

REVIEW PLAN
for
Rio de la Plata Project
Puerto Rico

Jacksonville District

October 15, 2009

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**US Army Corps
of Engineers** ®

1. PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan defines the scope and level quality management activities and peer review for the Rio de la Plata Flood Control Project. Quality Management activities consist of District Quality Control, Agency Technical Review and Type II Independent External Peer Review.

b. References.

- (1). ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 Aug 1999
- (2). ER 1110-1-12, Engineering and Design Quality Management, 21 Jul 2006
- (3). WRDA 2007 H. R. 1495 Public Law 110-114, 8 Nov 2007
- (4). EC 1105-2-410, Review of Decision Documents, 22 Aug 08
- (5). EC 1165-2-209, Civil Works Review Policy, 1 Sep 2009 draft
- (6). Army Regulation 15-1, Committee Management, 27 November 1992 (Federal Advisory Committee Act Requirements)
- (7). National Academy of Sciences, Background Information and Confidential Conflict of Interest Disclosure, BI/COI FORM 3, May 2003

c. Requirements. This review plan was developed in accordance with EC 1105-2-410 and draft EC 1165-2-209, which establishes the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision and implementation documents through independent review. The ECs outline three levels of review: District Quality Control, Agency Technical Review, and Independent External Peer Review.

(1) District Quality Control (DQC). DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). It is managed in the home district and may be conducted by staff in the home district as long as they are not doing the work involved in the study, or overseeing contracted work that is being reviewed. Basic quality control tools include a Quality Management Plan providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. Additionally, the PDT is responsible for a complete reading of the report to assure the overall integrity of the report, technical appendices and the recommendations before approval by the District Commander. The Major Subordinate Command (MSC)/District quality management plans address the conduct and documentation of this fundamental level of review; DQC is not addressed further in this review plan.

(2) Agency Technical Review (ATR). 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 team reviews the various work products and assures that all the parts fit together in a coherent whole. ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists (RTS), etc.), and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the parent MSC.

(3) Type II Independent External Peer Review (IEPR). IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. In accordance with Section 2035 of Water Resources Development Act (WRDA) of 2007, EC 1105-2-410 and draft EC 1165-2-209 all projects addressing flooding or storm damage reduction undergo a safety assurance review of the design and construction activities prior to initiation of physical construction and periodically thereafter until construction activities are completed. IEPR should occur on a

regular schedule sufficient to inform the Chief of Engineers on the adequacy, appropriateness, and acceptability of the design and construction activities for the purpose of assuring public health, safety, and welfare.

2. PROJECT INFORMATION AND BACKGROUND

2.1 Authority and Description

The Water Resources Development Act of 1990 authorized the Rio de la Plata project. The project features are intended to reduce the frequency and severity of flooding events in Mameyal Community and Dorado Town, Puerto Rico. The basin is located about 11 miles west of San Juan and drains approximately 240 square miles. Heavy rainfall combined with the steep headwater slopes causes frequent flooding in the towns of Dorado, Toa Baja, and Toa Alta. The non-Federal Sponsor is the Puerto Rico Department of Natural Resources (DNER).

The recommended plan provides 100-year protection upstream of PR Highway 2 and Standard Project Flood protection downstream. Project features consist of 7.0 miles of channel improvements, 7.6 miles of levee construction, the replacement of 3 bridges, recreation facilities, and mitigation for the loss of environmental habitats. The project is broken into three phases with Phase 1 broken into Contract 1A, contract for Dorado Bridge retrofit, and Contract 1B. This was due to funding streams and breakpoints in construction. Contract 1A includes 2.3 miles of levee construction and 2.1 miles of channel improvements. Contract 1B, along with Phases Two and Three will complete the remaining portions of levee construction and channel improvements.

The Puerto Rico Infrastructure Financing Authority (AFI) acting on the behalf of DNER awarded a design services contract to CMA Architect and Engineers LLP for Rio la Plata Flood Control Program Contract 1A. This contract included: providing services to prepare construction plans, specifications, quantity estimates, supporting documentation, and computations. Computations included all civil, structural and geotechnical analyses required for the proposed project. Included in supporting documentation would be analysis required for project site permitting including wetland determination, and mitigation, environmental assessment survey, and an archeological survey. To date, CMA has completed the final set of Plans and Specifications (P&S) for Contract #1A.

A sole source A-E contract between Jacksonville District (SAJ) and CMA would provide services to revise the previously completed final design P&S, quantity estimates, Design Documentation Report, computations, Independent Technical Review, Engineering During Construction and a Memorandum of Engineering Considerations and Instructions to Field Personnel for this construction project in order to make the documents compliant with federal construction procurement requirements.

2.2 History and ARRA Program Inclusion

The original set of pre-final P&S for Contract 1A were developed by SAJ District in February 1994 and updated in 2004 by SAJ. The design was Federally funded, along with sponsor contributions until 2005. No Federal construction has been pursued to date since sufficient funds have not been appropriated in the amount needed to award the first contract. Consequently, the non-Federal sponsor notified the Corps of their intent to move ahead with construction of Contract 1A and seek reimbursement through Section 211, WRDA 1996. The Section 211 Agreement was initiated in August 2007. SAJ began coordinating all necessary documentation and interaction with the non-Federal sponsor and HQUSACE. During the development of the Section 211 agreement, Rio de la Plata was deemed as one project with no severable elements.

The ASA (CW) notified the House and Senate appropriation subcommittees on 27 May 2008 of the Federal intent to proceed with the Section 211 agreement for reimbursement to the non-Federal sponsor. However, the non-Federal sponsor advertised and awarded a contract containing the work described in the Corps' Contract 1A without the Section 211 agreement being executed. The contract was awarded in September 2008 and construction began in October 2008. SAJ advised DNER in a letter dated 9 February 2009 that due to their award of a construction contract in advance of executing the 211 Agreement they are no longer eligible under existing law for reimbursement, and that any reimbursement would require enactment of additional Congressional legislation authorizing such reimbursement.

SAJ was notified on 28 April 2009 of Rio de la Plata's inclusion in the ARRA Program. The ARRA approved work included two Work Packages. The first Work Package provided for the award of "Phase 1" in the amount of \$20,000,000 and the second Work Package in the amount of \$10,000,000 was approved to complete design and land acquisition and award construction contract for phase 2. Due to the ARRA guidelines, the second work package could not be completed in FY 2010, therefore, the second work package has been combined with the first work package for a total of \$30,000,000 to accomplish the work on Contract #1A. SAJ received a letter from DNER on 22 May 2009 stating their desire to complete the "Contract 1A" work using the approved ARRA funds and assured SAJ of their ability to pay the cost share.

In an effort to pursue the project using ARRA funding, SAJ staff conducted a site visit and obtained engineering documentation from DNER on 24 June 2009. This information was used to determine if the non-Federal design documents met USACE technical standards and the extent of additional work needed to complete a Federal acquisition package. The review determined that the additional analysis and revisions to documents will be required to meet USACE standards.

The attendant necessary time and risk incurred by a new A-E assuming responsibility as designer of record when existing expertise already resides in CMA would result in a substantial duplication of effort and cost which will not be recovered through competition. Due to the performance requirements of the original contract, CMA has accumulated knowledge and expertise on this project that is not available from any other firm. Therefore, sole source justification authority to award a follow-on A-E contract to CMA was obtained 18 September 2009.

3. DISTRICT QUALITY CONTROL

District Quality Control Quality Control and Quality Assurance activities for implementation documents (DDRs and P&S) are stipulated in ER 1110-1-12, Engineering & Design Quality Management. Agency Technical Review (formally called Independent Technical Review), quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews are required by the ER and those items are embodied into the CESAJ EN Procedures Portal which can be viewed at the following hyperlink.

https://intranet.saj.usace.army.mil/~rwp/branch_procedures.htm

CMA Architect and Engineers LLP prepared products for Rio de la Plata are classified by SAJ as Products Prepared by Others. CMA will perform an Independent Technical Review and QC per ER 1110-1-12 and SAJ will perform QA per ER 1110-1-12. For related SAJ QM procedures, enter the above site and select QC/QA for Products Prepared by Others. Screen shots are also provided below. Note current Engineering and Design Regulations use the term Independent Technical Review (ITR). Please note that ITR, when performed by USACE, is now termed Agency Technical Review (ATR).

Jacksonville District Intranet : Engineering Division : Design Branch Procedures - Windows Internet Explorer

https://intranet.saj.usace.army.mil/~rwp/QCQAForProductsbyOthers.htm

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Engineering Division

US Army Corps of Engineers Jacksonville District.

What's New

[Design Branch](#)

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Quality Control / Quality Assurance (QC/QA) For Products Prepared By Others (A-E, Non-Federal Entities, or Other Federal)

*Last Updated
06-Aug-2008*

Quality Assurance (QA) is defined as that part of quality management focused on providing verification that project quality control requirements for products prepared by others as defined in the that entities QCP and the SAJ PMP QMP are fulfilled.

Quality control activities conducted by others (during the preparation of products prepared for SAJ) consist of the same (or equivalent) processes as those conducted for products prepared by SAJ. The A-E, Other COE District (Brokered), Non-Federal Entity or other Federal agency's quality control tools will include a Quality Control Plan that documents a project's QC activities; quality checks and reviews, PDT reviews, and independent technical reviews (ITR).

SAJ will prepare a Quality Assurance Plan (QAP) that documents the QC activities by others and the QA activities that will verify those activities.

QA Regulation Guidance Requirements

Quality Assurance definitions, roles and responsibilities and activities are defined ER 1110-1-12, Engineering and Design - Quality Management. Chapter 5 addresses Quality Assurance and Appendix F contains the QA certification forms. That guidance is located at the following hyperlink.

<http://www.usace.army.mil/publications/eng-regs/er1110-1-12/toc.htm>

Engineering Division Product Quality Assurance Requirements

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Jacksonville District Intranet : Engineering Division : Design Branch Procedures - Windows Internet Explorer

https://intranet.saj.usace.army.mil/~rwp/QCQAForProductsbyOthers.htm

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<http://www.usace.army.mil/publications/eng-regs/er1110-1-12/toc.htm>

Engineering Division Product Quality Assurance Requirements

SAJ-EN ETL will prepare a Quality Assurance Plan (QAP). The QAP will include a project specific checklist that includes all the activities listed in ER 1110-1-12 Para. 5-7 and any customer/sponsor specific requirements. Other Federal agencies will prepare and submit a QCP and A-E's will prepare and submit a Contractor Quality Control Plan per the above referenced ER.

The ETL will prepare a QAP that will incorporate QC/QA into the project schedule per the above guidance (in some cases a combined QC/QAP may be needed for projects with separable deliverables). During the project initiation phase, the ETL will insure Engineering Divisions QC/QA activities are addressed in the QMP. The ETL will execute the QA Certification. Related links follow.

[QM/QC/QA Assignment Matrix](#)
Quality Assurance Plan (Template, Example) – **to be added**
[Contractor Quality Control Plan \(CQCP\) Example](#)

QA Certification

The QA Certification will consist of the above completed QA Form, annotated QA comments, complete QA Checklist, completed Appendix E ITR forms and annotated ITR comments. The QA certification along with supporting documentation will be filed with the project records.

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4. AGENCY TECHNICAL REVIEW

4.1 Scope. Agency Technical Review (ATR) is undertaken to "ensure the quality and credibility of the government's scientific information" in accordance with ER 1110-1-12. In order to insure incorporation of COE national experience for Flood Risk Management Projects (as updated per post-Katrina investigations), and in addition to the A-E's ITR, an ATR will also be performed. Moreover, all provisions and checklists for Safety Assurance Review (SAR) contained in draft EC 1165-2-209 will be incorporated into the charge to the ATR team.

The ATR team will be established per ER 1110-1-12 and draft EC 1165-2-209. The above hyperlink provides related SAJ procedures to accomplish ATR. The Corps will manage the ATR internally and it will be conducted by individuals and organizations that are separate and independent from those that accomplished the work, in accordance with policy. The ATR Team Leader will be a Corps of Engineers employee outside the South Atlantic Division. The required disciplines are described below.

4.2 ATR Disciplines. As stipulated ER 1110-1-12, ATR members will be sought from the following sources: regional technical specialists (RTS); appointed subject matter experts (SME) from other districts; senior level experts from other districts; Center of Expertise staff; appointed SME or senior level experts from the responsible district; experts from other USACE commands; contractors; academic or other technical experts; or a combination of the above. The ATR Team will be comprised of the following disciplines.

Hydrology and Hydraulics. The team member should be a registered professional with 10 or more years experience in conducting and evaluating hydrologic and hydraulic analyses for flood risk management projects. Experience with 2 D modeling and performance of risk assessments is required. Experience with the Levee Safety program is also desired. Active participation in related professional societies is encouraged.

Geotechnical Engineering. The team member should have 10 or more years experience in geotechnical engineering. Experience needs to include geotechnical evaluation of flood risk management structures such as static and dynamic slope stability evaluation, evaluation of the seepage through earthen embankments and underseepage through the foundation of the flood risk management structures, including levee embankments, floodwalls, closure structures and other pertinent features, and in settlement evaluations.

Structural Engineering. The team member should have 10 or more years experience in structural engineering. Experience needs to include bridge design and bridge evaluations for modifications associated with flood risk management projects. Experience with AASHTO and state road and bridge standards is encouraged.

Civil Engineering. The team member should have 10 or more years experience with civil/site work projects to include levee systems, roads and highways, relocations, paving and drainage.

Cost Engineering. The team member should have 10 or more years demonstrated in the preparation of cost estimates, cost risk analyses and cost engineering. Experience is needed for complex Civil Works projects to include levee systems.

NEPA Compliance. The team member should have 10 or more years experience in NEPA compliance activities and preparation of Environmental Assessments and Environmental Impact Statements for complex civil/site work projects. Experience is needed for levee system projects.

Real Estate Specialists. The Real Estate Specialist will be senior level personnel with demonstrated project Pre-Construction, Engineering and Design Phase experience.

ATR Team Leader. The ATR Team Leader should have 10 or more years experience with Civil Works Projects and have performed ATR Team Leader duties on complex civil works projects.

5. INDEPENDENT EXTERNAL PEER REVIEW PLAN (WRDA 2007 Section 2035 Safety Assurance Review)

5.1 General

Draft EC 1165-2-209 provides implementation guidance for both Sections 2034 and 2035 of the Water Resources Development Act (WRDA) of 2007 (Public Law (P.L.) 110-114). The draft EC addresses QM procedures for both the planning and PED phases and incorporates requirements for conduct of Type II IEPR/SAR. The EC defines Section 2035 Safety Assurance Review, Type II Independent External Peer Review (IEPR).

Per draft EC 1165-2-209, Type II is mandatory when a project:

- addresses hurricane and storm risk management or flood risk management;
- involves existing and potential hazards that pose a significant threat to human life;
- uses innovative materials or techniques;
- lacks redundancy, resilience, or robustness in the design; or has unique construction sequencing or a reduced or overlapping design/construction schedule

Per the above criteria, a WRDA 2007 Section 2035 Safety Assurance Review is required.

5.2 Federal Advisory Committee Act (FACA) Implications

Draft EC 1165-2-209 notes a key difference between Section 2034 and Section 2035 in that Section 2034 exempts Type I IEPR from the Federal Advisory Committee Act (FACA). Since Type II IEPR are not exempt from Section 2035, the below discusses FACA activities and schedule impacts should the review need to comply with FACA.

The following excerpt is from EC 1165-2-209, Appendix E Para. 7.a. (4): “For panels not consisting entirely of Federal, state, local, or tribal employees, the requirements of AR 15-1 will be followed to ensure compliance with FACA.” Per AR 15-1, appended to this plan, several activities will need to be conducted if the review panel is composed of other than Federal, state, local, or tribal employees. Those requirements include:

- Contacting The Department of the Army Committee Management Officer (DACMO) 90 days prior to establishing panel;
- Develop a charter, (Upon approval of the Secretary of the Army and the Secretary of Defense, the charter will be forwarded to the Administrator, GSA. When the Administrator, GSA, concurs, an announcement of intent to establish an advisory committee is submitted to the Office of the Federal Register for publication.); and
- DACMO will coordinate committee nominations.

Based on the above, the IEPR for Rio de la Plata will have to be conducted outside FACA requirements in order to meet the project schedule. Therefore, in order to comply with both EC 1165-2-209 and to operate outside FACA, the review panel must be comprised of qualified Federal, State, or local employees, or the review must be of a scalable scope such that the review can be conducted by a single qualified expert. The scope and scale of the Rio de la Plata Project is such that its phases can be peer reviewed by a single qualified expert.

5.3 Type II Independent External Peer Review (IEPR), USACE Risk Management Center Operational Implications

The recently established USACE Risk Management Center (RMC) was designated in the draft EC 1165-2-409 to be the RMO for Type II IEPR. As of the date of this plan, RMC is not fully operational and will not be used for this Review Plan.

5.4 Rio de la Plata Project Type II Independent External Peer Review (IEPR) Methodology

The Rio de la Plata IEPR will be conducted in two phases. Phase I is for the remainder of the Pre-construction and Engineering Phase (PED) and Phase II will be for the Construction Phase. Each phase's panel will consist of one member. For the PED Phase, the panel member will address the flood hazard and will be an expert in the fields of hydrology and hydraulics. For the Construction Phase, the panel member will address levee construction and will be an expert in geotechnical engineering. Each panel will validate the state of the art approach being used to design and construct the system. Near the middle of the construction period, the Operations and Maintenance Manual will be subjected to IEPR. The panel member selection will be re-evaluated for the review of the Operations and Maintenance Manual.

The draft EC 1165-2-209 will be used to manage and develop the charges for the IEPR panels. The results of the ATR will be provided to the IEPR panels. The charges to the IEPR panels will complement the ATR process and not duplicate it. The following excerpt from Appendix E of the draft EC is included as the basis for this methodology.

“the intent of the reviews is to complement the existing process and to avoid impacts to program schedules and cost. Where appropriate and reasonable, the District can conduct the ATR and SAR concurrent and in concert if it enhances the review process. Every effort should be made to avoid having the SAR duplicate the ATR.”

To insure independence and to obtain the required expertise, the IEPR panel members will be acquired via the A-E process or with an Army Research Office eligible organization such as Battelle Memorial Institute. Panel members will submit and comply with National Academy of Sciences, Background Information and Confidential Conflict Of Interest Disclosure, BI/COI FORM 3, May 2003.

5.5 Type II IEPR and ATR Questions

The ATR Team will specifically address the following questions as part of its review.

- 1) Are the models used to assess hazards appropriate?
- 2) Are the assumptions made for the hazards appropriate?
- 3) Is the quality and quantity of the surveys, investigations, and engineering for the concept design in accordance with ER 1110-2-1150 sufficient to support the models and assumptions made for determining the hazards?
- 4) Does the analysis adequately address the uncertainty given the consequences associated with the potential for loss of life for this type of project?

The Type II IEPR Panels will confirm that ATR has addressed the above questions and will address the following questions as part of their reviews.

1) Do the assumptions made during the decision document phase for hazards remain valid through the completion of design as additional knowledge is gained and the state-of-the-art evolves?

2) Do the project features adequately address redundancy, robustness, and resiliency with an emphasis on interfaces between structures, materials, members, and project phases?

3) Do the assumptions made during design remain valid through construction?

4) For O&M manuals, do the requirements adequately maintain the conditions assumed during design and validated during construction; and will the project monitoring adequately reveal any deviations from assumptions made for performance? The Panel Member assigned this review will be determined near the mid-point of the construction period.

5.6 Type II IEPR Panels and Members

PED Phase Type II IEPR Hydrology and Hydraulics (H&H) Panel Member. The H&H Panel Member should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with 15 or more years experience in conducting and evaluating hydrologic and hydraulic analyses for flood risk management projects. Experience with 2 D modeling and performance of risk assessments for levee systems is required. Experience with the Levee Safety program is desired. Active participation in related professional societies is encouraged.

Construction Phase Type II IEPR Geotechnical Engineering Panel Member. The Geotechnical Engineering Panel Member should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with 15 years experience in conducting and evaluating geotechnical and geologic analyses and risk assessments for levees, dams and impoundments. Experience needs to include geotechnical evaluation of flood risk management structures such as static and dynamic slope stability evaluation, evaluation of the seepage through earthen embankments and underseepage through the foundation of the flood risk management structures, including levee embankments, floodwalls, closure structures and other pertinent features, and in settlement evaluations. Experience with the Levee Safety program is desired. Active participation in related professional societies is encouraged.

6.0 SUMMARY AND RIO de la PLATA PLAN APPROVAL

In summary, SAJ proposes to fully comply with all existing guidance, to add ATR (in addition to the A-E's ITR) and conduct Type II IEPR in accordance with draft EC 1165-2-209.

Approval of this plan is for the PED and Construction Phases. Approval of this plan as outlined above will help facilitate SAJ's completion of the Rio de la Plata Project within the ARRA schedule.

7.0 ESTIMATED COSTS AND SCHEDULE

The estimated cost for the ATR is \$60,000. The estimated cost for IEPR is \$100,000. The schedule follows:

Design Contract Award, ATR and PED Phase Type II IEPR Kickoff- 11Dec 09

In-progress ATR and PED Phase Type II IEPR – 29Jan10-26Feb10

A-E P&S and DDR Submittal and Construction Phase Type II IEPR Orientation – 11Mar10

District Quality Control – 11Mar10-16Mar10

ATR and PED Phase Type II IEPR – 12Mar10-18Mar10

PED Phase Type II IEPR Complete Back Check and Report – 25Mar10

ATR, Construction Phase Type II IEPR & BCOE Review of Corrected Final – 16Apr10-29Apr10

ATR and Construction Phase Type II IEPR Complete Back Checking – 20May10

ATR Certification – 27May10

BCOE Certification Complete - 4Jun10

Construction Contract Award – 6Aug10

Construction Type II IEPR will be continuous. Reviews will be conducted 60 days after commencement of work and quarterly thereafter. Exact dates will be included into this plan when developed.

Operation and Maintenance Phase Type II IEPR. The Operation and Maintenance Phase and Operation and Maintenance Manual Type II IEPR will be developed near the mid-point of the Construction Phase. Exact dates will be included into this plan when developed.

7.0 POINTS OF CONTACT

Per guidance, the names of the following individual will not be posted on the Internet with the Review Plan. Their titles and responsibilities are listed below.

Project Manager – Contact the Project Manager concerning project background, purpose, authorization and general information.

Engineering Technical Lead – Contact the Engineering Technical Lead concerning technical aspects such as review disciplines and the engineering aspects of the project.