EtaPRO®

EtaPRO® Advanced Pattern Recognition

EtaPRO® APR

The Electric Power Research Institute (EPRI) reports typical savings of $500,000 to $1,000,000 per year from early warning of impending equipment failure and successful intervention.

Unplanned and corrective maintenance of plant equipment remains one of the most significant power generation O&M expenses.

To provide this early warning and reduce unplanned maintenance, EtaPRO® integrated advanced pattern recognition (APR) technology into its world-class EtaPRO Performance and Condition Monitoring System. EtaPRO APR models are used to detect anomalies in plant or equipment conditions by continuously comparing current values to detailed empirical models of "normal" data. This technology offers detailed resolution and is highly effective in tracking equipment health parameters such as shaft vibration and bearing temperatures. APR technology is available fully integrated with comprehensive, first-principles thermodynamic models through EtaPRO and VirtualPlant® systems. This integrated solution delivers the capability to identify and diagnose root causes of system abnormalities AND quantify their impact on plant availability, efficiency, and operating costs.

EtaPRO®

EtaPRO® VIRTUALPLANT™

Drivers and Trends

As power generating companies seek to reduce operating costs, employees have been given more responsibility, leaving less time for monitoring equipment condition and plant performance. As such, subtle and slowly developing failures go undetected, often resulting in unnecessary forced outages and lost revenue. Early detection of an incipient failure allows for a planned outage at an economically advantageous time, reduces damage to equipment, and shortens repair times.

Proven Experience

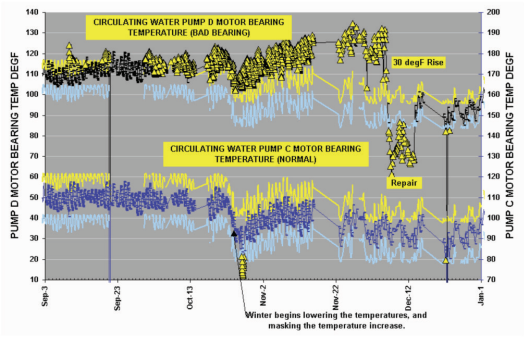
EtaPRO has been developing and implementing APR-based equipment condition monitoring solutions for over two decades. Our "power proven" engineers use their deep knowledge and understanding of power plant performance to deliver reliable APR solutions with fewer false positives than competing alternatives.

EtaPRO APR Technology

EtaPRO APR features localized modeling to eliminate the effects of data that are not applicable to the current equipment operation. For example, data records from full load operation when the unit is operating at 50% load. This unique approach provides inherent recognition of different operating modes, such as start-up, steady-state, and load following, resulting in improved model accuracy across the entire operating range.

EtaPRO' APR Implementation Features

- Extensive data filtering using software tools and domain expertise to establish accurate and comprehensive reference models
- Intelligent alarm thresholds and a modeling approach that minimizes false alarms while maintaining the earliest notification of process anomalies
- Comprehensive hierarchical display for viewing, trending, and managing APR-driven alerts
- Integrated first-principles calculations providing enhanced diagnostic capabilities and quantification of heat rate and capacity effects
- A proven user interface with unlimited distribution and flexibility for monitoring, trending, logging, alarming, and alerting critical operational information
- Knowledge of how power plants and their components work and interrelate
- End-user training for technology transfer



Circulating Water Pump bearing/race as found after APR notification of abnormal conditions

Demonstrated Results

EtaPRO APR extracts information from plant historical data and alerts personnel to equipment issues requiring action.

- Reduces forced outage rates by providing early warning of equipment problems
- Allows for planned outages and repairs before a catastrophic event occurs
- Uses management-by-exception techniques to increase effectiveness of plant and engineering staff
- Focuses attention on actionable issues, eliminating the need to review data when things are performing well
- Increases lead time for repair and minimizes unplanned maintenance activities

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