DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF

CEMVN-PM-B

December 12, 2012

MEMORANDUM FOR Commander, Mississippi Valley Division (MVN-DST/R. Wilbanks)

SUBJECT: Greater New Orleans Hurricane and Storm Damage Risk Reduction System – Peer Review Plan

1. The subject Review Plan (RP) (enclosure 1) is hereby submitted for review and approval.

2. The RP follows the Model RP in accordance with EC 1165-2-209. In addition, the RP was endorsed by the Coastal and Storm Damage Reduction PCX (Enclosure 2).

3. Due to the critical nature of the outputs and the level of decisions the study will make, Type I and Type II Independent External Peer Review is anticipated.

5. I recommend that this RP be approved as it has been endorsed and reviewed in accordance with EC 1165-2-209. The POC for this study is Mr. Thomas A. Holden Jr., Deputy District Engineer for Project Management. He can be reached at (504) 862-2204.

For MAJ

Encls
1. Peer Review Plan
2. Plan Endorsement

Edward R. Fleming
Colonel, EN
Commanding

DEPARTMENT OF THE ARMY
MISSISSIPPI VALLEY DIVISION, CORPS OF ENGINEERS
P.O. BOX 80 VICKSBURG, MISSISSIPPI 39181-0080

REPLY TO
ATTENTION OF:

CEMVD-PD-N

12 DEC 2012

MEMORANDUM FOR Commander, New Orleans District
(ATTN: CEMVN-PM-B)

SUBJECT: Greater New Orleans Hurricane and Storm Damage Risk Reduction System - Peer Review Plan

1. References:

a. Memorandum, CEMVN-PM-B, 12 December 2012, SAB (encl 1).

b. Memorandum, CEPCX-CSDR, 7 December 2012, subject: Endorsement of the Greater New Orleans Hurricane and Storm Damage Risk Reduction System Review Plan (encl 2).

c. Engineering Circular (EC) 1165-2-209, Change 1, Civil Works Review Policy, dated 31 January 2012.

2. The subject review plan (RP) provided under reference 1.a. was reviewed by the National Planning Center of Expertise for Coastal and Storm Damage Reduction and the Mississippi Valley Division staff. The RP was endorsed for approval by the National Planning Center of Expertise for Coastal and Storm Damage Reduction. The RP provides for an adequate level of peer review and complies with current peer review policy requirements outlined in EC 1165-2-209.

3. I hereby approve this RP, which is subject to change as circumstances require, consistent with the Project Management Business Process. Subsequent revisions to this RP or its execution will require new written approval from this office.

4. The RP is to be posted to the District website.

5. The POC for this action is Mr. Gary Young, CEMVD-PD-N, at (601) 634-5902.

2 Encl

EDWARD E. BELK, JR., P.E., SES
Director of Programs

CF:
CECW-MVD (J. Redican)

DEPARTMENT OF THE ARMY
NORTH ATLANTIC DIVISION, CORPS OF ENGINEERS
FORT HAMILTON MILITARY COMMUNITY
BROOKLYN, NY 11252-6700

REPLY TO
ATTENTION OF

CEPCX-CSDR

7 December 2012

MEMORANDUM FOR Commander, New Orleans District, U.S. Army Corps of Engineers, ATTN: Thomas Podany, CEMVN-PM-O

SUBJECT: PCX-CSDR Endorsement of the Greater New Orleans Hurricane and Storm Damage Risk Reduction System Review Plan

1. The National Planning Center of Expertise for Coastal and Storm Damage Reduction (PCX-CSDR) reviewed the revised Greater New Orleans (GNO) Hurricane and Storm Damage Risk Reduction System (HSDRRS) Review Plan (enclosed) dated 6 December 2012 which was originally developed by Task Force Hope (TFH) and now revised by New Orleans District.

2. The PCX-CSDR has reviewed the Greater New Orleans Hurricane and Storm Damage Risk Reduction System Review Plan and finds it acceptable for MVD approval.

3. For further information, please contact me at 917-613-3873, Mr. Larry Cocchieri, Deputy at (347) 370-4571 or Ms. Amy Guise, PCX IEPR lead at 410-962-2558.

Encl
as

JOSEPH R. VIETRI
Director, National Planning Center of Expertise for Coastal Storm Damage Reduction

CF:
CPD Reading File
CENAB-PL-P (Guise)
CENAB-EN (Fritz)
CEPCX-CSDR (Cocchieri)
CEMVD-PD-N, Chief, Rayford Wilbanks
CEMVD-PD-N, Deputy, Greg Ruff
CEMVD-TFH, Chief, Mike Park
CEMVN-PM-O, Chief, Thomas Podany
CEMVN-ED-E, Chief, Walter Baumy

REVIEW PLAN

FINAL REVISION

Implementation of Section 2035 of WRDA 2007
for the Greater New Orleans (GNO)
Hurricane and Storm Damage Risk Reduction System (HSDRRS)

MSC Approval Date: 12 Dec 12

Initial HQUSACE Approval Date: 19 Sep 08
Revised HQUSACE Approval Date: 22 Oct 08
Last Revision Date: 6 Dec 12

US Army Corps of Engineers ®

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APPENDIX

1. PURPOSE

This Peer Review Plan (PRP) provides a technical peer review mechanism for the Greater New Orleans (GNO) Hurricane and Storm Damage Risk Reduction System (HSDRRS), as required under the Water Resources Development Act (WRDA) of 2007, dated 08 Nov 2007. WRDA 2007 includes three (3) provisions that fall under the umbrella of "independent external peer review" or IEPR:

(1) Section 2034 of WRDA 2007, entitled *Independent Peer Review*, applies to project studies. Project studies may be subject to a peer review by an independent panel of experts if :
   a. The project has an estimated total cost of more than $45,000,000, including mitigation costs
   b. The Governor of affected State requests a peer review by an independent panel of experts
   c. The Chief of Engineers review determines that the project study is controversial

(2) Section 2035 of WRDA 2007, entitled *Safety Assurance Review*, addresses requirements for the design and construction activities for hurricane and storm damage reduction and flood damage reduction projects. The Chief of Engineers shall ensure that the design and construction activities for hurricane and storm damage reduction and flood damage reduction projects are reviewed by independent experts under this section if the Chief of Engineers determines that a review by independent experts is necessary to assure public health, safety, and welfare.

(3) Section 7009 of WRDA 2007, entitled *Independent Review*, establishes a council to be known as the "Louisiana Water Resources Council" which shall serve as the exclusive peer review panel for activities conducted by the Corps of Engineers in areas of Louisiana declared as major disaster areas after Hurricanes Katrina and Rita in 2005, in accordance with requirements of Section 2034.

Draft interim policy for Independent External Peer Review for the HSDRRS 100-Year Level of Protection was provided by HQUSACE dated 1 Feb 08 (see Appendix A). Since the HSDRRS is in a Post-Authorization phase for a civil works project, the interim policy brings the system's review processes into compliance with the new Independent External Peer Review (IEPR) requirements in WRDA 2007, Section 2035. The purpose of the *Safety Assurance Review* is to ensure that good science, sound engineering, and public welfare are the most important factors that determine a project's fate. In accordance with Section 2035, efforts shall include the review of design and construction activities prior to the initiation of physical construction and periodically thereafter. Peer review during construction will include observation and comment on the critical construction elements of the project.

This PRP focuses primarily on a programmatic IEPR plan for the HSDRRS, providing for a system-wide approach rather than piecemeal. The PRP does not provide the

specific details of overall quality management, District Quality Control (DQC) and Agency Technical Review (ATR) procedures for individual efforts within the HSDRRS.

The State of Louisiana, through the Louisiana Coastal Protection and Restoration Authority (CPRA), the Southeast Louisiana Flood Protection Authority – East (SLFPA-E) and the Southeast Louisiana Flood Protection Authority – West (SLFPA-W) and the levee districts under their supervision, were engaged in the development of the initial PRP in late 2008. Major updates to the PRP will be submitted to CPRA, SLFPA-E, SLWPA-W and the levee districts under their supervision for a two week comment prior to finalization. If requested by the State within the comment period, the Corps will set aside time to discuss and resolve key comments. The State's engagement in the IEPR process affords the opportunity to build on the existing State and Federal partnership as the Corps undertakes the design and construction of the HSDRRS.

2. REFERENCES

a. ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 Aug 1999

b. ER 1110-1-12, Engineering and Design Quality Management, 21 Jul 2006

c. National Research Council, "Review Procedures for Water Resources Project Planning", 2002

d. OMB "Final Information Quality Bulletin for Peer Review," Dec 2004

e. WRDA 2007 H. R. 1495 Public Law 110-114, 8 Nov 2007

f. Draft Interim Policy for an Independent Peer Review for the 100-Year level of Protection, Hurricane and Storm Damage Risk Reduction System (HSDRRS), New Orleans, LA, dated 1 Feb 08 (included as Appendix A)

g. EC 1165-2-209, Civil Works Review Policy, 31 Jan 10

h. CECW-CP Memorandum, Peer Review Process, 30 Mar 2007

i. Supplemental Information for the "Peer Review Process" Memo, dated March 2007

j. ER 5-1-11, USACE Business Process, 1 Nov 2006

3. SYSTEM BACKGROUND

3.1 Authority and Funding

The $14.431 Billion HSDRRS is authorized in accordance with Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico, to include: Pandemic Influenza Act, 2006 (P.L. 109-148, dated 30 Dec 2005), commonly

called the "3rd Supplemental"; Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (P.L. 109-234, dated 15 Jun 2006), commonly called the "4th Supplemental"; U. S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007 (P.L. 110-28, dated 25 May 2007), commonly called the "5th Supplemental"; the Supplemental Appropriations Act, 2008 (P.L. 110-252, dated 30 Jun 2008), commonly called the "6th Supplemental", and the Consolidated Security, Disaster Assistance, and Continuing Appropriations Act, 2009, (P.L. 110-319, dated 30 Sep 2008), commonly called the "7th Supplemental".

Federal funding totaling $14.431 Billion for the HSDRRS is provided by the supplemental appropriations as follows:

- 3rd Supplemental - $2.083 Billion
- 4th Supplemental - $3.647 Billion
- 5th Supplemental - $1.325 Billion
- 6th Supplemental - $5.761 Billion
- 7th Supplemental - $1.615 Billion

3.2 Description/Location

The HSDRRS generally consists of multiple projects and authorizations forming a comprehensive system of levees, floodwalls, gates, internal drainage and pumping stations and other structures, integrated into a single system designed to reduce the risk of hurricane and storm damage to the Greater New Orleans area and southeastern Louisiana. See Table 1 for Project/Features covered under this PRP.

The HSDRRS is integrated with the Mississippi River flood system along the main stem of the Mississippi River which protects against riverine flooding. The HSDRRS is designed to perform as an integrated system when completed.

Table 1. Projects/Features Included in $14.431 Billion HSDRRS

Appropriation	Projects/Features Included	Appropriation	Funding ($M), from authorizing bills 3-7th Suppl
3rd Supplemental, PL 109-148, dated 30 Dec 2005	Repair existing systems **(LPV, WBV, NOV, G Isle, SELA and LGM)** Restore existing systems to authorized design elevation **(LPV, WBV, and NOV)** Accelerate completion of authorized systems (**LPV**, **WBV, NOV, G Isle, SELA, and LGM)** Repair non-Federal levees and pump stations	FC&CE	$2,083.0
4th Supplemental, PL 109-234, dated 15 Jun 2006	**MRGO** Deep Draft Deauthorization Study	GI	$3.3
	Reduce risk of storm damage to GNO area by restoring the surrounding wetlands through measures to begin to reverse wetland losses in areas affected by navigation, oil and gas, and other channels and through **Modification to Caernarvon** (and **Barataria Basin Landbridge)**	CG	$20.2
	100-Yr Hurricane Protection for existing **LPV** and existing **WBV** projects to LOP necessary to achieve certification to participate in NFIP.	CG	$495.3
	PCCP: Modify the 17th St, Orleans Ave, and London Ave drainage canals and install pumps and closures structures at or near the lakefront	FC&CE	$530.0
	Storm-proofing interior pump stations to ensure operability of the stations during hurricanes, storms, and high water events	FC&CE	$250.0
	Selective Armoring of critical elements of the NO hurricane and storm damage reduction system (**LPV, WBV, and NOV** projects)	FC&CE	$170.0
	Improve protection at the **IHNC**	FC&CE	$350.0
	Replace or modify certain **non-Federal levees in Plaquemines Parish** to incorporate the levees into the existing **NOV** project	FC&CE	$215.0
	Reinforcing or replacing floodwalls, as necessary, in the existing **LPV** and the existing **WBV** projects to improve the performance of the systems	FC&CE	$1,584.0
	Repairs, replacements, modifications and improvements of **non-Federal levees** and associated protection measures in **Terrebonne Parish**	FC&CE	$30.0
5th Supplemental, PL 110-28, dated 25 May 2007	Expenses related to Katrina and 2005 storms, continue construction of projects related to interior drainage for the greater NO metropolitan area (ie **SELA)**	CG	$25.3
	Expenses related to Katrina and 2005 storms, carry out projects and measures for the **LPV** and **WBV** projects, as described in the 3rd Supplemental	FC&CE	$1,300.0
6th Supplemental, PL 110-252, dated 30 Jun 2008	Modify authorized projects in southeast LA to provide hurricane, storm and flood damage reduction in the greater NO and surrounding areas to the LOP necessary to achieve the certification required for participation in the NFIP under the BFEs current at the time of enactment of this Act (ie **LPV)**	CG	$1,077.0
	Same as above **(ie WBV)**	CG	$920.0
	Elements of **SELA** Urban Drainage project within the geographic perimeter of the WBV and LPV projects, to provide for interior drainage of runoff from rainfall with a 10% annual exceedance probability	CG	$838.0
	PCCP: Modify the 17th St, Orleans Ave, and London Ave drainage canals and install pumps and closures structures at or near the lakefront	FC&CE	$704.0
	Storm-proofing interior pump stations to ensure operability of the stations during hurricanes, storms, and high water events	FC&CE	$90.0
	Selective Armoring of critical elements of the NO hurricane and storm damage reduction system (**LPV, WBV, and NOV** projects)	FC&CE	$459.0
	Improve protection at the **IHNC**	FC&CE	$53.0
	Replace or modify certain **non-Federal levees in Plaquemines Parish** to incorporate the levees into the existing **NOV** project	FC&CE	$456.0
	Reinforcing or replacing floodwalls, as necessary, in the existing **LPV** and the existing **WBV** projects to improve the performance of the systems	FC&CE	$412.0
	Repair and restoration of authorized protections and floodwalls **(LPV, WBV, and NOV)**	FC&CE	$393.0
	Complete the authorized protection for the **LPV** and **WBV** and **NOV** projects	FC&CE	$359.0
7th Supplemental, PL 110-329, dated 30 Sep 2008	Fund the estimated amount of the **non-Federal cash contribution** for projects in southeast LA that will be financed in accordance with the provisions of Section 103(k) of PL 99-662 over a period of 30 years from the date of completion of the project or sepable element **(LPV)**	CG	$700.0
	Same as above **(WBV)**	CG	$350.0
	Same as above **(SELA)**	CG	$450.0
	Complete necessary expenses relating to the consequences of recent hurricanes and other natural disasters as authorized by law…to support emergency operations, repair eligible projects nationwide ($5M **LGM,** $5M **WBV,** $50M **G Isle**, $50M **LPV,** and $5M **NOV)** - Gustav & Ike	FC&CE	$115.0

3.3 Prior Peer Review Efforts

An external peer review of the overall system was completed in May 2007. This review was a high-level, independent external peer review of ongoing HSDRRS projects and plans for future HSDRRS projects with the objective "to determine if the authorized approach will achieve the desired level of protection and will effectively and efficiently operate as a system". This PRP does not include another system-wide review; rather the review will primarily focus on IEPR of the HSDRRS Design Guidelines and major changes to the guidelines; and project features that are unique or one-of-a-kind (never been built before), not captured under the Design Guidelines, or use innovative or non-conventional design or construction techniques/methods. This PRP is adaptive to evolving designs and new information and will be updated or revised accordingly.

4. DISTRICT QUALITY CONTROL (DQC)

District Quality Control/Quality Assurance (DQC) will be accomplished by MVN, the home district, in accordance with applicable regulations. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements.

Quality checks and reviews occur during the development process and are carried out as a routine management practice. Quality checks of in-house work products will be performed by staff responsible for the work, such as supervisors, work leaders, team leaders, designated individuals from the senior staff, or other qualified personnel, but not the same people who performed the original work. Quality checks of AE-prepared products will be in accordance with the Quality Assurance Surveillance Plan (QASP) prepared by the COR and reviewed by the MVN Quality Assurance Representative (QAR), usually the Technical Manager.

MVD and MVN have established standard process documents that provide DQC guidance for all engineering products. These are published on the USACE Quality Management System (QMS) Site. The relevant QMS references are:

a. 22500-MVD, Quality Control and Quality Assurance for Engineering Products
b. 22803-MVN, Quality Assurance of AE Prepared Technical Engineering Work Items

District leadership affirms that the District Quality Control (DQC) activities were sufficient and documented by signing the ATR certification.

5. AGENCY TECHNICAL REVIEW (ATR)

Agency Technical Review (ATR) is undertaken to "ensure the quality and credibility of the government's scientific information" in accordance with this circular, and the Quality Management (QM) of the responsible major subordinate command (MSC). (This level of review was previously named "Independent Technical Review" and may be described as

such in some referenced guidance.) This level of review shall also cover any necessary National Environmental Policy Act (NEPA) documents and other environmental compliance products and any in-kind services provided by local sponsors. ATR is mandatory for all decision and implementation documents. For other work products, a case specific risk-informed decision, as described in EC 1165-2-209, paragraph 15, shall be made as to whether ATR is appropriate.

Prior to the approval of EC 1165-2-209 in 31 Jan 2010, all ATRs are being conducted for the HSDRRS on a project-by-project basis in accordance with HSDRRS Review Plan approved in Oct 2008 and ER 1110-1-12, Engineering and Design Quality Management. All HSDRRS project work through development of product specific guidance, engineering, construction, and the operations and maintenance (O&M) program underwent an ATR, according to the phase of work. The Corps managed the ATR internally and it was conducted by individuals and organizations that were separate and independent from those that accomplished the work, in accordance with policy. At a minimum, MVN will accomplish all such reviews outside the district office that performed the work. The ATR could include reviewers external to Corps.

Since January 2010, Agency Technical Review (ATR) is being conducted for the HSDRRS in accordance with EC 1165-2-209 and ER 1110-1-12, Engineering and Design Quality Management. The Management of ATR reviews is dependent upon the phase of work and the reviews are all conducted by professionals outside of the home district. ATR teams will be comprised of senior USACE personnel, preferably recognized subject matter experts with the appropriate technical expertise such as regional technical specialists (RTS), and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the home MSC. For ATR on decision documents, the Review Management Organization (RMO) generally will be the appropriate Planning Center of Expertise (PCX). For other work products, the ATR shall be managed and performed outside of the home district. The USACE Risk Management Center (RMC) shall serve as the RMO for Dam Safety Modifications projects and Levee Safety Modification projects. For all other projects, the MSC shall serve as the RMO. There shall be appropriate coordination and processing through Communities of Practices (CoPs); relevant PCXs, and other relevant offices to ensure that a review team with appropriate independence and expertise is assembled and a cohesive and comprehensive review is accomplished. MVD is the lead for ATR. Independent External Peer Review (IEPR) is an extension (not a replacement) of the ATR requirements.

6. INDEPENDENT EXTERNAL PEER REVIEW PLAN

6.1 General

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 USACE is warranted. IEPR for the HSDRRS is done in accordance with the draft interim policy

dated 1 Feb 08 (Appendix A). Task Force Hope (TFH) led the development of the initial Peer Review Plan (PRP), in cooperation with the execution offices (Mississippi Valley Division (MVD) - New Orleans District (MVN), Protection and Restoration Office (PRO); and the Hurricane Protection Office (HPO)). Task Force Hope initially identified products where IEPR of the design and construction efforts were considered appropriate (see Table 2 and Figure 2). Local stakeholders, to include the Louisiana Coastal Protection and Restoration Authority (CPRA) and the Southeast Louisiana Flood Protection Authority – East (SLFPA-E) and Southeast Louisiana Flood Protection Authority – West (SLFPA-W) and levee districts under their supervision, reviewed the initial list of projects to undergo IEPR and offered their concurrence. The State is fully engaged during individual project reviews and participates in the process alongside Corps project managers. Revisions to the initial approach to conduct IEPR for the HSDRRS are discussed in further detail under Section 6.4.

Since January 2010, IEPR is being conducted for the HSDRRS in accordance with EC 1165-2-209. Any work product, report, evaluation or assessment that undergoes DQC and ATR also **MAY** be required to undergo IEPR under certain circumstances. A risk informed decision as described in paragraph 15 of EC 1165-2-209, will be made as to whether IEPR is appropriate for that product.

6.2 Independent External Peer Review (IEPR) Requirement Determination

Task Force Hope used the following factors to initially determine the need for IEPR on particular features of the HSDRRS. Project managers were asked to submit information on their project(s) related to the below factors:

- Significant threat to human life
- Cases where information is based on novel methods, presents complex challenges for interpretations, contains precedent-setting methods or models, or presents conclusions that are likely to change prevailing practices
- Project has a reduced or overlapping design-construction schedule
- Project has unique construction sequencing
- Project involves use of innovative materials or techniques
- Project lacks redundancy

Task Force Hope consulted ER 1110-2-1150, Engineering and Design for Civil Works Projects, which outlines typical products prepared for Civil Works projects during Pre-Construction, Construction, and O&M phases. Listed below are examples of engineering and construction products that can be subject to an IEPR when applicable to the triggers. Project managers were asked to submit information on their project(s) related to the below:

- Survey and Investigations studies to insure sufficient quality of data
- Design Documentation Reports, the record of final design
- Engineering Documentation Reports, a report to support when there are minor changes to design and costs
- Value Engineering Studies
- The Design for remediation of Hazardous, Toxic, and Radioactive Waste

- Utility relocations
- Physical model studies
- Engineering support to preparation of Project Partnership Agreements
- Plans, specifications, and cost estimates of critical project features
- Engineering considerations and instructions for field personnel
- Critical construction placement
- Construction Foundation and Concrete Reports
- Project O&M Manuals
- Post Project Monitoring Plans
- Contractor Submittals of critical project features
- Contract Change Order of critical project features
- Post Construction Reports such as Foundation Completion, Embankment Criteria and Performance Evaluations, and Concrete Materials Reports
- Construction Inspections

Task Force Hope considered information compiled from the above factors to develop the initial list of features to undergo IEPR. A series of meetings were held in which senior representatives from TFH, HPO and MVN/PRO participated. At these meetings, project managers were all invited and many attended. Prior to these meetings, TFH discussed the IEPR process at HPO and MVN/PRO meetings where handouts of the draft Independent Peer Review Program Management Plan (PgMP), WRDA Sections 2034, 2035, and 7009; along with HQ Interim Policy was presented to all in attendance. The series of meetings were completed and feature recommendations were requested and agreed upon by senior leadership from TFH, HPO, and MVN/PRO. It was agreed to aggregate the list into the following project types:

- floodwalls
- levees
- pump stations
- drainage structures
- sector gates
- fronting protection

In addition, unique products/features (i.e., storm surge barriers, permanent pump stations, design guidelines, armoring manual and quality management plan) were added to the list. As a result, the initial list ensured that the design guidelines used to design and construct the HSDRRS, representative features, and unique features of the HSDRRS were to be independently peer reviewed. It was also agreed that due to the critical suspense of 1 Jun 2011 to complete the HSDRRS that all design and construction activities would continue in parallel with the IEPR. The schedules for each contract do not permit design and construction to be delayed until IEPR is complete. The Corps understands the risk of proceeding forward prior to IEPR completion; however, the input from IEPR is valued and desired to reach a project/product that is safe and reliable. We are proceeding with caution should a major issue develop and prepared to address the issue as quickly as possible.

6.3 Development of Independent External Peer Review (IEPR) Scopes and Review Panels

The U. S. Army Corps of Engineers National Planning Center of Expertise for Coastal Storm Damage Reduction (PCX) directed by North Atlantic Division (NAD) has responsibility for managing the review of coastal storm damage reduction "Planning" products in New Orleans; that responsibility was extended to include all IEPR requirements during the MVN design and construction phase. The PCX, through Baltimore District (NAB), works with MVN execution offices to develop the "charge" (scope) for the reviews. The U. S. Army Research Office (ARO) serves as the contracting arm and contracts with the Contractor or IEPR Provider to select the Reviewers in accordance with National Academy of Science's policy to perform the peer review. This ensures a third-party relationship is maintained between the project's execution office and Battelle. A diagram showing the MVN/PCX organization/process is shown in Figure 1.

WRDA 2007 further directs the use of the National Academy of Science's (NAS) policy for the selection of reviewers and the review. That direction is consistent with existing Office of Management and Budget (OMB) requirements for IEPR. Consistent with OMB and NAS guidelines, the Corps has defined the IEPR as a review in which the responsibility for coordinating the review is granted to an organization independent of Corps; that entity must be in charge of selecting the reviewers, all of whom should be independent of the Corps and free of conflicts of interest. All IEPR efforts for the HSDRRS are and will be conducted in accordance with these policies.

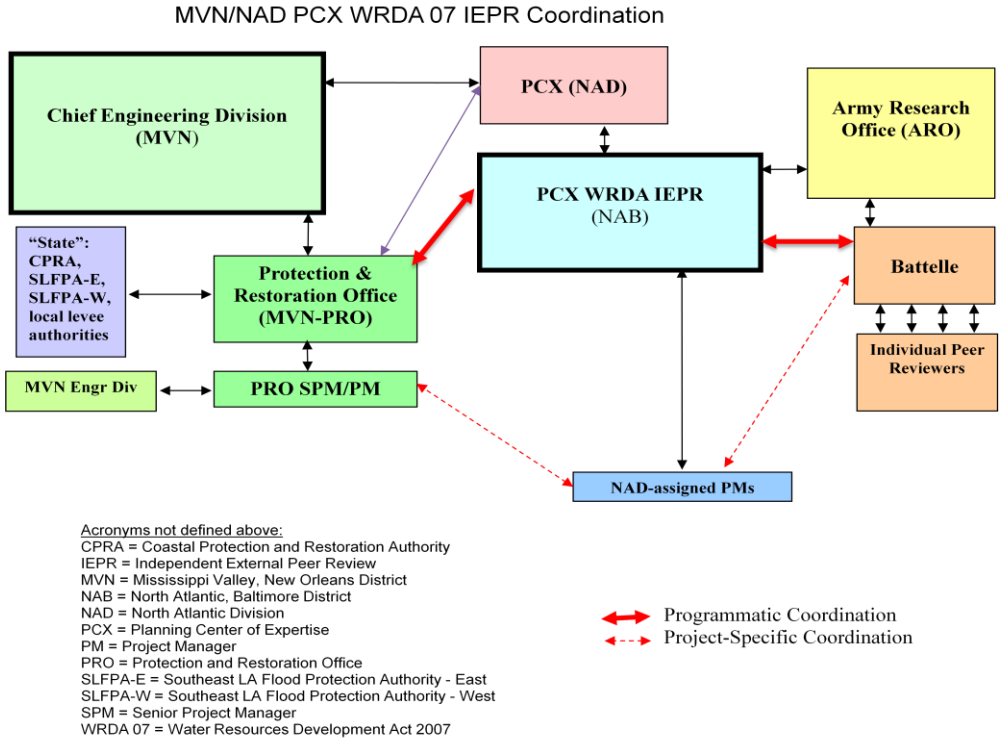

Figure 1. MVN/PCX WRDA 07 IEPR Organization

As part of each IEPR effort, the peer review panel's conclusions will be provided in a final report. A final report will be prepared by Battelle following completion of each phase of the project being peer reviewed (design and construction). Each report shall have an executive summary describing the recommendations and resolutions. Following the executive summary the report shall list in detail all the critical items reviewed, referenced criteria, computations, and all other pertinent information along with IEPR panel recommendations and final resolution. The reports are intended to provide final documentation of the ongoing review process for each phase. The report shall also include the methodology for conducting peer reviews of each phase. MVN execution office shall consider all IEPR comments and responses in the report and prepare a Summary Report to either adopt or not adopt the comment and an explanation. However, if review comments indicate an inherent weakness in a project, MVN needs to assess impacts and consult with Mississippi Valley Division, Regional Integration Team (MVD-RIT) for resolution. MVN, working with the appropriate execution office, will elevate comments on policy to HQUSACE for consideration under a non-project specific policy review. Review results will be presented to the Chief of Engineers before a final decision is made. This response to the comments completes the review cycle for the specific peer review effort. The final IEPR Package (IEPR Final Report and Summary Report) will be submitted to the Major Subordinate Command (MSC) for review and approval by the MVD Commander. Once final, results will be made available to the public on the New Orleans District website.

MVN, TFH and the PCX hold weekly conference calls to discuss issues, scopes, next steps, etc. regarding the overall program management of the peer review effort. In addition, program status reviews of all HSDRRS IEPR projects are held either quarterly or semi-annually. The program review is a non-technical program-level briefing that is scheduled by the PCX and MVN in conjunction with scheduled site visits or peer review conferences. The review will take place at the New Orleans District, New Orleans, Louisiana, and will involve the PCX, MVN, TFH, and Battelle managers. The State will be provided notification of the program status reviews and may attend these meetings. The program review will cover previous accomplishments, plans for the future program review period, and a discussion of open issues or problem areas. Battelle will submit read ahead materials prior to each briefing and will submit documentation of each program review following each review.

6.4 Updates to the Initial PRP

As this is the first application of Section 2035 to a Corps' civil works project, course corrections to the initial plan to complete a *Safety Assurance Review* of the HSDRRS are warranted. The course corrections outlined under Sections 6.4.1 and 6.4.2 were developed through multiple conference calls held between HQUSACE, MVD, TFH, and the PCX in March 2009.

6.4.1 General Charge Guidance from HQUSACE

Experience gained while conducting IEPR of the HSDRRS design efforts, in particular the IHNC-02 Lake Borgne Surge Barrier, revealed that a significant percentage of IEPR comments were redundant to ATR and were not at a *Safety Assurance Review* level. This prompted discussions between HQUSACE, MVD, TFH, and the PCX. It was agreed that the IEPR efforts should be refocused on a higher-level review of design assumptions and changes to those assumptions through all project phases (design, construction, O&M, and monitoring) to avoid further duplication of ATR efforts, which is in keeping with the principle that IEPR should be scalable to the work products being reviewed. As a result, HQUSACE issued "General Charge Guidance" for WRDA Section 2035 IEPR to TFH/PCX on 26 Mar 09 (provided below). For a Sec 2035, Type II – IEPR, the design and construction phases, the *Safety Assurance Review* should focus on unique features and changes from the assumptions made and conditions that formed the basis for the concept design. The general charge guidance identified the below questions that should be addressed during the review. This guidance has been incorporated into ongoing HSDRRS IEPR efforts and included in national guidance developed by HQUSACE, Engineer Circular (EC), EC 1165-2-209, Civil Works Review Policy, dated 31 Jan 10. EC 1165-2-209 has divided IEPR into two types for clarity: Type I, which is generally for decision documents and Type II, which is generally for implementation documents. It shall also be noted that the Governor of an affected State (or Non-Federal Sponsor) may also request a peer review by independent experts.

Per EC 1165-2-209, all civil works planning, engineering, and O&M products must undergo review. All products shall undergo District Quality Control/Quality Assurance (DQC), but only a subset of these work products will undergo Agency Technical Review (ATR). Smaller subsets of the ATR group will undergo only Type I IEPR, Type II IEPR or both Type I and Type II IEPR. A risk-informed decision will be made as to whether ATR and/or IEPR is appropriate for that product based on some level of judgment which is the responsibility of the PDT with Sponsor's engagement. All risk informed decisions shall be documented in a review plan for all work products.

WRDA 2007 Section 2035 "*Safety Assurance Review*"
General Charge Guidance
(received from HQ 26 Mar 09)
(updated per EC 1165-2-209, dated 31 Jan 10)

For a Sec 2035, Type II – IEPR, the design and construction phases, the *Safety Assurance Review* should focus on unique features and changes from the assumptions made and conditions that formed the basis for the concept design. The panel should address the following questions:

1. Do the assumptions made during the decision document phase (interpreted as the EAR, PDD, DDR, or similar appropriate design document for the specific project--to be provided to panel) 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, resiliency or robustness with the emphasis on interfaces between structures, materials, members and project phases?

(1) Redundancy. The use of multiple lines of defense that are linked to potential failure modes. The most vulnerable failure modes need the greatest redundancy.

(2) Resilience. The use of enhancements to improve the ability of the system to sustain loads greater than the design load to achieve gradual failure modes over some duration rather than sudden failure modes.

(3) Robustness. The use of more conservative assumptions to increase capacity to compensate for greater degrees of uncertainty and risk.

3. Do the project features and /or components effectively work as a system?

4. Do the design assumptions made during design remain valid through construction as additional knowledge is gained and the state of the art evolves? (Final DDRs, CO QMPs, site visits, and other similar appropriate documents to be provided to panel for this assessment.)

5. 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? (Understood that monitoring plans and O&M manuals may be developed after construction and before project turnover. Must determine how to retain panel or issue new task order for this work.)

6.4.2 Revised List of Individual Features Requiring a Separate IEPR

The 1 Feb 2008 Interim Policy from HQUSACE, states that TFH, in concert with the MVD RIT and stakeholders, should identify the products where IEPR is appropriate. The expectation is that applying the criteria in Section 2035 will clearly identify some critical products where an independent peer review is required. That list of products shall be reviewed and approved by HQUSACE and made public. Additions or deletions from the list should be based on experience gathered as the program advances. HQUSACE approval is required for the removal of any projects from the approved list. As a result,

HQUSACE approval of this revised PRP constitutes approval to modify the list of products where IEPR is required. The resulting modified approach is summarized in this paragraph with more details provided on the following 2 pages. Table 3 lists the features

included in the $14.431B HSDRRS, along with the recommended IEPR of the "plan selection" and Section 2035 IEPR. In the case of the GNO HSDRRS, only the Harvey-Algiers 100-Year alternative selection rises to the level of requiring an IEPR of the "plan selection". The cornerstone of the Section 2035 IEPR consists of the HSDRRS Design Guidelines (and major changes). IEPR of the guidelines satisfies Section 2035 IEPR compliance for all HSDRRS features that are designed and constructed in accordance with these guidelines. Figure 3 shows the modified list of IEPR products.

In addition to the IEPR of the Design Guidelines, individual features will require a separate IEPR when any of the following exist: the features are unique or one-of-a-kind (never been built before), not captured under the HSDRRS Design Guidelines, or when innovative or non-conventional design or construction techniques/methods will be used. HSDRRS features requiring a separate Section 2035 IEPR are: IHNC-02 Lake Borgne Storm Surge Barrier, GIWW-WCC, I-10/I-310 crossings with HSDRRS (review limited to overtopping and uplift issues in design, no IEPR expected during construction), and PCCP-01.

Modified Approach/Course Correction
For WRDA 2007 S2035 IEPR

WRDA 2007 Section 2035 IEPR of the Greater New Orleans HSDRRS includes:

1. Section 2035 IEPR of HSDRRS Design Guidelines:
   - IEPR of HSDRRS Design Guidelines (Design Guidelines as of June 2008 update).
   - IEPR of major changes to HSDRRS Design Guidelines (deep soil mixing (DSM), spiral-welded piles (SWP), barge impact criteria, armoring criteria, allowable organic content of borrow material, MR&T transitions to HSDRRS, and any future major changes). NOTES: Major changes would include actual technical changes to the content of the guidelines (i.e., the intent is not to peer review minor changes such as editorial changes or minor corrections/additions to the existing guidelines).
   - IEPR of the guidelines satisfies S2035 IEPR compliance for all HSDRRS features that are designed and constructed in accordance with the guidelines. However, if there is a deviation from the peer-reviewed HSDRRS Design Guidelines (at any time during a project's design, construction, or O&M/monitoring phases); an individual IEPR of that feature may be triggered.

2. IEPR of "Plan Selection":
   - It was agreed during HQ/MVD/TFH conference call on 25 Mar 09 that IEPR of Plan Selection is to be conducted on HSDRRS features where the plan *has not been selected* and for projects where *alternatives are truly varied*.
   - **In case of the Greater New Orleans HSDRRS, only the Harvey-Algiers 100-Year alternative selection rises to the level of requiring an IEPR of the "Plan Selection".**
   - IHNC-02 Lake Borgne Surge Barrier will not undergo an IEPR of the "Plan Selection" since the plan has already been selected.
   - It was generally agreed during HQ/MVD/TFH conference call on 25 Mar 09 that the alternatives considered on PCCP-01, WBV Eastern Tie-In, WBV Western Tie-in, IHNC-01 Seabrook Barrier, WBV Company Canal, and Plaquemines Parish non-Federal Levees are not "truly varied".
   - Where warranted, IEPR of "Plan Selection" includes review of the selected plan as outlined in the Individual Environmental Report (IER) and Project Description Document (PDD) to provide an independent, third party review of the decisions that went into selecting the plan that would be built.

Modified Approach/Course Correction
For WRDA 2007 S2035 IEPR (continued)

3. Section 2035 IEPR of Individual Features Requiring Separate IEPR in addition to the IEPR of the HSDRRS Design Guidelines:

- Required for individual features where:
  - The feature(s) are unique or one-of-a-kind (never been built before), or not captured under HSDRRS Design Guidelines
  - Innovative or non-conventional design or construction techniques/methods will be used.
- **HSDRRS features requiring separate S2035 IEPR of design, construction, O&M/monitoring *in addition* to the IEPR of the HSDRRS Design Guidelines:**
  - **IHNC-02 Lake Borgne Surge Barrier**
  - **GIWW-WCC**
  - **I-10/I-310 crossings with HSDRRS (review limited to overtopping and uplift issues in design, no IEPR expected during construction)**
  - **PCCP-01**
  - **LPV 109.02a SouthPoint to CSX RR**
  - **LPV 145 Bayou Bienvenue to Bayou Dupre**
  - **WBV 14e.2 V-Line Levee**
  - **WBV 14c.2 New Westwego Pump Station to Orleans Village**

4. IEPR of design, construction, O&M/monitoring of individual features include the following review milestones:

a. IEPR of Design Assumptions in "Decision Document":
- Initial IEPR of design assumptions in the "decision document" (in case of HSDRRS, this would be the Individual Environmental Report (IER) and Project Description Document (PDD)/Engineering Alternative Report (EAR)).
- S2035 Revised HQ Charge Questions (dated 26 Mar 09) #1 and #2 apply.

b. IEPR of Design Assumptions Through Completion of Design Phase (target review at 95% design completion level):
- Second IEPR of design assumptions on the project, to ensure that the initial design assumptions in the "decision document" remain valid through the completion of design phase.
- Expectation is to conduct one review, at or near 95% design completion.
- S2035 Revised HQ Charge Questions (dated 26 Mar 09) #1 and #2 apply.

c. IEPR of Design Assumptions Through Construction Phase (target review at various times over construction):
- Additional IEPR of design assumptions on the project, to ensure that the design assumptions made during design remain valid through the completion of construction phase.
- Expectation is to conduct 2 site visits per peer reviewer (one at start of construction, one nearer end of construction).
- S2035 Revised HQ Charge Questions (dated 26 Mar 09) #2 and #3 apply.

d. IEPR of Design Assumptions Through O&M/Monitoring Phase (target review at key times in O&M/Monitoring Phase):
- IEPR during O&M and Monitoring Phase to ensure the O&M/monitoring requirements adequately maintain the conditions assumed during design and validated during construction; and if project monitoring will adequately reveal any deviations from assumptions made for performance.
- S2035 Revised HQ Charge Question (dated 26 Mar 09) #4 applies.

On 12 March 2010, the Lake Pontchartrain and Vicinity, Louisiana Project, Project Partnership Agreement, Amendment No. 1, for Permanent Canal Closures and Pumps (PCCP), was executed between the US Army Engineer District, New Orleans District and the Coastal Protection and Restoration Authority of Louisiana (CPRA). The execution of that agreement required the Government to commission independent peer reviews of the new work, including PCCP, through a Safety Assurance Review of the design and construction of the 17th Street, Orleans Avenue, and London Avenue pump stations and closure structures.

In addition, SLFPA-E and SLFPA-W have identified the following three products/features to undergo independent peer review of the design and construction phases: LPV 109.02a and LPV 145 for the Lake Pontchartrain and Vicinity, Louisiana Project and WBV 14e.2, and WBV 14c.2 for the West Bank and Vicinity, Louisiana Project. Table 2A and Figure 3 have been updated to reflect these changes.

6.5 The Role of Peer Reviewers

As required by WRDA 2007, the NAS policy for selection of reviewers and the review will be followed. This is consistent with existing Office of Management and Budget (OMB) requirements for IEPR.

Reviews will be conducted to identify, explain, and comment upon assumptions that underlie engineering analyses, as well as to evaluate the soundness of models, surveys, investigations, and methods. Review panels will be given the flexibility to bring important issues to the attention of decision makers. Review panels will evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable. However, review panels will be instructed to not present a final judgment on whether a project should be constructed or whether a particular operations plan should be implemented, as the Chief of Engineers is ultimately responsible for this final decision.

Independent reviews, no matter how useful, are not expected to resolve fundamental disagreements and controversies. Reviews will focus on assumptions, data, methods, and models.

Reviewers could assist the Corps in making decisions, but they will not be asked to make decisions themselves. Indeed, reviewers engaged in the independent review processes should be identified for their professional expertise, deemed independent, and should not be "stakeholders" at all. Frequent communication between the Contractor/IEPR Provider and the Peer Reviewers will help the review panel understand the technical and practical implications of its recommendations. However, all communication is done in accordance with Figure 1.

An issue that frequently arises in review, and one not always easily agreed upon, is defining a review panel's boundaries of inquiry. It is not uncommon for an agency or other administrative group to try to limit a review panel's deliberation. However, the line between technical and policy issues is often blurred, and it is often difficult to clearly

separate them. Task Force Hope will accept comments, but make a distinction in responses when comments pertain to policy which is beyond the scope of a Safety Assurance Review. MVN will respond accordingly and elevate comments on policy to HQUSACE for consideration under a non-project specific policy review.

7. ADDITIONAL REVIEW CONSIDERATIONS

7.1 General

All Project Management Plans (PMP) for features that will undergo a separate IEPR in addition to the IEPR of the HSDRRS Design Guidelines will have a new project specific section developed to incorporate the requirement. The section of the PMP should be in accordance with ER 5-1-11.

Following final review and approval of this Peer Review Plan by Mississippi Valley Division (MVD), this modified list of products will be made public. Future recommendations for additions or deletions from the approved list will be based on experience gathered as the program advances. It is understood that MVD approval will be required for the removal of any features from the approved list.

In accordance with the requirements of WRDA 2007 Section 2035, the written responses of the review panels and the responses of the Chief of Engineers shall be made available to the public, including through electronic means on the Internet.

7.2 IEPR of Plan Selection or a Modified Sec 2035 IEPR

IEPR of plan selection or a modified Sec 2035 IEPR consists of a review of the decision documents and the design and construction features that are not in line with or may deviate from the HSDRRS Design Guidelines. Initially, only one effort was recommended to undergo a peer review of the plan selection. This review included the alternative evaluation and determination process during the preliminary assessment and evaluation phase for providing 100-Year Level of Protection to the Harvey-Algiers Canal portion of the West Bank and Vicinity, LA project. The peer review consisted of a review of the Individual Environmental Report (IER) for the area (IER#12) and the Project Description Document (PDD) for the area (PDD#9). The IEPR review of PDD#9 was concurrent with final MVD review and approval of the PDD. The MVD did take action to approve the PDD until comments from the IEPR were incorporated or otherwise resolved. Review of the final PDD submittal included review of the following items included as part of the PDD: Individual Environmental Report (IER), Engineering Alternative Reports (EARs), and Alternative Evaluation Process (AEP). This review has been completed and a final report was submitted by Battelle on 27 May 09. The final review results of the IEPR, along with the execution office's response to the review, were provided to the Chief of Engineers as required by the 1 Feb 08 interim HQUSACE policy. All IEPR comments were incorporated or otherwise resolved prior to MVD approval of PDD#9. PDD#9 was approved by the MVD Commander on 29 May 09.

MVN will post this report publicly and request that the PCX, MVD, and HQUACE establish links to the website.

Because the products/features of the HSDRRS have evolved and based on the guidance in EC 1165-2-209, two additional efforts have been recommended to undergo a peer review of the plan selection- New Orleans to Venice (NOV) Federal Project and Plaquemines Parish Non-Federal levee incorporation into NOV project, and HSDRRS Environmental Mitigation Plans. The New Orleans to Venice (NOV) Federal Project and the Plaquemines Parish Non-Federal levee features peer reviews will consist of reviewing the Project Information Report (PIR) with accompanying Supplemental Environmental Impact Statement (SEIS) for the restoration and completion of the NOV project and the Project Description Document with the Environmental Impact Statement (EIS) for the incorporation of certain non-Federal levees in Plaquemines Parish into the existing NOV project. The IEPR will be conducted by the LWRC and consist of a modified Section 2035, Type II review to focus on safety assurance and validate the results of the design as described in the PDD, EIS, PIR and SEIS. In addition, the HSDRRS Environmental Mitigation Project peer review will be conducted by the LWRC and consist of a Section 2034, Type I review. This review will not include the mitigation efforts as a result of the pre-Katrina Westbank & Vicinity, La Project, as this work does not meet any of the triggers for IEPR.

8. SCHEDULE

Peer review efforts for the HSDRRS are underway and some are complete or near completion. The PCX and MVN execution offices will ensure that remaining peer review efforts are scoped and undertaken in an expeditious manner to ensure project schedules are not impacted. The IEPR of the HSDRRS will take place through the design, construction, O&M, and monitoring of the system; therefore, efforts will be ongoing beyond completion of construction for projects where individual IEPR will take place. Additionally, if there is a deviation from the peer-reviewed HSDRRS Design Guidelines (at any time during a project's design, construction, or O&M/monitoring phases); an individual IEPR of that feature may be triggered. MVN will coordinate any such potential triggers with MVD as necessary to ensure the requirements of Section 2035 are satisfied.

In accordance with Section 7009 of WRDA 2007, the Louisiana Water Resources Council (LWRC) was officially established on 28 Sep 10, to serve as the exclusive peer review panel for the disaster recovery activities in the State of Louisiana. This Council will be responsible for peer reviewing activities conducted by the Corps of Engineers in areas of Louisiana declared as major disaster areas after Hurricanes Katrina and Rita in 2005, in accordance with requirements of Section 2034 and 2035.

The criteria for designing and constructing the GNO HSDRRS levees and structures are based on the HSDRRS Design Guidelines (DG) which is a vital component of the system. The DG underwent a rigorous independent, objective review by the Reviewers under the existing peer review program. When developing the scope (charge) for the

review of specific features or products, one of the requirements is to ensure that the design is consistent with the HSDRRS DG and standard practices for Safety Assurance Reviews. Therefore, it is critical for the Reviewers to have the knowledge and familiarity of the DG. This eliminates the learning curve for a Reviewer to review the DG, understand all of the assumptions and rationales as well as the time it will take for the PDT to address any clarifying questions. Therefore, it is recommended that ongoing and new reviews of HSDRRS products/features continue under the existing peer review process/program instead of being peer reviewed by the LWRC, as this could potentially save in time and cost. All non-HSDRRS projects or products which require peer review, HSDRRS Environmental Mitigation Project and the New Orleans to Venice Federal Project/Plaquemines Parish NFL will be reviewed by the LWRC. The current list of projects that will be reviewed by the LWRC can be found in Appendix B, Louisiana Water Resources Council Review Projects. This list will be updated as future products/projects are identified by the owning USACE districts or the Non-Federal Sponsor.

9. POINTS OF CONTACT

Due to confidentiality law requirements with posting documents on website for public review, only the MVN Protection and Restoration Office Chief is listed as the point of contact for any questions concerning this PRP. The MVN Protection and Restoration Office Chief, Mr. Thomas Podany, can be contacted at (504) 862-2502 or via email at Thomas.J.Podany@usace.army.mil.

Table 2. WRDA Independent External Peer Review List – Initial (included in HQ-approved PRP dated 22 Oct 08)

General:

1. **HSDRRS Design Guidelines**
2. **Armoring Manual**
3. **Quality Management Plan**

HPO:

1. **IHNC Surge Protection:**
    a. IHNC-01 Seabrook Surge Barrier
    b. IHNC-02 Lake Borgne Surge Barrier
2. **Permanent Canal Closures and Pumps (PCCP):**
    a. PCCP-01
3. **Levee/Floodwall in St. Bernard Parish:**
    a. LPV 149 (Chalmette Loop Caernarvon Floodwall / St. Bernard)
    b. LPV 146 (Chalmette Loop B. Dupre to Hwy 46 Levee / St. Bernard)
    c. LPV 144 (Chalmette Loop to B. Dupre Floodgate / St. Bernard)
4. **Levee/Floodwall in Orleans Parish:**
    a. LPV 105.01 (Floodwalls / Lakefront Airport / New Orleans East)
    b. LPV 105.02 (T-wall / Lakefront Airport / New Orleans East)
    c. LPV 111.01 – DSM Only (NO East Levee, CSX RR to Michoud / New Orleans East)

MVN/PRO:

1. **Levees**:
    a. LPV 04.02a (Levee, St. Charles)
    b. WBV 18.2 (Levee, Highway 90 to Lake Cataouatche, Phase 2 / Jefferson)
    c. WBV 14f.2 (Westwego to Harvey / Jefferson)
    d. WBV 12 (Hero Canal Levee Enlargement / Jefferson)
2. **Floodwalls:**
    a. LPV 18.2 (Floodwall and Gate at Williams Blvd. Boat Launch / Jefferson)
3. **Fronting Protection**:
    a. LPV 10.2 (Pumping Station #4, Suburban / Jefferson)
    b. WBV 16b (Segnette Pump Station Fronting Protection / Jefferson)
4. **Drainage Structures**:
    a. LPV 07d.2 (Almedia Drainage Structure / St. Charles)
5. **Sector Gate and Alternatives:**
    a. WBV 16.2 (Company Canal Closure / Jefferson)
    b. WBV (Algiers and Harvey Canals – 100 year Alternatives / Jefferson)

Table 2A. WRDA Independent External Peer Review List – Revised

General:

1. **HSDRRS Design Guidelines**
    a. **Barge Impact Study**
    b. **Spiral Weld Pipe Study**
2. **Levee Armoring Research and Recommendations Report**
3. **HSDRRS Design Elevation Report**
4. **2010 Revisions to HSDRRS Design Guidelines**
5. **HSDRRS Environmental Mitigation Plans**

MVN/MVK:

1. **IHNC Surge Protection:**
    a. IHNC-02 Lake Borgne Surge Barrier
2. **Permanent Canal Closures and Pumps (PCCP):**
    a. PCCP-01 (17th Street, Orleans Avenue, & London Avenue)
3. **GIWW-WCC and Alternatives:**
    a. WBV-90 (Algiers and Harvey Canals – 100-Year Alternatives / Jefferson)
4. **Levee/Floodwall in Orleans Parish:**
    a. LPV 109.02a – New Orleans East Levee
    b. LPV 111.01 DSM Only (NO East Levee, CSX RR to Michoud / New Orleans East)
5. **Levee/Floodwall in St. Bernard Parish:**
    a. LPV 145 Bayou Bienvenue to Bayou Dupre
6. **Levee/Floodwall in Jefferson Parish**
    a. WBV 14e.2 V-Line Levee, East of Vertex
    b. WBV 14c.2 New Westwego PS to Orleans Village
    c. LPV 03.2a & 06e.2 (I-10 & I-310 Crossings, Uplift & Overtopping Only) (Only Design, not Construction)
7. **New Orleans to Venice (NOV)**
    a. Repair, restore, or accelerate to complete Federal levee work
8. **Plaquemines Parish Non-Federal Levees:**
    a. Replace or modify non-federal levees to incorporate into NOV existing federal project

Table 3. WRDA Independent External Peer Review Project List – Revised (in red)

SUMMARY of Features/Efforts Covered under this "Peer Review Plan" and Recommended S2035 IEPR Activities			
Project/Features	**Suppl**	**Recommended IEPR of "Plan Selection" (where *plan has not yet been selected* AND *alternatives are not truly varied)***	**Recommended S2035 (design and construction IEPR)**
General: **HSDRRS Design Guidelines, Environmental Mitigation(excluding Pre-Katrina WBV Mitigation**	N/A	1. Conduct S2034 of HSDRRS Environmental Mitigation Project(LWRC)	1.Conduct discrete S2035 IEPR of HSDRRS Design Guidelines 2. Conduct IEPR as major changes are incorporated into the HSDRRS Design Guidelines (e.g. LPV 111(DSM), SWP, barge impact criteria, armoring criteria, MR&T transition into HSDRRS Design Elevation Report, etc.) 3. Conduct 2013 Revisions to HSDRRS Design Guidelines(Bending Moment in Piles; Corrosion
Repair existing systems **(LPV, WBV, NOV, G Isle, SELA, and LGM).** Restore existing systems to authorized design elevation **(LPV, WBV, and NOV).** Accelerate completion of authorized systems **(LPV, WBV, NOV, G Isle, SELA, and LGM).** Repair non-Federal levee and pump stations. Includes Gustav and Ike repairs for **LGM, LPV, WBV, NOV, and G Isle.**	3rd, 5th, 6th, 7th	1. No other features under LPV, WBV, SELA, LGM and Grand Isle rise to the definition of alternatives under consideration that are "truly varied".	**1. NOV-Repair, restore, or accelerate to complete work because work requires SEIS.(Modified Type II IEPR)**
MRGO Deep Draft Deauthorization Study	4th	**None**, study complete.	**None**, study complete. Construction of closure being conducted with funds not included under HSDRRS.
Modification to Caernarvon and BBLB (both marsh creation projects)	4th	**None**, features don't rise to the level of requiring an IEPR (<$10M, doesn't impact public safety, not highly complex, not controversial)	**None**, features don't rise to level of requiring an IEPR (failure not likely to cause loss of life, no novel methods or innovative materials, etc.)
100-Year Level of Protection for **LPV and WBV**, including reinforcing or replacing floodwalls (any co-located work).	4th, 6th	1. **Harvey-Algiers 100-Yr Alternative** (because alternatives are truly varied).(Modified IEPR) 2. No other features under LPV and WBV rise to the definition of alternatives under consideration that are "truly varied".	**1. GIWW-WCC** **2. LPV 03.2a, LPV 06e.2 (I-10 and I-310 crossing with the HSDRRS under LPV focused on uplift and overtopping only)** **3. LPV 109.02a, LPV 145** **4. WBV 14e.2, WBV 14c.2**
Modify the 17th Street, Orleans, and London Avenue drainage canals and install **pumps and closure structures** at or near the lakefront.	4th, 6th	**None**, Congressional authorizing language is very specific; therefore, alternatives are not truly varied.	**1.PCCP-01**
Stormproofing Interior Pump Stations to ensure operability during hurricanes, storms, and high water events.	4th, 6th	**None**	**None**, design in accordance with the HSDRRS Design Guidelines. No unique, innovative or non-conventional construction methods anticipated.
Selective Armoring of critical elements of the NO hurricane and storm damage risk reduction system (LPV, WBV, NOV Projects)	4th, 6th	**None**	Levee Armoring Research and Recommendations Report already completed a S2035 review; however, additional reviews of armoring will be required and could be covered under the 2010 Revisions to HSDRRS Design Guidelines
Improve protection at **IHNC**	4th, 6th	**None**, design and construction efforts of the "selected plan" for IHNC-02 are already underway.	**1.IHNC-02 Lake Borne Storm Surge Barrier**
Replace or modify certain **non-Federal levees(NFL) in Plaquemines Parish** to incorporate the levees into the existing **NOV** project	4th, 6th	1. No other features under Plaqs. NFL rise to the definition of alternatives under consideration that are "truly varied".	**1. Replace or modify NFL because an EIS is required. (Modified Type II IEPR)**
Repairs, replacements, modifications and improvements of **non-Federal levees** and associated protection measures in **Terrebonne Parish.** Levees will not be incorporated into Federal levee system	4th	**None,** Congressional authorizing language is very specific; therefore, alternatives are not truly varied. Levees remain "non-Federal" after completion of work.	**None,** design in accordance with standard Corps design guidelines. No unique, innovative or non-conventional methods anticipated.
Elements of **SELA urban drainage project** within the geographical perimeter of WBV and LPV projects, to provide for interior drainage or runoff from rainfall with 10% annual exceedance probability.	6th	**None,** Congressional authorizing language is very specific; therefore, alternatives are not truly varied.	**None,** doesn't involve life-safety issues, design in accordance with stand Corps design guidelines. No unique, innovative or non-conventional methods anticipated.

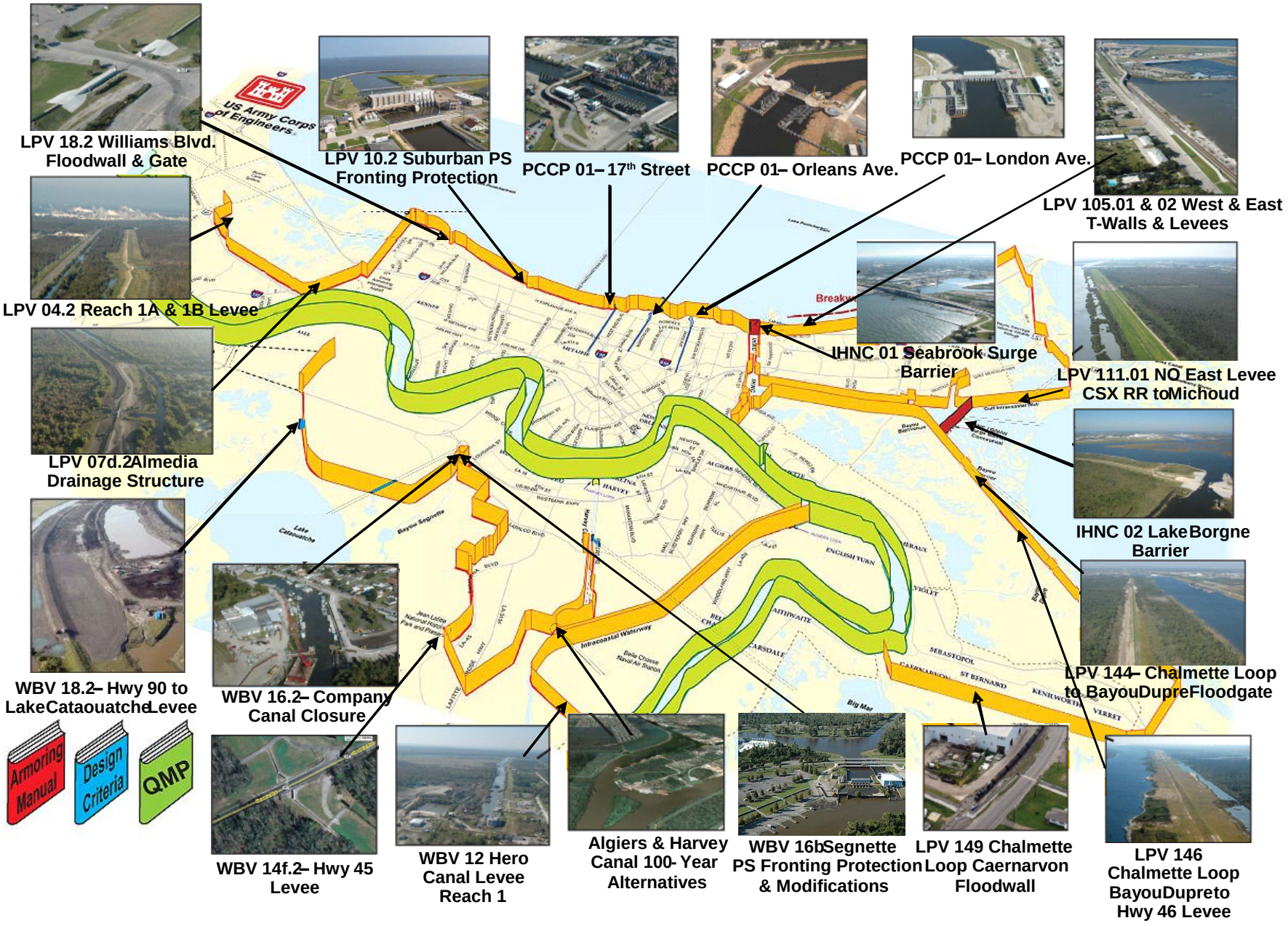

Figure 2. WRDA IEPR Projects – Initial List

Figure 3. WRDA IEPR Projects – Revised List

APPENDIX A

CECW-CE **UPDATED: 1 Feb 2008**

MEMORANDUM FOR COMMANDER Mississippi Valley Division

SUBJECT: Interim Policy for an Independent Peer Review for the 100-Year Level of Protection, Hurricane and Storm Damage Risk Reduction System (HSDRRS), New Orleans, LA

1. The Water Resources Development Act (WRDA) of 2007, Public Law 110-114, contains three specific requirements for independent external peer review (IPR)

a. Section 2034 addresses IPR requirements for decision documents.

b. Section 2035 of WRDA 2007 contains explicit requirements for the *Safety Assurance Review* of the design and construction activities for hurricane and storm damage reduction and flood damage reduction projects.

c. Section 7009 outlines IPR requirements specific to the areas in Louisiana declared a disaster following Hurricane Katrina and Rita 2005. In particular, the Secretary shall establish a council known as the "Louisiana Water Resources Council," which shall serve as the exclusive peer review panel for the disaster recovery activities.

2. Since this program is in a Post-Authorization phase for a civil works project, the purpose of the interim policy is to bring the Hurricane and Storm Damage Risk Reduction System (HSDRRS) review processes into compliance with the new IPR requirements in section 2035. The purpose of the *Safety Assurance Review* is to ensure that good science, sound engineering, and public welfare are the most important factors that determine a project's fate. WRDA 2007 further directs the use of the National Academy of Science's policy for the selection of reviewers and the review. That direction is consistent with existing Office of Management and Budget (OMB) requirements for IPR.

3. The policy is based on the following references:

a. ER 1110-2-1150, Engineering and Construction for Civil Works Projects
b. ER 1110-1-12, Engineering and Design Quality Management
c. National Research Council, "Review Procedures for Water Resources Project Planning", 2002
d. OMB "Final Information Quality Bulletin for Peer Review," Dec 2004
e. WRDA 2007 H. R. 1495 Public Law 110-114

4. Consistent with OMB and National Academy of Sciences guidelines, USACE has defined the IPR as a review in which the responsibility for coordinating the review is granted to an organization independent of USACE; that entity must be in charge of selecting the reviewers, all of whom should be independent of USACE and free of conflicts of interest.

5. IPR is an extension (not a replacement) of the Agency Technical Review (ATR) (formerly Independent Technical Review (ITR)) requirements outlined in ER 1110-1-12, Engineering and Design Quality Management; however, the intent of the reviews is to complement the existing process and to avoid impacts to program schedules and cost. Where appropriate and reasonable, TFH can conduct the ATR and IPR concurrent and in concert if it enhances the review process.

6. TFH can apply this policy concurrent with current project schedules. However, if review comments indicate an inherent weakness in a project, TFH needs to assess impacts and consult with Mississippi Valley Division, Regional Integration Team (MVD-RIT) for resolution.

7. IPR costs should be within reasonable limits, commensurate with the project magnitude and scale, and in line with other project study costs.

8. TFH will lead the development of a Review Plan. At a minimum, the Review Plan will include the Hurricane and Storm Damage Risk Reduction System Protection System Design Guide which serves as the basis for all subsequent engineering design for the program. Though the document is evolving, the review should begin immediately and the review should remain flexible to additions and changes to the design guide. In developing the review plan the following guidance applies:

a. The North Atlantic Division Planning PCX already has responsibility for managing the review of coastal storm damage reduction “Planning” products in New Orleans; that responsibility is being extended to include all IPR requirements during the TFH design and construction phase. The PCX shall work with those familiar with the design guide to develop the “charge” (scope) for the review. That charge shall be reviewed and approved by the Chief of Engineering and Construction, HQUSACE.

b. TFH, in concert with the MVD RIT and stakeholders, should identify the products where IEPR is appropriate. The expectation is that applying the criteria in Section 2035 will clearly identify some critical products where an independent peer review is required. That list of products shall be reviewed and approved by HQUSACE and made public. Additions or deletions from the list should be based on experience gathered as the program advances. HQUSACE approval is required for the removal of any projects from the approved list.

c. Another area for WRDA compliance is IPR requirements during construction. The screening, review and approval process used to identify IPR requirements for Pre-

Construction phase work should also be applied to the construction phase. For those products selected, an assessment of corresponding construction activities should be made and the charge to the IPR panel would be to observe and comment on those critical construction elements.

d. All work through development of product specific guidance, engineering, construction, and the operations and maintenance (O&M) program will undergo an ATR to "ensure the quality and credibility of the government's scientific information" in accordance with the quality assurance and quantity control procedures of each major subordinate command. USACE 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. At a minimum, TFH should accomplish all such reviews outside the district office that performed the work. The ATR can include reviewers external to USACE.

e. The IPR is a function of various triggers identified in Section 2035. The level of review is commensurate with the project's magnitude and risk. Past experience has shown the importance of IPR in improving USACE plans, projects, and programs. USACE will use the following factors to determine the need for IPR.

- Significant threat to human life
- Cases where information is based on novel methods, presents complex challenges for interpretations, contains precedent-setting methods or models, or presents conclusions that are likely to change prevailing practices
- Project has a reduced or overlapping design-construction schedule
- Project has unique construction sequencing
- Project involves use of innovative materials or techniques
- Project lacks redundancy

f. TFH should consult ER 1110-2-1150, Engineering and Design for Civil Works Projects, which outlines typical products prepared for Civil Works projects during Pre-Construction, Construction, and O&M phases. Listed below are examples of engineering and construction products that can be subject to an IPR when applicable to the triggers:

- Survey and Investigations studies to insure sufficient quality of data
- Design Documentation Reports, the record of final design
- Engineering Documentation Reports, a report to support when there are minor changes to design and costs
- Value Engineering Studies
- The Design for remediation of Hazardous, Toxic, and Radioactive Waste
- Utility relocations
- Physical model studies
- Engineering support to preparation of Project Partnership Agreements
- Plans, specifications, and cost estimates of critical project features
- Engineering considerations and instructions for field personnel

- Critical construction placement
- Construction Foundation and Concrete Reports
- Project O&M Manuals
- Post Project Monitoring Plans
- Contractor Submittals of critical project features
- Contract Change Order of critical project features
- Post Construction Reports such as Foundation Completion, Embankment Criteria and Performance Evaluations, and Concrete Materials Reports

9. The IPR may take the form of a standing advisory panel of experts that will provide non-binding review of engineering and construction documentation, and inspect construction placement. The IPR panel will perform reviews and site visits in accordance with milestones identified in the Review Plan. The IPR panel has the option to request additional or alternate milestones where warranted and reasonable.

10. An important step in ensuring effective use of the results of review is to clarify at the outset the review panel's roles and how results from the panel's report are to be used. The charge to the review panel should be defined as to whether consistency with an agency's mission and goals is part of the review ("right job"), and/or whether the review is confined to the methods used and the validity of the conclusions and recommendations derived there from ("job right").

11. Recommendations of review panels are not binding. A review panel is to provide a credible assessment of the program or products, which should serve as an evaluation aid to the "Louisiana Water Resources Council", and the Chief of Engineers who is ultimately responsible for the final decision. A review panel should also be able to evaluate whether interpretation of analysis and conclusions based on analysis are reasonable. A review panel should not, however, present a final judgment regarding whether a project alternative or a particular operation plan should be implemented.

12. TFH should provide to the panel information necessary for conducting the review. In addition, the review panel should receive input from relevant stakeholders. The panel's conclusions are provided in a final report. TFH shall consider all comments in the report and prepare a written response to each comment either adopting the comment or not adopting the comment and explaining why. TFH's response to the comments completes the review cycle.

13. The following bullets are guidance for developing the "Charge".

a. Reviews should be conducted to identify, explain, and comment upon assumptions that underlie engineering analyses, as well as to evaluate the soundness of models, surveys, investigations, and methods. A review panel should be given the flexibility to bring important issues to the attention of decision makers. Review panels should be able to evaluate whether the interpretations of analysis and the conclusions based on analysis are

reasonable. However, review panels should be instructed to not present a final judgment on whether a project should be constructed or whether a particular operations plan should be implemented, as the Chief of Engineers is ultimately responsible for this final decision.

b. Independent reviews, no matter how useful, should not be expected to resolve fundamental disagreements and controversies. Reviews should focus on assumptions, data, methods, and models.

c. Reviewers could assist USACE in making decisions, but they should not be asked to make decisions themselves. Indeed, reviewers engaged in the independent review processes should be identified for their professional expertise and should not be "stakeholders" at all.

d. Frequent communication will help the review panel understand the technical and practical implications of its recommendations.

e. An issue that frequently arises in review, and one not always easily agreed upon, is defining a review panel's boundaries of inquiry. It is not uncommon for an agency or other administrative group to try to limit a review panel's deliberation. However, the line between technical and policy issues is often blurred, and it is often difficult to clearly separate them. TFH should accept comments, but make a distinction in responses when comments pertain to policy which is beyond the scope of a Safety Assurance Review. TFH should respond accordingly and elevate comments on policy HQUSACE for consideration under a non-project specific policy review.

f. Review results should be presented to the Chief of Engineers before a final decision is made. Results should be available to the public.

14. Review panels might carry out their duties in numerous ways. Reviews are often conducted in the traditional style of face-to-face panel discussion led by a panel chair. These meetings often extend over a one to three-day period, and over the course of a study or project, several such meetings may be held. There are, however, other ways in which reviews might be conducted. Review panels might conduct their work sequentially, with pre-meeting assignments followed by discussions in subgroups, followed by reports and plenary discussion by the entire panel. A review panel could employ a professional facilitator, leaving the chair free to fully participate in the discussions. Panels might operate in the open or (consistent with applicable laws) behind closed doors, or both. Panels might meet once or dozens of times. Panels can be standing or ad hoc.

15. A review does not necessarily require panels to meet. There may be instances in which meetings are not feasible because of time, resource, or other constraints, and there are many alternatives to face-to-face meetings. For example, federal agencies commonly use "mail" or "ad hoc" reviews in which draft reports are mailed to expert reviewers. Mail reviews are much less expensive, as there are no travel costs, but they may be far less effective, as reviewers are not able to engage in face-to-face discussion. There may even be instances

when a single expert, rather than a panel, is used to review an issue or report. Reviews can employ multiple review levels, in which a parent panel coordinates the review activities of smaller panels, or task forces that are engaged in specific review activities. Difference review panels could be employed at different stages of a study. Telephone calls have been used as a review mechanism, and video-conferencing is increasingly employed. In revising its review procedures, the Corps should be aware of the range of review options, and it may wish to experiment with some of them as its review process matures and improves.

16. In accordance with Reference 3.c, the National Research Council offers the following guidelines for the reviewer's role:

a. Reviewers should identify, explain, and comment upon assumptions that underlie engineering, analyses, as well as to evaluate the soundness of models, surveys, investigations, and methods. A review panel has the flexibility to bring important issues to the attention of decision makers. Review panels should be able to evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable. However, review panels should avoid presenting a final judgment on whether a project should be constructed or whether a particular operations plan should be implemented, as the Chief of Engineers is ultimately responsible for this final decision.

b. Review panels should highlight areas of disagreement and controversies that may need resolution.

c. It is important that panelists focus on their review, and not become defenders of their recommendations.

d. Reviewers should assist the Corps in making decisions, but should avoid making decisions themselves.

e. Reviewers should avoid findings that become "directives" in that they call for modifications or additional studies or suggest new conclusions and recommendations. In such circumstances the reviewers may have assumed the role of advisors as well as reviewers, thus introducing bias and potential conflict in their ability to provide objective review later in the project.

f. Reviewers should aim to draw distinctions between criticisms of the regulations and guidelines and criticisms of how well the Corps conformed to the guidance.

17. This is the first application of Section 2035 to a civil works project. It is important to capture lessons learned for incorporation in to the development and evolution of national policy. If you have any questions, please contact David A. Pezza or Zoltan L. Montvai of my office.

DON T. RILEY
Major General, USA
Director of Civil Works

APPENDIX B. LOUISIANA WATER RESOURCES COUNCIL (LWRC) REVIEW PROJECTS (HSDRRS & Non-HSDRRS PROJECTS)

Anticipated USACE Projects in Louisiana for FY11, FY12, FY 13 and FY14		Information Related to WRDA 2007 Sec 2034/2035 and Reporting Requirements		
District	**Study/Project Name**	**Is an IEPR Anticipated?**	**Estimated or Actual Date FY IEPR Will Start (mm/yy)**	**Review Type**
SECTION 2034 – TYPE I REVIEWS				
MVN	Amite River & Tributaries Bayou Ecosystem Restoration	Yes	June 13	ECO Type I
MVN	Calcasieu Lock	Yes	June 13	NAV Type I
MVN	Donaldsonville to the Gulf	Yes	Aug 12	FRM Type I
MVN	Larose to Golden Meadow	Yes	Jul 12	PAC Type I
MVN	Houma Navigation Canal Deepening	Yes	May 12	NAV Type I
MVN	Southwest Coastal Louisiana Hurricane Protection Study	Yes	Sep 12	FRM Type I
MVN	Mississippi River and Tributaries - Morganza to the Gulf, LA	Yes	Dec 13	FRM Type I
MVN	West Shore, Lake Pontchartrain, LA	Yes	Mar 13	FRM Type I
MVN	Bayou Sorrel	Yes	May 12	FRM Type I
MVN	Mississippi River Gulf Outlet - Ecosystem Restoration	Yes	Feb 11	ECO Type I
MVN	St. Charles Urban Flood Control	Yes	June 13	FRM Type I
MVN	Louisiana Coastal Area Barataria Basin Barrier Shoreline FS	Yes	PENDING	ECO Type I
MVN	Louisiana Coastal Area 4 – Caillou Lake	Yes	PENDING	ECO Type I
MVN	Louisiana Coastal Area 4 – Point Au Fer	Yes	PENDING	ECO Type I
MVN	Louisiana Coastal Area 4 – Davis Pond	Yes	PENDING	ECO Type I
MVN	Louisiana Coastal Area 4 – Caernarvon Diversion	Yes	PENDING	ECO Type I

District	Study/Project Name	Is an IEPR Anticipated?	Estimated or Actual Date FY IEPR Will Start (mm/yy)	Review Type
SECTION 2034 – TYPE I REVIEWS (cont'd)				
MVN	Louisiana Coastal Area 5 – Myrtle Grove	Yes	Nov 12	ECO Type I
MVN	Louisiana Coastal Area 5 – Mississippi River Hydro	Yes	Sep 14	ECO Type I
MVN	Louisiana Coastal Area 5 – Hope Canal	Yes	Dec 13	ECO Type I
MVN	Louisiana Coastal Area 5– Bayou Lafourche	Yes	Dec 13	ECO Type I
MVN	Continuing Authorities Program – Town of Carencro	Yes	Nov 11	FRM Type I
MVK	Spring Bayou	Yes	FY 13	ECO Type I
MVK	Cross Lake Water Supply	Yes	FY 13	Type I
MVK	Bossier Parish	Yes	Sep 12	FRM Type I
SWG	Sabine-Neches Waterway, TX		Awaiting Authorization	Mitigation
MVN	HSDRRS Environmental Mitigation Plans	Yes	Apr/May 11	Mitigation Type I
SECTION 2035 – TYPE II REVIEWS				
MVN	Atch Basin Construction	Yes	Aug 12	FRM Type II
MVN	Atch Basin Flood System	Yes	Sep 13	FRM Type II
MVN	Mississippi River Levee Construction	Yes	FY12 – construction completion	FRM Type II
MVN	Louisiana Coastal Area 6 - Terrebonne Basin	Yes	Aug 12	ECO Type II
MVN	Louisiana Coastal Area 6 - Atchafalaya River	Yes	Aug 12	ECO Type II
MVN	Louisiana Coastal Area 6 - Blind River	Yes	Aug 12	ECO Type II
MVN	Louisiana Coastal Area 6 - Amite River Diversion	Yes	Aug 12	ECO Type II
MVN	Louisiana Coastal Area 6 - White Ditch	Yes	Aug 12	ECO Type II
MVN	SELA – Algiers Sub basin	Yes	Jan 13	FRM Modified Type II

District	Study/Project Name	Is an IEPR Anticipated?	Estimated or Actual Date FY IEPR Will Start (mm/yy)	Review Type
SECTION 2035 – TYPE II REVIEWS (cont'd)				
MVN	SELA – W-14 Canal	Yes	Jan 13	FRM Modified Type II
MVN	St. Charles Urban Flood Control	Yes	Jun 14	FRM Type II
MVN	East Baton Rouge	Yes	Jun 12	FRM Type II
MVN	Donaldsonville to the Gulf	Yes	Aug 13	FRM Type II
MVN	Louisiana Coastal Area 4 – Cailou Lake	Yes	Jul 13	ECO Type II
MVN	Louisiana Coastal Area 4 – Point Au Fer	Yes	Jul 13	ECO Type II
MVN	Louisiana Coastal Area 4 – Davis Pond	Yes	Jul 13	ECO Type II
MVN	Louisiana Coastal Area 4 – Caernarvon Diversion	Yes	Jul 13	ECO Type II
MVN	Louisiana Coastal Area 5 – Myrtle Grove	Yes	Jul 14	ECO Type II
MVN	Comite River Diversion	Yes	June 11 – construction completion	FRM Type II
MVN	Inner Harbor Navigation Canal Lock Replacement	Yes	Aug 13	NAV Type II
MVN	Bayou Sorrel	Yes	May 12 – construction completion	FRM Type II
MVN	Southwest Coastal Louisiana Hurricane Protection Study	Yes	Jun 14	FRM Type II
MVN	West Shore, Lake Pontchartrain, LA	Yes	Sep 14	FRM Type II
MVN	New Orleans to Venice Federal Project/Plaquemines Parish NFL	Yes	Jun 11	Modified Type II