MINUTES OF
SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY-EAST
ENGINEERING ADVISORY COMMITTEE MEETING
HELD ON NOVEMBER 4, 2010

PRESENT: Thomas Jackson, Chair
Stephen Estopinal, Vice Chair
Louis Wittie, Commissioner
George Losonsky, Commissioner
Ricky Brouillette, Office of Coastal Protection and Restoration (OCPR)

The Engineering Advisory Committee (EAC) met on November 4, 2010, in the Second Floor Hall of the Lake Vista Community Center, 6500 Spanish Fort Blvd., New Orleans, Louisiana. Chairman Jackson called the meeting to order at 12:03 p.m.

Opening Comments: Mr. Jackson advised that Ricky Brouillette was invited to participate on the EAC as the contact person for the Coastal Protection and Restoration Authority (CPRA). He noted that the EAC deals primarily with high end engineering issues.

Adoption of Agenda: The agenda was adopted as presented.

Approval of Minutes: The minutes of the September 2, 2010 EAC meeting were approved.

Public Comments: Public comment was provided during discussion of Item No.1 under New Business.

Old Business:

1. **Corrosion protection of St. Bernard T-Walls – Status of the letter from the Office of Coastal Protection and Restoration.**

Mr. Jackson advised that a recent meeting in which he participated by teleconference concluded with the understanding that a letter would be sent by the Office of Coastal Protection and Restoration relative to the corrosion issue. The purpose of the letter concerned issues relating to the uncoated sheet pile and H-pile used in the construction of the St. Bernard T-walls. A waiver was issued for the U.S. Army Corps of Engineers (USACE) to use a thickened section of sacrificial steel in lieu of the coating process required in the USACE's design manual. The CPRA had indicated that it concurred with the resolution adopted by the SLFPA-E.

Mr. Brouillette addressed the status of the CPRA's letter and advised that some individuals wanted to see the facilities before the letter is issued. The letter is anticipated to be issued early next week. He stated that the State's concerns are similar to those of the SLFPA-E regarding the corrosion issue.

Mr. Jackson commented that the Project Partnering Agreement is between the USACE and the CPRA, as the local sponsor. The SLFPA-E is not a signatory to the Agreement. As time goes on and steel sheet piles and H-piles are driven into the ground, this issue becomes closer to being a moot point; however, the difference in the design opinion should be reflected in the record. He pointed out that the waiver was granted due to scheduling; however, the steel piling could have been field coated on site. He explained that the SLFPA-E requested that the USACE conduct an accelerated Independent External Peer Review (IEPR) of the corrosion issue. The IEPR process was briefly discussed by the Committee. Mr. Jackson noted that the request for a variance from the design manual on a project as important as the T-wall project should have automatically triggered an IEPR process. He added that the SLFPA-E will not have access to the IEPR report until after it is cleared by the Chief of Engineers, which will be after construction is completed. He suggested that after seeing the CPRA's letter the EAC may wish to request an update on the accelerated IEPR process.

2. <u>Outfall Canals – Update from Halcrow and meeting with S&WB.</u>

Mr. Jackson reported that he, Robert Turner, SLFPA-E Regional Director, and Stevan Spencer, SLFPA-E Regional Chief Engineer, participated in a teleconference with Halcrow, Inc., the consultant engaged by the SLFPA-E for a peer review on the remedial work along the Orleans Avenue, London Avenue and 17th Street Outfall Canals. Halcrow is currently checking the factor of safety along the canals and attempting to identify the areas needing remediation. Halcrow is performing calculations based on the same data used by the USACE's consultants to calculate a factor of safety for given canal reaches. The existing cross sections taken by the USACE are being used. Halcrow's results thus far appear to be close to those of the USACE's consultant. Areas with a very low factor of safety are being identified for remediation. The report from Halcrow was positive in terms of confirming the numbers and identifying sections needing remediation. Halcrow has not yet started looking at the remediation proposals.

Mr. Jackson explained that in the teleconference he brought up a question about conveyance and it was determined that a meeting was needed with the Sewerage and Water Board (S&WB), since conveyance is the responsibility of that entity. The S&WB's position is that its responsibility is from bank to bank and that the levee districts are responsible for the adjacent levees. He expressed concern about the S&WB's need to excavate the canals in the future, which the S&WB estimates will take place on a ten-year cycle. A subsequent meeting took place with S&WB representatives, including Marcia St. Martin, S&WB Executive Director, Joe Becker, S&WB General Superintendent, and a staff engineer. Four items were discussed at the meeting:

1) Has the S&WB checked the hydrology (conveyance) of the three outfall canals?
2) How often does the S&WB feel that it needs to excavate the canals? The S&WB confirmed this to be about every 10 years.
3) The need to request a clean-out template for the canals from the USACE for future use. Mr. Jackson advised that John Greishaber with the USACE indicated that this would not be a problem.
4) The calculations for the containment system are being checked for a maximum water elevation of +8-ft. for the three outfall canals. The issue was brought up about levees

that have a 12-ft. or 12.5-ft. elevation. Since this is a closed system during an emergency, what should be done to contain the water and ensure that it does not exceed elevation +8-ft.?

Mr. Jackson explained that the S&WB leadership is politically, but not technically, nervous about lowering the walls along the outfall canals. The S&WB seems to have a meeting of the minds with the USACE concerning the hydraulics; i.e., the water level should not rise to the maximum height with the existing pumping equipment. He commented on pumping capacities and in-take elevations, and the need for these issues, which are outside of the SLFPA-E's responsibility, to be addressed. He pointed out that the hydraulics of the outfall canals are the responsibility of the SLFPA-E only as they relate to the stability of the levees. After the discussion at the aforementioned meeting, the S&WB did not seem to have a problem with obtaining a template. The excavation template for clean out purposes will be used when future permits are requested by the S&WB from the SLFPA-E.

The Committee discussed pumping needs, conveyance parameters and floodwall design needs. Mr. Brouillette pointed out that the State, S&WB and SLFPA-E are involved in the design-build effort for the new pump stations and are looking at some of the issues discussed. The USACE has acknowledged the need to look at the canals and floodwalls as a system.

NEW BUSINESS:

1. **To discuss the hiring of a modeler to review the U.S. Army Corps of Engineers' (USACE) models, assumptions and boundary conditions and to perform the appropriate statistical analysis.**

Robert Jacobsen with Taylor Engineering, Inc. advised that Taylor Engineering was selected by the SLFPA-E as one of its ID-IQ coastal engineering contractors. Taylor Engineering has 25 years experience in surge modeling. Mr. Jacobsen stated that he has worked with ADCIRC models since 2004 and has worked this past year with Robert Turner in answering some of his questions about the ADCIRC model. He acknowledged Nancy Powell, Chief of the Hydraulics and Hydrology Branch of the USACE New Orleans District, who was present at the meeting. He stated that virtually all of the modeling work by the USACE was done under Ms. Powell's supervision.

Mr. Jacobsen explained that the USACE's development of the methodology used to estimate the one percent return level wave heights and surge levels was done in the context of five different programmatic efforts. The five different programs in the wake of Hurricane Katrina drove a tremendous investment on the part of the USACE into this modeling effort. The USACE was challenged before Katrina to develop flood insurance maps and was well on its way towards that process with ADCIRC. Many additional investments were made in the wake of Katrina to improve what the USACE anticipated doing at the time because of IPET, LaCPR, emergency authorizations to raise the design level to the 100-year standard and litigation. The USACE quadrupled the size of the model and the cost of the run time. The effort envisioned before Katrina costing several millions of dollars was turned into an effort costing tens of millions of dollars.

The post-Katrina effort was started in 2005 and was largely completed by 2007. The product used to develop the one percent surge model is basically a three year old project. There are a few estimates and calculations that continue to be looked at. The information in this model is still being used to make design decisions. The model information is not changing, but some of the choices about parameters and the values to be used with how much uncertainty are still being made. The USACE must still develop a certification document for flood insurance purposes. The certification will only be good for ten years. The Authority will be responsible for the calculations, models and determinations in the future.

Mr. Jacobsen advised that the SLFPA-E held a one day workshop in January, 2010, during which most of the aspects of the models that were developed were reviewed. The models reviewed included ADCIRC, which drives surge elevations, STWAVE, and JP-MOS, which is used to analyze a number of synthetic storms, along with the overtopping calculations. A number of questions posed by Board members and other individuals were covered in the workshop. He commented that he and the other workshop presenters could revisit the questions and provide additional clarifications.

Mr. Losonsky commented that the questions posed by Mr. Goins at the last Board meeting concerned the geographic distribution of the storms and the size distribution of the storm population. Mr. Jacobsen advised that he provided information on the 152 storms to Mr. Goins earlier in the week. He explained that there are a number of parameters in characterizing storms; i.e., size, forward speed, track, central pressure, maximum radius and maximum winds, and at what point in the storm track are these parameters to be considered. He stated that this information was available and that one of the factors that was not clear when it was reviewed with Mr. Goins dealt with wind field. He explained that different wind averages are used for different purposes. A one minute wind average is used to classify a storm on the Saffir-Simpson scale. A ten minute wind average is used to calculate wind stress on a water surface. A vortex generating model that generates a synthetic hurricane generates 30 minute winds. A point of confusion was that some of the documentation for the 152 storms laid out the 30-minute wind field. A typical conversion can be used to determine a one minute wind field at a particular point in the storm. Mr. Jacobsen clarified that of the 152 storms in the Gulf of Mexico, 50 were Category 3, 61 were Category 4, and 41 were Category 5 storms. The documentation for JP-MOS provides a justification for using 152 storms.

Mr. Jackson requested that Nancy Powell address the peer review issue. Ms. Powell explained that common storms were used for FEMA flood insurance, LaCPR, the IPET risk work and work with the one percent design elevations. Each of these efforts had a different review, which is documented. LaCPR went through an external review by NRC. IPET had ASCE do a partial review and other parts went to the NRC for review. FEMA had its own review process. The efforts on the one percent design elevations underwent several different reviews, including an agency review, ASCE and an on-going independent external peer review of the actual physical design elevation report.

Mr. Jacobsen commented on the NRC reviews on LaCPR and IPET. The reviews acknowledged the difficulty in communicating the one percent risk and residual risk to the public and recommended that risk be communicated to the public using other

benchmarks, such as historical storms (Katrina, Betsy or a variation). He suggested that the SLFPA-E consider the NRC's recommendation on the communication of residual risks.

Stevan Spencer, SLFPA-E Regional Chief Engineer, informed the Committee that Taylor Engineering, Inc. could be engaged through the issuance of a Task Order under their ID-IQ contract; however, a specific scope of work should be identified. Mr. Jackson clarified that the Committee must report to the Board with a recommendation. He asked about the CPRA's position on this issue. Ms. Powell pointed out that the USACE is continuing to use the same methodology on projects that are being partnered with the State. Mr. Brouillette commented that his personal opinion is that the job that was done was as good as could have been done based on the information available. He added, however, that it is good for the local sponsor and the State to continue to be engaged in the process.

Mr. Losonsky stated that he accepted the expert's suggestion on having residual risks as the objective and on understanding the residual risks. He added that the scope of work should not be to reinvent the wheel, but should encompass the identification and explanation of risk factors after looking at the range of parameters. Mr. Jackson suggested that Mr. Jacobsen recommend a scope of work and estimated cost for negotiation. Mr. Jacobsen stated that identifying issues of residual risk should be the main issue. Validation of the model is problematic. The model validates better for some locations than other locations. He pointed out that one aspect of residual risk deals with free board in relation to still water elevation and discussed this issue.

Mr. Losonsky offered a motion to recommend that the Authority engage a modeling expert to examine residual risk concerns within its area of jurisdiction raised by the USACE's storm modeling effort. The motion was seconded by Mr. Estopinal.

Mr. Brouillette advised that the State has an on-going effort called the Intelligent Levee Monitoring System Program. The State has a team of experts that will be looking at residual risk issues associated with the new system that will be in place in June, 2011. The State has committed a significant amount of funding for this effort. Mr. Losonsky pointed out that the State's study is a different type of study. The study proposed by the Authority will look at boundary conditions, different parameters and how the parameters are treated. Mr. Brouillette further advised that the State is undertaking the update of the Master Plan and will be doing some storm surge modeling in association with this update.

John Koeferl stated that he is a resident of the Lower Ninth Ward in New Orleans and represents the Holy Cross Neighborhood Association. He stated that he had seen the IER 11 presentations by the USACE; however, he did not see what he considers as adequate levee protection across the top of the Lower Ninth Ward along the five or six mile channel that is still designated as the MRGO. He stated that there is a 12-ft. earthen levee on both the Lower Ninth Ward and New Orleans East sides. The USACE has assured the community that it is safe because of the surge barrier and the modeling, which was approved by the National Academy of Sciences. He stated that the Association has questions about the protection in this area and commented that the

protection that is provided does not seem right. This area has been flooded at least twice in the past and the people want to have the correct protection. A USACE representative had stated that the National Academy of Sciences looked at several phases of the work that had been done; however, he wondered who has looked at everything.

Mr. Koeferl advised that he was concerned about the USACE's lock replacement project. He expressed a concern that the modeling for the levees included not putting the levee along the MRGO to enable the USACE to place dredged material from the Industrial Canal in a confined disposal facility and to place the lock modules on that plateau. In addition, an undesirable situation exists with the walls along the Industrial Canal, particularly on the east bank where there are soft soils and relief valves have been placed. He stated that the lock project will mean a deeper channel in the Industrial Canal and that something needs to be done with the levees. He stated that he had not received an answer as to whether the additional work for protection is accounted for in the $1.3 billion for the lock project. The USACE has advised that protection is being brought to the 100-year level; however, this does not include the construction of a levee along the portion of the MRGO that is still open above the Lower Ninth Ward. He stated that the modeling that needs to be done should be very broad and deep. In addition to the numbers, it should look at the projects, and the storms modeled should include a storm that sits over the Lower Ninth Ward and Chalmette for days producing rainfall, along with the outfall from the City of New Orleans coming into the Industrial Canal, while the gates are closed. Not providing for these issues in a vision of what the levees need to be in a time of sea level rise and subsidence is a mistake. He commented that all of these factors need to be considered and the appropriate decisions made. He requested that the SLFPA-E select the best individual and take the broadest vision possible for the modeling work.

Mr. Jackson responded that the SLFPA-E did question the USACE and received at least two presentations from the USACE about the way that they approached the Industrial Canal protection and the expected water levels in the Industrial Canal. The new closure that closes off the MRGO and GIWW is designed for overflow in certain storms. The way the USACE calculated the handling of the overflow was based on the stage volume (overflow, rainfall and pumping). The USACE has assured the SLFPA-E that the maximum water level that can be reached during a 100-year event will be elevation +8-ft. and that the levees can accommodate this elevation. He stated that his understanding is that the Industrial Canal levees will receive the same level of scrutiny and remediation work as is being done along the Outfall Canals. One of the parameters of system's operation is that the navigation gates will be closed at elevation +3-ft.; however, he cautioned that a situation could possibly take place in which the closing of the navigation gate is delayed due to navigation. The SLFPA-E has been attempting to have the responsibility for the operation of the navigation gates placed on the USACE; however, this would require Congressional action. He reiterated that the SLFPA-E did question the USACE and required presentations by the USACE twice on this issue. The USACE's calculations seemed reasonable.

The question was called on the motion, which was unanimously adopted.

2. Discussion of resolution to request the USACE to provide a canal Template for future canal excavations in the London Avenue, Orleans Avenue and 17th Street Outfall Canals.

The draft resolution was read to the Committee. A motion was offered by Mr. Estopinal, seconded by Mr. Wittie and unanimously adopted, to forward the resolution to the Board with a recommendation for approval.

3. Discussion of resolution to request the USACE to lower outfall canal walls to one-foot above safe water level

Mr. Jackson explained that he placed this item on the agenda following the discussions with Halcrow, Inc. and the S&WB. He stated that he did not know whether a situation would possibly occur where there is a violation of the safe water elevation (SWE) because of mismanagement of the operation of the in-series pumping operations; however, the possibility exists. In many, if not most, of the areas along the outfall canals, the canal levee and floodwall system is at about elevation +12-ft. The computations that are currently being done and the remediation work that will take place will be based on elevation +8-ft. The USACE is looking at the stability and remediation necessary to contain water to elevation +8-ft. The ability of the S&WB's pumps to raise the water elevation above elevation +8-ft. is fairly slim due to the restricted head capacity of the pumps. However, if a scenario occurs where the SWE is being violated by the operation of the pumping system, the issue is whether it would be better to have a breach because the protection system contains water to a level higher than it can safely be contained, or would it be better to lower the floodwalls to perhaps a foot above the SWE and allow the water to overflow the wall. An overflow condition along the outfall canals could be easily controlled. However, if a breach occurs there would be a sudden failure and sudden flow of water into the neighborhood at the point of the breach. The outfall canal system would have to be closed down until the breach is repaired. An overflow of water along the length of a floodwall would provide enough warning without a sudden failure. He suggested that the SLFPA-E start a discussion through the passage of a resolution supporting the idea of lowering the outfall canal protection level to some level above the SWE in order to prevent a sudden breach failure under certain conditions.

Mr. Estopinal concurred with Mr. Jackson and offered a motion, which was seconded by Mr. Wittie, to bring a resolution to the Board for the purpose stated by Mr. Jackson. Mr. Jackson clarified that this would initiate discussions between the USACE, S&WB and SLFPA-E. Mr. Estopinal added that the new condition parameters would need to be considered. There is a different set of hydraulic parameters involved with a closed system. Mr. Jackson noted that the public must be made aware that the outfall canal levees would not be subject to hurricane tidal surge. The question was called on the motion, which was unanimously adopted.

There was no further business; therefore, the meeting was adjourned at 1:52 p.m.