

***Advanced Calibration Monitor (ACM)
Product Description***

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Performance Consulting Services, Inc.

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Advanced Calibration Monitoring with **ACM**™

Fuel costs are rising, emission standards are tightening, and skilled manpower is always in short supply. Accurate instrumentation is essential for minimizing operating costs and ensuring compliance with new emission standards. However, maintaining instrument accuracy with limited plant staff is often difficult, if not impossible. Consequently, most power plants are required to operate with instrument errors that can result in reduced generation, increased heat rate, and increased emissions of SO₂, NO_x, CO₂. All of this translates into increased operating costs. Fortunately, excessive operating costs due to instrument errors can be avoided with the Advanced Calibration Monitor from Performance Consulting Services, Inc.

The Advanced Calibration Monitor (**ACM**) is a computerized calibration monitoring system with superior capabilities for assessing the health and validity of power plant instrumentation. **ACM** is ideally suited to performing all essential calibration monitoring functions including:

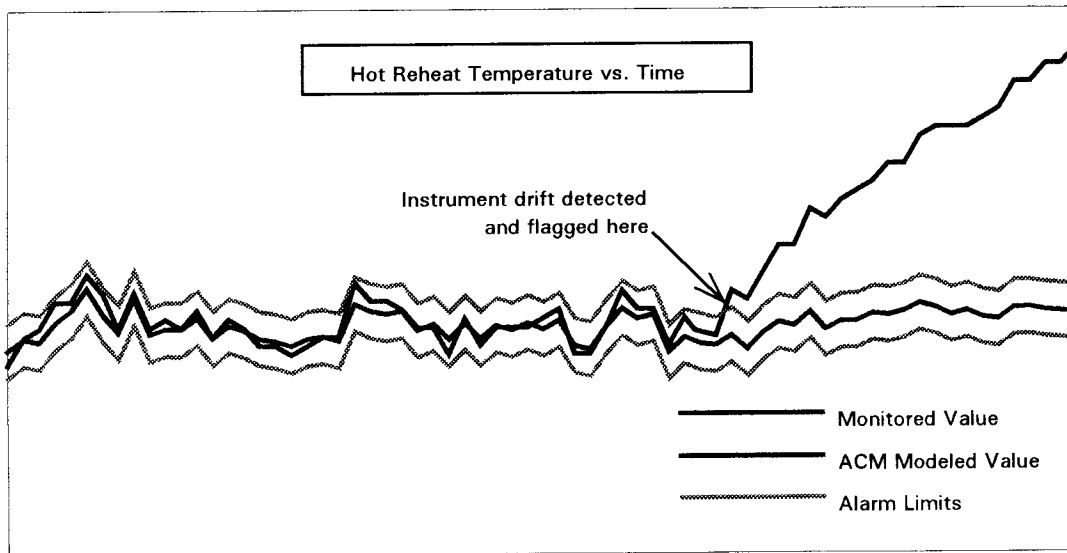
- Providing early warning of problems with plant instrument and equipment,
- Detecting which plant instruments have drifted or failed,
- Quantifying precisely the amount of instrument drift,
- Providing accurate replacement values for faulted instruments,
- Identifying specific instruments requiring attention during an outage, and
- Assessing overall plant health and operating conditions.

ACM has been specially adapted to operate on a standard PC under Windows. All data management, analysis, display, and report functions are handled by **ACM**. Calibration monitoring is performed automatically by **ACM** with instrument data downloaded to the PC via serial port, modem, or disk file. **ACM** monitors all plant instrumentation simultaneously and can operate effectively either off-line or in real-time.

ACM embodies a sophisticated mathematical modeling algorithm based on advanced pattern recognition techniques. This makes it fast, accurate, and easy to use. In operation, **ACM** utilizes historical plant data to automatically generate modeled values for every monitored instrument:

Plant Instrument	Monitored Value	Modeled Value (ACM)
Main Steam Temperature	1004.0	1003.6
Cold Reheat Temperature	637.1	639.2
Cold Reheat Pressure	561.5	562.7
A Heater Extr. Temperature	631.3	632.9
A Heater Extr. Pressure	555.4	556.5
Etc.	----	----

ACM uses the modeled instrument values to provide dynamic alarm limits for detecting instrument drift. **ACM** alarm limits for a given instrument are set by adding user-specified increments above and below the **ACM** modeled instrument values. Recorded instrument values which lay outside of the dynamic alarm limits are flagged by **ACM** as being incorrect. The following figure illustrates this concept:



At the left side of the graph, the monitored sensor closely matches **ACM** modeled values and remains well within the dynamic alarm limits. This indicates that the sensor was initially operating properly. But at the right side of the graph, the monitored sensor crosses over the **ACM** alarm limit indicating that the sensor has drifted significantly out of calibration.

What is the value of calibration monitoring using **ACM**? A recent cost analysis was performed on a single 440 MW coal-fired unit. The analysis examined the cost impact resulting from historical inaccuracies in just three critical instruments -- throttle pressure, throttle temperature, and hot reheat temperature. From the errors in these measurements alone, the additional annual cost of fuel and replacement power was nearly \$1,000,000.

ACM can also help to reduce costs by streamlining general calibration procedures. Many utilities perform instrument calibrations on a scheduled or planned maintenance basis with little regard for which instruments actually need calibration. The result is that some instruments are calibrated unnecessarily and others are not checked often enough. With **ACM**, as instruments begin to drift, they will be accurately flagged, and they can be immediately scheduled for calibration. Those instruments that are not flagged can be left unchanged, resulting in manpower savings.

These are just a few of the ways that advanced calibration monitoring with **ACM** can help decrease costs and increase productivity in your plant. For more information about **ACM**, please contact:

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