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PROJECT SUMMARY

DATE	Aug 2004	LOCATION	**Zambia, Luano**
SUBJECT	**RETROFIT OF CONTROL SYSTEMS FOR EA2 AVON GAS TURBINES**		

Copper mining and processing in Northern Zambia is a hazardous activity where secure electricity suppliers are essential to ensure safety of personnel and to avoid asset damage. Failure of power supply to underground water pumps, ventilation fans and hoists endangers both people and assets in mines.

Overview

Copperbelt Energy Corporation (CEC), the local power distribution company, owns and operates Avon powered standby generators spread between four locations with total installed capacity of 80MW to provide emergency power to the mines in the event of loss of supply from the national distribution network. These machines are also used for peak load control. It is therefore essential that these sets are available for operation and have high start reliability.

The Problem

Over time reliability and cost issues impacted the generation sets. These machines are nearly 40 years old and the original governing and fuel-modulating equipment was causing problems with plant availability and reliability. Mean time between overhauls was falling with regard to best practice and spare parts became relatively expensive. Furthermore, the spares required to maintain and repair the electro-mechanical governing systems were becoming increasingly difficult to source.

TCL were commissioned to address these issues.

The Solution

Remove the existing fuel system, governors and generator protection and replace by modern state of the art equipment that will be supported well into the future. Turbine Controls achieved this by:

- Installing a new 4 bay panel for:
  - generator protection
  - load control (with GT control and protection)
  - synchronisation
  - variable speed control for the fuel control skid
- Replacing on engine fuel pumps with the Posiflow © fuel skid
- Replacing the old governor and AVR
- Providing a new PLC system

At the three sites where the new equipment has been installed reliability has significantly improved while at the same time reducing spares holdings and maintenance costs.

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