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Katrina: one year later

VICKSBURG, Miss. (August 25, 2006) – Hurricane Katrina was one of the largest natural disasters in the history of our country with more than 1,300 lives lost and more than $150 billion in damages. Having maintained Category 5 strength until less than 12 hours before landfall, Hurricane Katrina surge measured from 28 to 30 feet along the Mississippi coast, her winds registered 127 mph at Louisiana landfall and 75 percent of New Orleans was flooded.

“We had been tracking Katrina all along,” recalled Brigadier General Robert Crear, Commander of the Mississippi Valley Division U.S. Army Corps of Engineers. “When it seemed imminent that Katrina would make landfall along the Gulf Coast, I activated our emergency operations centers in all six districts.”

The Mississippi Valley Division is responsible for Corps of Engineers water resources programs in a 370,000-square-mile area in portions of 12 states from Canada to the Gulf of Mexico. Its subordinate districts are headquartered in St. Paul, Minn.; Rock Island, Ill.; St. Louis, Mo.; Memphis, Tenn.; Vicksburg, Miss.; and New Orleans, La.

For the past 12 months, the Mississippi Valley Division, in conjunction with other federal, state and local partners, have continued an unprecedented, multi-faceted effort to assist in the recovery and rebuilding of the areas affected by this devastating hurricane.

Engaging more than 3,800 personnel at its peak, this is the largest disaster recovery operations in the history of the Corps of Engineers. Cumulatively, more than 8,000 Corps employees have provided assistance. As a comparison, during the Florida hurricanes in October 2004, approximately 1,500 Corps employees supported the hurricane recovery efforts; while in February 2005, 127 Corps employees were involved.

The Corps conducts its emergency response activities under two basic authorities: the Flood Control and Coastal Emergency Act (Public Law 84-99, as amended) and the Stafford Disaster and Emergency Assistance Act (Public Law 93-288, as amended). Under the Stafford Act, the Corps supports the Federal Emergency Management Agency in carrying out the National Response Plan, which calls on 26 Federal departments and agencies to provide coordinated disaster relief and recovery operations.

The Mississippi Valley Division has a vital role in support of the National Response Plan. The plan describes the basic structure by which the federal government will mobilize resources and conduct response and recovery activities to assist states and local governments in coping with the consequences of significant natural or man-made disasters, to include terrorist events.

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Within this plan, the Department of Defense has designated the Corps as the primary agency for planning, preparedness and response under Emergency Support Function #3, Public Works and Engineering. The type of assistance provided by the Corps includes restoration of critical public services and facilities, including supply of adequate amounts of potable water and ice, temporary restoration of water supply systems, provision of temporary emergency electrical power, temporary emergency housing, structural evaluation of buildings and damage assessment, and clearance, removal, and disposal of debris.

Following Hurricane Katrina, the Mississippi Valley Division, with support from sister divisions throughout the Corps was able to stand up a large response force in a matter of days. Just hours before Katrina arrived, the division's emergency response team was tasking specialized response teams of all types from around the world to support the traditional USACE (http://www.usace.army.mil) missions tasked by FEMA (http://www.fema.gov) during disaster response.

Prior to Katrina's landfall, command posts were set up at Keesler Air Force Base in Biloxi, Miss., and Baton Rouge, La. Once FEMA declared the disaster, recovery field offices were immediately established at both sites. Colonel Charles Smithers, Commander of the Corps' Memphis District, headed up the Louisiana RFO, and Colonel Tony Vesay, Commander of the Corps' Vicksburg District, was tasked to lead the Mississippi RFO.

Shortly thereafter, on September 1, General Crear established his Mississippi Valley Division-Forward (http://www.mvd.usace.army.mil) command post aboard the Motor Vessel *MISSISSIPPI* in Baton Rouge. Within the first two weeks, more than 1,500 Corps personnel had deployed to the Louisiana and Mississippi offices. The *MISSISSIPPI* serves as an inspection and workboat for the Mississippi River Commission, with 90 percent of its time spent as a working towboat for the Memphis District. Its main role is moving barges, equipment and supplies on the Mississippi River in support of the Corps' mat sinking operations.

Recap of Hurricane Katrina recovery efforts:

Water & Ice Missions - complete
The Corps orders ice and water for transport to disaster victims under the direction of FEMA, and awards advance contracts with commodities suppliers and then activates those contracts when a disaster is anticipated or has occurred. Following Hurricane Katrina, ice and water were delivered by the contractors to specified staging areas for further distribution, at the appropriate time, to points closer to disaster victims. Final distribution to individual victims was accomplished through local governments. Approximately 170 million pounds of ice and more than 5,500 truckloads of bottled water were delivered to the affected areas. One ice truck equals 40,000 lbs. of ice and serves 5,000 people for one day. One water truck equals18,000 liters, and at 3 liters per person serves 6,000 people per day.

Temporary Emergency Power Mission - complete
As Corps responders battled to help the affected areas recover, one critical mission hummed along without much fanfare, but with an electrifying effect. The power mission brought life to critical services following Katrina. Immediately following the storm, more than 1.3 million homes and businesses in Louisiana, Mississippi and Alabama were without electricity, according to utility companies. Combined, the Louisiana and Mississippi RFOs conducted 1,337 emergency power assessments across the two states and then installed 318 FEMA generators. The offices have now "uninstalled" and returned those generators to storage for the next hurricane season.

Unwatering Mission - complete
The Corps began unwatering the city of New Orleans on September 6, 2005. Lasting 53 days, the unwatering mission was completed on October 28. More than 767,000 acre feet - or 250 billion gallons of water - was removed from the greater New Orleans area. This equates to water 17 feet deep over an area the size of Washington, D.C. The water was pumped into three locations: Lake Borne, the Gulf of Mexico, and Lake Pontchartrain.

Colonel Duane Gapinski, Commander of the Corps' Rock Island District, was given the task of unwatering New Orleans. He also had the task of emergency repair of the levees, which meant that his team was pumping water out of New Orleans in one area and repairing damaged levees in another.

One of Col. Gapinski's top priorities became repairing the city's pumps. Although more than 100 temporary pumps were working around the clock, their pumping capacity couldn't compare to the amount of water New Orleans' permanent pumps could move. For example, the largest temporary pump in use could move water at a rate of 44,883 gallons per minute, whereas many of the permanent pump stations could move water at a rate 10 times that, or 448,830 gallons per minute.

The unwatering team worked with local levee districts, state and federal environmental protection agencies, sewerage and water boards and private contractors to get the job done.

Temporary Roofing Missions - complete
Operation Blue Roof is a priority mission managed by the Corps for FEMA. The program provides assistance to storm victims in disaster areas through the installation of rolled plastic sheeting on damaged roofs, thereby helping to protect property and allowing residents to remain in their homes, and reducing the amount of temporary housing needed.

In less than six months, 81,318 temporary blue roofs were installed in Louisiana, with the last blue roof installed on March 6, 2006. In Mississippi, 47,976 roofs were installed in less than 4 months, with the last blue roof installed by the end of December 2005. Mississippi roofing teams established an outstanding benchmark by installing 1,750 blue roofs in a single day.

Temporary Public Structures - complete
The Louisiana RFO completed installation of 310 temporary public structures on August 18, 2006, including 216 classrooms, several police stations, fire stations and pumping station facilities.

In Mississippi, the hardest hit towns lost most of their public infrastructure. By February 14, 2006, Corps teams had completed 726 temporary structures, enabling communities to get moving again. The RFO was able to set up and complete a single classroom, ready for use, in as little as 8 days from delivery. On average, a 50 to 80 classroom school, on a vacant site where utilities had to be established, would take about 80 days to complete - from delivery to ready for occupancy.

Debris Mission

The Louisiana RFO removed almost 24 million cubic yards of an estimated 26.5 million cubic yards of what the Corps calls "traditional" hurricane debris. We all know that sometimes work stinks. Well, it was stinky *every* day for those involved in the Corps meat removal mission. In addition to removing the traditional type debris, the Louisiana RFO was also tasked by FEMA with removing massive amounts of spoiled meat from warehouses in New Orleans – more than 36 million pounds.

The RFO also hauled nearly 120 million pounds of trash from the city of New Orleans and cleaned mile after mile of drainage ditches across the state.

Additionally, the RFO has been tasked to remove 6.5 million cubic yards of demolition debris from an estimated 18,000 structures in Louisiana. This adds up to near four and one-half times the debris from Hurricane Andrew. Picture if you can, 40+ million washing machines at 1 cubic yard each.

The debris mission in Mississippi included about 80 miles of the Mississippi coast from Waveland, Pass Christian, Gulfport, Biloxi and Pascagoula. Nearly 45 million cubic yards of debris has been removed from public and private property in Mississippi by the Corps and locally hired contractors. The Corps' mission was just over 20 million cubic yards and the Corps contractor averaged about 66,000 cubic yards of debris per day for 305 days through June 30, 2006. The Corps' debris mission (in Mississippi) was extended after that through August 28, 2006, to help pick up smaller and more isolated amounts of debris while local governments put contracts in place to finish collecting debris as homeowners continue to return and rebuild their homes and businesses.

While flying over the Mississippi Gulf Coast to survey the damage, Col. Vesay thought to himself, "Less the shooting, downtown Baghdad was in much better shape than the Mississippi Gulf Coast."

The Corps has not been alone in the FEMA-assigned debris mission. Disposal efforts associated with this cleanup will continue to be done in close coordination with the local community, the Louisiana and Mississippi Departments of Environmental Quality, the Environmental Protection Agency and the U.S. Coast Guard, among others.

Task Force Guardian

Colonel Lewis Setliff, the Corps' St. Louis District Commander, was tasked to head up Task Force Guardian. This special task force was responsible for repairing damages to the Greater New Orleans federal hurricane and flood protection system, and restoring the system to pre-storm levels of protection by June 1, 2006, the start of hurricane season.

The Corps of Engineers repaired and restored 220 miles of floodwalls and levees since September 2005. With a few exceptions, New Orleans had Pre-Katrina flood and storm-level protection by the beginning of this hurricane season (June 1, 2006). This system is in equal or better condition than it was when Katrina hit. For example, new levees were constructed with erosion-resistant clay and a more stable construction (T-wall versus I-wall). In addition, new erosion protection has been added at several sites, and a program of tree cutting on existing levees for protection is ongoing. Additional pumping capacity and floodgates have been added at the outfall canals.

"It was an unprecedented effort," said Col. Setliff. "There were a lot of folks who didn't believe it could be done." But TF Guardian accomplished the task by utilizing a team of national and local contractors, the Corps, local experts, and citizens of Southeast Louisiana. Most worked seven days a week, usually 12 hours a day, for more than eight months.

The cost of the work totaled more than $801 million; construction included 59 projects using 26 contractors. Excavation work in rebuilding the levees took nearly 5.5 million cubic yards of soil. Several times that amount was dug, however, in order to find enough soil that qualified as upgrade material. 155 vessels had to be removed from the levees.

"It's not about statistics," Gen. Crear said. "In the final analysis, as I look back on this disaster, what I am most impressed with are the people. It was a team of teams. They delivered an unheard-of performance in just eight months.

"The locals who participated in this – and that includes New Orleans District (Corps) people – did an amazing job. These people lived behind the levees, too," stated Crear. Their families were impacted, but they put their lives on hold to help get this work done."

In Mississippi, by the end of August, the Corps will have completed all tasks assigned by FEMA and local partners. On August 29th, the Corps will no longer have contractors, personnel, or authority in place to provide additional support. Debris removal operations after August 28 will be coordinated directly by local authorities with direct support from FEMA.

In Louisiana, the Corps continues to upgrade the hurricane protection system in order to better defend New Orleans against another massive storm. The Corps will soon begin the process of bringing levees and floodwalls in the Hurricane Protection System up to the FEMA certified level for a 100-year flood.

The Corps commissioned an Interagency Performance Evaluation Task Force (IPET) composed of 150 subject matter experts from government, academia and industry to analyze the effects of Hurricane Katrina on the hurricane protection system to develop a list of lessons learned which are leading to state of the art improvements in the engineering of a comprehensive hurricane protection system.

IPET findings and recommendations were continually provided to the Corps (since November 2005) and used to make their repairs stronger and better. IPET findings helped the Corps in the assessment of weaknesses in the protection system and IPET results will also be used in design guidance to build future protection projects.

The Corps' work to upgrade the flood and storm protection will continue through 2010. This work includes stronger levees, floodwalls and interior drainage, including:

- Replacing failed I-wall design floodwalls with stronger T-wall or L-wall design floodwalls.
- Reinforcing the most vulnerable undamaged I-walls and the surge protection closures.
- L-wall structures are used in areas where sufficient land is not available for T-wall design structures.

To date, the federal government has appropriated more than $5 billion to complete this work.

Congress has directed the Corps to develop a plan to protect the State of Louisiana from damages caused by a Category 5 hurricane. That effort is underway. The plan is expected to include a combination of structural features, such as levees or gates; non-structural features (which could include enhanced evacuation planning and protocols for more rigorous building codes); and restoration of coastal features, such as wetlands, that can dampen storm surge. The Corps is required to present the plan to Congress not later than December 2007, although some highly promising components of the plan may be recommended in advance of the complete report. Actual construction of the plan components will require authorization and annual funding by Congress.

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