Honolulu Harbor Generator Project Pays Off

Full Mitigation Best Practice Story

Honolulu County, Hawaii

Honolulu, HI - When the Kiholo Bay earthquake (measuring Mw6.7) struck early on a Sunday morning in October 2006, the shaking was felt on the islands of Hawaii, Oahu and Maui. Seven minutes later, another powerful earthquake occurred, this one measuring Mw6.0. Following the earthquakes, the island of Oahu experienced a major power outage which lasted for 13 hours. Fortunately for the residents, visitors and businesses of the State, the large generators that were installed at the Honolulu Harbor performed as planned: providing power to maintain refrigerated containers with perishable goods, operating cranes and avoiding dependency on city power.

The State of Hawaii consists of an island chain situated in the northern Pacific Ocean. Because of the remote location of the Islands, the residents and businesses are dependent on the transport of goods from the mainland to Hawaii and then to the neighboring islands. The primary providers of this service are Matson Navigation Company and Young Brothers, Limited. Young Brothers, a private company, is the principal inter-island maritime freight company and moves approximately three million tons of goods per month. All containerized shipments are handled through Honolulu Harbor and transshipped to the neighboring islands by barge. Matson Lines receives shipments from the mainland and handles approximately 70 to 80 percent of the cargo in and out of Honolulu Harbor. Perishable goods for the islands are shipped in refrigerated containers (reefers). The proper temperature must be maintained within these reefers throughout the transport to avoid loss of the perishable goods. “If the facility would shut down,” states Jeffrey Low, Manager, Planning and Facilities for Young Brothers, “the entire inter-island distribution of needed goods is affected.”

Matson Terminal was in full discharge mode Sunday morning, October 15, 2006, when the earthquakes struck. A vessel had arrived at the terminal on Saturday and Matson was preparing to unload the perishables. At the time, there were over eighty longshoremen at work, all of whom felt the earthquakes. Their immediate concern was for a tsunami and a call was placed to the Pacific Tsunami Center (PSC). Once the report was received that there was no danger of a tsunami resulting from the earthquakes, an assessment of the cranes was done. The cranes, which are very flexible, were surveyed and found to be undamaged. Off-loading a vessel requires three cranes. The generators, which came on automatically, powered the three cranes, buildings and lights for the Matson Terminal. “Matson was able to continue operations and the perishable products arrived to the customer on schedule,” stated David Franco, Matson’s Facilities and Maintenance Manager. Other Matson customers had reefers that had not yet been unloaded. Matson was called and power through their generators was provided to preserve the unloaded cargo.

The Young Brothers facility was shut down per their normal schedule on the morning of the earthquakes. An assessment of the facility post earthquake was done by the Port Manager and no structural damages were found to the Oahu site. However, damages to the Kawaihae Port, on the Kohala coast off Hawaii, resulted in shut down of the port for a period of time, but it returned to partial operations. The generators at Young Brothers were also used to provide power to refrigerated containers. One generator provides power to four banks of refrigerated containers (30 total), each of which is forty feet long. If the city had requested generators during the post earthquake power outage, Young Brothers would have made three available.

Hawaii’s major harbors are all administered statewide by state government, State of Hawaii, Department of Transportation, Harbors Division. The State of Hawaii Department of Business, Economic Development & Tourism (DBEDT) realized the importance of emergency backup power so that the essential movement of cargo could continue in the event of emergency power disruption. In 1998, an agreement was executed between DBEDT and Young Brothers for the installation of generators to be funded through a cost share with FEMA’s Hazard Mitigation Grant Program (HMGP). Additionally, there is a Memorandum of Agreement (MOA) between the parties which provides for state government deployment of the generators for response and recovery activities associated with a declared emergency.

The installation of generators at both facilities proved to be a very effective mitigation measure, both operationally and financially. Matson has three which are housed in containers and located centrally to the crane operations. They are protected from truck traffic by bollards and k-rails placed around the perimeter of the generator site. Maintenance of the generators is a high priority. The maintenance schedule is based on the hours of use, however, they are fired up monthly in coordination with

the testing of the State Civil Defense sirens. Additionally, there are unscheduled opportunities to test the generators when Hawaiian Electric Company requires back-up. Young Brothers has two, custom built in 2000 and housed in containers mounted on pallets for portability. The generators at Young Brothers are used for daily business, however, they can be pulled off line in the event of an emergency. A cooperative effort exists between both facilities, the public sector and private business, resulting in benefits to operations for the islands as well as the companies.

David Franco estimates the losses that would have occurred on the day of the earthquakes to $30,000 in employee wages alone for operation of the cranes. The potential loss of cargo of perishable goods in dollars, impact on the retail market, and subsequent inability to supply the residents with perishables for an unknown period of time constitute some of the benefit to cost for the project. Without the generators, the return to normal operations would have taken two to three weeks. “The pipeline comes to a halt”, comments Franco. The subsequent damages would be felt by all residents of the State of Hawaii.

The generator project has been highly successful. “They have enabled us to support our customers, support every load”, claims Jeffrey Low.

Activity/Project Location

Geographical Area:	**Single County in a State**
FEMA Region:	**Region IX**
State:	**Hawaii**
County:	**Honolulu County**
City/Community:	**Honolulu**

Key Activity/Project Information

Sector:	**Public/Private Partnership**
Hazard Type:	**Earthquake**
Activity/Project Type:	**Utility Protective Measures**
Activity/Project Start Date:	**05/1998**
Activity/Project End Date:	**06/2001**
Funding Source:	**Hazard Mitigation Grant Program (HMGP)**
Funding Recipient:	**State Government**

Activity/Project Economic Analysis

Cost:	**$690,000.00 (Estimated)**

Activity/Project Disaster Information

Mitigation Resulted From Federal Disaster?	**No**
Value Tested By Disaster?	**Yes**
Tested By Federal Disaster #:	**No Federal Disaster specified**
Year First Tested:	**2006**
Repetitive Loss Property?	**No**

Reference URLs

Reference URL 1:	**http://www.fema.gov/government/grant/hmgp/**
Reference URL 2:	**http://www.hawaii.gov/dbedt**

Main Points

- Hawaii is supported by massive shipping operations to transport goods between islands.
- After the earthquake in October of 2006 major power outages caused many goods to be lost due to lack of power.
- Young Brothers, Limited, and Matson Navigaion Company both installed massive generators at their piers to power refrigerated shipping containers and cranes to load and unload ships.

Generators in place at Matson Terminal, Honolulu Harbor

Container ship ready for unloading.

Cranes powered by the emergency generators at Matson Terminal.

Jeffrey Low explains function of generators.

HMGP funded generator in use providing power to refirgerated containers at Young Brothers, Honolulu Harbor.