

REVIEW PLAN

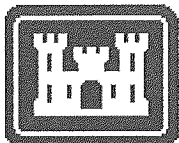
UNIT 4 INTAKE AND DISCHARGE BULKHEAD REPLACEMENT

P2 # 111604

WEST POINT POWERHOUSE, GEORGIA
U.S. Army Corps of Engineers
Mobile District
South Atlantic Division

13 JUNE 2014

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REVIEW PLAN

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REVIEW PLAN

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REVIEW PLAN

UNIT 4 INTAKE AND DISCHARGE BULKHEAD REPLACEMENT WEST POINT POWERHOUSE, GEORGIA

1. INTRODUCTION

a. Purpose

The purpose of this Review Plan (RP) is to describe the technical review process for the Unit 4 Intake and Discharge Bulkhead Replacement project at the West Point Powerhouse, Georgia (**P2 # 111604**). The RP is a living document and may change as the project progresses. This RP shall be posted to the Mobile District's website when completed.

U.S. Army Corps of Engineers (Corps) guidance for conduct of this review is contained in Engineer Circular (EC) 1165-2-214, Civil Works Review Policy, dated 15 Dec 2012. EC 1165-2-214 provides procedures for ensuring the quality and credibility of the Corps decision and implementation documents through an independent review process. It complies with Section 515 of Public Law (P.L.) 106-554 (referred to as the "Information Quality Act"); and the Final Information Quality Bulletin for Peer Review by the Office of Management and Budget (referred to as the "OMB Peer Review Bulletin"). It also provides guidance for the implementation of Section 2034 of WRDA 2007 (P.L. 110-114).

b. Project Description and Information

West Point Dam is located on the Chattahoochee River 201.4 miles above the mouth in the western-most part of Georgia approximately 3 miles north of West Point, Georgia and 12 miles southeast of LaGrange, Georgia. The dam is located between two Non-USACE dams operated by Georgia Power. Morgan Falls Dam is located approximately 110 river miles upstream and



Figure 1: West Point Project Aerial Photograph

Langdale Dam is approximately 10 river miles downstream. The reservoir is located in the Apalachicola-Chattahoochee-Flint (ACF) River Basin in Chambers and Randolph counties in Alabama and Troup and Heard counties in Georgia.

Physical Project Description

The West Point Dam is a concrete gravity type structure with rolled earthen embankments joining the high ground on the east and west sides of the river. The total length of the concrete dam and earth embankments is 7,250 feet. At the top of the structures, elevation 652 feet above mean sea level (MSL), the length of the concrete portion of the dam is 896 feet. The principal structures that make up the concrete dam are a non-overflow section, an intake-powerhouse structure, a gated spillway located in the main river channel, and concrete gravity abutment walls which supports the left earth embankment.

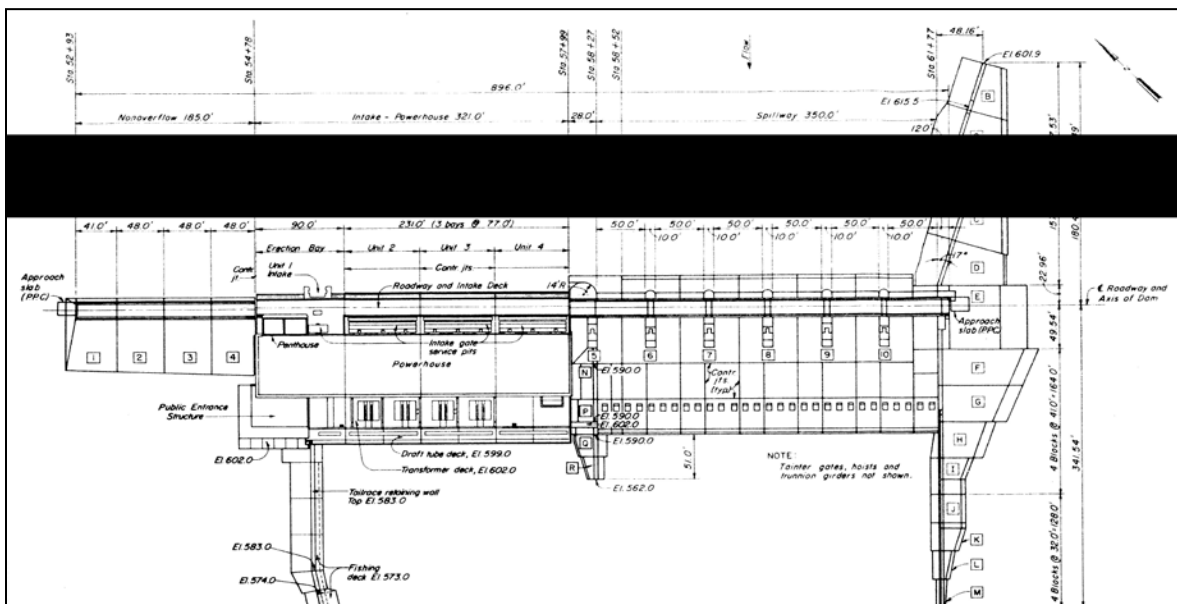


Figure 2: Plan View of Principle Structures

Powerhouse and Intake

The powerhouse and intake structure are integrated into a reinforced concrete unit which acts as a part of the dam. The structure is 321 feet in length and consists of four monoliths located between the spillway and non-overflow section. Each monolith joint extends from the foundation to the powerhouse roof and intake deck. The landward monolith adjacent to the non-overflow section provides access to the plant and contains the erection bay, service area, and equipment rooms. The main entrance is at elevation 602 feet MSL which permits operation of the generator room without adverse effects from the Spillway Design Flood (SDF), tailwater elevation 597 feet MSL. The intake structure provides waterway openings for three main generating units (two installed initially and one for a future unit) and one small generating unit to provide continuous minimum flow releases. A concrete bulkhead was installed in the future unit intake bulkhead slot to close the intake water passage. The additional generating unit has not

been installed, so the temporary bulkhead is still in place to date. Two intermediate piers are located in each main intake opening to meet structural requirements. The main units have three service gate openings 17 feet wide by 30 feet high. The small unit has a waterway opening that is 15 feet wide by 30 feet high at the upstream face of the structure. Trash racks are located on the upstream face of the intake to allow for easy access and cleaning. A set of stoplogs for one gate slot are available to facilitate the removal on an intake gate for inspection and repair. Stoplogs and trash racks will be placed and removed by a mobile crane.

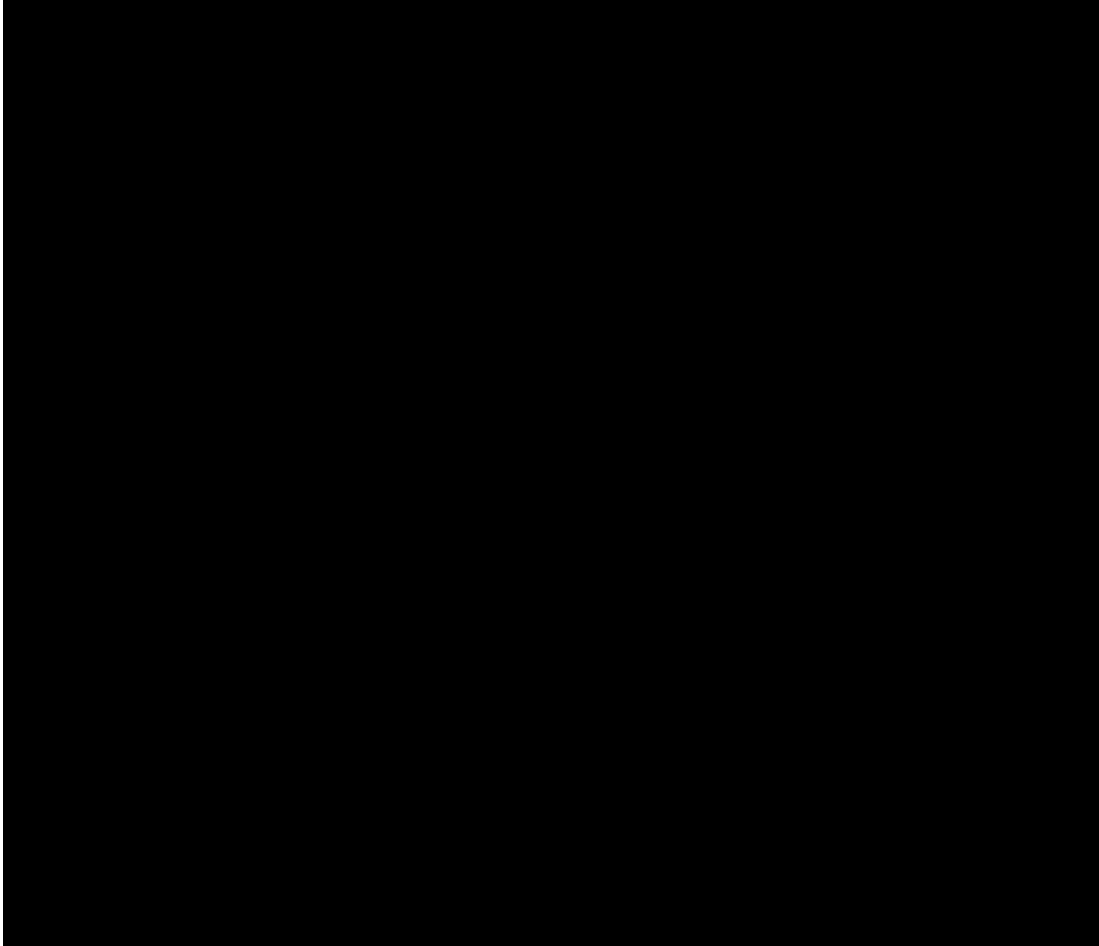


Figure 3: Powerhouse Typical Section

c. Information for Review

When the powerhouse was completed in 1975, the concrete infrastructure for a fourth turbine generator unit (Unit 4) was constructed with temporary concrete stoplogs (bulkheads) placed in the intake and discharge bulkhead slots. A service gate for the future Unit 4 was never installed. Within the last five years, a leak between the second and third temporary intake stoplogs has developed. The leakage rate fluctuates with seasonal temperatures as the concrete expands and contracts. Estimates using station sump pump run times range from 80 gpm during summer months to 300 gpm during the winter. The temporary discharge bulkheads are submerged due to normal tailwater elevations making inspection difficult. A catastrophic failure of the intake bulkheads would flood the entire powerhouse endangering plant personnel and the general

population downstream. As a result of this potential failure, based on the recent Periodic Assessment report, the Dam Safety Oversight Group (DSOG) decreased the Dam Safety Action Classification (DSAC) from a DSAC III to a higher risk DSAC II. The purpose of the Unit 4 Intake and Discharge Bulkhead Replacement project will be to permanently plug the Unit 4 intake slots and to build new concrete stop logs for the discharge. Engineering products that will be provided for review include Final Plans and Specifications, a Design Documentation Report, As-Built drawings of original construction, Design Memorandum 32, Volume II, and West Point Operations and Maintenance Manuals Volume I and II.

d. Real Estate Requirements

There are no additional Real Estate or perpetual easement acquisitions required for the Unit 4 Intake and Discharge Bulkhead Replacement project.

e. Project Delivery Team

The Project Delivery Team (PDT) is comprised of those individuals involved directly in the development of the implementation documents. The individual contact information and disciplines of the Mobile District PDT are included in Attachment 2 of this document.

f. Levels of Review

This Review Plan (RP) describes the levels of review and the anticipated review process for the various documents to be produced. All levels of review are addressed in this RP: District Quality Control (DQC) and Biddability, Construct Ability, Operability, Environmental, and Sustainability (BCOES), and Agency Technical Review (ATR) and Independent External Peer Review (IEPR) in coordination with the Risk Management Center (RMC).

g. Review Team

Review Management Office: The USACE Risk Management Center (RMC) is the Review Management Organization (RMO) for dam safety related work, including this RP. Contents of this review plan have been coordinated with the RMC and the South Atlantic Division, the Major Subordinate Command (MSC). Informal coordination with SAD will occur throughout the project development, including briefings to the SAD Dam Safety Committee and Program Review Board updates. In-Progress Review (IPR) team meetings with the RMC, SAD, and HQ will be scheduled on an “as needed” basis to discuss programmatic, policy, and technical matters. The SAD Dam Safety Program Manager will be the POC for vertical team coordination. This review plan will be updated for the construction phase once funded.

Agency Technical Review Team: At a minimum, the following disciplines should be represented on the ATR team. All ATR members shall be certified in the Corps of Engineers Reviewer Certification and Access Program (CERCAP) system.

Required ATR Team Expertise: The ATR team will be chosen based on each individual’s qualifications and experience with similar projects.

ATR Lead: The RMC will assign the ATR lead. The ATR team is a senior professional with extensive experience in preparing Civil Works documents and conducting ATRs (or ITRs). The lead has the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline, in this case, Structural Engineering.

Structural Engineer: Team member should have experience in the analysis and design of large monolithically poured concrete structures as well as working knowledge of hydropower operations, construction in confined spaces, and general worker safety concerns.

2. REQUIREMENTS

a. Reviews

The review of all work products will be in accordance with the requirements of EC 1165-2-209 by following the guidelines established within this review plan. All engineering and design products will undergo District Quality Control Reviews.

i. District Quality Control: All documents to be produced will undergo District Quality Control (DQC). DQC is the review of basic science and engineering work products focused on fulfilling the project quality. Major subordinate command (MSC) and District quality management plans address the conduct and documentation of this fundamental level of review. DQC will be managed by SAM in accordance with ER 1110-1-12, Engineering & Design Quality Management, EC 1165-2-214, Civil Works Review Policy, and the District Quality Management Plan. The DQC will include quality checks and reviews, supervisory reviews, PDT reviews, and BCOES reviews required by ER-1110-1-12. The DQC review will be completed prior to submitting documents for ATR. Documentation of the DQC review as contained in DrChecks will be certified during the ATR that DQC activities were sufficient and documented.

ii Engineering and Construction, Biddability, Construct Ability, Operability, Environmental and Sustainability (BCOES): The value of BCOES reviews is based on minimizing problems during the construction phase through effective checks performed by knowledgeable, experienced personnel prior to advertising for a contract. Biddability, Constructability, Operability, Environmental, and Sustainability requirements must be emphasized throughout the planning and design processes. This will help to ensure that the government's contract requirements are clear, executable, and readily understandable by private sector bidders or proposers. It will also help ensure that the construction may be done efficiently and in an environmentally sound manner, and that the construction activities and projects are sufficiently sustainable. Finally, effective BCOES reviews of design and contract documents will reduce risks of cost and time growth, unnecessary changes and claims, as well as support safe, efficient, sustainable operations and maintenance by the facility users and maintenance organization after construction is complete.

iii. Agency Technical Review (ATR): All documents produced as part of this effort will undergo ATR to ensure consistency with established criteria, guidance, procedures, and policy. ATR is an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the day-to-day production of the project/product. The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. The ATR will assess whether the analyses presented are technically correct and comply with published Corps guidance, that design plans and specifications and supporting analyses are clear, constructible, environmentally sustainable, operable, and maintainable.

The ATR team will consist of the individuals that represent the significant disciplines involved in the accomplishment of the work. ATR will be managed within the Corps and conducted by senior Corps personnel outside of the Mobile District that are not involved in the day-to-day production of the project. DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. The documents to be reviewed are the Design Memorandum, original Powerhouse contract drawings, and the proposed technical plans, specifications and design analysis. The PDT will evaluate comments in DrChecks and revise the documents as necessary. The ATR leader will be from outside the MSC, and must complete a statement of technical review for all final products and final documents. By signing the ATR certification, the district leadership certifies policy compliance of the document and also that the DQC activities were sufficient and documented.

iv. Independent External Peer Review: Independent External Peer Review (IEPR) is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of the Corps is warranted. Type II IEPR, Safety Assurance Review, is applicable to implementation documents for projects where potential hazards pose a significant threat to human safety (public safety). Given the catastrophic nature of the potential Unit 4 temporary intake bulkhead failure, based on criteria contained in EC 1165-2-214, the District Chief of Engineering, as the Engineer-In-Responsible-Charge, recommends a Type II IEPR Safety Assurance Review for this project. The IEPR will be conducted by a Level 3, Structural engineer. Level 3 requires a minimum of 15 years of specialized experience and considered to be an expert in their field.

v. Policy and Legal Compliance Review: Policy and Legal Compliance Review is required for decision documents. Since this RP is not a decision document it does not require a Policy and Legal Compliance Review. The project consists of the replacement of existing components interior to the powerhouse, and therefore presents no environmental implications. Construction will comply with applicable industry codes and EM 385-1-1, USACE Safety and Health Requirements.

vi. Peer Review of Sponsor In-Kind Contributions: There will be no in-kind contributions for this RP.

b. Approvals

The MSC for this RP is the South Atlantic Division. The MSC Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving the Mobile District, MSC, RMC and HQUSACE members) as to the appropriate scope and level of review for the study and endorsement by the RMC. Like the PMP, the Review Plan is a living document and may change as the study progresses. The District is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval will be documented in an Attachment to this plan. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-endorsed by the RMC and re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, will be posted on the District's webpage and linked to the HQUSACE webpage.

3. GUIDANCE AND POLICY REFERENCES

- EC 1165-2-214, Civil Works Review, 15 Dec 2012
- ER 5-1-11, USACE Business Process, 1 Nov 2006
- ER 415-1-11, Engineering and Construction, Biddability, Construct Ability, Operability, Environmental and Sustainability (BCOES) Reviews, 1 Jan 2013
- ER 1110-1-12, Engineering and Design Quality Management, 31 March 2011(Change 2)
- ER 1110-2-1156, Safety of Dams – Policy and Procedure, 31 Mar 2014

4. SUMMARY OF REQUIRED LEVELS OF REVIEW

The dam safety program follows the policy review process described in EC1165-2-214, Civil Works Review Policy. The RMC will be the review management office for the ATR and IEPR. The RMC must certify that the risk assessment was completed in accordance with the USACE current guidelines and best risk management practices. A Quality Control and Consistency (QCC) review will be conducted including the district, MSC, and RMC.

5. REVIEW SCHEDULE AND COSTS

The cost for DQC, BCOES, ATR, and the IEPR is estimated to be approximately \$5,000, \$5,000, \$5,000, and \$25,000 respectively. The documents to be reviewed and scheduled dates for review are as follows:

Documents	Review	Schedule Dates
100% Unreviewed P&S	DQC	26-27 May 14
Final P&S, and DQC Cmts	BCOES	4-10 Jun 14
Final P&S, and DQC and BCOES Cmts	ATR	23 Jul 14 – 6 Aug 14
Final P&S, and DQC, BCOES Cmts	IEPR	23 Jul 14 – 22 Aug 14

6. PUBLIC PARTICIPATION

The review plan will be made accessible to the public for thirty (30) days through the Mobile District website link <http://www.sam.usace.army.mil/>. Public review of the review plan can begin as soon as it is approved by the Division Commander and posted by the Mobile District. Comments made by the public will be available to the review team.

7. EXECUTION PLAN

a. District Quality Control

i General: DQC will be conducted after completion of the final plans and specifications. DQC requires both supervisory oversight and District technical experts. The District will conduct a robust DQC in accordance with EC 1165-2-214, Civil Works Review Policy, the District's Quality Management Plan, and ER 1110-2-12, Quality Management. Documentation of DQC activities is required and will be in accordance with the District and MSC Quality manuals. The DQC and ATR will be concurrent. Comments and responses from DQC will be available for the ATR team to review through ProjNet DrChecks.

ii DQC Review and Control: The District Project Manager will schedule DQC review meetings. The in-progress review meetings will include PDT members from Dam Safety, Structures, General Engineering, Cost Engineering, Project Management, and Operations. DQC Review will be conducted on the completed final plans and specifications and will include comments, backcheck, and revisions. ProjNet DrChecks review software will be used to document reviewer comments, responses and associated resolutions. Comments should be limited to those that are required to ensure the adequacy of the product.

iii BCOES Review and Certification: Final plans and specifications, cost estimate, and comments from the DQC review shall be reviewed by the Maxwell Construction Resident Engineer and the South Alabama Construction Area Engineer who will administer the Awarded Construction Contract, and the West Point Power Project Manager from Operations Division. Again, ProjNet DrChecks review software will be used to document reviewer comments, responses, and associated resolutions.

b. Agency Technical Review

i General: ER 1110-2-1156, Chapter 8 describes the purpose, process, roles and responsibilities for an IES in addition to the submittal, review, and approval process. The Risk Management Center (RMC) is responsible for coordinating and managing agency technical review of the Final Plans and Specifications in accordance with EC 1165-2-214. The ATR Lead will be an RMC team member unless otherwise approved by the RMC Director. The ATR team (Attachment 4) will consist of the ATR Lead and a level 3 structural engineer.

i. ATR Review and Control: Reviews will be conducted in a fashion which promotes dialogue regarding the quality and adequacy of the Final Plans and Specifications. The level of effort for each ATR reviewer is expected to be between 16 and 32 hours. DrChecks review software will be used to document reviewer comments, responses and associated resolutions. Comments should be limited to those that are required to ensure the adequacy of the product. The RMC in conjunction with the MSC, will prepare the charge to the reviewers, containing instructions regarding the objective of the review and the specific advice sought. A kick off meeting will be held with the ATR team to familiarize reviewers with the details of the project.

The four key parts of a review comment will normally include:

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

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist. The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical coordination, and lastly the agreed upon resolution. The ATR team will prepare a Review Report which includes a summary of each unresolved issue; each unresolved issue will be raised to the vertical team for resolution. Review Reports will be considered an integral part of the ATR documentation and shall also:

- (1) Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer.
 - (2) Include the charge to the reviewers prepared by the RMC in accordance with EC 1165-2-214.
 - (3) Describe the nature of their review and their findings and conclusions.
 - (4) Include a verbatim copy of each reviewer's comments and the PDT's responses.
- ATR may be certified when all ATR concerns are either resolved or referred to HQUSACE for resolution and the ATR documentation is complete. Certification of ATR should be completed,

based on work reviewed to date, for the final report. A draft certification is included in Attachment 1.

c. Independent External Peer Review

Independent External Peer Review: The Type II IEPR will be contracted with an A/E contractor or arranged with another government agency to manage external to the Corps of Engineers. The IEPR panel member(s) will be made up of an independent recognized expert(s) from outside of the USACE in the appropriate disciplines, representing a balance of expertise suitable for the project. IEPR panel member(s) will be selected using the National Academy of Science (NAS) policy which sets the standard for “independence” in the review process. IEPR comments shall be documented in an IEPR Review Report, with design team responses and annotations provided as an appendix. The Review Report and Appendix shall be approved by the MSC Division Commander and made accessible to the public for thirty (30) days through the Mobile District website link <http://www.sam.usace.army.mil/>.

8. REVIEW PLAN POINTS OF CONTACT – See Appendix A