

**DEPARTMENT OF THE ARMY**

**CORPS OF ENGINEERS**

**COMPLETE STATEMENT**

**OF**

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**U. S. ARMY CORPS OF ENGINEERS**

**COMMITTEE ON APPROPRIATIONS**

**SUBCOMMITTEE ON HOMELAND SECURITY**

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## **I. Opening Remarks**

I am Major General John Peabody, Commanding General of the Mississippi Valley Division for the U.S. Army Corps of Engineers (Corps), and President of the Mississippi River Commission. On behalf of the hundreds of U.S. Army Corps of Engineers professionals who prepared for, responded to, and are helping to recover from Hurricane Isaac, thank you for the opportunity to testify today.

As with many natural disasters, Hurricane Isaac brought with it forces that overwhelmed elements of the built and natural environments. It damaged and in some cases destroyed many engineered structures and property, flooded hundreds of homes and businesses, rendered many people homeless, and resulted in several deaths. The Corps extends our deepest sympathies to all of the citizens suffering losses from Hurricane Isaac – several of our own professionals suffered personal losses from this storm as well. Along with physical destruction, natural disasters also bring out the best in people. There are countless stories of heroism and compassion carried out by the citizens of Louisiana and Mississippi during this storm. The Corps is proud to be part of the communities that make up these states.

The safety of the public is the Corps top priority. Every year the Corps, as part of the federal government's unified response to disasters, sends hundreds of experts to respond to disasters at home and abroad. The Corps assists the Department of Homeland Security (DHS) and the Federal Emergency Management Agency (FEMA) as the primary agency with expertise in public works and engineer-related support. As part of the National Response Framework, the Corps executes a multitude of functions in support of FEMA, including emergency power, commodities distribution, debris removal, temporary roofing and temporary housing, infrastructure assessment, inundation mapping, and technical assistance, among others. The Corps has dozens of Planning and Response teams (PRTs) trained and ready to deploy in advance of and in response to natural disasters. For Hurricane Isaac, we deployed over 100 pre-positioned professionals from across the nation ahead of Isaac's landfall and ready for a rapid response, and then deployed over 300 more in the immediate aftermath of the storm. The Corps received 40 Mission Assignments from FEMA totaling over \$20 Million. Although we did not need to execute the full capability of these mission assignments for this event, we were ready for a much more robust response requirement. For example, although we installed 9 generators to provide temporary power in Louisiana, we had nearly 160 generators deployed to Baton Rouge prepared and ready to be sent throughout the state, along with 6 dozen contractors and 20 Prime Power Soldiers, and we conducted power assessments at 2 dozen critical facilities in Louisiana which will help the state better prepare for future events.

Each region and district in the Corps has standard Operational Plans prepared, updated and rehearsed on an annual basis for the kinds of disasters expected in the region. In the case of the Mississippi Valley Division, our primary response plans relate to hurricanes, floods, and a New Madrid Seismic Zone event. Our hurricane response plans are updated each winter based on the lessons from the most recent hurricane events as well as changed conditions on the ground. Our plans include the mobilization

of up to three district command teams to provide robust senior leader support to the states of Mississippi (Vicksburg District) and Louisiana (Memphis District), and an Unwatering Task Force (Rock Island District) if needed, as well as general support from the other districts. Elements from all three of these commands were mobilized and deployed for this event in addition to seven PRTs, and dozens of augmentation personnel. As the affected district, the New Orleans District commander and his staff focus on executing actions in collaboration with state, parish, and local levee board officials to prepare the Hurricane and Storm Damage Risk Reduction System (HSDRRS) for storm surge, as well as the civil works structures and operating elements (locks and dams, operating vessels, etc.) that is within the district's jurisdiction. . The Corps has the capability to mass its full resources and energy on any disaster, if required. In the case of Hurricane Isaac, the Mississippi Valley Division executed our operational plan, with some variations for potential unwatering and other requirements.

In addition to disaster response in support of FEMA, the Corps has inherent authorities under Public Law 84-99, Flood Control and Coastal Emergencies, to provide technical assistance to non-federal authorities, to provide flood fighting assistance, and to rehabilitate projects in the PL 84-99 program following a natural disaster. During Hurricane Isaac, the Corps responded to mud slides on Mississippi's Lake Tangipahoa Dam by sending geotechnical and dam safety experts to make assessments and provide technical assistance to the state for consideration in its decision-making process, as well as developing and providing inundation maps to downstream areas in both Mississippi and Louisiana. We also provided unwatering advice and assistance to include pumps to the Lake Tangipahoa Dam as well as Plaquemines Parish to unwater the Braithwaite polder, which was flooded after non-federal levees were overtopped by the 10 to 14 foot storm surge. We are currently assessing damages from Hurricane Isaac.

## **II. Hurricane Preparedness Improvements since Hurricane Katrina**

Following Hurricane Katrina, the Corps has diligently prepared for the day that another hurricane would threaten the greater New Orleans area. Because of the work on the HSDRRS since then, the greater New Orleans area has a much greater reduced risk of flooding from hurricane surges now than it has had at any other time in history. Our experience from Hurricane Isaac bore this out. Along with our federal, state and local partners, the Corps strengthened and improved nearly 133 miles of levees, floodwalls, gated structures and pump stations, forming the new Greater New Orleans perimeter system. Construction of surge barriers at Lake Borgne, Seabrook, the New Orleans Outfall Canals and the West Closure Complex have pushed the line of defense outside of the city and removed about 68 miles of interior levees and floodwalls from exposure to storm surges. We also have improved internal drainage conveyances with pump stations under Southeastern Louisiana (SELA) – integrated HSDRRS perimeter and internal works. Much of the work planned for this element of the system continues.

It is important to emphasize that the Corps has not have accomplished this work on its own. This was absolutely a complete team effort, with full engagement by federal and state authorities, local governments, levee authorities, levee boards, academia, industry, non-governmental organizations, peer reviewers and other stakeholders. We

have been able to accomplish this in a short time span by sharing responsibility and working collaboratively with the single focus to complete the HSDRRS. The Corps and its partners were enabled by a number of key factors. After Hurricane Katrina, the Corps received \$14.6 billion for work on the HSDRRS. By the beginning of the 2011 hurricane season, the Corps was able to provide 100-year protection to the city of New Orleans. The Army is now focused on completing work on other components of the HSDRRS. In addition, the Council on Environmental Quality authorized alternative environmental arrangements for major elements of the Greater New Orleans HSDRRS, to comply with NEPA while the system was under construction. We also applied innovative acquisition approaches on a large scale to deliver the work efficiently and effectively, and our non-federal partners delivered the real estate requirements to sustain aggressive execution. In short, the Greater New Orleans HSDRRS was executed efficiently and functioned effectively during Hurricane Isaac because the Corps was able to leverage the capabilities and knowledge of the full panoply of experts, stakeholders and authorities at every level.

The HSDRRS was developed by rigorous application of cutting edge scientific knowledge of storm impacts, and the concepts of engineered structural redundancy, and resiliency. The known impacts from Hurricane Isaac make clear, however, that while the Greater New Orleans area has achieved substantial hurricane storm risk reduction, much of coastal Louisiana remains at risk. The contributions made by Southern Louisiana to the Nation's economy are significant, as are its ecological resources. The Corps has many responsibilities to manage aspects of the Nation's water resources in this region. Situated at the confluence between the Mississippi River watershed and the Gulf of Mexico, coastal Louisiana is home to one of the largest port complexes in the world, is the top producer of domestic oil, and is the top fisheries producer in the lower 48 states.

Managing flood risk is a shared responsibility between all levels of government – Federal, State, and local – as well as the people at risk. Managing risk should include all methods of risk reduction: land use zoning; building codes; flood insurance; evacuation plans; ecosystem restoration and resiliency, and structural measures. The methodology for managing these storms must be multiple lines of defense – all of the things I mentioned, as well as barrier island creation, creation or restoration of marsh and swamp land – things that can be accomplished to lessen the impacts of these storms before they arrive at the doorsteps.

The Corps' primary role in Flood Risk Reduction is to evaluate alternative approaches to reduce flood risk by performing feasibility studies and to make investment recommendations related to three factors associated with any potential project: whether it is technically feasible, environmentally acceptable and economically justified. The Corps must evaluate projects based upon sound engineering and science, and in accordance with law and established regulations including our Principles and Guidelines. In an effort to improve our performance, the Corps has begun an effort to transform our Civil Works program to adjust to the fiscal and infrastructure realities we face today.

Part of that effort includes a transition toward a new Planning Paradigm with the intent of executing feasibility studies in less time, at less cost, and with greater confidence in the outcome. The transformation of the Corps' Civil Works program ranks at the top of the Corps' current strategic priorities, and reforming our planning program is one of the key aspects of that effort. In a constrained fiscal environment, the Corps' priorities are based upon performance of the project in comparison to other projects, with the goal of recommending those projects that return the highest benefit for the investment to the Nation. To achieve this, the Corps is conducting more rigorous analysis to ensure that the "future without project conditions" are accurately portrayed, and that project benefits are accurately captured. This will result in an increased confidence in the Corps' judgments related to projects' technical feasibility, environmental acceptability, and economic justification.

### **III. HSDRRS Preparations, Rehearsals, and Execution**

Since 2006, the Corps has improved how it does business not only in design and construction of the HSDRRS, but in our operational and contingency planning for HSDRRS closure. The New Orleans District conducts annual structural assessments of the HSDRRS in partnership with federal, state and local leaders. We have been open and transparent every step of the way – for example, since the start of construction we have published a HSDRRS map each June that provides a snapshot of construction status, and where we focused efforts to effect interim and permanent feature closures. We have shared this strategic communication tool at public meetings and engagements, as well as with elected leaders through meetings and briefings.

Prior to the start of each hurricane season, the New Orleans District tests the operation of all major structures and conducts tabletop exercises centered on a variety of hypothetical storms. The purpose is to exercise our planned command and control procedures, as well as our technical steps for responding to a storm event, to test the procedures for closing and re-opening major structures, and to exercise collaborative partnership efforts among federal, state and local agencies. Major partners including the U.S. Coast Guard, Coastal Protection & Restoration Authority Board, New Orleans Sewerage and Water Board, the Jefferson Parish Drainage Department, the Governor's Office of Homeland Security and Emergency Preparedness, the Southeast Louisiana Flood Protection Authorities and the Louisiana Department of Transportation and Development all participate in the Corps' extensive planning process to ensure the successful overall operation of the HSDRRS.

Cultivating and maintaining partnerships within states, parishes, cities and neighborhoods, as well as communicating the importance of shared responsibility for risk has been one of the strategic objectives in Louisiana and the Nation since Hurricane Katrina. To that end, we have conducted more than 500 public meetings and engagements in Louisiana to facilitate an open dialogue about the HSDRRS and risk; held regular meetings with federal, state and local partners; established a hotline to convey up-to-date construction impacts for open and transparent communication; and implemented social media channels, among many other efforts.

Another critical measure has been the cross agency and industry planning to ensure that risk from water borne vessels is mitigated and that U.S. Coast Guard Regulated Navigation Area (RNA) roles and responsibilities are clearly defined in advance of the start of each hurricane season. This is particularly important for the Inner Harbor Navigation Canal – Gulf Inter-Coastal Waterway detention basin and the Harvey-Algiers Detention basin. The U.S. Coast Guard, Corps, local levee districts and navigation industry stakeholders meet regularly to review the RNA, which is necessary to ensure all vessels therein have approved mooring plans to reduce the threat posed by the possibility of break-away vessels. Finally, lessons learned from post event assessments and after action reviews have been implemented to improve emergency operations planning and seamless coordination with our partners.

#### **IV. Performance during Hurricane Isaac**

All of our efforts since Hurricane Katrina to plan, design, construct, and utilize the HSDRSS prior to each hurricane season resulted in the system essentially performing as anticipated during Hurricane Isaac. While the overall system performed as designed, that performance was not without its challenges. For example, the massive temporary pumps at the outfall canals along the south shore of Lake Pontchartrain are performing well beyond the time they were intended to be there. All pumps are machines that can break, just like cars and air conditioners. During Hurricane Isaac, we had five of 43 total pumps that we could not start at the 17th Street Interim Closure Structure from inside the control structure. The New Orleans District professionals were prepared for just such a contingency, with crews on site. Those crews braved the hurricane force winds and started those pumps manually, one of whom had his family and home flooded in Laplace while he executed his duty. Unfortunately, we had one pump fail to operate properly, resulting in the flooding of four homes in a neighborhood in Oakville inside of the HSDRRS. The cause of that incident is still being investigated.

In the aftermath of Hurricane Katrina, the New Orleans District instituted procedures for repeatedly rehearsing its established response to hurricanes prior to the beginning of each hurricane season. This ensures that the New Orleans District will be ready to respond quickly to such an event. The New Orleans District validated closure plans through desk top exercises, rehearsed structure closures and documentation of notifications in Louisiana's Levee Information Management System (LIMS) reporting system, and developed contingency plans to respond to possible issues to assist the New Orleans Sewerage & Water Board and Jefferson Parish Drainage Department. Already storm-proofed pump stations and those undergoing storm proofing proved their worth during Hurricane Isaac.

One of the keys to success was the use of the Local Government Liaisons (LGLs). These are Corps personnel that the New Orleans District deploys to, and embeds with, parish and levee authorities. Whenever local parish officials had a problem, their embedded LGLs got an answer within minutes. We prepared our contractors to close their construction gaps on time. We used our own in-house labor to effect transportation system closures on Highways 23 and 90 at the advent of tropical storm

winds. We capitalized on lessons learned from previous hurricanes and the spring 2011 flood to work effectively with the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP). In anticipation that the major effects from this storm would hit Louisiana, I personally displaced to Baton Rouge ahead of landfall and set up a forward command post at GOHSEP, effectively embedding myself and several of our staff as another Corps link for the Governor and his staff.

During Hurricane Isaac, the Corps shared its projected storm surge hydrographs for the east bank and west bank of Plaquemines Parish from our Advanced Circulation Model. The local parish leaders used these storm surge model forecasts to inform their decision-making related to parish actions.

## **V. Post Isaac-Assessment**

Hurricane Isaac's impact to the coastal Louisiana area, including the greater New Orleans region and surrounding communities, was considerable. While the HSDRRS prevented the storm surge from inundating the areas on the protected side of the system, significant flooding from storm surge and rainfall occurred in areas outside of the federal levee systems including Slidell, Mandeville, Madisonville, LaPlace, Braithwaite, Lafitte and other locations.

The Corps bases its decisions, designs and construction on the best science and engineering available. Prior to the start of construction for the HSDRRS, the Corps conducted extensive surge modeling and analysis that indicated minimal to no flooding impacts to communities or areas outside of the system as a result of the HSDRRS. Hurricane Isaac was a large, slow-moving storm with a considerable amount of surge and rainfall that appear to have been the primary variables driving the flooding witnessed from this storm. Nonetheless, some have speculated that the HSDRRS caused unintended induced flooding to areas outside the system as a result of Hurricane Isaac. Congressional leaders, local and state officials have requested a comprehensive analysis to identify the effects that the HSDRRS had during Hurricane Isaac on the areas outside of the system.

The Corps has already begun this analysis. Engineers and scientists from the Mississippi Valley Division, Engineering Research and Development Center, the New Orleans District and the National Weather Service will participate in the effort. My guidance to the modeling team is to model the specific meteorological characteristics of Hurricane Isaac; conduct a comparative analysis to high water data that we collect through USGS; validate the 100-year elevations pre and post HSDRRS; conduct an Independent External Peer Review consistent with the Water Resources Development Act of 2007 through the Louisiana Water Resources Council; engage the state of Louisiana and Water Institute of the Gulf to participate in a simultaneous review; and finally to ensure that the National Weather Service characterization of the storm is included in our modeling parameters. The findings from this analysis will be released to the public once the appropriate internal quality assurance reviews have taken place, after which it will be subjected to Independent External Peer Review.

Following the initial evaluations, a second phase involving detailed hydrodynamic modeling of specific areas impacted by Isaac will be conducted over a period of several months. The Corps will use the information obtained during this modeling effort to further improve our emergency planning and preparations for the next tropical weather event to hit this region.

## **VI. Closing Remarks**

This concludes my testimony. The Corps is proud to serve the people of the United States and the Gulf coastal region. Thank you for the opportunity to testify and I look forward to your questions.