR will be revised to include more recent traffic displays, as well as more detailed displays of the commodity traffic forecasts and explanation of the low growth/no growth scenarios. All 3 recommendations will be adopted and the PACR revised accordingly (see attached).

Submitted By: [Rebecca Moyer](#) (251-690-2065) Submitted On: 13-Dec-10
(Attachment: [Comment_3_Olmsted_PACR_IEPR.docx](#))

1-1 Backcheck Recommendation Close Comment

Concur

Submitted By: [Julian Digialleonardo](#) (561-656-6303) Submitted On: 22-Dec-10

Current Comment Status: **Comment Closed**

3613429 Economics n/a' Comment 4 n/a

(Document Reference: [Significance - Medium](#))

The transportation rate analysis in Appendix A does not clearly describe the rate analysis methodology and derivation of project benefits.

(Attachment: [Olmsted_IEPR_Comment_4.doc](#))

Submitted By: [Julian Digialleonardo](#) (561-656-6303). Submitted On: 16-Nov-10

1-0 Evaluation Concurred

The PACR will be revised to include additional discussion of the transportation rate analysis and both recommendations will be adopted (see attached).

Submitted By: [Rebecca Moyer](#) (251-690-2065) Submitted On: 13-Dec-10

(Attachment: [Comment_4_Olmsted_PACR_IEPR.docx](#))

1-1 Backcheck Recommendation Close Comment

Concur

Submitted By: [Julian Digialleonardo](#) (561-656-6303) Submitted On: 22-Dec-10

Current Comment Status: **Comment Closed**

3613431 Economics n/a' Comment 5 n/a

(Document Reference: [Significance - Medium](#))

The cost risk analysis and contingency determination does not include remaining work or consider experience with the dam construction methods, changes in dam construction assumptions, or changes in the economic climate that have occurred in the nearly four years since it was completed.

(Attachment: [Olmsted_IEPR_Comment_5.doc](#))

Submitted By: [Julian Digialleonardo](#) (561-656-6303). Submitted On: 16-Nov-10

1-0 Evaluation Concurred

The PACR will be revised with additional explanation of the dam cost risk analysis. All six panel recommendations will be adopted (see attachments).

Submitted By: [Rebecca Moyer](#) (251-690-2065) Submitted On: 13-Dec-10

(Attachment: [Comment_5_Olmsted_PACR_IEPR.docx](#))

1-1 Backcheck Recommendation Close Comment

Concur.

Submitted By: [Julian Digialleonardo](#) (561-656-6303) Submitted On: 22-Dec-10

Current Comment Status: **Comment Closed**

3613434 Economics n/a' Comment 6 n/a

(Document Reference: Significance - Medium)

The without project future condition is not properly specified and authorized changes since the 1990 update are not clearly described.

(Attachment: [Olmsted_IEPR_Comment_6.doc](#))

Submitted By: [Julian Digialleonardo](#) (561-656-6303). Submitted On: 16-Nov-10

1-0 Evaluation Concurred

The PACR will be revised to include additional description of the without project condition. One of two panel recommendations will be adopted (see attached).

Submitted By: [Rebecca Moyer](#) (251-690-2065) Submitted On: 13-Dec-10
(Attachment: [Comment_6_Olmsted_PACR_IEPR.docx](#))

1-1 Backcheck Recommendation Close Comment

Concur. The Panel also recommends that the PACR revision clearly indicate that the "fix-as-fail" assumption is consistently applied to both with- and without-project conditions.

Submitted By: [Julian Digialleonardo](#) (561-656-6303) Submitted On: 22-Dec-10

Current Comment Status: **Comment Closed**

3613440	Economics	n/a'	Comment 7	n/a
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(Document Reference: Significance - Medium)

The PACR does not include a report section that identifies, describes, and analyzes areas of risk and uncertainty for the project.

(Attachment: [Olmsted_IEPR_Comment_7.doc](#))

Submitted By: [Julian Digialleonardo](#) (561-656-6303). Submitted On: 16-Nov-10

1-0 Evaluation Concurred

The PACR will be revised with a summary section to discuss the areas of risk and uncertainty relevant to cost engineering and economics. All 3 panel recommendations will be adopted.

Submitted By: [Rebecca Moyer](#) (251-690-2065) Submitted On: 13-Dec-10

1-1 Backcheck Recommendation Close Comment

Concur.

Submitted By: [Julian Digialleonardo](#) (561-656-6303) Submitted On: 22-Dec-10

Current Comment Status: **Comment Closed**

3613442	Economics	n/a'	Comment 8	n/a
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(Document Reference: [Significance - Low](#))

National Economic Development (NED) costs may not accurately reflect project implementation costs.

(Attachment: [Olmsted_IEPR_Comment_8.doc](#))

Submitted By: [Julian Digialleonardo](#) (561-656-6303). Submitted On: 16-Nov-10

1-0 Evaluation Concurred

1. Adopt. The relevant PACR and Appendix A Sections will be re-written as follows: "Project formulation and selection of a recommended plan is done by calculation and comparison of the alternative's net benefit (costs minus benefits); or more specifically the alternative's incremental net benefit over the base or without-project condition. Despite this, a benefit-to-cost ratio (BCR) is an often referenced performance metric of a cost benefit analysis. For this metric, the analysis period benefit and cost cash flows are discounted, amortized, and divided; the BCR is defined as the average annual equivalent benefits divided by average annual equivalent costs. The BCR has traditionally only been used as a summary statistic demonstrating the economic viability of the alternative (i.e. $BCR > 1.0$). Traditionally in the Ohio River Division (ORD), and now in the Great Lakes and Ohio River Division which replaced ORD, this BCR has been calculated as an incremental benefit to incremental cost ratio. This means that the without-project condition costs foregone are subtracted from the recommended plan construction cost to reflect an actual incremental cost of the investment over the base condition. This ratio is dependent upon the discount and amortization rate, and upon which specific cash flows are considered benefits and which specific cash flows are considered costs. Depending upon the specific cash flows, an incremental benefit to incremental cost ratio will typically be higher than a straight benefit to cost ratio where costs foregone are counted as a benefit (rather than a negative cost). "

Submitted By: [Rebecca Moyer](#) (251-690-2065) Submitted On: 13-Dec-10

1-1 Backcheck Recommendation Close Comment

Concur. The Panel also recommends that the second sentence in paragraph 11.3.2 of the PACR and the second sentence in paragraph 10.2.2 of Appendix A be rewritten to read "The BCRs utilizing this methodology are calculated and compared in Table XX."

Submitted By: [Julian Digialleonardo](#) (561-656-6303) Submitted On: 22-Dec-10

Current Comment Status: **Comment Closed**
