Electrical Retrofit Aids in Hurricane Response

Full Mitigation Best Practice Story

Escambia County, Florida

Pensacola, FL - When the lights go out, seemingly small things take on a much larger significance. During a major power outage, valuable time is saved through the ability to plug in a generator without having to hotwire it into an electrical panel. This is especially important when quickly connecting power will prevent damage to homes from sewer backup.

Over the course of four years, the Pensacola-based Emerald Coast Utilities Authority (ECUA) has been retrofitting its sanitary sewer lift stations with electrical connections for portable generators. So far, 300 of the 332 lift stations have been retrofitted. ECUA plans to retrofit the remaining lift stations within the next year.

Because the retrofit helps reduce damages during a disaster, a portion of the cost of the project was eligible for a grant provided by the Department of Homeland Security's Federal Emergency Management Agency, under the Hazard Mitigation Grant Program (HMGP) managed by the Florida Department of Community Affairs. The HMGP grant funded the retrofitting of 41 lift stations with a transfer switch and an electrical receptacle connection, along with the flood-proofing of 26 electrical panels located in low-lying areas. The rest was funded by ECUA.

William Ellis, Utility Maintenance Manager for ECUA, estimates that power outages lasting 24 hours at just one lift station can result in a sewer backup costing up to $5,000 in damages.

Lift stations pump waste from lower to higher elevations for eventual delivery into a wastewater treatment plant. When there is a loss of power, these lift stations stop working. The sewer lines intended to carry sewage away from homes to the lift station may instead cause a backup of effluents into homes. Residents returning to hurricane-damaged or flooded homes will then find an additional, and possibly contaminated, mess to cleanup.

In the past, ECUA workers responded to power outages by using portable pumps loaded onto trucks to bypass lift station pumps, or rewired the lift station electric panels to connect portable generators. To streamline the process, ECUA electricians placed power cable connector receptacles (plug-ins for the generators) on the above-ground electrical systems. They installed transfer switches to make it easy to transfer power from the power company line to the portable generator. In the event of a power failure, ECUA workers can now operate a generator without having to rewire the electrical panels. Likewise, they can unplug and transfer a generator to another lift station in need of power.

"If you get the generator in there quick enough, you can do it before the tank fills in the lift station and it's business as usual," said Utility Equipment Supervisor Wayne Lister.

Electrical Supervisor Alfred A. Spencer explained that the old method of hardwiring the generator was dangerous and took a lot of time. "Workers have to get inside the box, work with the wires to hook up the generator, then put it all back when you move the generators."

To prevent sewer backups, ECUA uses a sophisticated communication system to monitor lift station activity. Workers monitoring the system know immediately when there is a power failure at any one of the 320 lift stations in service. When storms approach, bringing the possibility of a loss of power, workers are at the ready to put the generators into service.

"(Hurricane) Ivan was a great teacher," said Spencer. "The system was put to the test."

ECUA workers learned where to strategically stage generators in order to bring them first to critical facilities and main hub lift stations. With experience, they also learned the most efficient ways to move generators between lift stations. To promote better communication when responding to a power outage, the area that handles the mechanical aspect of the lift stations and the area that handles the electrical aspect merged into the same unit and are housed in the same facility.

When Hurricane Dennis hit and the lights went out, staff at ECUA's emergency control center directed generators to the affected areas. The majority of lift stations had a receptacle in place, and within a few minutes the generator was hooked up.

“[Compared to Ivan,] our response time to Dennis was cut way down,” said Lister.

Activity/Project Location

Geographical Area:	**Single County (County-wide)**
FEMA Region:	**Region IV**
State:	**Florida**
County:	**Escambia County**

Key Activity/Project Information

Sector:	**Public**
Hazard Type:	**Flooding; Hurricane/Tropical Storm**
Activity/Project Type:	**Retrofitting, Non-structural; Elevation, Utilities**
Activity/Project Start Date:	**01/2001**
Activity/Project End Date:	**Ongoing**
Funding Source:	**Hazard Mitigation Grant Program (HMGP)**
Application/Project Number:	**9999**

Activity/Project Economic Analysis

Cost:	**$100,043.00 (Actual)**

Activity/Project Disaster Information

Mitigation Resulted From Federal Disaster?	**Yes**
Federal Disaster #:	**1344 , 10/03/2000**
Federal Disaster Year:	**2000**
Value Tested By Disaster?	**Yes**
Tested By Federal Disaster #:	**No Federal Disaster specified**
Year First Tested:	**2004**
Repetitive Loss Property?	**Unknown**

Reference URLs

Reference URL 1: **http://www.fema.gov/government/grant/hmgp/index.shtm**

Reference URL 2: **http://www.ecua.org/**

Main Points

- The Pensacola-based Emerald Coast Utilities Authority is retrofitting its sanitary sewer lift stations with electrical connections for portable generators.
- Use of generators during a power outage will prevent damage to homes from sewer backup.
- 300 of the 332 lift stations have been retrofitted.
- An HMGP grant funded the retrofitting of 41 lift stations with a transfer switch and an electrical receptacle connection, along with the flood-proofing of 26 electrical panels located in low-lying areas.

ECUA Electrical Supervisor Alfred A. Spencer displays a lift station electrical box.