



Mount Coffee Hydro Power Plant

Rehabilitation, reconstruction and upgrade



Powerhouse | Photo: Olof Skuncke, Multiconsult

The Mt Coffee Hydro Power Plant was first commissioned in 1967 with two Francis turbines followed by installation of two additional Francis turbines in 1973 bringing the installed capacity to 64 MW. The rebel forces seized the Mt. Coffee Plant in July 1990, halting production causing the dam to breach. In the following years, the plant was looted for all power generating equipment, a majority of the hydraulic steelworks, and all-non embedded equipment.

Liberia's electricity infrastructure was almost entirely destroyed during the conflict and efforts have been underway since 2006 to restore the Monrovia grid which currently rely on diesel generators.

PROJECT

Owner's Engineer for Rehabilitation of the Mount Coffee Hydro-power Project

PROJECT TYPE

Hydropower

LOCATION

Liberia

CLIENT

Liberia Electricity Corporation

PERIOD

2013 – pt.

KEY NUMBERS

Project cost approx. 320 MUSD

SCOPE OF WORK

In spring 2013, Norplan-Fichtner Joint Venture (NFJV) was assigned the role as the Owner's Engineer for the project. Multiconsult ASA has formerly carried out its international work within renewable energy under the brand name Norplan. The project is financed jointly by European Investment Bank (EIB), the German Government within the scope of German Financial Cooperation with Liberia administered by Reconstruction Credit Institute of Germany (KfW), the Norwegian Government through the Norwegian Ministry of Foreign Affairs, the Millennium Challenge Corporation (MCC) and Government of Liberia

The first representatives from NFJV arrived at the Mt. Coffee plant in 2013 with the assignment to analyse the condition of the structures to define the necessary works to enable re-start of power generation in December 2015, and increase the capacity of the plant as much as practically possible. The members found a skeleton of a powerhouse almost overgrown by the jungle.

In spite of adverse geometrical conditions such as the turbines unusual large distributor height, modern turbine design using CFD tools permitted to obtain a substantial increase in output: the output of the upgraded units is 22 MW for each unit compared to the original 15 MW for the first two units and 17 MW for the third and fourth units. The electro-mechanical rehabilitation also includes rehabilitation of 10 radial gates (10 x 10 m), new hydraulic steelworks for waterways and auxiliary systems in the Powerhouse. The works also comprise reconstruction of earth fill dam and powerhouse, new substation and new transmission lines.

The project has been, and continues to be challenging with respect to technical solutions, fast track schedule and conditions in the country and region. The fast track project schedule was almost brought to a halt by the emergence of an unprecedented Ebola epidemic in 2014. The project took the decision to suspend site works while continuing with design and manufacturing. This enabled a fast resumption of works in 2015 with the plan to re-start power generation in December 2016.

SERVICES PROVIDED

- Condition assessment
- Economical analyses
- Design and development of tender documents
- Procurement of 8 main contracts
- Design review of electro-mechanical equipment
- Design review of hydraulic steelworks
- Manufacturing supervision
- Construction management
- Development and supervision of Environmental and Social Management Plans
- Development of Resettlement Action Plans

DISCIPLINES

- Mechanical
- Electrical
- Environmental and Social
- Health and Safety
- Civil
- Transmission lines
- Roads



Spillway | Photo: Anders Tørklep, Multiconsult

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