

Our energy working for you.™



Prime Power

Case History

Where:

Monrovia, Liberia

What:

- 10 1000 kW generator sets
- 11 generator set transformers
- 1 distribution panel
- 1 switchgear with breakers at MV

Application:

Prime power for municipal lighting

Partner:

The Louis Berger Group

Primary Choice Factors:

- Global expertise
- Start-to-finish technical assistance
- Management of multiple vendors and partners

Cummins Power Generation teams with The Louis Berger Group to re-electrify the capital of Liberia

Joint venture doubles prior electric capacity of war-damaged city

Berger/Cummins is a successful partnership of The Louis Berger Group — an international engineering firm — and Cummins Power Generation. The combined entity (<http://www.bergercummins.com/>) provides global expertise in the design, procurement, construction, operation and maintenance of power generation and distribution systems.

The people of Berger/Cummins routinely work in harsh, challenging environments and take on difficult projects. The two firms started working together in a very challenging region: Afghanistan, delivering diesel-fueled power for the U.S. Agency for International Development (USAID). The partnership again proved its expertise in supplying prime power to military bases in Iraq.



Liberia in red square, on the west coast of Africa.

In 2010 the challenge was the construction and installation of a power plant for the Liberia Electricity Corporation (LEC). Liberia was rebuilding after years of civil war. This involved a broad series of projects and investments that included restoring its electric grid, which had been substantially damaged in the fighting. In fact, over 90% of Monrovia had no commercial power.

Part of the rebuilding effort, therefore, was the building of a 10 MW power plant, which would more than double the previous installed capacity for the entire capital of Monrovia. The plant, a gift to the people of Liberia from the USAID, would provide immediate relief while the larger required electrical infrastructure projects were undertaken.



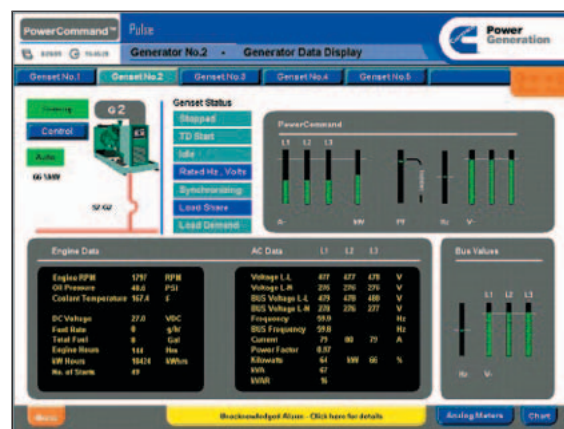
Some members of the Liberia project team, including representatives of Cummins Power Generation, Liberia Electricity Corporation, Berger/Cummins and USAID.

The components of the system

The LEC project was comprehensive, encompassing:

- 10 generator sets — in 40-foot containers — each rated at 1000 kW, with sound attenuation, day tank and exhaust system
- 10 generator set transformers, each with 1600 kVA, 2200/400 V
- One 750 kVA transformer for services in the power plant
- One neutral earthing (grounding) chamber
- One distribution panel

An additional dedicated container holds the paralleling switchgear and related equipment, and the system is monitored and controlled by a PowerCommand® Pulse system.



The graphical user interface for the PowerCommand Pulse management system enables quick and easy monitoring of the system.

Beyond the equipment

The project involved more than just installing the power plant. It also included:

- Synchronizing the new 10 MW plant with an existing 5 MW plant
- Designing and constructing an above-ground fuel supply and storage system adequate for seven days of operation
- Designing and constructing a hurricane-resistant structural cover
- Training the LEC staff to operate the plant



From left, in front: U.S. Ambassador to Liberia Linda Thomas-Greenfield; President of Liberia Ellen Johnson Sirleaf, a 2011 recipient of the Nobel Peace Prize; USAID Mission Director Patricia Rader; and Chairman of the LEC Board of Directors Francis B. Cooper, Sr. They took part in the official inauguration of the completed 10 MW power plant, joined by Berger/Cummins Liberia Site Manager Michael Hurley and Zein Jaffal of KNZ International Logistics Support, which assisted on the project.

Up and running on local diesel fuel

One of the jobs involved in this assignment was to define a method to measure the fuel efficiency of the generator sets, to meet the requirements of the customer of 0.27 L/kW-hr. The Berger/Cummins team, led by Six Sigma Black Belt Antonio Faz, employed Six Sigma tools in measuring fuel efficiency, given the weather and geographical conditions, the electrical load and the available diesel fuel.

Berger/Cummins completed all project requirements, on time and on budget, and turned over operation of the plant to LEC. The plant is currently providing electricity for several areas around Monrovia.

This project is a key element in the reconstruction of the country after a long and devastating civil war. Already significant progress has been made in controlling diseases such as malaria, encouraging Liberians who fled the country to return, and in improving the business climate. Cummins Power Generation is proud to play a role in this national renaissance.



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