



TURBINE

DIAGNOSTIC

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PRESS RELEASE

Turbine Diagnostic Services Inc. is proud to announce the release, installation, & commissioning of our first complete **TurboNet Dash 1** DCS structured Turbine Generator Control System. This system included a complete control panel, HMI (Human Machine Interface) station, EWS (Engineering Work Station), and our integral Historian.

TDS is manufacturing the TurboNet *Dash 1* controls at our headquarters in Pasco County, North of Tampa, Florida. TDS is a complete turbine generator service company providing troubleshooting and specialized maintenance services to the Power Generation Industry. TDS expertise extends from start up and controls engineering service, to major mechanical maintenance, operational and performance inspections, and specializing in vibration analysis and balancing of all types of steam and gas turbines, and generators.

The new TDS TurboNet *Dash 1* controls are simple and inexpensive. The system has been engineered by field engineers for field engineers and end users. The system is fast and extremely capable of incorporating all I/O functions associated with the turbine generator. The system's DCS structure has huge expansion capabilities and capable of controlling multiple units and balance of plant activities. Most of the primary components are readily available from national vendors or through the internet at very competitive prices. The system controlling panel is provided with redundant power supplies and a hot standby processor. The system is capable of accepting triple redundant I/O interface with field devices.

This system was installed at Wheelabrator Pinellas Inc., Unit 1, 56 megawatt steam turbine generator. This unit is an EHC controlled steam turbine located in St. Petersburg, Florida. The TDS speed control, servo position control, load control, pressure control, auto turbine start up, triple redundant back up overspeed protection, HMI, EWS, and historical storage and retrieval have all been proven. While the TDS TurboNet *Dash 1* control system has been implemented at several sites for the monitoring and historical data storage, this is the first complete system interfacing with the turbine field I/O and controlling the unit and processes. The unit checkout was completed by TDS engineers and technicians in 5 days and the start up and commissioning was smooth, trouble free, and

required no programming changes to the system and only minor tuning for IPC (inlet pressure control) stability. The unit was started and initially synchronized on 11/2/03.

The TurboNet *Dash 1* □ SPEED/OVERSPEED MODULE is capable of reading speed as low as turning gear from passive speed probes, and used in a triple redundant application to provide back up overspeed protection. The three speed values derived are used in a voted manner in the control processor for speed control and primary overspeed protection.

The TurboNet *Dash 1* □ SERVO LOOP CONTROL MODULE is fast and capable of supporting all EHC servo loop control schemes used by the OEM for steam and gas turbine control. This module provides direct interface between the LVDT feedback and the servo current driver. This module will support single, double, or triple LVDT or servo coils in the field and is equipped with a flow divider speed input to allow for the control of OEM gas turbine liquid fuel regulator systems.

TDS will be soon releasing the TurboNet *Dash 1* □ VIBRATION MODULE. This module will be released and implemented within several weeks. The vibration module will eliminate the need for a separate vibration monitoring system, incorporating velocity coil and proximity inputs into the control system directly and processing these signals into unfiltered and filtered vibration data for the display of Bode, Polar, and Shaft Centerline plots on the HMI operator interface station.

The TDS engineered and standard Terminator I/O modules interface to the field via TDS engineered termination boards. These termination boards provide locations to land the field cabling and route the signals to the I/O modules in a clean and organized fashion. The termination boards are designed for each type of I/O module to provide the applicable protection and suppression of the signals involved. The termination boards provide optional selections to power field devices from internal power sources and select berg jumper configuration options.

The TurboNet *Dash 1* □ control system is designed to accept all specialized I/O hardware associated with the control of steam and gas turbine generators. Expansion to incorporate the entire plant BOP functions is easily accomplished. The TurboNet *Dash 1* □ is built on a LINUX platform designed to allow for remote operation, monitoring, troubleshooting, and programming via internet access with password protection. The LYNX OS 4.0.0 control processor operating system provides continuous reliable operational processing and communications.

Please consider the TurboNet *Dash 1* □ system for your turbine control retrofit and DCS needs. Contact Turbine Diagnostic Services Inc. for additional information and demonstrations of the TurboNet *Dash 1* □ control system.

Additional system description information, TDS service descriptions and TDS contact information is located on our website at **www.turbinedoctor.com**.