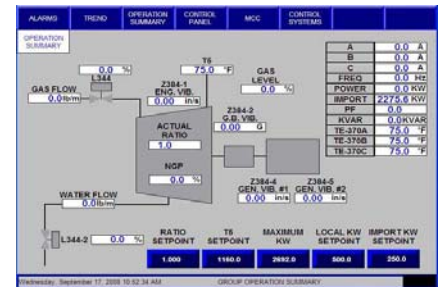


Solar Turbine (Centaur 40) Cogeneration Refurbishment and Upgrade Project

State of California – Department of Corrections & Rehabilitation
Richard J. Donovan Correctional Facility



LOCATION:

San Diego, California

PROJECTS & SERVICES:

- Project Management
- Turbine/Generator Refurbishment
- Engineering Control System Design
- Material Procurement
- Construction
- Startup

PROJECT OVERVIEW:

Source California Energy Services, Inc. (SCES) was the primary contractor for a 3-part Engineer, Procure, and Construct (EPC) contract with the State of California.

Part 1 consisted of the complete refurbishment of a Centaur 40 Solar Turbine that had been operated just beyond its life expectancy of 50,000 hours of operation and left abandoned for two (2) years. Part 2 was the complete replacement of the obsolete hardwired relay logic turbine control system with modern Allen-Bradley (A-B) PLC computer controls. Part 3 consisted of a replacement of the obsolete and non-functional control system for the 45,000 lb/hr saturated steam at 125 psig Heat Recovery Steam Generator (HRSG).

Specific areas of work included:

- ◆ Complete turbine removal, disassembly, refurbishment, and reinstallation
- ◆ SCADA and plant controls upgrade to A-B PLC including:
 - Operator interface using touch screen LCD display
 - Recalibration, repair, and/or replacement of all field transmitters
- ◆ Generator excitation equipment upgrade to an A-B CGCM.
- ◆ HRSG control system upgrade for drum level and heat input control loops utilizing SC Energy stabilization control theory.
- ◆ Auto Synchronization and governor control imbedded in the A-B ControLogix PLC code.

In addition, the obsolete and problematic turbine hydraulic starter system was upgraded to an A-B PowerFlex 700 Adjustable Frequency AC Drive (VFD) for improved reliability during turbine rollup starter operation.