Viking Power
Plant Assembly Description

The following is a technical description of the Viking Power plant design:

The heart of the peaking power plant is the Viking Gas Turbines, one model KG2-3C and three model KG2-3A machines currently upgraded to KG2-3C technology and firing status. These radial flow gas turbines with Ideal generators were originally designed as emergency standby generators. These four gas turbine generators have been inspected, repaired and upgraded to allow for continued operation at higher firing temperatures. These units are being constructed into a modular peaking power plant totaling 5-6.5 megawatts, depending on the site conditions. The only requirements for the site is the access of power lines, access of fuel and a water supply to feed the inlet air water fogging system (BACT).

The site consists of four turbine containers and inlet containers, an electrical services container, and a control room container.

These four gas turbines are packaged into 20' shipping containers. The containers are lined with sound attenuation insulation. The lube oil coolers are installed into the packages and provide ventilation as well as cooling for the package. The air inlet filter house, silencer, and inlet duct work is mounted and supported on the top of the turbine container. The inlet duct elbow is fitted with inlet air water fogging nozzles from a system supplied by MEE Industries. This inlet water fogging system will reduce the inlet temperature, reducing NOX emissions, and increasing power output. The exhaust ducts, silencer, and stack exit the container and turns upward supported off of the end of the shipping container.

The units are black start capable. The control system will run off of a 24vdc battery bank for power with a small UPS system to supply power to the HMI computers. The machines use air stored in two tanks at 475 psig for air starting of the units along with the air driven start up oil and fuel pumps.

The Ideal generators output power at 480vac voltage level and cable tray carries the generator leads to the breakers in the switchgear container. The units are synchronized to a 480vac power bus located inside the switchgear container. This bus is back fed from the distribution size transformer and the transmission size transformer from the transmission lines. Power signals are supplied to multifunction relays located in the breaker panels for generator protection. The multifunction relays provide operational output information to the control system in the control container via a modbus communications link. The Viking Power distribution step-up transformers are be monitored by multi-function relays located a cabinet in the electrical container (no transformers provided).

The control container contains the turbine control systems with two PLCs per panel. On each panel will have auto synchronizing relays for the two machines controlled from that panel. The panel also contains provisions to conduct manual synchronizing. The turbine control systems and a balance of plant PLC interfaces with two HMI (Human Machine Interface) computers set up with graphics to allow for the site control. One HMI is for control and the other HMI is for software development and backup. These HMI units communicate with a historian used to collect sequence of events and performance data from the data highway. The entire plant will be controlled from the HMI station and via a modem connection to remote locations with proper password protection.

The units are currently set up for operation on liquid fuel, however, they can be modified to burn natural gas.