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

JUL 11 2013

REPLY TO
ATTENTION OF

CEMVN-ED-E

MEORANDUM FOR Commander, Mississippi Valley Division (CEMVN-PD-N/Mr. Rayford Wilbanks)

SUBJECT: Independent External Peer Review of Greater New Orleans Hurricane and Storm Damage Risk Reduction System (GNOHSDRRS): Crossings with I-10 and I-310, Lake Pontchartrain and Vicinity (LPV) 03.2a and 06e.2

1. Reference subject Final Independent Peer Review (IEPR) Report, December 15, 2010. This memo summarizes the results of the IEPR and provides the final responses to comments offered by the IEPR team.

2. The IEPR of the Greater New Orleans Hurricane and Storm Damage Risk Reduction System (GNOHSDRRS): Crossings with I-10 and I-310, Lake Pontchartrain and Vicinity (LPV) 03.2a and 06e.2 was conducted from March 12, 2009 to January 30, 2011 by the Batelle Memorial Institute. The independent team assembled by Batelle consisted of two (2) Panel Members with broad-ranging experience in civil/structural, geotechnical, hydraulics and water resources engineering. The IEPR effort included orientation kick-off teleconferences, the development of a critical items list, the development of comments, initial responses by USACE to comments, the IEPR team's backcheck of comments and closeout of comments. The IEPR team provided subject report to recap and summarize review comments and recommendations which was submitted to USACE.

3. A total of 39 comments were submitted by the IEPR Team; 17 pertaining to the I-10 crossing and 22 to the I-310 crossing. All 17 of the I-10 crossing comments were either closed or withdrawn; 15 of the I-310 comments were resolved, with the panel members requesting further information or clarification on the remaining 7 comments. The final IEPR report was submitted without any further action regarding these unresolved comments.

4. The following responds to the IEPR's request for further information or clarification on the 7 remaining comments. The comments (reproduced in italics) are followed by the USACE response.

a. IEPR Comment: It is not clear if the wave characteristics (Hs, T, etc.) were adjusted from those used for the Mississippi River Gulf Outlet (MRGO).

USACE Response: The boundary conditions established for St Charles Parish were not derived from MRGO results (refer to Figure 23 and Table 7 of "Elevations for

Design of Hurricane Protection Levees and Structures, Lake Pontchartrain, Louisiana and Vicinity Hurricane Protection Project and West Bank and Vicinity, Hurricane Protection Project" report). Furthermore, future condition values were developed by adding 0.75 feet to the existing condition wave heights.

b. IEPR Comment: The results of the latest Barge Impact Study should be used to estimate boat/barge impact load on the floodwall.

USACE Response: The design at I-10 accounted for a 50-kip pleasure craft impact load per the HSDRRS Design Guidelines. The I-310 crossing design accounted for a 0.5 kip/ft debris load per the HSDRRS Design Guidelines. These values are in compliance with the HSDRRS Design Guidelines which had been modified to include the results of the latest barge/boat impact studies.

c. IEPR Comment: The structural integrity of the bridges should be evaluated beforehand and monitored during construction staging and pile driving activities.

USACE Response: The 95% Plans and Specifications used by the IEPR panel in their review called for pile driving to be done from the I-310 bridge. The final P&S did not allow work to be done from on the bridge. The project P&S were followed and no issues with structural integrity were noted. Louisiana Department of Transportation and Development representatives were included in pre-construction meetings, meetings during construction, and post-construction meetings.

d. IEPR Comment: The floodwall design should consider that high velocity currents during a potential overtopping event may impose an additional lateral load on the floodwall.

USACE Response: The walls were designed for a 100-year level of risk reduction and the HSDRRS Design Guidelines were followed, including all required design load cases and design checks. Walls throughout the system are designed to elevations that limit overtopping during a 1% chance per year event to harmless levels. In addition, walls are designed with elevations to avoid storm surge overtopping during the 0.2% chance per year event (500-year recurrence).

e. IEPR Comment: It is not clear if the designers considered the possibility of seiches and standing waves in the lake during a hurricane in the design.

USACE Response: The potential for seiches and standing waves is built into the ADCIRC model that was used to design the HSDRRS. The basic governing equations and a thorough discussion of the ADCIRC model can be found in the paper, "Formulation and Numerical Implementation of the 2D/3D ADCIRC Finite Element Model Version 44.XX," Rick Leuttich and Joannes Westerink, 2004. This document is available on the internet from the software developers at http://adcirc.org/ or at http://dl.dropboxusercontent.com/u/74679281/adcirc_theory_2004_12_08.pdf.

f. IEPR Comment: It is not clear if the designers evaluated the potential soil scour and scour depth for both floodwall and the bridge piers.

USACE Response: The IEPR team used 95% Plans and Specifications for the review. Final plans for the project did include riprap and/or a concrete apron along the I-10 and I-310 floodwalls to provide protection from potential scour at these crossings.

g. IEPR Comment: The floodwall design considered the 10% exceedance condition for hydraulic analyses in accordance with Southeast Louisiana Authorization instead of 1% exceedance in accordance with the design guidelines. The design should consider the 100 year storm event and the 500 year storm surge.

USACE Response: EM 1110-2-1413 (Hydrologic Analysis of Interior Areas) reads "If a local storm drainage system is in existence, then the minimum facility should pass the local system design event with essentially no increase in interior flooding." The minimum facility was equated to the design event for which the interior pump station(s) or drainage structures have been sized. The interior drainage system and pump stations for Jefferson and St. Charles Parishes have been designed for the 10% exceedence 24-hour extra-tropical rainfall event. Thus, a rainfall event of the same magnitude and duration was selected for the modeling effort.

5. As stated in the final report, "In general, the IEPR panel members agreed that the numerical modeling results developed for and provided in the 95% project review documents for the project design are acceptable, subject to the following recommendations:

a. Adjust wave characteristics (Hs, T, etc.) from those used for the MRGO.

b. Estimate boat/barge impact load on the floodwall using the results of the Barge Impact Study.

c. Evaluate and monitor the structural integrity of the interstate bridges during construction staging and pile driving loads.

d. Consider the high velocity currents during an overtopping event may impose an additional lateral load on the floodwall.

e. Consider the possibility of seiches and standing waves in the lake during a hurricane in the design.

f. Evaluate the soil scour and scour depth for both floodwall and the bridge piers.

g. Consider the 1% exceedance in accordance with the design guidelines, the 100-year storm event, and the 500-year storm surge in the design of the floodwalls."

6. Conclusion: Each of the 7 IEPR panel recommendations correlate to one of the 7 unresolved comments of the IEPR members associated with the I-310 crossing. Those comments and MVN-ED's final responses are contained in this document. The USACE team appreciates the input of the IEPR panel during this review process. As the project evolved and developed through the final design and construction phases, the comments and recommendations of the IEPR panel contributed much to the improvement of the project. This report concludes the IEPR action for this project.

7. The point of contact for this action is Timothy M. Ruppert, P.E. at (504) 862-2106.

Mark R. Hoague

MARK R. HOAGUE, P.E.
Chief, Engineering Division

CF:
CEMVN Commander, Colonel Richard L. Hansen
Chief, TFH, Michael F. Park
Mark H. Gonski, CEMVN-ED-T
Richard B. Pinner, CEMVN-ED-F
Nancy J. Powell, CEMVN-ED-H
Jake A. Terranova, CEMVN-ED-S
Jean Vossen, CEMVN-ED-L

c. Evaluate and monitor the structural integrity of the interstate bridges during construction staging and pile driving loads.

d. Consider the high velocity currents during an overtopping event may impose an additional lateral load on the floodwall.

e. Consider the possibility of seiches and standing waves in the lake during a hurricane in the design.

f. Evaluate the soil scour and scour depth for both floodwall and the bridge piers.

g. Consider the 1% exceedance in accordance with the design guidelines, the 100-year storm event, and the 500-year storm surge in the design of the floodwalls."

6. Conclusion: Each of the 7 IEPR panel recommendations correlate to one of the 7 unresolved comments of the IEPR members associated with the I-310 crossing. Those comments and MVN-ED's final responses are contained in this document. The USACE team appreciates the input of the IEPR panel during this review process. As the project evolved and developed through the final design and construction phases, the comments and recommendations of the IEPR panel contributed much to the improvement of the project. This report concludes the IEPR action for this project.

7. The point of contact for this action is Timothy M. Ruppert, P.E. at (504) 862-2106.

MARK R. HOAGUE, P.E.
Chief, Engineering Division

Ruppert
ED-E

for Varuso
C/ED-E

Powell
ED-H

Gonski
ED-TM

Bivona
AC/ED

Hoague
C/ED

CF:
CEMVN Commander, Colonel Richard L. Hansen
Chief, TFH, Michael F. Park
Mark H. Gonski, CEMVN-ED-T
Richard B. Pinner, CEMVN-ED-F
Nancy J. Powell, CEMVN-ED-H
Jake A. Terranova, CEMVN-ED-S
Jean Vossen, CEMVN-ED-L