

**U.S. Army Corps of Engineers
New Orleans District
ATTN: CEMVN-ERO**

New Orleans, LA

**Project Information Report
Damaged Flood Control Works**

**FEDERAL AND NON-FEDERAL PUMP STATIONS, FLOOD
CONTROL**

Orleans Parish, LA

April 2006

EXECUTIVE SUMMARY

Orleans Parish is located in southeast Louisiana. Portions of the parish are in the Louisiana coastal area and the Pontchartrain Basin, situated near the center of the Gulf Coastal plain in the lower reaches of the Mississippi Embayment. Lake Pontchartrain, a shallow, land-locked tidal basin approximately 640 square miles in area with an average depth of 12 feet, is the dominant topographic feature in the area.

Generally, the areas near the Mississippi River are above sea level with ground elevations decreasing with distance from the river. The developed areas are protected from river and hurricane flooding by levee systems and drained by pumps, which discharge primarily into estuarine water bodies. The leveed areas are divided into many subbasins by natural and man-made barriers and are webbed with drainage canals that terminate at pump stations.

There are a total of 24 pump stations in Orleans Parish, with a total drainage capacity of approximately 50,000 cfs. The New Orleans Sewerage and Water Board (SWB) is responsible for the drainage system. In 1997, the Corps of Engineers entered into a Project Cooperation Agreement with the SWB to improve drainage. Authority of this endeavor is the Southeast Louisiana, Louisiana Project (SELA). Under the SELA project, drainage improvements consist of channel improvement projects, adding capacity to existing pump stations and constructing new pump stations. Specifically, under the SELA project, additional pumping capacity was added to Pump Station No. 1 and the Pritchard Pump Station was constructed. The Dwyer Pump Station is presently under construction. Additionally, Pump Station No. 11 was constructed by the Corps of Engineers as part of the Gulf Intracoastal Waterway Project with the SWB operating and maintaining the station.

The pump stations were damaged by Hurricane Katrina, a Category 3 hurricane on August 29, 2005, when it made landfall near Buras-Triumph, immediately southeast of Jefferson Parish. Most of the pump stations on the east bank of Orleans Parish were damaged by flood waters. All the stations in the parish sustained damage by either flood waters or wind and wind driven rain.

Restoration and rehabilitation is to provide the level of protection for which the pump stations were designed, at full Federal expense, as authorized by Public Law 109-148. The estimated cost for the recommended alternative is \$39,633,000 with an overall benefit cost ratio of 15.4 to 1.0. The cost of the rehabilitation effort for the Federal (SELA) pump stations is \$2,096,000 and the cost of the non-Federal pump stations is \$37,527,000. The table below presents a summary of the project costs and benefits.

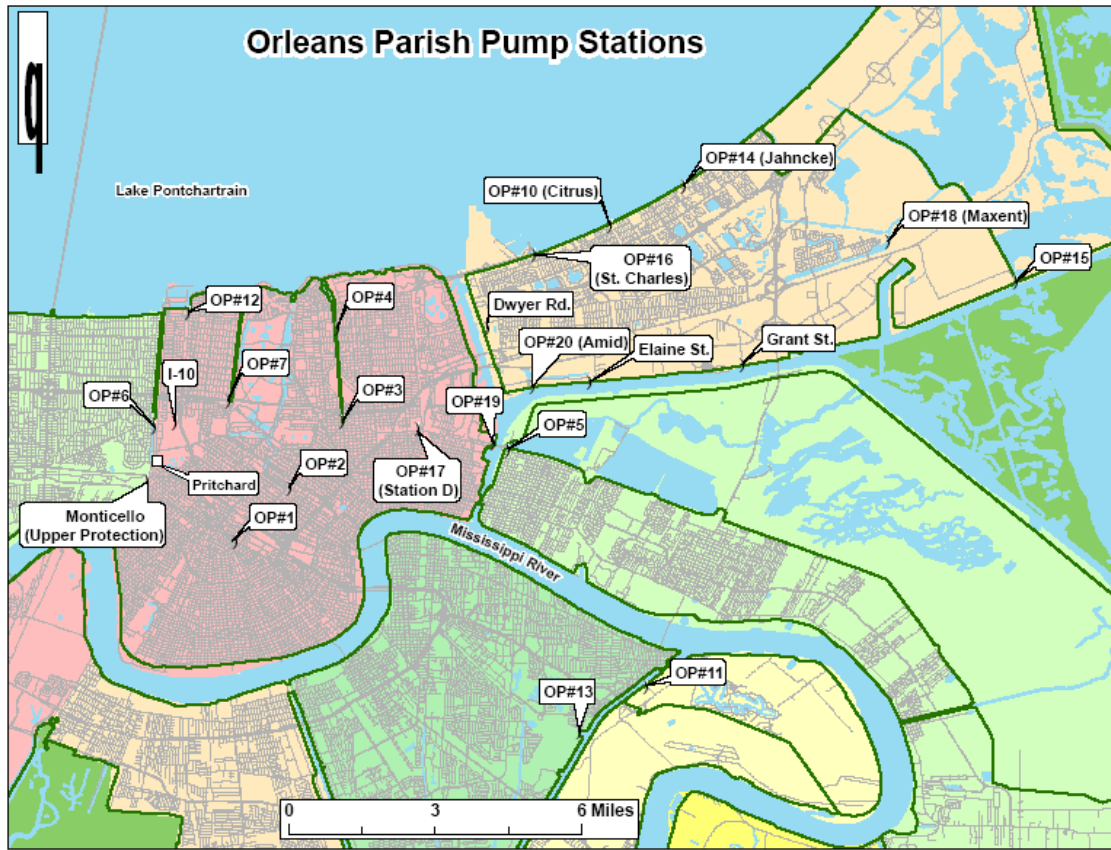


Figure Exec Sum 1. Orleans Parish Pump Station Location

Table Exec Sum 1. Summary of Cost and Benefits

	Cost	Average Annual Cost (\$)	Average Annual Benefits (\$)	Net Benefits (\$)	B/C Ratio	Federal Cost (\$)	Non-Federal Cost (\$)
Meto Orleans East Bank							
Drainage Pump Station #3	2,410,000						2,410,000
Drainage Pump Station #4-London Avenue	473,000						473,000
Drainage Pump Station #19-W. of Indust. Canal	702,000						702,000
Drainage Pump Station #2	2,759,000						2,759,000
Drainage Pump Station #7-Orleans Avenue	1,074,000						1,074,000
Drainage Pump Station #12	128,000						128,000
I-10 Underpass Drainage Pump Station.	298,000						298,000
Drainage Pump Station #6-17th Street	2,494,000						2,494,000
Drainage Pump Station #1-Broad Street	2,080,000					2,080,000	
Monticello Drainage Pump Station	6,000						6,000
Pritchard Place Drainage Pump Station.	16,000					16,000	
Drainage Pump Station #17-Station D	7,492,000						7,492,000
Carrolton Frequency Changer	2,585,000						2,585,000
Subtotal	22,517,000	1,258,000	16,320,000	15,062,000	13	2,096,000	20,421,000
Lower Ninth Ward							
Drainage Pump Station #5-E. of Indust. Canal	1,670,000	93,000	193,000	100,000	2.1	0	1,670,000
Lower Algiers/English Turn							
Drainage Pump Station #11	2,780,000	155,000	8,781,000	8,626,000	56.7	0	2,780,000
Algiers							
Drainage Pump Station #13	2,990,000	167,000	4,821,000	4,654,000	28.9	0	2,990,000
New Orleans East							
Drainage Pump Station #10-Citrus	3,770,000						3,770,000
Drainage Pump Station #14-Jahncke	1,220,000						1,220,000
Drainage Pump Station #16-St. Charles	1,020,000						1,020,000
Drainage Pump Station #20-Amid	2,062,000						2,062,000
Grant Drainage Pump Station	274,000						274,000
Elaine Drainage Pump Station	573,000						573,000
Drainage Pump Station #18-Maxent	1,000						1,000
Drainage Pump Station #15-Michoud	756,000						756,000
Subtotal	9,676,000	540,000	4,046,000	3,506,000	7.5	0	9,676,000
Total	39,633,000	2,213,000	34,161,000	31,948,000	15.4	2,096,000	37,537,000

TABLE OF CONTENTS

1.	Project Identification	1
2.	Project Authority	1
3.	Project Sponsors	2
4.	Project Location and Area Description	3
5.	Project Design	4
6.	Disaster Incident	7
7.	Project Damages	7
8.	Project Performance Data	14
9.	Project Repair Alternatives	14
10.	Recommended Alternative	15
11.	Economic Analysis	16
12.	Environmental	21
13.	Interagency Levee Task Force	22
14.	Project Management	22
15.	Guidance for Emergency Supplemental Appropriations	23
16.	Requirements of Federal and Public Sponsor Cooperation for the Rehabilitation Effort	24
17.	Real Estate Requirements	27
18.	Recommendations/Project Authentication	27

Appendices

Appendix A	Project Sponsor's Request for Assistance
Appendix B	Project Location
Appendix C	Disaster Incident (See Section 6 Main Report)
Appendix D	Damages
Appendix E	Repair Alternatives (See Section 9 Main Report)
Appendix F	Economic Analysis (See Section 12 Main Report)
Appendix G	Environmental
Appendix H	Construction Cost Estimates
Appendix I-P	Not Used
Appendix Q	Post Hurricanes Katrina, Wilma, Ophelia Expenditure of Flood Control and Coastal Emergency (FCCE) Funds for Restoration and Rehabilitation, and for Accelerated Work to Complete Authorized Projects, in accordance with the Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza Act, 2006 (public Law 109-148), dated February, 14, 2006, signed by Don Riley, Major General, Director of Civil Works
Appendix R-Y	Not Used
Appendix Z	PIR Review Checklist

1. Project Identification.

a. Project Name. Pump Stations Flood Control, Orleans Parish, Louisiana (See Figure 1)

b. Project Funding Classification. FCCE 326 for non-Federal
FCCE 316 for Federal (SELA)

c. Project CWIS Number. 030725 for non-Federal
075517 for Federal (SELA)

2. Project Authority.

a. Classification. Non-Federal and Federal Flood Control

b. Authority.

1) Non-Federal: See Section 15.

2) Federal Project:

a) SELA

The Southeast Louisiana (SELA) Project was authorized by the Fiscal Year 1996 Appropriations Act, Public Law 104-46 (Section 108) and the Water Resources Development Act of 1996, Public Law 104-303 (Section 533). Section 108 reads as follows:

“SEC. 108. Using \$2,000,000 of the funds appropriated herein, the Secretary of the Army, acting through the Chief of Engineers, is authorized and directed to proceed with engineering, design, and construction of projects to provide for flood control and improvements to rainfall drainage systems in Jefferson, Orleans, and St. Tammany Parishes, Louisiana, in accordance with the following reports of the New Orleans District Engineer; Jefferson and Orleans Parishes, Louisiana, Urban Flood Control and Water Quality Management, July 1992 Tangiphahoa, Techefuncte and Tickfaw Rivers, Louisiana, June 1991; Schneider Canal, Slidell, Louisiana, Hurricane Protection, May 1990. There is authorized to be appropriated \$25,000,000 for the initiation and partial accomplishment of projects described in these reports. The cost of any work performed by the non-Federal interest subsequent to the above cited reports as determined by the Secretary of the Army to be a compatible and integral part of the projects, shall be credited toward the non-Federal share of the projects.”

Section 533 reads as follows:

“SEC. 533. SOUTHEAST LOUISIANA. (a) FLOOD CONTROL.- The Secretary shall proceed with engineering, design, and construction of projects to provide for flood control and improvements to rainfall drainage systems in Jefferson, Orleans, and St. Tammany Parishes, Louisiana, in accordance with the following reports of the New Orleans District Engineer: Jefferson and Orleans Parishes, Louisiana, Urban Flood Control and Water Quality Management, July 1992 Tangiphahoa, Techefuncte and Tickfaw Rivers, Louisiana, June 1991; Schneider Canal, Slidell, Louisiana, Hurricane Protection, May 1990. (b) COST SHARING.- The cost of any work performed by the non-Federal interests subsequent to the dates of the reports referred to in subsection (a) and determined by the Secretary to be a compatible and integral part of the projects shall be credited toward the non-Federal share of the projects. (c) FUNDING.- There is authorized to be appropriated \$100,000,000 for the initiation and partial accomplishment of projects described in the reports referred to in subsection (a). (d) ADDITIONAL OBLIGATIONS.- No funds may be obligated in excess of the amount authorized by subsection (c) for the projects for flood control and improvements to rainfall drainage systems authorized by subsection (a) until the Corps of Engineers determines that the additional work to be carried out with such funds is technically sound, environmentally acceptable, and economic, as applicable.”

c. Estimated original cost of project: non-Federal unknown
 Federal (SELA) \$209,000,000 Fed Cost and \$70,000,000 non-Fed. The non-Federal cost identified is the non-Federal share of the SELA Project.

d. Construction completion date of project.

Pump Station No. 1 (SELA)	2001
Pritchard Place Pump Station (SELA)	2005

e. Major modifications/improvements/betterments since beginning of project. Pump Station No. 11 original constructed under the GIWW project was modified by the SWB in 1993, with the addition of two horizontal pumps and building additions.

f. Need for Rehabilitation. Rehabilitation assistance is necessary to return the system to an adequately functioning project and reduce the immediate threat to life and improved property. Restoration and rehabilitation is to provide the level of protection for which the pump stations were designed, at full Federal expense, as authorized by Public Law 109-148. While the next Atlantic hurricane storm season will begin on June 1, 2006, significant rainfall can occur at any time.

3. Project Sponsors.

a. Sponsor Identification. The New Orleans Sewerage and Water Board for Federal (SELA) and non-Federal.

b. Application for Assistance. On September 15, 2005, the New Orleans District Engineer, Colonel Richard P. Wagenaar issued a Notice to Public Sponsors notifying them that the application period to request Rehabilitation Assistance for Flood Damaged Flood Control Projects expired on October 15, 2005. Requests for assistance for both non-Federal pump stations and the Southeast Louisiana Urban Flood Control Project were received from the New Orleans Sewerage and Water Board on October 15, 2005, signed by, Marcia St. Martin, Executive Director (Appendix A).

c. Sponsor Coordination Summary. Inspection was conducted to determine the extent of the damages to the pump stations caused by Hurricane Katrina. The inspection and Damage Survey Report (DSR) was performed by Corps of Engineers' Project Delivery Team the Sewerage and Water Board, and consulting engineers working for the Corps.

Structural Engineer	Larry Mickal
Electrical Engineer	Dan Bradley
Project Manager	Jim St. Germain
NOSWB	Rudy St. Germain
Mechanical/Electrical/Structural	Aimes Group, Consulting Engineers

4. Project Location and Area Description.

Orleans Parish is located in southeast Louisiana. Portions of the parish are in the Louisiana coastal area and the Pontchartrain Basin, situated near the center of the Gulf Coastal plain in the lower reaches of the Mississippi Embayment.

Orleans Parish is bisected by the Mississippi River, creating east and west bank areas. The parish is geographically subdivided into five basins by the Mississippi River and the Inner Harbor Navigation Canal: New Orleans East Bank, New Orleans East, Algiers, Lower Ninth Ward, and English Turn.

Generally, the areas near the Mississippi River are above sea level, and ground elevations decrease with distance from the river. Most of the developed areas are protected from river and hurricane flooding by levee systems and drained by pumps, which discharge primarily into estuarine water bodies. The leveed areas are divided into many subbasins by natural and man-made barriers and are webbed with drainage canals that terminate at pump stations.

Elevations on the east bank of the Mississippi River can be as low as -9 feet NGVD in the artificially drained, former marsh and swamps that are presently commercially or residentially developed. The west bank of the Mississippi River is characterized by mostly low relief associated with an alluvial plain. Land elevations slope gently from an average elevation of 12 feet NGVD along the natural banks of the Mississippi River to several feet below sea level in portions of the leveed areas.

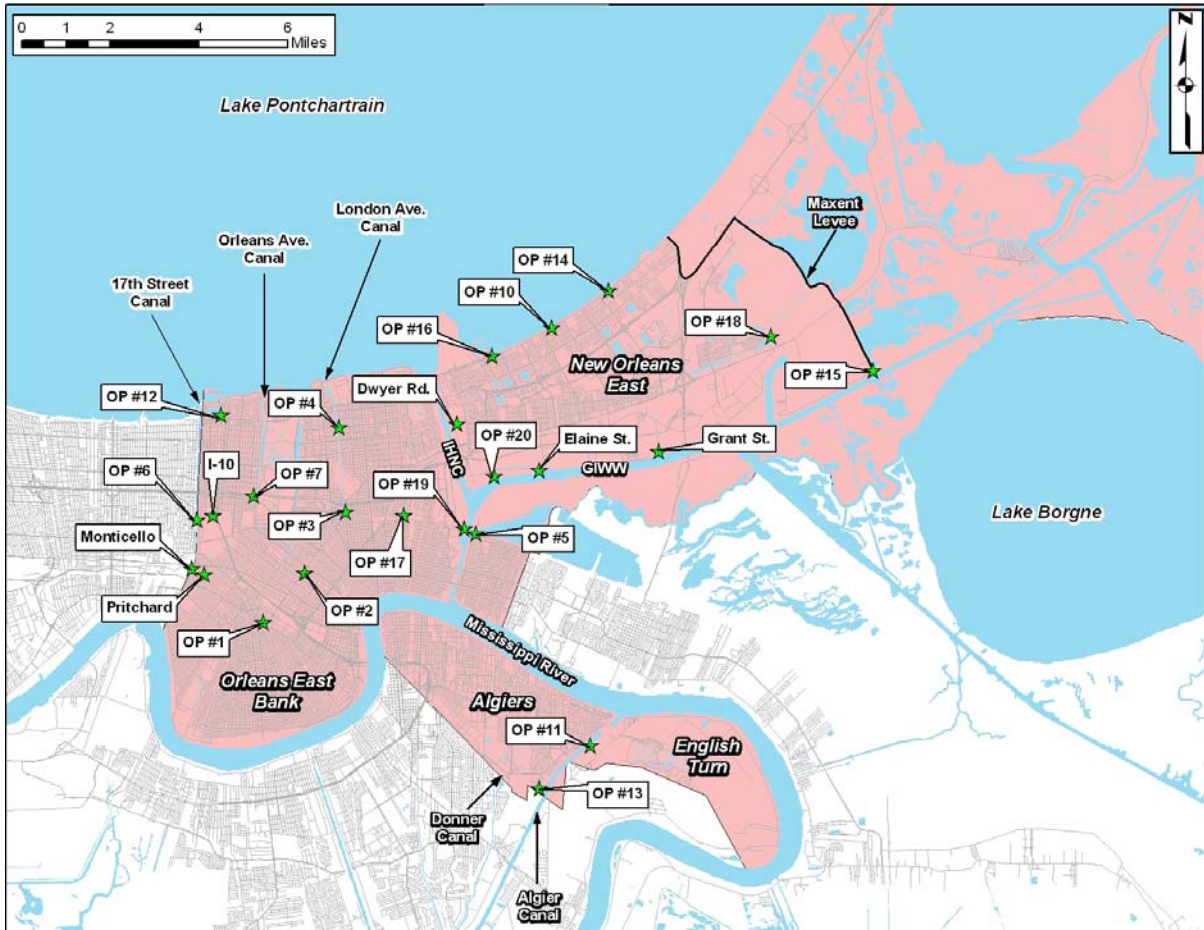


Figure 1. Orleans Parish Pump Stations

5. Project Design.

a. The New Orleans Sewerage and Water Board operates 24 pump stations within Orleans Parish. The total capacity of the stations is 49,948 cfs. The drainage areas are general divided into 5 major areas: New Orleans East Bank; New Orleans East, Lower Ninth Ward, Algiers, and English Turn.

1) New Orleans East Bank: The New Orleans East Bank is bound to the west by the 17th Street canal, to the east by the Inner Harbor Navigation Canal (IHNC), to the north by the Lake Pontchartrain, and to the south by the Mississippi River. The drainage area is approximately 27,500 acres. Pump Station No. 6 and the I-10 Pump Station drain into the 17th Street Canal. Pump Station No.'s 3 and 4 drains into the London Avenue Canal and Pump Station No. 7 drains into the Orleans Avenue Canal. The damage to the three outfall canals is addressed in the Orleans East Bank PIR. Preliminary analysis of the wall stability at the canals indicates that under normal condition (*i.e.*, lake stages of 0 to 1 feet NAVD) the pump stations' discharge will not be limited by safe water levels in the canal.

2) New Orleans East. New Orleans East is generally bound to the west by the IHNC, to the east and north by Lake Pontchartrain and to the south by the Gulf Intracoastal Waterway (GIWW). The New Orleans East drainage area is approximately 19,120 acres.

3) Lower Ninth Ward. The Lower Ninth Ward is bound to the west by the IHNC, to the east by the Orleans and St. Bernard Parish line, to the north by the local back levee, and to the south by the Mississippi River. Pump Station No. 5 drains this area. The area is approximately 1,465 acres.

4) Algiers. The Algiers basin is located on the west bank of the Mississippi River. The area is bound by the Mississippi River to the north and east, to the west by the Orleans and Jefferson Parish line (Donner Canal), and to the south by the GIWW. Pump Station No. 13 drains this area. The area is approximately 6,800 acres.

5) Lower Algiers/English Turn. The English Turn Basin is located on the west bank of the Mississippi River. The area is bound by the river to the north and east, to the west by the IHNC and to the south by Orleans and Plaquemines Parish line (Donner Canal). The area is approximately 4,500 acres.

b. The drainage system operates on 25 cycle and 60 cycle power, with the older equipment using 25 cycle. The SWB operates a power plant generating 25 cycle power for the drainage pump stations. Additionally, frequency changes are used to convert commercially available 60 cycle power to 25 cycle power. Two facilities are used to convert the power, the Carrolton Frequency Changer Facility and Pump Station 17 (D). Additionally, Pump Station 17 (D) is a combination sewer lift station and drainage station pumping dry weather flow to the Mississippi River.

Table 1
Summary of Orleans Parish Pump Stations

Pump Station Number	Pump Station Description	Number of Pumps	Full Capacity (cfs)	Fed Non-Fed
<u>New Orleans East Bank</u>				
1	Broad Street	11	6,825	Fed (SELA)
3	London Ave	9	4,260	non-Fed
4	London Ave	6	3,720	non-Fed
6	17th Street Canal	15	9,480	non-Fed
7	Orleans Ave	5	2,690	non-Fed
19	Industrial Canal West	5	3,650	non-Fed
I-10	I-10 Mounds Underpass	4	860	non-Fed
17	Station D	2	300	non-Fed
2	PS 2	7	3,190	non-Fed
12	PS 12	1	1,000	non-Fed
N/A	Monticello	3	99	non-Fed
N/A	Pritchard	2	250	Fed (SELA)
<u>New Orleans East</u>				
16	St. Charles	4	1,000	non-Fed
10	Citrus	4	1,000	non-Fed
14	Jahncke	4	1,200	non-Fed
N/A	Dwyer Road	2	120	non-Fed
18	Maxent	2	150	non-Fed
20	Amid	2	500	non-Fed
N/A	Grant Street	6	172	non-Fed
N/A	Elaine Street	2	90	non-Fed
15	Michoud	3	750	non-Fed
<u>Lower Ninth Ward</u>				
5	Industrial Canal East	7	2,260	non-Fed
<u>Algiers</u>				
13	Pump Station 13	7	4,650	non-Fed
<u>English Turn</u>				
11	Pump Station 11	5	1,670	non-Fed
<u>Total Capacity</u>			49,886	

c. Federal (SELA). The SELA project was designed to reduce flooding damages in Orleans Parish. Flood damage reduction features included in the SELA project consist of additions to existing pump stations, construction of additional pump stations, and improvements to existing drainage canals. Generally, the project is designed for the 10-year event. Specifically, the capacity of Pump Station No. 1 was increased by 1,000 cfs and a new 250 cfs pump station at Pritchard Place was constructed. A new station at Dwyer Road is under construction. Additional improvements are planned for the People's Triangle but construction has not begun. The SELA project relies on the existing drainage system to achieve its project benefits.

b. Background.

In 1913, A.B. Wood provided the solution to the problem of providing greater pumping capacity for New Orleans and the prevention of severe flooding in the city. The solution was large diameter screw pumps. Wood's electric screw pump consisted of a large discharge pipe within which an impeller was housed. The 12 foot diameter pumps were installed and in use by 1915 and the 14 foot diameter pumps were installed in 1928 (Figure 3). The pump driver is a synchronous motor. A synchronous motor uses the application of three-phase ac power to the motor stator causing a rotating magnetic field to be set up around the rotor. The rotor is energized with dc power from a motor generator set (the rotor consists of winding which act like poles of a bar magnet). The strong rotating magnetic field attracts the strong rotor field activated by the dc current. This attraction results in a strong turning force (torque) on the rotor shaft. The rotor is therefore able to turn a load (in this case a pump impeller) as it rotates in step with the rotating magnetic field. Wood's pump driver is an open winding synchronous motor used for pump application circa 1913. The rotors resemble a Ferris Wheel of diameters ranging from 6 feet for constant duty pumps and up to 14 feet for the large pumps. These original motors, which are still in use, run on 25Hz power supplied by a central power plant operated by the Sewerage and Water Board of New Orleans. There are no replacement motors available and all repairs to motor components are made on an as needed basis. Because of the uniqueness of these machines, repairs can only be performed by a few specialized companies. One of the most difficult repairs to accomplish is the rewinding of the poles (rotor coils).

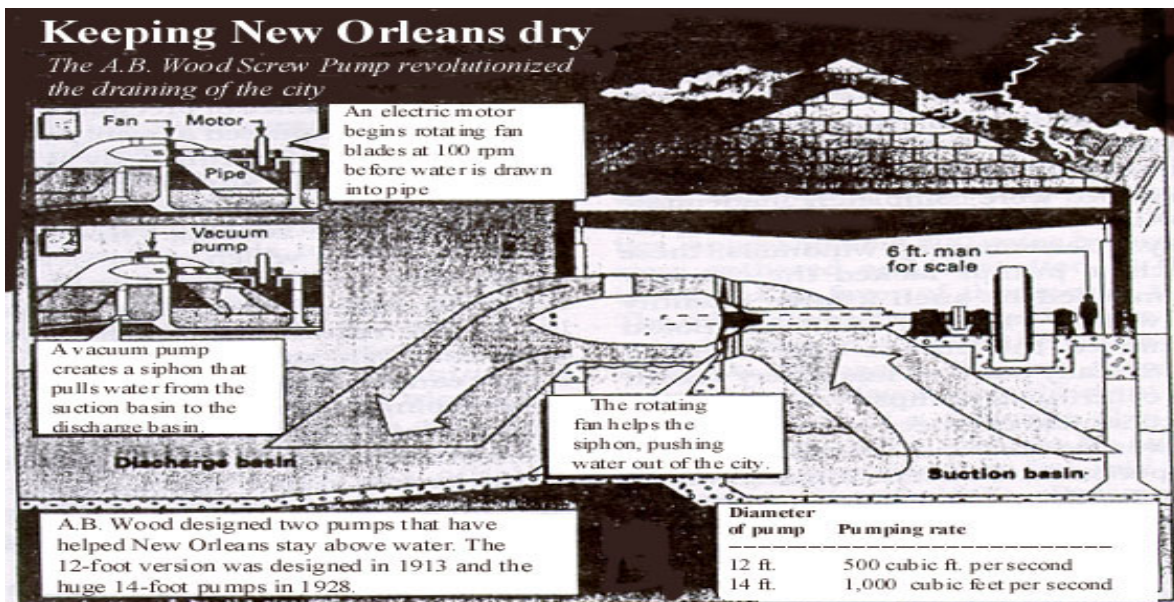


Figure 3. A. Baldwin Wood Screw Pump

c. Katrina Flooding.

When Hurricane Katrina flooded the pump stations and Wood screw pump motors, the brackish water remained in some stations for a period of several days and, in others, up to two weeks. Corrosion quickly developed at contact points and connections and electrical

insulation became saturated with the brackish water. As a consequence, most electrical equipment and components, which were flooded and could be quickly replaced, were replaced on an emergency basis. Other equipment, including the pump drivers, was cleaned, dried and field tested to ensure that most moisture was essentially baked out of the insulation.

The initial clean up of the pump stations was conducted by a local contractor using high pressure washers. Representatives of General Electric witnessed the power washing at one station and feel that, based on inspections, the same procedure was used at all stations. General Electric later performed more appropriate cleaning using proper techniques and equipment.

d. Damage to Rotor and Stator Windings (Poles).

A visual inspection of the pump driver poles show that insulation on connecting conductors and coils are frayed and flaking (Figures 4 and 5). In the emergency repairs undertaken just after the storm, General Electric was tasked to do whatever it took, in the shortest timeframe possible, to return pump capacity to the flooded stations. In the process, what ever conductor and rotor coil insulation that could be cleaned, baked, and pass a megohmmeter test of relative insulation resistance was considered operational even though the motors have yet to be tested under load. Those coils which measured at extreme low resistance values relative to other coils were considered to have too high a probability of failure and were removed and rewound. Those coils which had values in the general range of the other coils were left in place. The rewind coils carry a full years warranty on parts and labor. However, General Electric (G.E.) will not warranty any of the cleaned, baked and tested coils for any length of time. The megohmmeter tests conducted were not a pass or fail test, because the tests were relative tests.

e. Recommendations.

This PIR recommends that the poles flooded by Hurricane Katrina be rewound to ensure a high level of confidence in pump stations' reliability. The reliability of the pump motors has been compromised by extended submersion in water and being exposed to high pressure washers. The fact that no one can determine the probability of a successful operation of the pump motors, whether it is the first time they are operated in a rain storm or at time when the city is in critical need of the pumps, is major concern. In fact on December 15, 2005, A pump at Pump Station No. 1, after being cleaned, baked and tested, shorted under a load and was destroyed (Figure 7).



Figure 4. G.E. motor specialist shows sprayer damage Figure 5. Flaking and peeling coil insulation



Figure 6. Typical pump motor arrangement

Figure 7. Damaged Motor

f. Summary of Damages by Station.

1) Pump Station No. 1. The pump station was flooded 1 foot above the operating floor. Repairs will consists of rewinding motors B, C, D, and E, replacing the inboard bearing for pumps G and F, replacing roof ridge line flashing, repairs to the roll-up door, and replacing the flooring and paneling in the control house.

2) Pump Station No. 2. The pump station was flooded 15-inches above the operating floor and 5-inches above the floor in the control room. Repairs will consists of rewinding 4 motors, A, B, C, and D, replacing the inboard bearings in pumps F and G, and replacing the roof gutters and flashing. In the control room, the floor and wall paneling will be replaced.

3) Pump Station No. 3. Water levels in the building were approximately 24 inches above the lower operating level and 6 inches above the upper operating level. The control room was flooded 12 inches above the floor level. Repairs will consist of rewinding 5 motors, A, B, C, D, and E. Pump D will require removing and inspecting prior to any repairs. The pump station building roof will be repaired along with replacing the flooring

and wall panels in the operating room. The site fence will be repaired as needed and general cleaning and roof repairs are required for the storage building.

4) Pump Station No. 4. Water levels in the building were approximately 12 inches above the floor level and 9 inches above the control room floor. Wiring in the basement will be replaced and the inboard bearings for pumps C, D, and E will be replaced. The motors for the trash racks will require rewinding and the gear boxes replaced. The control room flooring was damaged and requires replacement along with the fence and gates. The metal roof was also damaged.

5) Pump Station 5. The pump room was flooded to 9 feet above the operating floor and the electrical equipment room was flooded to 4 feet above the operating floor. Pump motors A, B and D were flooded and will require complete rewinding. All lighting and low voltage wiring below the main floor area and equipment pits were submerged and will require replacement. The inboard bearing for pump D will be replaced along with the entire fuel system. Motor and gear boxes for the trash racks were flooded and will be replaced. The entire asphalt shingled roof was damaged and requires replacement. The control room floor was damaged by the flood along with doors and windows. The oil storage building was completely submerged and wood framed roof will require reconstruction along with fascia, soffits and exterior lighting.

6) Pump Station 6. Pump Station 6 has various floor levels with pumps, motors, and switchgear. Flood waters reached levels damaging most of the electrical equipment. Pump motors C, D, E, and F were flooded and should be rewound. Motors for pumps A and B are being completely rewound by the SWB. The inboard bearings for pumps G, H, and I require replacement. The suction bay has a significant build up of silt and trash and will require clean out. Damage to the roof, fencing and gates was also evident.

7) Pump Station 7. Water levels in the building were 28 inches above the operating floor. Pump motors A and C require complete rewinding. There was some scour at the northwest corner of the stations. The station wall is cracked. The control room was flooded and requires new paneling and flooring. The fence was damaged and the suction bay contains a significant amount of silt and trash.

8) Pump Station 12. The floodwater in the station was 25 inches above the slab on grade and peak water levels significantly higher. The floor level of the build is about 15 inches higher than the exterior slab on grade. Pump D will be inspected and repaired. The office floor and doors and window need replacement.

9) Pump Station 17 (D). Flood waters inside the building reached a height of 2 feet. The motors for drainage pumps A and D and four motors for frequency changes 3 and 4 were submerged and require rewinding. Medium voltage switchgear was flooded and requires replacement. The vacuum pump and ventilation fan unit was damaged. Three rollup doors were damaged and the control room and restroom floor and paneling were damaged. Finally, the 48-inch discharge line was damaged near Claiborne Ave and at the river and will require repairs.

10) Oleander (Monticello) Pump Station. The building was not flooded; however, wind damaged some ceramic ridge tiles.

11) Pritchard Place Pump Station. The building was not flooded; however, some wind and water damaged the generator muffler insulation, fuel line and roof and some scour developed near the discharge line.

12) I-10 Underpass Pump Station. While flood waters inundated the first floor the operating floor was not flooded. The bearings for pumps 1, 2, and 3 require replacement because raw water was used to operate the pumps when clean water was not available during the storm. The waste oil system and the sump pump controls were damaged along with the expansion joint of the 12-inch discharge line. Building damage consists of roof leaks, ceiling tiles, doors, and fencing.

13) Carrollton Frequency Changer. Floodwaters reached a height of 2 feet above the floor slab. The motor pits were flooded inside the building and the transformers outside received about 2 feet of water. The four frequency changer motors require full rewinding along with rewiring conductors in the pits and replacing the battery rack and drip pans. The outdoor electrical equipment requires cleaning and repairs.

14) Pump Station 11. While the station was not flooded, high winds damaged the roof and requires full replacement. Rainwater damage consists of damage to the acoustic ceiling in the control house. The switchgear and motor control centers were damaged by the rain water and require replacement.

15) Pump Station 13. The basement was flooded but the operating floor was above the flood waters. Roof damage allowed rainwater to damage switchgear. Low voltage wiring, switches, and lighting in the sump were damaged along with sump pumps. Wind damaged the roof, skylights, gutters, rollup doors, screens intake pipe, and vent stacks.

16) Pump Station 10 Citrus. Flood waters did not reach the operating floor of the station. However, 75 percent of the roof was damaged causing rainwater damage in the stations. Damaged switchgear and motor control centers will require repair or replacement. The bearings for pumps 1, 2, 3, and 4 require replacement. Trash screen motors were flooded. Building damage consist of roof damage, damage to the gutters, downspouts, control room ceiling tiles and the security fence.

17) Pump Station 14 Jahncke. The pump motors, diesel generator, and switchgear are on an elevated platform approximately 15 feet above grade and were not flooded. The trash rack motors were flooded. The float house was flooded damaging the low voltage wiring, switches, and lighting. The motor control center, controls, and sump pump were damaged. Because clean water was not available during the storm, pump was run with dirty water and damaged the bearing for pumps 1, 2, 3 and 4. The vacuum system was damaged from pumps 2 and 4. The entire float house built up roof and copper flashing were damaged. The control room was damaged by rain water and the fence was damaged by the

wind. The float house and control room roofs and concrete block walls were damaged structurally and require replacement.

18) Pump Station 15. Flood waters were approximately 2 feet below the operating floor. Because clean water was not available after the storm, raw water was used to lubricate the bearings. The dirty water caused damage to the bearings for pumps 1, 2 and 3. The gear boxes for the three pumps also require service. Damage to the building consists of damage to the basement level doors, fence, roof vents, and trash rack supports.

19) Pump Station 16 St. Charles. The operating floor was not flooded. However, the float house was flooded. The screen motors and starters and gear boxes require replacement along with low voltage wiring, switches and light fixtures in the basement of the float house. The auto/manual controls in the pump house were damaged. The sump pump requires replacement. Bearings were damaged on three pumps. Building damage consists of damage to the entire flat built up roof, and damage to floor tiles, interior walls and ceilings due to rainwater. The fence was destroyed and the air conditioner located on the roof was destroyed. The float house and control room roofs and concrete block walls were damaged structurally and require replacement.

20) Pump Station 18, Maxent. The flood water was below the operating floor. The chain link fence was damaged.

21) Pump Station 19. The station has three levels, ground level, second level, and the control level. Flood waters reached 18 inches above the second level. Everything at that level will require replacement, including the sewer grinder pump and the sump pump. Pump bearing for vertical pumps 1 and 2 and horizontal pump 2 require replacement. Hydraulic oil system needs to be drained, tested and replaced. One ventilation fan is damaged and pipe railing around the suction basin. The roof is leaking and the chain link fence is damaged. Erosion around the building is evident requiring fill material and replacement of sidewalks, pavement and curb and gutter.

22) Pump Station 20, Amid. The operating floor is elevated about 15 feet above grade. The underneath portions were flooded with about 7 to 10 feet of water. The trash rack motors, starters chains, and bars were damaged. The generator was flooded and requires replacement. Pump 2 has damage to the impeller. Scour is evident around the building and the access road and parking lot need fill and aggregate. One wall of the generator building will require replacement. The roof of the office building is damaged and will require replacement. The chain link fence and light poles were damaged.

23) Pump Station Elaine. The stations electric pump motors and vacuum pump motors were submerged under 8 feet of water. They will require replacement. The bearing for pumps 1 and 2 require replacement. The site has considerable scour and will require fill material. A steel door will not open and tie down straps on the outlet pipes are damaged. Additionally a 12 foot steel support member has collapsed.

24) Pump Station Grant. The station has outdoor pumps 1, 2, 3, and 4 along with pumps 5 and 6 enclosed in a raised pump house. The outdoor pumps are lower than the pump house and were flooded. Therefore, the four outdoor pump motors should be rewound. All lighting and low voltage power and devices below the platform require replacement. The switchgear and motor controls require replacement. Bearing for the four outdoor pumps require replacement. Scour is evident at the site and fill and aggregate required along with the replacement of pavement. Roof flashing and site fencing were damaged.

8. Project Performance Data.

a. Inspection Results.

1) Date of Last Inspection.

a) Non-Federal: Because the pump stations are not active in the RIP, inspections of the stations were not performed prior to the disaster. Therefore, a project condition code was not assigned by the Corps.

b) Federal.

- (1) Pump Station No. 1—Completed 2001
- (2) Pritchard Pump Station—Completed 2005
- (3) Dwyer Pump Station—under construction

2) Type of Last Inspection.

a) Non-Federal: Not active in the RIP.

b) Federal:

- (1) Pump Station No. 1—Completed 2001
- (2) Pritchard Pump Station—Completed 2005
- (3) Dwyer Pump Station—under construction

3) Project Condition Code of Last Inspection. Not active in the RIP

b. Sponsor's Annual O&M Cost. unknown

c. Estimated cost to repair maintenance deficiencies. Not evaluated.

9. Project Repair Alternatives.

a. Description.

1) No Action. This alternative consists of providing repairs to the flood control system. The area would be vulnerable to flooding caused by rainfall events and would not be suitable for residential, industrial and other urban usage.

2) Non-Structural Flood Recovery / Floodplain Management. This alternative consists of non-structural strategies generally involving changes in land use

offered by other federal and state programs. Such strategies would include: (1) acquisition, relocation, elevation, and flood proofing existing structures; (2) acquisition of fee interest and/or conservation or other types of land easements and acquisitions; and (3) restoration of wetland. The sponsor has not requested any consideration of a non-structural alternative.

3) Restoration and rehabilitation is to provide the level of protection for which the pump stations were designed.

b. Discussion.

1) The no action alternative is not acceptable to the Sponsor because the area would be subject to flooding from rainfall events. This situation would prevent reliable residential and industrial use of the land.

2) The non-structural flood recovery / floodplain management alternative is not acceptable due to the numerous industrial uses for the lands within the protected area. In addition there will be residents who will want to and will be allowed to rebuild their homes. The sponsors have not requested a non-structural alternative.

3) The repair alternative restores the flood control system to the pre-storm condition and capacity. Without the repairs the area would be subject to flooding from rainfall events. Repairs would consist of replacement of damaged and non-operational equipment, replacement of damage roofs and other building damage.

10. Recommended Alternative.

a. Description. The recommended alternative is to restore and rehabilitate the stations and pumps to provide the level of protection for which they designed.

b. Standard Limits for Cost. ER-500-1-1, Section 5-2, paragraph v(1) limits the construction contingency to 10%; however, because of the emergency conditions under which the design and contract documents will be prepared, the short amount of time allowed for construction completion, and the high level of competition for construction contractor resources in the area, a 25% construction contingency is used. Additionally, because of the nature of rehabilitating mechanical and electrical work, including the uncertainty of rebuilding equipment and hidden damage, E&D of 10 % and S&A of 12 % of the construction cost is used.

c. In connection with Hurricane Katrina, the contractor for the Dwyer Pump Station currently under construction has reported flood damage to equipment stored at his facility. The Contracting Officer is has consulted with legal and technical advisors who have determined that within the terms of the contract, the Government is not liable for the damage. Therefore, the cost is not presented in the PIR.

ASSESSMENT OF SELECTED ALTERNATIVE

11. Economic Analysis.

The economic feasibility analysis was conducted in accordance with the requirements of EP 500-1-1 in support of the restoration and rehabilitation of Federally-authorized flood control works as provided for under Public Law 109-148. Without the identified repairs, the pump stations cannot be reliably maintained in good, safe working condition and must be repaired to fully restore the functional integrity of each pump station to provide the level of protection for which the pump stations were designed. The assumption made in terms of long term reliability for the economic and hydrologic/hydraulic analysis is that without the repairs, the station will not operate at full capacity. Therefore, a reduced capacity of 50 percent was used as the without project condition. The with project condition includes 100 percent capacity.

a. New Orleans East Bank.

1) Benefit Analysis.

The total average annual benefits for the New Orleans East Bank Basin are \$16,320,000. The benefits were based on inventory collected during several studies including the Southeast Louisiana Urban Flood Control Project, Orleans Parish, Louisiana, Uptown Sub-basin, Section 533 (d) Post Authorization Change Report and the Southeast Louisiana Urban Flood Control Project, Orleans Parish, Louisiana, Peoples Sub-basin, Section 533 (d) Post Authorization Change Report. Inundation damage reduction benefits include those associated with avoided losses to residential, commercial, and industrial structures, their contents, and vehicles associated with these structures. This figure is estimated using April 2006 price levels.

Two sets of hydraulics were used for the analysis. The without-project condition was defined as the existing pump capacity reduced to 50 percent of its pre-storm capacity and the with-project condition is the pre-Katrina pumping capacity. Stage frequency data and depth damage information was generated to determine the difference between the with-and without-project condition. These benefits are based upon an expectation that all damaged or destroyed facilities will be fully restored and is consistent with current planning guidance that requires adjustments if there is specific information that indicates such restoration will not occur. No adjustments were made to account for the partial replacement of structures that have been damaged or destroyed by Hurricane Katrina.

2) Cost Analysis.

The total first cost for the New Orleans East Bank Basin rehabilitation work is \$22,517,000 with an average annual cost of \$1,257,000. The total first costs for the work to be performed includes construction costs, contingencies, engineering and design costs, and supervision and administration costs. The total first costs reflect April 2006 price levels and were amortized at the FY 2006 Federal discount rate of 5.125 percent over a 50-year period of analysis. Because the repairs to the stations are expected to be completed with one year, no interest during construction accrues.

No incremental operation and maintenance costs are expected since the scope of the original project design has not changed.

3) Benefit Cost Ratio.

The degree to which the average annual project benefits exceed the average annual project costs is the measure of positive average annual net benefits and is consistent with a benefit-to-cost ratio of 1 or greater. The net benefits for the rehabilitation work are \$15,063,000. The benefit-to-cost ratio is 13.0 to 1.0.

b. Lower Ninth Ward Basin.

1) Benefit Analysis.

The total average annual benefits for the Lower Ninth Ward Basin are \$193,000. Inundation damage reduction benefits include those associated with avoided losses to residential, commercial, and industrial structures, their contents, and vehicles associated with these structures. This figure is estimated using April 2006 price levels.

Two sets of hydraulics were used for the analysis. The without-project condition was defined as the existing pump capacity reduced to 50 percent of its pre-storm capacity and the with-project condition is the pre-Katrina pumping capacity. Stage frequency data and depth damage information was generated to determine the difference between the with-and without-project condition. These benefits are based upon an expectation that all damaged or destroyed facilities will be fully restored and will be consistent with current planning guidance that requires adjustments if there is specific information that indicates such restoration will not occur. No adjustments were made to account for the partial replacement of structures that have been damaged or destroyed by Hurricane Katrina.

2) Cost Analysis.

The total first cost for the Lower Ninth Ward Basin rehabilitation work is \$1,670,000 with an average annual cost of \$93,000. The total first costs for the work to be performed includes construction costs, contingencies, engineering and design costs, and supervision and administration costs. The total first costs reflect April 2006 price levels and were amortized at the FY 2006 Federal discount rate of 5.125 percent over a 50-year period of analysis. Because the repairs to the stations are expected to be completed with one year, no interest during construction accrues. No incremental operation and maintenance costs are expected since the scope of the original project design has not changed.

3) Benefit Cost Ratio.

The degree to which the average annual project benefits exceed the average annual project costs is the measure of positive average annual net benefits and is consistent with a benefit-to-cost ratio of 1 or greater. The net benefits for the rehabilitation work are \$100,000. The benefit-to-cost ratio is 2.1 to 1.0.

c. Lower Algiers/English Turn Basin.

1) Benefit Analysis.

The total average annual benefits for the Lower Algiers/English Turn Basin are \$8,781,000. Benefits were based on inventory collected during the West Bank of the Mississippi River in the Vicinity of New Orleans, Louisiana, (East of Harvey Canal) Hurricane Protection Study. Inundation damage reduction benefits include those associated with avoided losses to residential, commercial, and industrial structures, their contents, and vehicles associated with these structures. This figure is estimated using April 2006 price levels.

Two sets of hydraulics were used for the analysis. The without-project condition was defined as the existing pump capacity reduced to 50 percent of its pre-storm capacity and the with-project condition is the pre-Katrina pumping capacity. Stage frequency data and depth damage information was generator to determine the difference between the with-and without-project condition. These benefits are based upon an expectation that all damaged or destroyed facilities will be fully restored and will be is consistent with current planning guidance that requires adjustments if there is specific information that indicates such restoration will not occur. No adjustments were made to account for the partial replacement of structures that have been damaged or destroyed by Hurricane Katrina.

2) Cost Analysis.

The total first cost for the Lower Algiers/English Turn Basin rehabilitation work is \$2,780,000 with an average annual cost of \$155,000. The total first costs for the work to be performed includes construction costs, contingencies, engineering and design costs, and supervision and administration costs. The total first costs reflect April 2006 price levels and were amortized at the FY 2006 Federal discount rate of 5.125 percent over a 50-year period of analysis. Because the repairs to the stations are expected to be completed with one year, no interest during construction accrues. No incremental operation and maintenance costs are expected since the scope of the original project design has not changed.

3) Benefit Cost Ratio.

The degree to which the average annual project benefits exceed the average annual project costs is the measure of positive average annual net benefits and is consistent with a benefit-to-cost ratio of 1 or greater. The net benefits for the rehabilitation work are \$8,626,000. The benefit-to-cost ratio is 56.7 to 1.0.

d. Algiers Basin.

1) Benefit Analysis.

The total average annual benefits for the Algiers Basin are \$4,821,000. Benefits were based on inventory collected during the West Bank of the Mississippi River in the Vicinity of New Orleans, Louisiana, (East of Harvey Canal) Hurricane Protection Study. Inundation damage reduction benefits include those associated

with avoided losses to residential, commercial, and industrial structures, their contents, and vehicles associated with these structures. This figure is estimated using April 2006 price levels.

Two sets of hydraulics were used for the analysis. The without-project condition was defined as the existing pump capacity reduced to 50 percent of its pre-storm capacity and the with-project condition is the pre-Katrina pumping capacity. Stage frequency data and depth damage information was generated to determine the difference between the with-and without-project condition. These benefits are based upon an expectation that all damaged or destroyed facilities will be fully restored and will be consistent with current planning guidance that requires adjustments if there is specific information that indicates such restoration will not occur. No adjustments were made to account for the partial replacement of structures that have been damaged or destroyed by Hurricane Katrina.

2) Cost Analysis.

The total first cost for the Algiers Basin rehabilitation work is \$2,990,000 with an average annual cost of \$167,000. The total first costs for the work to be performed includes construction costs, contingencies, engineering and design costs, and supervision and administration costs. The total first costs reflect April 2006 price levels and were amortized at the FY 2006 Federal discount rate of 5.125 percent over a 50-year period of analysis. Because the repairs to the stations are expected to be completed within one year, no interest during construction accrues. No incremental operation and maintenance costs are expected since the scope of the original project design has not changed.

3) Benefit Cost Ratio.

The degree to which the average annual project benefits exceed the average annual project costs is the measure of positive average annual net benefits and is consistent with a benefit-to-cost ratio of 1 or greater. The net benefits for the rehabilitation work are \$4,654,000. The benefit-to-cost ratio is 28.9 to 1.0.

e. New Orleans East Basin.

1) Benefit Analysis.

The total average annual benefits for the New Orleans East Basin are \$4,046,000. The benefits were based on inventory collected during the Southeast Louisiana (SELA) Urban Flood Control Project, Dwyer Canal Sub-basin, Limited Reevaluation Report, dated October 2002. Inundation damage reduction benefits include those associated with avoided losses to residential, commercial, and industrial structures, their contents, and vehicles associated with these structures. This figure is estimated using April 2006 price levels.

Two sets of hydraulics were used for the analysis. The without-project condition was defined as the existing pump capacity reduced to 50 percent of its pre-storm capacity and the with-project condition is the pre-Katrina pumping capacity.

Stage frequency data and depth damage information was generator to determine the difference between the with-and without-project condition. These benefits are based upon an expectation that all damaged or destroyed facilities will be fully restored and will be is consistent with current planning guidance that requires adjustments if there is specific information that indicates such restoration will not occur. No adjustments were made to account for the partial replacement of structures that have been damaged or destroyed by Hurricane Katrina.

2) Cost Analysis.

The total first cost for the New Orleans East Basin rehabilitation work is \$9,676,000 with an average annual cost of \$540,000. The total first costs for the work to be performed includes construction costs, contingencies, engineering and design costs, and supervision and administration costs. The total first costs reflect April 2006 price levels and were amortized at the FY 2006 Federal discount rate of 5.125 percent over a 50-year period of analysis. Because the repairs to the stations are expected to be completed with one year, no interest during construction accrues. No incremental operation and maintenance costs are expected since the scope of the original project design has not changed.

3) Benefit Cost Ratio.

The degree to which the average annual project benefits exceed the average annual project costs is the measure of positive average annual net benefits and is consistent with a benefit-to-cost ratio of 1 or greater. The net benefits for the rehabilitation work are \$3,506,000. The benefit-to-cost ratio is 7.5 to 1.0.

f. Summary of Costs and Benefits. Table 2 provides a summary of the costs and benefits associated with the rehabilitation effort. The total estimated cost of the rehabilitation effort is \$39,633,000.

f. Construction Cost Estimate. The estimated construction cost is \$39,633,000. Appendix H contains a detailed construction cost estimate for each pump station.

Table 2
Cost and Benefit Cost Ratios
Table Exec Sum 1. Summary of Cost and Benefits

	Cost	Average Annual Cost (\$)	Average Annual Benefits (\$)	Net Benefits (\$)	B/C Ratio	Federal Cost (\$)	Non-Federal Cost (\$)
Meto Orleans East Bank							
Drainage Pump Station #3	2,410,000						2,410,000
Drainage Pump Station #4-London Avenue	473,000						473,000
Drainage Pump Station #19-W. of Indust. Canal	702,000						702,000
Drainage Pump Station #2	2,759,000						2,759,000
Drainage Pump Station #7-Orleans Avenue	1,074,000						1,074,000
Drainage Pump Station #12	128,000						128,000
I-10 Underpass Drainage Pump Station.	298,000						298,000
Drainage Pump Station #6-17th Street	2,494,000						2,494,000
Drainage Pump Station #1-Broad Street	2,080,000					2,080,000	
Monticello Drainage Pump Station	6,000						6,000
Pritchard Place Drainage Pump Station.	16,000					16,000	
Drainage Pump Station #17-Station D	7,492,000						7,492,000
Carrolton Frequency Changer	2,585,000						2,585,000
Subtotal	22,517,000	1,258,000	16,320,000	15,062,000	13	2,096,000	20,421,000
Lower Ninth Ward							
Drainage Pump Station #5-E. of Indust. Canal	1,670,000	93,000	193,000	100,000	2.1	0	1,670,000
Lower Algiers/English Turn							
Drainage Pump Station #11	2,780,000	155,000	8,781,000	8,626,000	56.7	0	2,780,000
Algiers							
Drainage Pump Station #13	2,990,000	167,000	4,821,000	4,654,000	28.9	0	2,990,000
New Orleans East							
Drainage Pump Station #10-Citrus	3,770,000						3,770,000
Drainage Pump Station #14-Jahncke	1,220,000						1,220,000
Drainage Pump Station #16-St. Charles	1,020,000						1,020,000
Drainage Pump Station #20-Amid	2,062,000						2,062,000
Grant Drainage Pump Station	274,000						274,000
Elaine Drainage Pump Station	573,000						573,000
Drainage Pump Station #18-Maxent	1,000						1,000
Drainage Pump Station #15-Michoud	756,000						756,000
Subtotal	9,676,000	540,000	4,046,000	3,506,000	7.5	0	9,676,000
Total	39,633,000	2,213,000	34,161,000	31,948,000	15.4	2,096,000	37,537,000

12. Environmental

The New Orleans District Commander has considered the probable environmental consequences of the proposed work under this PIR. No adverse impacts to endangered species, important fish and wildlife resources, waters of the United States subject to Section

404 permitting including wetlands, water quality, floodplains, or other natural resources are expected. One of the pump stations to be repaired under this PIR, the Prichard Place Pump Station, was constructed under the SELA project. Pump Station Number 1 was upgraded with additional pumping capacity under the SELA. Repairs to these pump stations are categorically excluded from additional National Environmental Policy Act (NEPA) documentation as per Engineering Regulation ER 200-2-2, Paragraph 9.a., which provides for NEPA exclusion of “activities at completed Corps projects which carry out the authorized project purposes.” Examples of such activities include “repair, rehabilitation, replacement of existing structures and facilities.” The requirements of other applicable environmental laws and regulations remain in effect and the proposed work will comply with them.

The other pump stations to be repaired under this PIR are not part of any Federal project. The environmental effects of the non-Federal pump station work are included in an environmental assessment for all of the flood protection repair work being undertaken by the Corps in the Metropolitan New Orleans area. The environmental assessment has been distributed for 30-day public and agency review and comment. The comment period ends on May 16, 2006. It is anticipated that, barring any comments that identify previously undisclosed environmental impact, the New Orleans District Commander will sign a finding of no significant impact, thereby completing the NEPA process. The authority for this approach is per ER 500-1-1, Paragraph 2-3.k(1), and ER 200-2-2, Paragraph 8, and a determination made by the New Orleans District Commander on January 5, 2006, that this work prevents or reduces an imminent risk of life, health, property, or severe economic losses. (See Appendix G).

In order to comply with other applicable laws and regulations, the New Orleans District has coordinated the proposed action with appropriate Federal and state agencies. Pump Stations 1, 2, 3, 5, 6, and 7 are eligible for or are included on the National Register of Historic Places. The New Orleans District is coordinating the repair and rehabilitation effort with the State SHPO. The Corps will not need to apply for a storm water pollution prevention permit from the Louisiana Department of Environmental Quality (LDEQ) pursuant to Section 402 of the Clean Water Act since LDEQ has granted the Corps blanket authority to discharge storm water runoff from construction activities related to hurricane response activities in the declared disaster areas. A State Water Quality Certification pursuant to Section 401 of the Clean Water Act will not have to be obtained from the LDEQ since that office sent a letter to the New Orleans District dated September 7, 2005, which waives and dispenses with the requirement of State Water Quality Certification prior to performing such work as needed to repair, replace, or restore public infrastructure damaged or destroyed by 2005 hurricanes.

13. Interagency Levee Task Force.

Not applicable.

14. Project Management.

a. Funding Authority.

(1) Program and Appropriation. FCCE, 96x3125

(2) Class. For non-Federal 326, for Federal 316

(3) CWIS Number. For non-Federal 030725, for Federal 075517

b. Project Funds. Cost of Field Investigations /PIR Preparation: \$30,574 Fed, \$202,210 non-Fed

c. Project Repair Schedule.

DSR Complete	12/20/05
PIR Complete	05/01/06
Begin Construction	05/10/06
Complete Construction	05/20/07

15. Implementation Guidance for Emergency Supplemental Appropriations.

Pursuant to CECW-HS, Memorandum for Commanders, South Atlantic Division and Mississippi Valley Division, SUBJECT: Post Hurricanes Katrina, Wilma, Ophelia Expenditure of Flood Control and Coastal Emergency (FCCE) Funds for Restoration and Rehabilitation, and for Accelerated Work to Complete Authorized Projects, in accordance with the Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza Act, 2006 (Public Law 109-148), dated February, 14, 2006, signed by Don Riley, Major General, Director of Civil Works (Appendix N), for the purpose of delegating certain approval authority and to provide guidance concerning restoration and rehabilitation of flood damage reduction and hurricane and storm damage reduction project, and the acceleration of work to complete certain Federally authorized projects, in accordance with the funding and authority provided by PL 109-148, as follows:

Public Law 109-148 directs that in using funds appropriated for construction to Hurricane Katrina in the areas covered by the disaster declaration, the Corps of Engineers will restore flood damage reduction and hurricane and storm damage reduction projects and related works to provide the level of protection for which they were designed, at full Federal expense. The Joint Explanatory Statement of the Committee of Conference accompanying Public Law 109-148 further clarifies that the funds are provided to fund repairs to non-Federal levees and pumps and to construct levees and floodwalls to original design levels, rather than to pre-storm condition. Therefore, within the funds provided, for Federally authorized projects with levee and floodwall components, and non-Federal levees and pumps, which were damaged by Hurricane Katrina, restoration and rehabilitation will be undertaken to the previously constructed design level. The costs for restoration and rehabilitation construction and construction related activities will be at full Federal expense. These costs include Engineering and Design, Supervision and Administration, actual construction acquisition of real estate interests not already owned by or

under the control of the non-Federal sponsor, and relocations. HTRW investigations will be performed at Federal expense, if HTRW is discovered, then a mutual decision will be made by the Federal Government and the non-Federal sponsor on whether to proceed with acquisition of the property; and if the parties mutually agree to proceed, then the non-Federal sponsor will be responsible of HTRW clean-up costs. Other non-Federal responsibilities, including operation and maintenance and the requirement to hold and save the Federal Government free from damages, remain.

16. Requirements of Federal and Public Sponsor Cooperation for the Rehabilitation Effort

A Cooperation Agreement will be entered into between the Government and the New Orleans Sewerage and Water Board as the Public Sponsor. Obligations of the Government and the Public Sponsor for the herein described rehabilitation efforts are described in the following sub-paragraphs.

a. Lands, Easements, Rights-of-Way, and Disposal or Borrow Areas (LERD)

(1) LERD Owned, Claimed or Controlled by the Public Sponsor: Upon the Government's request that the Public Sponsor provide right of entry for LERD determined by the Government to be necessary for the construction, operation and maintenance of the permanent rehabilitation efforts herein described, the Public Sponsor shall provide, at no cost to the Government, a right of entry to LERD on lands that were owned, controlled, or claimed by the Public Sponsor on the date of the Government's request for right of entry (hereafter "Public Sponsor LERD"). The Public Sponsor shall secure, at no cost to the Government, the subordination or release of all third party interests within said Public Sponsor LERD, as required by the Government's request for right of entry.

(2) LERD Owned, Claimed or Controlled by Other Non-Federal Governmental Entities: The Public Sponsor, at no cost to the Government, shall use its best efforts to provide right of entry, as requested by the Government, to LERD that were owned, controlled or claimed by other non-Federal Government entities on the date of the Government's request for right of entry (hereinafter "Other Non-Federal Governmental LERD"). If the Public Sponsor, despite diligent efforts, is unable to acquire right of entry to Other Non-Federal Governmental LERD, the Government shall obtain right of entry to the Other Non-Federal Governmental LERD from the non-Federal governmental entity who owns, controls or claims said LERD.

(3) Owned by Private Interests: For the rehabilitation efforts described herein, the Government shall fund the acquisition of LERD that are not owned, claimed or under the control of the Public Sponsor or any other non-Federal governmental entities on the date of the Government's request for right of entry (hereinafter "Private LERD"). The Government's responsibility to fund the acquisition of Private LERD shall be in accordance with the following procedures and requirements

(a) Exercise of Commandeering Powers: Immediately upon the Government's request that the Public Sponsor provide Private LERD, the Public Sponsor shall secure or cause to be secured an executive commandeering order or orders from the Mayor of the City of New Orleans or the Governor of the State of Louisiana for Private LERD situated in Orleans Parish, Louisiana, for the construction of the permanent rehabilitation efforts herein described. The exercise of such commandeering powers and authorities is subject, under the cited state law, to the requirement that the owners of any commandeered interest that is compensable under the law, be identified and justly compensated under the law. Repairs to the pump stations will be performed within existing right-of-way already under the control of the New Orleans Sewerage and Water Board. Therefore, it is anticipated that commandeering powers will not be required.

(b) Provision of Right of Entry: At no cost to the Government, the Public Sponsor shall promptly provide right of entry to the Government to the Private LERD for the construction, operation and maintenance of the rehabilitation efforts described herein.

(c) Responsibility for Acquisition of Private LERD: After receipt of the executed Commandeering Order and right of entry from the Public Sponsor, the Government will perform, or cause to be performed, the acquisition of the Private LERD determined by the Government to be necessary for the construction, operation and maintenance of the LERD described herein. The acquisition of LERD by the Government will be subject to the availability and receipt of P. L. 109-148 appropriations and the provision by the Public Sponsor, at no cost to the Government, of the Commandeering Order and right of entry referenced in Paragraph 16.a.(3)(a) and 16.a.(3)(b), respectively.

(d) Acquisition in the Name of the Public Sponsor: The Government shall acquire, as appropriate, any Private LERD and Other Non-Federal Governmental LERD and relocations, as well as any subordinations or releases of interest required to be obtained from third parties in the name of the Public Sponsor. Provided however, that if the Government is required to acquire said interests through the exercise of its Federal powers of eminent domain authority, the Government shall file such proceedings in a Federal district court, such that possession and ownership of the condemned LERD and interests shall be in the name of the United States of America. The Government shall thereafter quitclaim such interest to the Public Sponsor and the Public Sponsor shall agree in the Cooperation Agreement to accept the quitclaim of any LERD and interests so acquired by the Government for the purposes of the Rehabilitation Effort herein described.

b. Construction

The Government will expeditiously construct the rehabilitation efforts described herein, subject to the provision of and availability of P.L. 109-148 funds by the Congress, and subject to the commandeering of Private LERD by the chief executive officer of the parish or city where the Private LERD are located and to the provision by the Public Sponsor of a right of entry to the LERD determined by the Government to be necessary for the construction, operation and maintenance of the Rehabilitation Effort.

c. Relocations

The Government will determine and accomplish or assure accomplishment of all the relocations necessary for the construction, operation and maintenance of the rehabilitation effort described herein, including those necessary to enable the removal of borrow materials and the proper disposal of dredged or excavated material; provided however, that the Public Sponsor, without cost to the Government, shall commandeer the privately-owned relocated facilities or utilities in accordance with its powers under La. R.S. 29:721, et seq.; shall diligently exercise its rights and authority to secure a subordination or release of third party interests on Public Sponsor LERD; and shall use its best efforts to secure a subordination or release of third party interests on other non-federal Governmental LERD. If the Public Sponsor, despite diligent efforts, is unable to secure the release or subordination of third party interests in other non-federal Governmental LERD, the Government shall obtain such subordination or release from the owners of such interests.

d. Hazardous Substances

The Government shall perform, or cause to be performed, such investigations for hazardous substances as are determined to be necessary by the Government to identify the existence and extent of hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 U.S.C. 9601-9675, on all lands that are determined by the Government to be necessary to the construction, operation, and maintenance of the subject Rehabilitation Effort. In the event that hazardous substances are determined to exist on lands acquired for the rehabilitation effort and the Government and the Public Sponsor determine to proceed or continue with the construction after considering liability that may arise under CERCLA, the Public Sponsor shall be responsible, as between the Government and the Public Sponsor, for any and all necessary clean up and response costs, to include the costs of any studies and investigations necessary to determine an appropriate response to the contamination. Such costs shall not be considered a part of the total rehabilitation effort for the subject project.

e. Indemnification

The Public Sponsor shall hold and save the Government free from all damages arising from the construction, operation, and maintenance of the subject Rehabilitation Effort and any related betterments, except for damages due to the fault or negligence of the Government or the Government's contractors.

f. Betterments

The Public Sponsor may request the Government to accomplish betterments and shall be solely responsible for any increase in costs resulting from the betterments. All such increased costs will be paid in advance by the non-Federal sponsors.

g. Operation and Maintenance

The Public Sponsor shall operate and maintain those portions of the Rehabilitation Effort herein described at no cost to the Government, in accordance with specific directions prescribed by the Government in Engineer Regulation 500-1-1 and any subsequent amendments thereto and other applicable authorities

17. Real Estate Requirements.

All applicable Rights of Entry will be provided by the appropriate Public Sponsor prior to each construction contract in accordance with the procedures set forth in paragraph 16 above.

PROJECT SUMMARY

18. Recommendations/Project Authentication

a. It is recommended that this project should be repaired. The recommended alternative is to repair or replace damage caused by Hurricane Katrina. Without repairs to the flood control Project, the threat of flooding from rainfall events would continue to leave the area unusable for residential and commercial use.

b. It is recommended that this project be approved. The project first cost is \$39,633,000 with a benefit-to-cost ratio of 1 to 15.4. The cost of the rehabilitation effort for the Federal pump stations is \$2,096,000 and the cost of the non-Federal pump stations is \$37,537,000. The final design will be completed with contract award scheduled to ensure repairs are completed as soon as practical.

DISTRICT PROJECT AUTHENTICATION

Project Information Report, PUMP STATIONS FLOOD CONTROL, Orleans Parish, Louisiana

Report Prepared By: James J. St. Germain 4/25/06
James J. St. Germain Date
Project Manager

Emergency Management Approval By: Michael Lowe 28 APR 06
Michael Lowe Date
Chief, Emergency Operations

CERTIFICATION OF LEGAL REVIEW

The Project Information Report (PIR) for repair of the Federal and non-Federal Pump Stations in Orleans Parish, Louisiana has been reviewed by the Office of Counsel, New Orleans District and is approved as a legally sufficient document for commencement of construction.

Reviewed by: Heidi Blue 28 APR 06
Assistant District Counsel Date

Certified by: Mary McKinney 28 April 06
District Counsel Date

District-Level Approval By: Richard P. Wagenaar 4-28-06
Richard P. Wagenaar Date
Colonel, U.S. Army
District Commander

TECHNICAL POINTS OF CONTACT

Project Management			
Project Manager	Jim St. Germain	CEMVN-PM-E	504-862-2499
Emergency Management			
Emergency Mgmt Approval	Michael Lowe	CEMVN-OD-R	504-862-2244
Engineering			
Electrical Engineer	Dan Bradley	CEMVN-ED-GE	504-862-2696
Mechanical Engineer	Dennis Strecker	CEMVN-ED-GE	504-862-2694
Structural Engineer	Larry Mickal	CEMVN-ED-T	504-862-2711
Hydraulic Engineer	Clyde Barre	CEMVN-ED-HD	504-862-2429
Economics			
Economist	Toni Baldini	CEMVN-PM	504-862-1814
Environmental			
Biologist	Richard Boe	CEMVN-PM-RP	540-862-1505
Real Estate			
Real Estate Analysis	Michelle Marceaux	CEMVN-RE-E	504-862-1190
Construction			
Construction Mgmt	Glen Grimillion	CEMVN-CD-NO-Q	504-861-2439
Office of Counsel			
Attorney	Steve Bland	CEMVN-OC	504-862-2026
Attorney	Mary V. Kinsey	CEMVN-OC	504-862-2828
Executive			
DDPM Chief	Greg Breerwood	CEMVN-EX	504-862-2204
District Engineer	Col R. Wagenaar	CEMVN-DE	

Sponsor Points of Contact

New Orleans Sewerage and Water Board		
Marcia St. Martin, Executive Director, New Orleans Sewerage and Water Board		(504) 585-2365
Joe Sullivan, General Superintendent, New Orleans Sewerage and Water Board		(504) 865-0409

APPENDICES

APPENDIX A.	Project Sponsor's Request for Assistance
APPENDIX B.	Project Location
APPENDIX C.	Disaster Incident (See section 6)
APPENDIX D.	Damages
APPENDIX E.	Repair Alternatives (See section 9)
APPENDIX F.	Economic Analysis Documents (See section 11)
APPENDIX G.	Environmental
APPENDIX H.	Construction Cost Estimates
APPENDIX I-P.	Not Used
APPENDIX Q.	Post Hurricanes Katrina, Wilma, Ophelia Expenditure of Flood Control and Coastal Emergency (FCCE) Funds for Restoration and Rehabilitation, and for Accelerated Work to Complete Authorized Projects, in accordance with the Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza Act, 2006 (public Law 109-148), dated February, 14, 2006, signed by Don Riley, Major General, Director of Civil Works
APPENDIX R-Y	Note Used
APPENDIX Z.	PIR Review Checklist

APPENDIX A

**Request for Assistance
Orleans Parish
New Orleans Sewerage and Water Board

Federal and Non-Federal**

October 15, 2005

Corps of Engineers, New Orleans District
Attn: Operations Division, Readiness Branch (Herbert J. Wagner)
7400 Leake Avenue
New Orleans, Louisiana 70118-3651

This letter is a written request for rehabilitation assistance for the Lake Pontchartrain, Louisiana and Vicinity Hurricane Projection Project, Mississippi River and Tributary Project and Southeast Louisiana Urban Drainage Project.

1) Name of Requesting Agency: Sewerage and Water Board of New Orleans

Points of Contact:	Phone Number:
Marcia St. Martin	(504) 585-2210
Joseph Sullivan	(504) 585-2365
Rudy St. Germain	(504) 865-0410

2) Date of Last Inspection: June 2005 (last inspection of accepted project (SELA))

3) Flood Control Project Location (Section, Township, Range, City and Parish):
Parish of Orleans, State of Louisiana

4) Locations of damaged Sections: All project features for projects listed above protecting Parish of Orleans, State of Louisiana

5) Waterways causing the damage: All waterways, lakes and bodies of water adjacent to and running through Orleans Parish, Louisiana, such as Lake Pontchartrain and the Mississippi River.

6) Financial Capability of the Non-Federal Sponsor: Hurricane Katrina, August 29, 2005, was a devastating hurricane of catastrophic proportions. The undersigned non-Federal Sponsor requests that the Federal Government assume responsibility and/or cost of the following items of non-Federal responsibility under the requirements of the project's statutory authority and/or under Public Law 84-99: [SIGNIFY REQUEST BY PLACING AN "X" IN THE SPACE PROVIDED.]

a. . After required new real property interests identified by the Federal Government are commandeered by or on behalf of the non-Federal sponsor, assume responsibility for

acquisition and funding of land payments and incidental cost thereof, of newly acquired lands, easements, rights-of-way, relocations, and disposal areas (LERRDs), including credit/reimbursement for fair market value, settlement or final judgment for LERRDs commandeered by or on behalf of the non-Federal sponsor, subject to the requirement that the Federal Government must provide prior approval of fair market value and settlement determinations prior to the non-Federal tender of an offer to land owner:

 X

b. Non-Federal Sponsor's proportionate share of total project Rehabilitation Effort: X

c. Costs of Hazardous, Toxic, Radioactive Waste (HTRW) Investigation: X

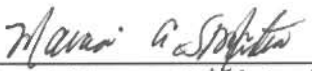
7) The need for Federal Government assumption of cost-sharing responsibility for the above items of local obligation is requested due to the extraordinary demands upon the fiscal resources of the undersigned non-Federal sponsor, as follows: The Sewerage and Water Board of New Orleans has suffered the catastrophic loss of its tax base, its business and industry community, its population base, its physical infrastructure, municipal employees and now has physical restraints upon recovering any reasonable portion of any or all of the forgoing municipal assets without Federal assumption of cost-sharing.

8) Despite current and anticipated future non-Federal fiscal constraints, the non-Federal sponsor can provide the following services and/or items of local obligation, without credit or reimbursement: Assist in securing property title searches including assisting Orleans Levee Board when necessary, and assist in negotiations with property owners and acquisition of real property, i.e. immovable property, rights and titles.

9) It is in the national interest to provide permanent rehabilitation of the above described projects for the following reasons: New Orleans is one of the largest ports in the world, and the largest in the nation, at the base of the largest river system in the nation serving as a major economic gateway for industry and commerce to the nation and the world including the export market for the nations grain to the world. There are three petroleum refineries producing a fuel at a critical juncture in our nation's energy plan and serving natural gas pipelines serving major portions of the Northeastern United States. The Sewerage and Water Board of New Orleans provides water and sewerage services, and drainage to many of the aforementioned businesses and many residents who are employed in the aforementioned industries and business. Additionally, the Sewerage and Water Board of New Orleans drains 2,200 acres of the adjacent parish, Jefferson Parish.

10) It is understood and agreed that the Government's decision regarding the request in Paragraph 6 above will be within the Government's sole discretion, and will be determined based on the facts and circumstances applicable to each project.

Sincerely,


Printed Name: MARCIA A. ST. MARTIN
Official Title: EXECUTIVE DIRECTOR

October 15, 2005

Corps of Engineers, New Orleans District
Attn: Operations Division, Readiness Branch (Herbert J. Wagner)
7400 Leake Avenue
New Orleans, Louisiana 70118-3651

This letter is a written request for rehabilitation assistance for the following flood control project constructed by the non-Federal sponsor in Orleans Parish, Louisiana: all drainage pumping stations, drainage canals and collection systems, and related power plants and flood control structures owned or controlled by the Sewerage and Water Board of New Orleans or other similarly situated projects.

1) Name of Requesting Agency: Sewerage and Water Board of New Orleans

Points of Contact:	Phone Number:
Marcia St. Martin	(504) 585-2210
Joseph Sullivan	(504) 585-2365
Rudy St. Germain	(504) 865-0410

2) Corps assistance with Drainage Canals and Collection systems damage assessments: Yes No
Corps assistance with Pump Station damage assessments: Yes No
Corps assistance with Power Plant damage assessment: Yes No

3) Flood Control Project Location (Section, Township, Range, City and Parish):
Parish of Orleans, State of Louisiana

4) Locations of damage: All project features for projects listed above protecting Parish of Orleans, State of Louisiana

5) Waterway causing the damage: All waterways, lakes and bodies of water adjacent to and running through Orleans Parish, Louisiana, such as Lake Pontchartrain and the Mississippi River.

6) Financial Capability of the Non-Federal Sponsor: Hurricane Katrina, August 29, 2005, was a devastating hurricane of catastrophic proportions. The undersigned non-Federal Sponsor requests that the Federal Government assume responsibility and/or cost of the following items of non-Federal responsibility under the requirements of Public Law 84-99: [SIGNIFY REQUEST BY PLACING AN "X" IN THE SPACE PROVIDED.]

a. After required new real property interests identified by the Federal Government are commandeered by or on behalf of the non-Federal sponsor, assume responsibility for acquisition and funding of land payments and incidental cost thereof, of newly acquired lands, easements, rights-of-way, relocations, and disposal areas (LERRDs), including credit/reimbursement for fair market value, settlement or final judgment for LERRDs commandeered by or on behalf of the non-Federal sponsor, subject to the requirement that the Federal Government must provide prior approval of fair market value and settlement determinations prior to the non-Federal tender of an offer to land owner:

 X

b. All reasonable, allocable and allowable cost of the project Rehabilitation Effort:

 X

c. Costs of Hazardous, Toxic, Radioactive Waste (HTRW) Investigation: X

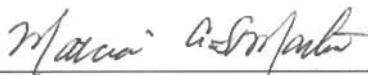
7) The need for Federal Government assumption of cost-sharing responsibility for the above items of local obligation is requested due to the extraordinary demands upon the fiscal resources of the undersigned non-Federal sponsor, as follows: The Sewerage and Water Board of New Orleans has suffered the catastrophic loss of its tax base, its business and industry community, its population base, its physical infrastructure, municipal employees and now has physical restraints upon recovering any reasonable portion of any or all of the forgoing municipal assets without Federal assumption of cost-sharing.

8) Despite current and anticipated future non-Federal fiscal constraints, the non-Federal sponsor can provide the following services and/or items of local obligation, without credit or reimbursement: Assist in securing property title searches including assisting Orleans Levee Board when necessary, and assist in negotiations with property owners and acquisition of real property, i.e. immovable property, rights and titles.

9) It is in the national interest to provide permanent rehabilitation of the above described projects for the following reasons: New Orleans is one of the largest ports in the world, and the largest in the nation, at the base of the largest river system in the nation serving as a major economic gateway for industry and commerce to the nation and the world including the export market for the nations grain to the world. There are three petroleum refineries producing a fuel at a critical juncture in our nation's energy plan and serving natural gas pipelines serving major portions of the Northeastern United States. The Sewerage and Water Board of New Orleans provides water and sewerage services, and drainage to many of the aforementioned businesses and many residents who are employed in the aforementioned industries and business. Additionally, the Sewerage and Water Board of New Orleans drains 2,200 acres of the adjacent parish, Jefferson Parish.

10) It is understood and agreed that the Government's decision regarding the request in Paragraph 6 above will be within the Government's sole discretion, and will be determined based on the facts and circumstances applicable to each project.

Sincerely,

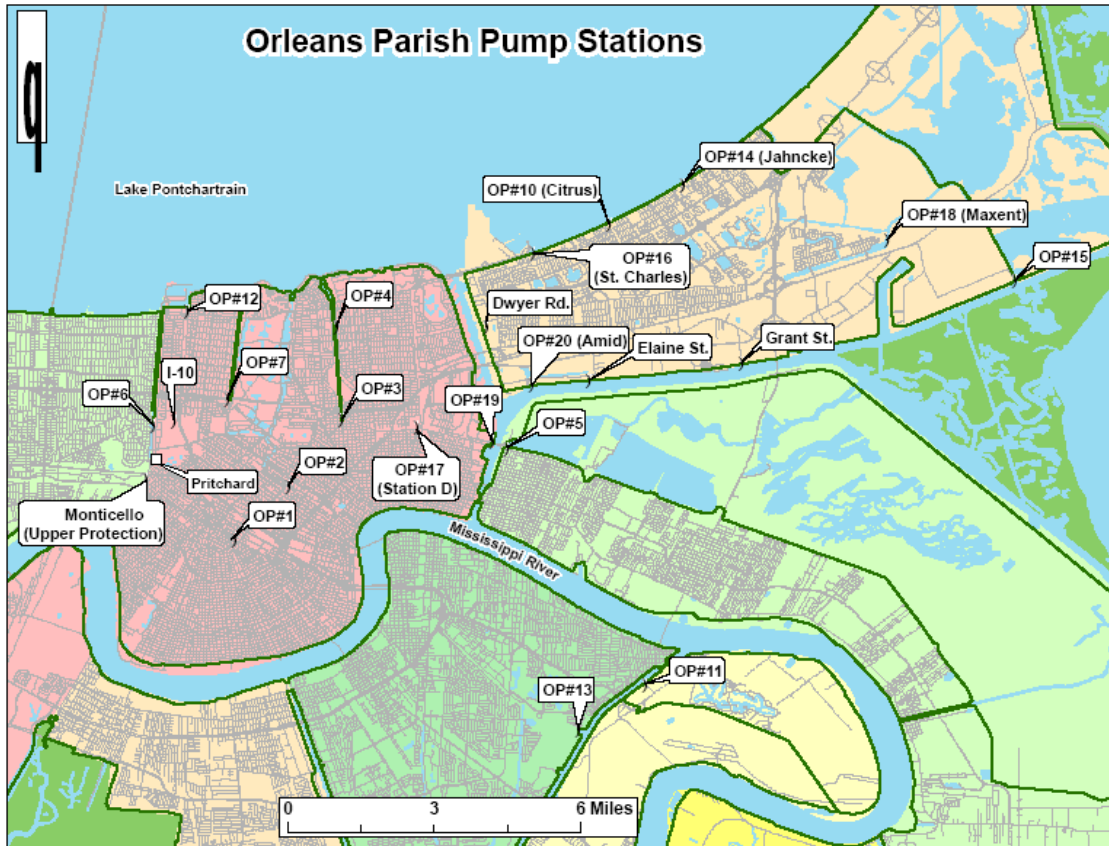


Printed Name: MARCIA A. ST. MARTIN

Official Title: Executive Director

Appendix B

Orleans Parish Pump Stations, Flood Control



Appendix C

Disaster Incident

See Section 6 of Main Report

Appendix D

Damages

Appendix D

Damages

Table of Contents

Pump Station No. 1	D-1
Pump Station No. 2	D-2
Pump Station No. 3	D-3
Pump Station No. 4	D-4
Pump Station No. 5	D-5
Pump Station No. 6	D-6
Pump Station No. 7	D-7
Pump Station No. 12	D-8
Pump Station No. 17 (D)	D-9
Oleander (Monticello) Pump Station	D-10
Pritchard Place Pump Station	D-11
I-10 Underpass Pump Station	D-12
Carrollton Frequency Changer	D-13
Pump Station No. 11	D-14
Pump Station No. 13	D-15
Pump Station No. 10 (Citrus)	D-16
Pump Station No. 14 (Jahncke)	D-17
Pump Station No. 15 (Michoud)	D-18
Pump Station No. 16 (St. Charles)	D-19
Pump Station No. 18 (Maxent)	D-20
Pump Station No. 19	D-21
Pump Station No. 20 (Amid)	D-22
Elaine Pump Station	D-23
Grant Pump Station	D-24

DRAINAGE PUMPING STATION NO. 1

Observations, Conclusions and Recommendations

Electrical:

1. Pump motors for drainage pumps A, B, C, D and E were cleaned and baked. Because the motors sustained damage from being submerged in the hurricane, this procedure doesn't guarantee they will continue to work when needed. In fact, the motor for Pump A had been baked and had selected poles repaired, but it failed the first time it was energized and loaded. Therefore, it is recommended that the stators and poles for the rotors be rewound for the motors for Pumps B, C, D, and E. (The S&WB is currently rewinding the stators and rotors for Pump A motor.)

Mechanical:

1. Inspect and replace the inboard bearings for Pumps G and F.

Structural:

1. The flood water level in the station was 11 inches above the operating floor, and 5 inches above the control room floor.
2. Replace roof ridge line flashing missing on SE and SW end of building (about 10' each). There is evidence of roof leaks on the west end of the building. Repair roof as necessary.
3. The 7' X 14' wooden roll-up door on the north end of the building is broken off the rail. Recommend repair of the wooden doors.
4. Replace control room vinyl floor tiles and wood paneling (15' X 15' X 8'). Replace wood paneling on the outside of the control room.



Photo 1 – Roof ridge flashing missing; west end of bldg.



Photo 2 – Pump G

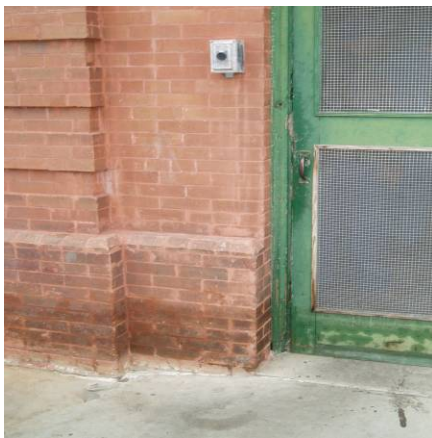


Photo 3 – Water mark on station bldg.



Photo 4 – Burned motor for Pump A.

DRAINAGE PUMPING STATION NO. 2

Observations, Conclusions and Recommendations

Electrical:

1. Pump motors for drainage pumps A, B, C and D were cleaned and baked. It is recommended that the motors for these 4 pumps have the stators and coils rewound due to having been submerged. (See Electrical description for Station No. 1)

Mechanical:

1. Replace the bearings and seals for the 2 constant duty pumps.

Structural:

1. The water level in the building was approximately 15 inches above the operating floor and 5 inches above the floor in the control room.
2. The roof sustained damage as follows:
 - a. Approximately 160' of copper gutter along the center gable on the east side was damaged or missing,
 - b. Approximately 170' of copper fascia on the east side was missing,
 - c. The entire shingle roof is in poor condition and should be replaced with a metal roof.
3. About 50' of the clay ridge tiles on the roof were blown off. The entire building should be replaced or demolished. (Recommend demolition of the building; S&WB does not need building.)
4. The vinyl tile flooring, and the wood sub-floor, in the control room was damaged. The estimated area is 550 square feet. Recommend replacement.
5. The lag bolts, which attach the roof to the steel purlins, are missing in the NE area of the roof, directly over Constant Duty Pumps Nos. 2 and 3. These should be replaced.



Photo 1 – Roof damage to station bldg.



Photo 2 – Damage to control room floor.

DRAINAGE PUMPING STATION NO. 3

Observations, Conclusions and Recommendations

Electrical:

1. Pump motors for drainage pumps A,B,C, D, and E were cleaned and baked. It is recommended that the motors for these 5 pumps have the stators and coils rewound due to having been submerged. (See Electrical description for Station No. 1)
2. Re-support cable trays.

Mechanical:

1. Remove protective shroud and inspect Pump D; match and mark all pieces and fasteners and place shroud back together as waterproof. Repair or replace defective pump components as required.

Structural:

1. The water level in the building was approximately 24 inches above the lower operating level and 6 inches above the upper operating level. The control room was flooded 12 inches above the floor level. The basement was completely submerged.
2. The roof, consisting of copper standing seam panels, leaks. Extent of repairs include four locations, measuring approximately 6' X 20'.
3. The storage building, measuring 25' x 25', was flooded 11" above the floor and needs cleaning out. About 50' of the clay ridge tiles on the roof were blown off. Recommend replacement.
4. The vinyl tile flooring and the wood paneling in the control room should be replaced.
5. Replace about 100' chain link fence along Broad St. Fence is 6' with 3 strands of barbed wire on top.



Photo1—Motor to be rewound



Photo 2—Pump D Protective Shroud



Photo 3—Damaged Floor and Wall



Photo 4—Damaged Fence

DRAINAGE PUMPING STATION NO. 4

Observations, Conclusions and Recommendations

Electrical:

1. Flood waters flooded the basement. All basement lighting and power should be rewired.

Mechanical:

1. The inboard bearings on Pumps C, D, and E should be replaced.
2. The motors for the trash racks should be rewound and the gear boxes replaced (25 cycle).
3. Minor repairs are required to the piping and valves for the cooling water system.

Structural:

1. The water level in the building was approximately 12 inches above the floor level inside the building, approximately 20 inches above the exterior concrete slab, 9 inches above the control room floor, and 12 inches above the 25-cycle building floor.
2. The vinyl floor tiles in the control room were damaged and should be replaced. The approximate area is 250 sf.
3. Replace about 40' of 8' chain link fence along north side of property, and a 15' gate located at the north end of the east side fence shall be replaced. The fence along the south side should be realigned.
4. About 40' of the metal roof along the north edge was peeled back, and should be repaired.



Photo 1 – Trash Racks.



Photo 2 – Damaged roof.



Photo 3 – Damaged tiles in control room.

DRAINAGE PUMPING STATION NO. 5

Observations, Conclusions and Recommendations

Electrical:

1. Pump motors for drainage Pumps A and B were cleaned and baked. It is recommended that the motors for these 2 pumps and Pump D have the stators and coils rewound due to having been submerged. (See Electrical description for Station No. 1)
2. It is recommended that all lighting and low voltage wiring below the main floor area and equipment pits be replaced since all was submerged by floodwaters

Mechanical:

1. Replace entire fuel system due to being completely flooded.
2. Replace inboard bearings for Pump D.
3. Rewind motor and replace gear box for the trash racks on the Jordan Ave. side of the station.
4. Miscellaneous cabinets, water cooler, refrigerator, etc., need to be replaced due to being submerged.

Structural:

1. Drainage Pump Station No. 5 consists of the main pump building and two smaller buildings: the oil storage building and the "D" pump control room. The main building has two sections: the pump room and the electrical equipment room. The pump room was flooded to 9 ft above the operating level. The electrical equipment room was flooded to 4'-3" above the operating level.
2. The pump room building roof, consisting of asphalt shingles, had considerable damage in the form of missing and broken shingles. It is recommended that the entire pump room roof be replaced. The electrical equipment room roof, a copper standing seam, was undamaged.
3. In the interior, (2) 3' x 7' aluminum doors and (2) 6' x 10' aluminum double doors were corroded and stained. These should be replaced.
4. The vinyl tiles in the break room, measuring 20' x 40', are peeling and many have broken up or have come loose. The floor should be replaced with new vinyl tiles.
5. The oil storage building was completely submerged. The interior of the building is full of spilled oil, and should be completely cleaned out. The wood frame roof was damaged, and should be reconstructed. This includes the roof shingles, fascia, plywood soffits, and (2) exterior light fixtures. The windows were broken, and should be replaced.



PHOTO 1—PUMP D



PHOTO 2 ROOF DAMAGE



PHOTO 3 – DAMAGED OIL STORAGE BLDG.

DRAINAGE PUMPING STATION NO. 6

Observations, Conclusions and Recommendations

Electrical:

1. Pump motors for Pumps C, D, E and F were cleaned and baked. It is recommended that the motors for these 4 pumps have the stators and coils rewound due to having been submerged. (See Electrical description for Station No. 1) Motors for Pumps A and B are currently being rewound by the S&WB.

Mechanical:

1. Replace inboard bearings for Pumps G, H, and I.
2. Remove debris from trash screens.
3. Replace one exhaust fan.

Structural:

1. The building structure frame generally was not damaged. Replacement of approximately six feet of missing copper down-spout on the southwest corner of the building is recommended.
2. On the Maryland side of the station, a 36' X 10' wood gate with a metal frame was damaged, and 18' X 10' high wood fence was missing. On the Orpheum Street side of the station, a gate was missing and approximately 60' of 10' high wood fence was damaged or missing, and 60' of 10' high chain link fence was down. Eight 6"X6" wood bollards were sheared off. On the east side of the station approximately 150 LF of 10' high wood fence was damaged. Replacement is hereby recommended.
3. Pump Station Building Roof: Copper roof damage was evident from the east end of the building to Pump G, with two other isolated leaks near Pumps CD1 and V3. Approximately 200' X 48' of roof replacement is recommended.
4. The suction bay has a significant build-up of silt and trash that should be removed in order to function properly.



Photo 1 – Damage to roof.



Photo 2 – 25 cycle pump motors to be rewound.



Photo 3 – Damaged fence on Maryland side.

DRAINAGE PUMPING STATION NO. 7

Observations, Conclusions and Recommendations

Electrical:

1. Pump motors for Pumps A and C were cleaned and baked. It is recommended that the motors for these 2 pumps have the stators and coils rewound due to having been submerged. (See Electrical description for Station No. 1)

Mechanical:

1. All required mechanical work has been completed by the S&WB

Structural:

1. Water level in the building was approximately 28 inches above the operating floor, and according to the operator, most of the flooding entered through the doors and roll-up doors and the brick wall on the north (lake side) of the station. There was evidence of water washing over the levee and some scour at the northwest corner of the pumping station.
2. There is a crack line in the brick column near the center of the station and seepage lines in the pump pits below the operating floor. Sealing and repair of the existing brick walls are recommended.
3. The 23' X 24' control room wall paneling (inside and out), and vinyl floor tile and sub-floor were damaged and replacement is recommended.
4. A 10' X 10' chain link fence gate at the NW corner of the building was destroyed, as well as a 30' section of 10' high chain link fence at the SW corner of the pumping station. Replacement is recommended.
5. The suction bay has a significant build-up of silt and trash that should be removed in order to function adequately.



Photo 1 – Missing tiles and damaged floor in control room



Photo 2 – Damage to walls in control room.

DRAINAGE PUMPING STATION NO. 12

Observations, Conclusions and Recommendations

Electrical:

1. Replace battery drip pan.

Mechanical:

1. Open and inspect Pump D and repair or replace defective components.

Structural:

1. Standing floodwater reached 25 inches above the slab-on-grade and peak levels were significantly higher. The floor level inside the building is about 15 inches higher than the exterior slab-on-grade.
2. The floor tile in the office requires replacement and one door and one window need replacement.



PHOTO 1—PUMP D



PHOTO 2—DAMAGED TILE IN CONTROL ROOM

DRAINAGE PUMPING STATION NO. 17 (D)

Observations, Conclusions and Recommendations

Electrical:

1. The motor for drainage Pumps A & D and the 4 motors for Frequency Changers #3 & 4 should be totally rewound due to having been submerged.
2. Replace all medium voltage switchgear (60 Hz) due to it being either submerged or flooded by rainwater.
3. Repair recorder that was flooded.

Mechanical:

1. Replace vacuum pump by office.
2. Replace ventilation fan unit.

Structural:

1. Flood water inside the building reached a height of about 2 feet inside the building.
2. Three rollup steel doors were damaged. Replace doors in kind.
3. Replace the tile floor and the paneling in the office and the bathroom due to these areas being submerged.
4. Repair leaking 48" St. Ferdinand discharge line at Claiborne Ave.
5. Repair damage to discharge end of 48" St. Ferdinand line at river due to wharf damage.



Photo 1 – Damaged roll-up door.



Photo 2 – Motor for drainage pumps A & D.



Photo 3 – Frequency changer motors.

DRAINAGE PUMPING STATION: Oleander (Monticello)

Observations, Conclusions and Recommendations

Electrical:

1. No electrical repairs are required.

Mechanical:

1. Replace one ventilation fan in the operating room.

Structural:

1. Standing floodwater reached 80 inches above grade and peak levels were significantly higher. The operating floor level is about 88 inches above grade.
2. About 15 lf of ceramic ridge tiles were missing from the roof. Acoustic ceiling tiles were missing inside the operating room. Replacement is recommended.



PHOTO 1 – ROOF DAMAGE.



PHOTO 2 – DAMAGED CEILING TILES

DRAINAGE PUMPING STATION: PRITCHARD

Observations, Conclusions and Recommendations

Electrical:

1. Repair generator muffler insulation.

Mechanical:

1. Repair fuel leak and hydrotest.

Structural:

1. Standing floodwater reached 58 inches above grade and peak levels were significantly higher. The operating floor level is about 61 inches above grade.
2. Copper roof line ridge repair was observed – 20 LF.
3. Repair scour hole near discharge pipe outfall (30' X10' X3').



PHOTO. DAMAGED GENERATOR MUFFLER



PHOTO 2. ROOF DAMAGE



PHOTO 3. SCOUR AT DISCHARGE PIPES

DRAINAGE PUMPING STATION: I-10 UNDERPASS

Observations, Conclusions and Recommendations

Electrical:

1. Inspect all gear that was exposed to rainwater and covered by tarps due to roof leakage. Replace damaged components.

Mechanical:

1. Replace the bearings on Pumps P-1, P-2, P-3. These pumps were operated with “dirty water.” Pump P-4 was not run.
2. Repair leaking expansion joint on 12 inch discharge line.
3. The control panel for the sump pumps requires replacement.
4. There was heavy damage to the waste oil system. Overhaul waste oil system.

Structural:

1. The floodwater reached a level of 7’-2” above the first floor. The operating level is on the second floor.
2. The roof leaks. It is apparent that the joint sealant between the pre-cast panels had blown out; therefore, all the joints should be resealed.
3. Ceiling tiles in the control room were missing or damaged; these should be replaced.
4. Replace (2) 3’ x 7’ metal doors, which were corroded and warped.
5. About 175 lf of 12’ vinyl fence, with a 15 ft gate, along the Academy Dr. side was destroyed; this should be replaced in kind.
6. A 6’ x 8’ noise reduction panel was missing. This should be replaced.
7. Reinstall one light pole at the suction basin, next to the crane mounted on the basin wall.



Photo 1 – Damaged ceiling tiles



Photo 2 – Damaged Noise Reduction Panels



Photo 3 – Damaged vinyl fence.

DRAINAGE PUMPING STATION: Carrollton Frequency Changer

Observations, Conclusions and Recommendations

Electrical:

1. Recommend that all 4 frequency changer motors be fully rewound due to having been submerged.
2. Rewire conductors in pits that were fully submerged.
3. Inspect, clean and repair damaged components of outdoor electrical equipment.
4. Replace battery rack and drip pan that are corroded due to salt water flooding

Mechanical:

1. No mechanical repairs are required.

Structural:

1. No structural repairs are required.



Photo 1—Outdoor Electrical Equipment



Photo 2 Motor Pit Equipment

DRAINAGE PUMPING STATION NO. 11

Observations, Conclusions and Recommendations

Electrical:

1. Inspect switchgear and motor control centers' internal components and replace damaged components as required.

Mechanical:

1. No mechanical repairs are required.

Structural:

1. The flood water level in the station was confined to the basement area open to the intake side of the station. The operating floor was not flooded.
2. Approximately 4000 square feet of metal roofing was damaged. Repair is recommended
3. In the control room area approximately 10' X10' acoustical ceiling tile showed stains as a result of the station roof leaking. Replacement is recommended.



Photo 1—Damaged Roof



Photo 2--Switchgear

DRAINAGE PUMPING STATION NO. 13

Observations, Conclusions and Recommendations

Electrical:

1. Inspect switchgear and MCC to determine damage due to water entry from roof leakage near north end of building. Replace damaged components as required.
2. Replace low voltage wiring, switches, and lighting fixtures in pump and equipment pits that were submerged; located below the main floor area in the east of the control house.
3. Repair exterior switches for raw water intake diesel engines 4 & 5.
4. Repair wiring to low voltage pump on exterior platform next to the discharge pump #4

Mechanical:

1. Replace sump pumps.
2. Replace blown away roof ventilators.
3. Replace damaged air conditioner (AC) condensing unit.

Structural:

1. The flood water level rose approximately to the top of the access road. The operating floor is approximately 7' above the road elevation.
2. A 6' x 8' air-conditioned metal guard station building was destroyed. Replacement is recommended.
3. According to the operator, approximately 90% of the copper metal roof blew off. The estimated leaking part of the roof dimensions is approximately 200' X 50'. Repair with a new metal roof is recommended.
4. Recommend replacement of approximately 110 LF of copper gutter, which is missing.
5. Recommend replacement of eleven 5' x 5' skylights, which are missing. Replace with same material as new metal roof.
6. Ten feet of copper down spout on the southwest side of the building is missing, and a 4" vent pipe is leaning away from the building. Recommend replacement and repairs.
7. Recommend repair of a 12' X 19' steel roll-up door at the north end of the building, which blew out.
8. Eight 44" X 48" screen openings in the wall of the building were damaged. Recommend replacement.
9. Two sixty-inch air intake pipes blew off on the discharge side of the station. Recommend replacement.
10. Four 6" insulated meter vent stacks were blown off. Recommend replacement.
11. Both the inside and outside gantry cranes cable units were damaged. Recommend repairs.

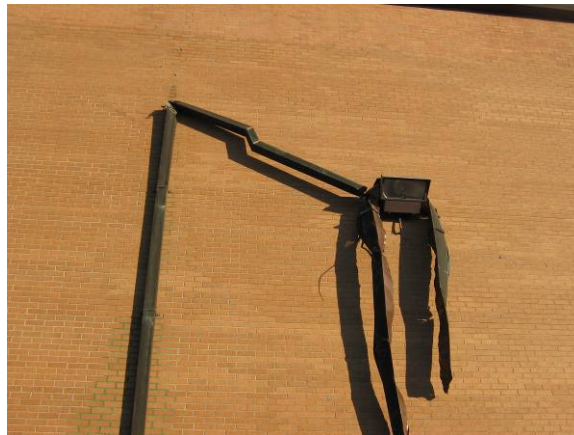


Photo 1—Missing Roll Up Door Photo 2—Damaged Down Spout

DRAINAGE PUMPING STATION NO. 10 - CITRUS

Observations, Conclusions and Recommendations

Electrical:

1. Inspect switchgear and MCC to determine damage due to water entry from roof leakage. Replace damaged components as required.

Mechanical:

1. Replace the bearings for Pumps 1, 2, 3, and 4.
2. Replace the trash screen cleaner motors.

Structural:

1. The flood water level was approximately 2" above the operating floor level.
2. Seventy five percent of the roof (64' X 140') was damaged. Repair with a new metal roof is recommended.
3. Replacement of approximately 175 LF missing copper gutters is recommended.
4. Eight copper downspouts are broken (40 LF). Replacement is recommended.
5. Approximately 14' X 20' of the 18"X18" acoustical roof panels are damaged in the control room. Recommend replacement.
6. Seventy-five feet of 6' high chain link fence topped with barbed wire was damaged. Replacement is recommended



Photo 1—Screen Cleaners



Photo 2—Damaged Ceiling Tiles



Photo 3—Damaged Gutter and Downspouts

DRAINAGE PUMPING STATION NO. 14 - JAHNCKE

Observations, Conclusions and Recommendations

Electrical:

1. Replace screen motors, starters, and wiring
2. Replace low voltage wiring, switches, and lighting fixtures in basement of float house.
2. Repair west door on motor control center
3. Replace auto/manual controls in pump house
4. Replace sump pump in float house

Mechanical:

1. Vacuum system needs repairs on vacuum breaker for Pumps #2 and #4. Repair leaks on hydraulic system for siphon breaks valve and pressure test.
2. Replace bearings for Pumps 1, 2, 3, and 4. All pump bearings need to be replaced because dirty water was used during operation.
3. Open Pump 3 gear and repair/replace as required.
4. Rebuild or replace sump pumps.

Structural:

1. The flood water level at the station was approximately 2.5' above ground level
2. The entire flat built-up roof and copper flashing were damaged. Approximate dimensions are 28.5' X 37'.
3. A crack line on the concrete block walls located approximately 18" below the roof suggests that the 5' roof overhang, which extends on all sides of the building, may have contributed to a "wing effect," causing uplift on the roof during the storm. The control room roof and concrete block walls are damaged and require replacement.
4. Rain water seeped through the roof and cracks in the walls damaging the vinyl tile floor (18' X 26'). Replacement of the control room roof and walls is recommended.
5. Approximately 250 LF of chain link fence 12' high was damaged. Two chain link gates on the levee (4' X 8') were damaged, and approximately 26' of 8' high chain link fence destroyed. Replacement is recommended.
6. On the levee there is scour approximately 4' deep around the concrete base supporting the valve actuators, and the wood cross beams between piles supporting the out-fall pipes are missing or damaged. Repairs are recommended.
7. The float house asphalt built-up roof was damaged, and there was a crack similar to that described in Item 3 above on this structure (22' X 26' roof area). The building floor area is approximately 16' X 20'. The 4' X 8' steel door does not close. Replacement of the float house roof and concrete block walls is recommended.



Photo 1—Wall Crack Below Roof



Photo 2—Roof Damage

DRAINAGE PUMPING STATION NO. 15 (MICHOUD)

Observations, Conclusions and Recommendations

Electrical:

1. No electrical repairs are required.

Mechanical:

1. Inspect gear boxes for Pumps 1, 2, and 3, and repair/replace defective components.
2. Drain fuel tank and piping, flush, hydrotest, repair, and refill.
3. Replace stainless steel cable trays on trash rakes in Bays #1 and #2.
4. Replace bearings in Pumps 1, 2, and 3.

Structural:

1. The flood water level was approximately 2 feet below the operating floor level.
2. Three 4' X 7' steel doors on the basement level are corroded through. Replacement is recommended.
3. Replacement of 100 LF of 6' high, barbed wire topped fence and gates, which are missing on the east side of the station is recommended.
4. Replacement of 80 LF of galvanized steel hand railing, which is damaged along the cat walk at the trash rack is recommended.
5. The ladder leading to the roof is bent out of shape. Repair is recommended.
6. Replacement of two 12" diameter roof vents, which blew off, is recommended.
7. Replace two damaged trash rake support struts, approximately 40 LF each.



Photo 1—Damaged Trash Rake Cable Tray



Photo 2—Damaged Door

DRAINAGE PUMPING STATION NO. 16 – ST. CHARLES

Observations, Conclusions and Recommendations

Electrical:

1. Replace screen motors, starters, and wiring
2. Replace low voltage wiring, switches, and lighting fixtures in basement of float house.
3. Replace auto/manual controls in pump house

Mechanical:

1. Replace sump pump in float house.
2. Trash rakes were underwater. Open motors and gearboxes to determine extent of necessary repairs. Replace motors if required.
3. Replace bearings on 3 pumps because of using dirty water for lubrication during operation.
4. Replace damaged air conditioner condensing unit.

Structural:

1. The flood water level at the station was approximately 4' above round level.
2. The entire flat built-up roof was damaged. Approximate dimensions are 28.5' X 37'.
3. A crack line on the concrete block walls located approximately 18" below the roof suggests that the 5' roof overhang, which extends on all sides of the building, may have contributed to a "wing effect," causing uplift on the roof during the storm. The control room roof and concrete block walls are damaged and require replacement.
4. Rain water seeped through the roof and cracks in the walls damaging the vinyl tile floor (18' X 26'). Replacement of the walls, roof and vinyl floor are recommended.
5. Approximately 120 LF of 12' high chain link fence was destroyed. Replacement is recommended.
6. The float house roof and concrete block walls are damaged and require replacement.



Photo 1—Crack in Building



Photo 2—Damaged Air Conditioner



Photo 3—Damaged Trash Rakes

DRAINAGE PUMPING STATION NO. 18 - MAXENT

Observations, Conclusions and Recommendations

Electrical:

1. No electrical repairs required.

Mechanical:

1. No mechanical repairs required.

Structural:

1. The flood water level was below the operating floor level.
2. 30 LF of 6' chain link fence on the outlet structure is damaged. Repairs are recommended.



Photo 1—Pump Station 18

DRAINAGE PUMPING STATION NO. 19

Observations, Conclusions and Recommendations

Electrical:

1. Replace all lighting/power wiring and devices below operating floor.
2. Inspect electrical gear on the third level.
3. Inspect/test emergency duct bank running from generator to station.

Mechanical:

1. The first level was completely flooded. The sewer grinder pump and the sump pump require inspection to determine condition and required repairs or replacement. Inspect pumps and meg motors and repair or replace as required.
2. Drain hydraulic oil system for Pumps V1, V2. Repair leaks, hydro-test, refill and run test.
3. Replace pump bearings on Pumps V1, V2, and H2. Inspect gearboxes on all pumps and repair as required.
4. Replace one ventilation fan.

Structural:

1. Flood water just reached the height of the second operating level, which is 10'-2" higher than the lower operating level (at grade). At the generator building, located to the west of the main building, the flood water reached a height of 36" above grade around the building.
2. The roof is leaking along the valley running lengthwise along the center of the building, as well as over the electrical panels on the south side of the building. Repair of copper standing seam roof is recommended.
3. Rebuild 150 lf of 10 ft. high chain link fence w/ 3 strand barbed wire on top, located on top of wall on west side and 100 lf of 6 ft. high chain link fence on south wall w/ 3 strand barbed wire on top.
4. Repair about 50 lf pipe rail along suction basin.
5. Rebuild 600 lf of 6 ft. high chain link fence w/ 3 strand barbed wire on top, and a 30 ft rolling gate, around generator building.
6. Replace about 30 lf concrete sidewalk between main and generator buildings, with about 20 cy of soil material, which was washed out during the storm. Also, replace about 140 lf of concrete curb and gutter, and about ½ of 26 ft. wide paved surface with about 50 cy of soil material, which was washed away.



Photo 1—Damaged Fence



Photo 2—Damaged Pipe Rail



Photo 3. Damaged Low Voltage Wiring

DRAINAGE PUMPING STATION NO. 20 - AMID

Observations, Conclusions and Recommendations

Electrical:

1. Replace screen motor and starter and wiring.
2. Inspect service entrance junction box for splices and water intrusion. Repair damaged components.

Mechanical:

1. Diesel generator completely flooded and inoperative. Replace generator and diesel engine. New generator and engine should be raised.
2. Pump 2. Open and inspect to determine damage. It is likely that the impeller is off the shaft.
3. Repair trash racks chains, bars, sprockets and replace motor. Remove all debris.

Structural:

1. Seven feet of water was reported over the site. Use of the site for temporary pumps generally damaged the landscape.
2. Repair of site soil scoured areas, and access road grading is recommended, along with replacement of aggregate road and parking areas is recommended.
3. One wall of the generator building will require demolition and replacement to accommodate submerged generator replacement. The roof of the generator building is a flat concrete slab with a built-up roof and 5' overhang, which may produce a wing effect in high winds.
4. The roof of the office building (41' X 43'), consisting of a flat concrete slab, topped by built-up roofing, was cracked and leaking. There was evidence that the built-up material had blown off. It is recommended that the existing concrete roof be replaced (without the 5' overhang), and that the new built-up roofing be installed. The flashing around the perimeter of the roof was for mostly missing. The ceiling tiles should also be replaced.
5. Significant scour occurred under the concrete slab supporting the pipe at the levee crossing. The scoured soil should be replaced with approximately about 50 cy of soil.
6. The 12' x 14' steel rollup door in the Generator building was damaged and should be replaced.
7. An enclosed steel ladder was torn off the office building. This should be reinstalled.
8. About 300 lf of 8 foot chain link fence with 3 strands of barbed wire is damaged. Replacement in kind is recommended.
9. One light pole at the suction basin was damaged and requires replacement.



Photo 1—Damaged Control Panel for Trash Rack Photo 2—Damaged Diesel Engine

DRAINAGE PUMPING STATION: Elaine

Observations, Conclusions and Recommendations

Electrical:

1. Replace electrical and automation systems due to submersion of all electrical equipment.

Mechanical:

1. Replace the entire vacuum system.
2. Inspect and replace the bearings for Pumps 1 and 2.

Structural:

1. It was reported that floodwater reached 8' over the site, with 2.5 feet standing water over the site. The levee failed on either side of the pump outlet pipes causing considerable scour on the site. A sink hole 10' X 4' over the intake drain, behind the sheet pile wall was noted. Fill and grading of these areas are recommended.
2. Debris and fill in the intake channel should be removed. (120' X 60' sheetpile, walled intake area).
3. Site grading adjacent to the access road is needed (approximately 130' X 30').
4. A 3' x 8' steel door on the switch gear building will not open. Recommend replacement.
5. Five 6" steel tie-down straps on the outlet pipes are damaged. A 12' steel support member supporting one outlet pipe has collapsed near the outlet, and needs replacement. Recommend repair and replacement.



DRAINAGE PUMPING STATION: Grant

Observations, Conclusions and Recommendations

Electrical:

1. Rewind motors for Pumps 1, 2, 3, and 4.
2. All lighting and low voltage power and devices below the platform should be replaced and rewired due to having been submerged
3. Switchgear and MCC should be inspected due to partial submersion in floodwaters. Replace defective components.

Mechanical:

1. Replace pump bearings, Pumps 1, 2, 3, and 4.

Structural:

1. Floodwater reached 15" below the operating floor. The site was flooded over the exterior pumps.
2. Twenty feet of copper roof flashing on the west side of the building is missing.
3. Water washing over the levee generally scoured the site. General site fill and grading are needed to restore the grades. Approximately 200' of access road and a 150' X 30' parking area at the station washed away. Replacement is recommended.
4. 335' of 8 ft. high fence with wire topping, and gates were destroyed. Recommend replacement.
5. Scour under a 20' X 4' sidewalk at the entry-way caused considerable walkway differential settlement. Sidewalk replacement is recommended.



Photo 1—Pump Motors



Photo 2—Site Erosion

Appendix E

Repair Alternatives

See Section 9 of Main Report

Appendix F

Economic Analysis

See Section 12 of Main Report

Appendix G

Environmental



REPLY TO
ATTENTION OF:

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

Planning, Programs and Project
Management Division
Environmental Planning and
Compliance Branch

MEMORANDUM FOR New Orleans District Staff and All Interested Parties


SUBJECT: Imminent Threat of Flooding Due to Damaged Hurricane Protection Works

1. On August 29, 2005, Hurricane Katrina caused major damage to the hurricane protection system in Orleans, St. Bernard, Plaquemines, and Jefferson Parishes, Louisiana. Since the storm, the U.S. Army Corps of Engineers has been working to restore the hurricane protection system to the level of protection provided prior to the 2005 hurricane season. These efforts have been conducted mainly under the authority provided by Public Law 84-99, Rehabilitation of Damaged Flood Control Works.
2. While significant progress is being made in restoring the hurricane protection system to its pre-storm conditions, the system remains vulnerable to tropical weather systems. It is imperative that all hurricane protection works are restored to their pre-storm conditions as soon as possible to protect life, health, property, and economic losses.
3. Engineering Regulation 200-2-2, Environmental Quality, Procedures for Implementing the National Environmental Policy Act (NEPA) provides for District commanders to respond to emergency situations to prevent or reduce imminent risk of life, health, property, or severe economic losses without first preparing specific documentation and following the procedural requirements of the NEPA. Engineering Regulation 500-1-1, Emergency Employment of Army and Other Resources - Civil Emergency Management Program, provides that emergency flood control activities performed under Public Law 84-99 are not subject to the NEPA documentation requirements if risk to life, health, property, or severe economic losses is imminent. This regulation defines imminent risk as a subjective, statistically supported evaluation of how quickly a threat scenario can develop, how likely that threat is to develop in a given geographical location, and how likely the threat will produce catastrophic consequences to life and improved property. Implicit in the timing aspect can be considerations of time or season or of known cyclical activities.

4. Several words in the above definition are important in determining if there is an imminent threat to flooding within the four parishes listed above. The first is "subjective" which allows a decision to be based on sound reasoning. The second and third are "statistically supported evaluation" and "how likely that threat is to develop in a given geographical location." During the past four hurricane seasons, New Orleans has had 13 tropical storms or hurricanes pass within 300 miles of the city (three in 2002, two in 2003, three in 2004, and five in 2005), an average of over three storms per hurricane season. The National Hurricane Center has been reporting for the past several years that we have entered a period of more active hurricane seasons. The next key phrase is "how likely the threat will produce catastrophic consequences to life and improved property." Nothing demonstrates this better than Hurricane Rita in 2005. Hurricane Rita came ashore along the Louisiana/Texas state line, approximately 250 miles from New Orleans, yet the impacts of the storm in the Metropolitan New Orleans area were significant. Without a complete rehabilitation of the hurricane protection system to pre-storm levels, the New Orleans area could again be faced with the potential for catastrophic damages from a storm making landfall hundreds of miles away. The last phrase of significance is "known cyclical activities." As every day passes, the 2006 hurricane season gets closer, and the threat to life and property increases without adequate storm surge protection.

5. Based upon applicable regulations and guidance, I consider the Metropolitan New Orleans Area to be under an imminent threat from flooding due to the damaged hurricane protection system. I consider this threat to remain in effect until the hurricane protection system is restored to its pre-storm condition. The District will continue preparing an environmental assessment of the impacts associated with restoration of the hurricane protection system, and release the document for public and agency review and comment as soon as possible after all features of the restoration work are determined.

11/5/06
Date



Richard P. Wagenaar
Colonel, U.S. Army
District Engineer

Appendix H
Cost Estimates

**The information contained
in Appendix H is
proprietary to the
Government and can not be
posted on the public
website.**

APPENDIX Q

Post Hurricanes Katrina, Wilma, Ophelia Expenditure of Flood Control and Coastal Emergency (FCCE) Funds for Restoration and Rehabilitation, and for Accelerated Work to Complete Authorized Projects, in accordance with the Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza Act, 2006 (public Law 109-148), dated February, 14, 2006, signed by Don Riley, Major General, Director of Civil Works

On Following 4 pages



DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CECW-HS

FEB 14 2006

MEMORANDUM FOR

COMMANDER, SOUTH ATLANTIC DIVISION
COMMANDER, MISSISSIPPI VALLEY DIVISION

SUBJECT: Post Hurricanes Katrina, Wilma, and Ophelia Expenditure of Flood Control and Coastal Emergency (FCCE) Funds for Restoration and Rehabilitation, and for Accelerated Work to Complete Authorized Projects, in accordance with the Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza Act, 2006 (Public Law 109-148)

1. Reference:

- a. Memorandum, HQ USACE, CECW-HS, 25 Oct 04, subject: Post-Hurricane Flood & Coastal Storm Damage Reduction Project Rehabilitation Policy Guidance.
- b. Circular 11-2-189, CECW-I, 31 Dec 05, subject: Execution of the Annual Civil Works Program.

2. The purpose of this memorandum is to delegate certain approval authority and to provide guidance concerning restoration and rehabilitation of flood damage reduction and hurricane and storm damage reduction projects, and the acceleration of work to complete certain Federally authorized projects, in accordance with the funding and authority provided in Public Law 109-148.

3. In order to expedite the restoration and rehabilitation of flood damage reduction and hurricane and storm damage reduction projects damaged by Hurricanes Katrina, Ophelia, and Wilma, subject to the further guidance provided in this memorandum, authority is delegated to the Division Commander to:

- a. Determine whether a storm qualifies as extraordinary under the criteria provided in ER 500-1-1, section 5-20, paragraphs a & b, for determining eligibility of damaged hurricane and storm damage reduction projects; and
- b. Approve Project Information Reports (PIR), such as those prescribed in EP 500-1-1, to document restoration and rehabilitation determined to be eligible for FCCE funding.

CECW-HS

SUBJECT: Post Hurricanes Katrina, Wilma, and Ophelia Expenditure of Flood Control and Coastal Emergency (FCCE) Funds for Restoration and Rehabilitation, and for Accelerated Work to Complete Authorized Projects, in accordance with the Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza Act, 2006 (Public Law 109-148)

4. Public Law 109-148 directs that in using funds appropriated for construction related to Hurricane Katrina in the areas covered by the disaster declaration, the Corps of Engineers will restore flood damage reduction and hurricane and storm damage reduction projects and related works to provide the level of protection for which they were designed, at full Federal expense. The Joint Explanatory Statement of the Committee of Conference accompanying Public Law 109-148 further clarifies that the funds are provided to fund repairs to non-Federal levees and pumps and to construct levees and floodwalls to original design levels, rather than to pre-storm condition. Therefore, within the funds provided, for Federally authorized projects with levee and floodwall components, and non-Federal levees and pumps, which were damaged by Hurricane Katrina, restoration and rehabilitation will be undertaken to the previously constructed design level. The costs for restoration and rehabilitation construction and construction related activities will be at full Federal expense. These costs include Engineering and Design, Supervision and Administration, actual construction, acquisition of real estate interests not already owned by or under the control of the non-Federal sponsor, and relocations. HTRW investigations will be performed at Federal expense; if HTRW is discovered, then a mutual decision will be made by the Federal Government and the non-Federal sponsor on whether to proceed with acquisition of the property; and if the parties mutually agree to proceed, then the non-Federal sponsor will be responsible for HTRW clean-up costs. Other non-Federal responsibilities, including operation and maintenance and the requirement to hold and save the Federal Government free from damages, remain.

5. Projects damaged by Hurricanes Ophelia and Wilma to be restored and rehabilitated to the pre-storm condition using FCCE funds will be implemented in accordance with cost sharing set out in ER 500-1-1, Paragraph 5-11. In some cases it may be appropriate to fully restore sacrificial beach elements of these projects beyond the pre-storm condition, with this work cost shared as periodic renourishment by the Federal Government (using Construction, General (CG) funds) and the non-Federal sponsor in accordance with the Project Cooperation Agreement. In these cases, following the guidance provided in memorandum referenced in paragraph 1, the PIR should document undertaking the CG-funded periodic renourishment at the same time as the FCCE-funded restoration and rehabilitation, except that as provided in paragraph 3. above, approval of the PIR shall be with the Division Commander.

6. Public Law 109-148 also authorizes, at full Federal expense, within the funds provided, acceleration of work to complete unconstructed portions of Federally authorized projects in the State of Mississippi along the Mississippi Gulf Coast and Federally authorized flood damage and hurricane and storm damage reduction projects in the greater New Orleans and South Louisiana area. The costs for new construction and currently ongoing construction and construction related activities to accomplish acceleration of completion of unconstructed portions of Federally

CECW-HS

SUBJECT: Post Hurricanes Katrina, Wilma, and Ophelia Expenditure of Flood Control and Coastal Emergency (FCCE) Funds for Restoration and Rehabilitation, and for Accelerated Work to Complete Authorized Projects, in accordance with the Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza Act, 2006 (Public Law 109-148)

authorized projects will be at full Federal expense. These costs include Engineering and Design, Supervision and Administration, actual construction, acquisition of real estate interests not already owned by or under the control of the non-Federal sponsor, and relocations. HTRW investigations will be performed at Federal expense; if HTRW is discovered then a mutual decision will be made by the U.S. and the non-Federal sponsor on whether to proceed with acquisition of the property; and, if the parties mutually agree to proceed, then the non-Federal sponsor will be responsible for HTRW clean-up costs. Other non-Federal responsibilities, including operation and maintenance and the requirement to hold and save the Federal Government free from damages, remain. The non-Federal sponsor's operation and maintenance responsibilities will include operation and maintenance of the new construction under Public Law 109-148. Existing agreements will be amended to make it clear that 1) new construction and associated activities will be at full Federal expense; b) the non-Federal sponsor's operation and maintenance responsibilities will include operation and maintenance of the new construction; and c) HTRW investigations will be performed at Federal expense and if HTRW is discovered and the parties mutually agree to proceed, then the non-Federal sponsor will be responsible for HTRW clean-up costs.

7. For accelerated completion of projects in the South Atlantic Division, Accelerated Project Information Reports (APIRs) will be prepared to document proposed accelerated work for those unconstructed portions of authorized projects that are not covered by existing Project Cooperation Agreements (PCAs). The Accelerated Project Information Report will be approved by the Division Commander. The PCA will be approved by the ASA(CW).

8. For accelerated completion of projects in the Mississippi Valley Division, amendments to the existing agreements and sufficient supporting documentation will be developed in coordination, as appropriate, with the Headquarters and OASA(CW). Authority is delegated to the Division Commander to approve amendments to existing agreements for the accelerated construction to be undertaken in accordance with Public Law 109-148.


9. Construction and operation of the temporary closures in New Orleans, including temporary pumping stations, during the extended construction period of 1-3 years will be performed by the Federal Government in order to ensure optimum and safe construction. Funds provided in Public Law 109-148 will be used to fund operations of necessary temporary closures or temporary pumping at the outfall canals in New Orleans during the extended construction period of 1-3 years; however, FCCE funds other than those provided in Public Law 109-148 will not be available for this purpose.

CECW-HS

SUBJECT: Post Hurricanes Katrina, Wilma, and Ophelia Expenditure of Flood Control and Coastal Emergency (FCCE) Funds for Restoration and Rehabilitation, and for Accelerated Work to Complete Authorized Projects, in accordance with the Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza Act, 2006 (Public Law 109-148)

10. We will manage Public Law 109-148 funding in the FCCE program as programs, projects, and activities (PPA) IAW reference 1.b above. Work allowance documents will be issued by project for work in these PPAs. Any re-distribution of funds allocated between projects as included in the 9 Dec 06 estimates of project requirements different from the work allowance must be coordinated with the headquarters FCCE program manager prior to re-distribution.

11. Questions concerning this policy should be directed to Jeffrey Jensen, HQUSACE, Civil Emergency Management Branch, (202) 761-7687.


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

CF:
COMMANDER, NORTH ATLANTIC DIVISION
COMMANDER, NORTHWESTERN DIVISION
COMMANDER, PACIFIC OCEAN DIVISION
COMMANDER, SOUTH PACIFIC DIVISION
COMMANDER, SOUTHWESTERN DIVISION
COMMANDER, GREAT LAKES & OHIO RIVER DIVISION

APPENDIX Z

PIR REVIEW CHECKLIST

ER 500-1-1, 30 Sept 01

PROJECT: FEDERAL and NON-FEDERAL PUMP STATIONS, FLOOD CONTROL
ORLEANS PARISH

PIR Review Checklist				
	YES	NO	N/A	
1.		X		The project is active in the RIP. [ER, 5-2.a.] See Note Below
2.	X			The project was damaged by flood(s) or coastal storm(s) [ER, 5-2.]
3.	X			The Public Sponsor has requested Rehabilitation Assistance in writing. [EP, 5-10.]
4.	X			The Public Sponsor has agreed to sign the Cooperation Agreement, which will occur before USACE begins rehabilitation work. [ER, 5-10]
5.	X			The estimated construction cost of the rehabilitation is greater than \$15,000, and is not considered sponsor maintenance. [ER, 5-2.q.]
6.	X			The repair option selected is the option that is the least cost to the Federal government , or, the sponsor's preferred alternative is selected with all increases in cost paid by the public sponsor. [ER, 5-2.h. and 5-11.e.(3)]
7.	X			The public sponsor is aware of the opportunity to seek a nonstructural alternative project, and has decided to proceed with a structural rehabilitation. [ER, 5-16]
8.			X	The cost estimate in the PIR itemized the work to identify the Public Sponsor's cost share [ER, 5-11]
9.	X			The rehabilitation project has a favorable benefit cost ratio of greater than 1.0:1. [ER, 5-2.r]
10.	X			The proposed work will not modify the FCW to increase the degree of protection or capacity, or to provide protection to a larger area [ER, 5-2.n.]
11.			X	Betterments are paid 100% by the Public Sponsor. [ER, 5-2.o.]
12.		X		The CA contains a provision for 80% Federal and 20% local cost share for non-Federal projects. [ER, 5-11.a.] See Note Below
13.			X	Cost for any betterments are identified separately in the cost estimate. [ER, 5-2.o.]
14.			X	Repair of deliberate levee cuts is the responsibility of the public sponsor, except as provided for in ER 500-1-1, paragraphs 5-2.j. and 4-3.h. [ER, 5-2.j. and 4-3.h.]
15.			X	All deficient and deferred maintenance will be paid for or accomplished by the public sponsor, without receiving credit toward any sponsor's cost share. [ER, 5-2.g.]
16.			X	Any relocation of levees is adequately justified. [ER, 5-2.h.]

17.	X		USACE assistance does not correct design or construction deficiencies. [ER, 5-12.a.]
18.	X		An assessment of environmental requirements was completed [ER, 5-13.]
19.	X		The project complies with NEPA, and required documentation was completed and placed in PIR. [ER, 2-3.k. and 5-13.f.]
20.	X		The Endangered Species Act was appropriately considered. [ER, 5-13.g.]
21.	X		EO 11988 requirements were considered in the process of evaluation the proposed project for rehabilitation. [ER, 5-13.f.]
22.	X		The completed PIR has been reviewed and the PIR checklist has been reviewed and signed by the Emergency Management Office.
23.	X		The completed PIR meets all policy, procedural, content, and formatting requirements of ER 500-1-1 [ER, 2-3.h.]

Item 1 and 12. The costs for restoration and rehabilitation construction and construction related activities associated with this PIR will be full Federal expense, in accordance with 8th Supplemental Appropriations and implementation guidance received from HQUSSACE, dated 14 Feb 06.

Item 16. The environmental assessment has been distributed for 30-days public and agency review and comment. The comment period ends on May 16, 2006. It is anticipated that, barring any comments that identify a previously undisclosed environmental impact, the New Orleans District Commander will sign a finding of no significant impact, thereby completing the NEPA process. Portions of the pump station work occur within the existing Federal project (SPLA) and are categorically excluded from additional NEPA documentation. Per ER200-2-2, Paragraph 9a.

Item 23. ER-500-1-1, Section 5-2, paragraph v(1) limits the construction contingency to 10%; however, because of the emergency conditions under which the design and contract documents will be prepared, the short amount of time allowed for construction completion, and the high level of competition for construction contractor resources in the area, a 25% construction contingency is used. Additionally, because of the nature of rehabilitating mechanical and electrical work, including the uncertainty of rebuilding equipment and hidden damage, E&D of 10 percent and S&V of 12 percent of the construction cost is used.

EM REVIEWING OFFICIAL'S SIGNATURE

NAME: Michael Lowe
 TITLE: Chief, Readiness Branch CEMVN-010-R
 TELEPHONE NUMBER: 504-862-2244

Signature of Michael Lowe
 28 APR 06

Routing Slip

Project Information Report
Federal and Non-Federal Pump Stations Flood Control
Orleans Parish, Louisiana

1. Jim St. Germain
Task Force Guardian

James St. Germain 4/27/06

2. Brett Herr
Task Force Guardian

Brett Herr 4/27/06

3. Walter Dauray
Task Force Guardian

Walter Dauray P.E. 4/28/06

4. Colonel Sediff
Task Force Guardian

Col Sediff 28-Apr-06

5. Michael Lowe
Emergency Operations

James W. Lowe for Michael Lowe 28 Apr 06

6. Mary Kinsey
Office of Counsel

Mary Kinsey

7. Colonel Wagenaar
District Commander

[Signature]

Lat