

## CASE STUDY

### LONG BANGA - Sarawak, Malaysia



#### KEY STATISTICS

**Customer:** Restu Indah SDN BHD  
**Operator:** Sarawak Energy Berhad  
**Net Head:** 148 metres  
**Flow:** 145 litres/sec  
**Turbine type:** Gilkes TJ HCTI Turgo  
**Number of Turbines:** 2  
**Number of Jets:** 2  
**Power (kW):** 320 (combined)

**Date of Order:** March 2012

**Date of Commissioning:** May 2014

**Speed:** 1500 rpm

**Scope of Supply:** 12 TJ HCTI Turgo Impulse Turbine and Flywheel. Hydraulic Control Module, MIV and Bypass, PLC Control System & Digital Governor, Synchronous Generator 160 kW, 0.85 PF, 415V/3PH/50HZ.

The small village of Long Banga is located in Sarawak, Malaysia close to the border with Kalimantan. Such is its remoteness that a mains electricity supply is not practical. Residents generated electricity using small diesel generators but the supply was not constant or reliable and relied on fuel that was transported over long distances. Long Banga was identified as an ideal location to install a mini hydro scheme to provide a 24 hour electricity supply for the residents.

The sediment laden River Banga is an ideal site for a Gilkes Turgo Turbine. Gilkes supplied two 12" twin jet high capacity Turgo impulse turbines. These were coupled to synchronous generators with flywheels to provide improved frequency stability on the isolated network. Actuator control was provided by a hydraulic control module for each turbine. The system is designed for the turbines to run in a duty and standby arrangement. Synchronising equipment is included in the control panel for paralleling to a grid in the future.

The system has been designed to black start with an operator hand pumping the hydraulic system. Once online each individual turbine can provide up to 180kW of electrical power. Speed regulation is carried out by deflector governing which provides stable speed regulation with the ability to accept significant loads with a minimal drop in frequency. Commissioning was completed in May 2014 and the villagers of Long Banga are now able to enjoy a reliable 24 hour a day supply of electricity.

#### CONTACT

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