



AirPro PEMS

EPA-Approved Predictive Emissions Monitoring Systems for 40 CFR Part 75 Subpart E and 40 CFR Part 60 Appendix B Facilities

For a fraction of the budget of a traditional CEMS, AMP-Cherokee provides a year-round system and maintenance package that includes all RATA & RAA compliance tests, equipment warranties, and field support for true hands-off operation at your facility.

Easy to Use Software CEMS.
High Performance.
High Reliability.

PEMS Pro-Logix 60 combines its comprehensive dialogue screens and monitoring analysis tools into an easy to use interface. Pro-Logix PEMS offers all the monitoring capability needed to perform accurate data collection and real-time analysis. PEMS Pro-Logix 60 runs efficiently providing constant visibility via real-time data, trending and customizable reporting.

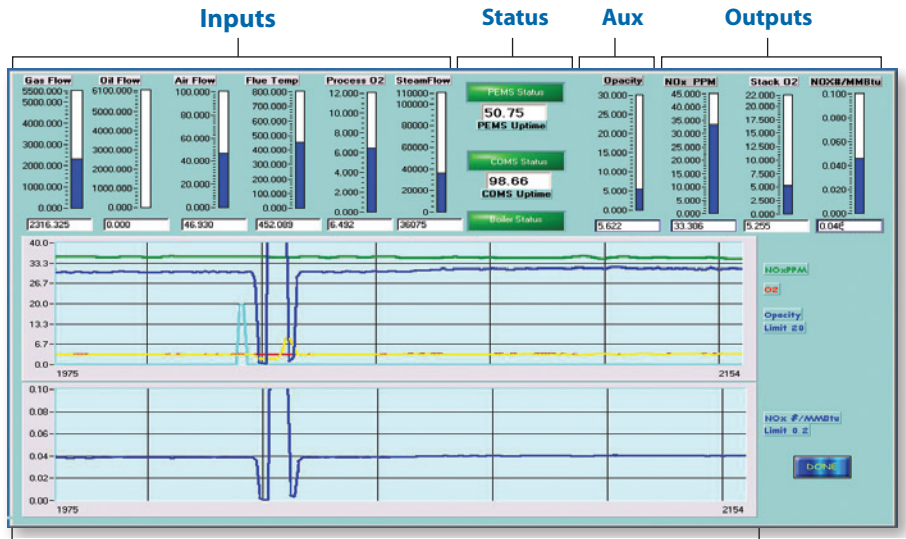
Low Cost. Low Maintenance.

AMP-Cherokee is dedicated to providing cost-effective compliance, performance and process monitoring solutions. PEMS Pro-Logix 60 is the perfect solution for boilers and other affected sources qualifying for predictive emissions monitoring systems (PEMS).

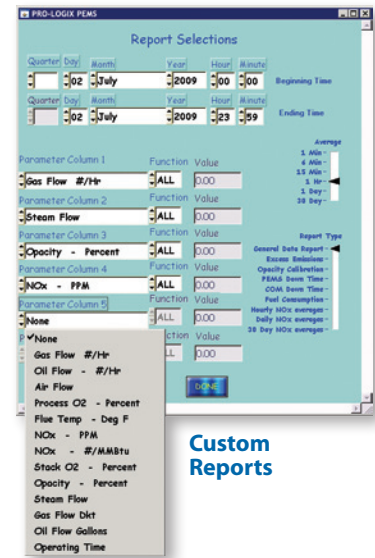
Do You Qualify for Pro-Logix PEMS?

As your emissions monitoring consultant, AMP-Cherokee can determine your eligibility to install a PEMS at your facility. Our consultants can perform a thorough walk-through of your facility to ascertain which processes and sources can be monitored. A monitoring plan that includes all the advantages of PEMS Pro-Logix 60 will provide you with significant savings over traditional CEMS and costly proprietary monitoring equipment.

Call AMP-Cherokee today at **800.399.4236** for a free consultation on the best predictive monitoring solution available - PEMS Pro-Logix 60.



Trends



Custom Reports



A Pedigree PEMS

At the Oak Ridge National Labs, the original CEMS was replaced with PEMS Pro-Logix 60 according to EPA's recently promulgated PS-16 monitoring requirements for all 40 CFR 75 Subpart E and 40 CFR 60 Appendix B sources.



Steam Operations Management

Constellation Energy selected AMP-Cherokee's Prologix PEMS 60 for emissions monitoring of three (3) boilers at a steam generation plant for a nonwoven fabrics plant in middle Tennessee.



901 Bridge Street | Fuquay-Varina, NC 27526
8705 Unicorn Drive, Suite B302 | Knoxville, TN 37923
800.399.4236 www.ampcherokee.com

Raleigh | Knoxville | Fort Smith

PEMS Pro-Logix 60 FAQs

What is PEMS ProLogix?

PEMS ProLogix from AMP-Cherokee is a predictive emissions monitoring system (PEMS) for compliance with U.S. EPA 40 CFR Part 60 regulations and is offered as a user-operated system or as a fully supported monitoring package.

How are the PEMS ProLogix predictive results determined?

To create the emission model, continuous emissions monitoring (CEM) or reference method (RM) tests are conducted to collect current and historical emissions and process data. A PEMS database is created and input parameters from the process control system are configured in the PEMS software.

With data collected during daily operations, during startups and shutdowns, and all other operational aspects of plant operation, the PEMS is programmed to predict emissions over the full load range of the monitored unit. With sufficient sensor locations to supply multiple data inputs, PEMS ProLogix has the ability to accommodate failed inputs or missing data.

What are the most important features of PEMS ProLogix 60?

The statistical hybrid approach is a unique empirical predictive system that requires only a fixed sample of paired process and emissions data. A statistical hybrid PEMS has the following features:

- Accurate across the full load range of the unit
- Valid for normal operations, startup and shutdown
- Equivalent accuracy as a CEMS with higher reliability
- Compatible with process instrumentation and data interfaces
- Certified under U.S. EPA as a 40 CFR Part 60, SP 16 system
- Alarms can be easily established for operations personnel

Can PEMS ProLogix replace a CEMS?

PEMS ProLogix 60 can be installed to satisfy 40 CFR Part 60, Performance Specification 16 (PS-16) compliance requirements. PEMS ProLogix 60 runs on a PC workstation as a stand-alone system to provide data acquisition, real-time and averaged emission data, and report generation. The PEMS data model is based on historical or temporary CEMS data collected to create the PEMS model.

What is the level of accuracy and reliability?

Accuracy is comparable to a CEMS providing <10% relative accuracy even at very low levels of NOx (less than 10 ppmv). In many cases, SmartCEM can achieve accuracy levels less than 5% and maintain this level of accuracy for many years running the same model. SmartCEM reliability approaches 100% in our installations, typically better than the majority of CEMS installed to date.

What are the 40 CFR Part 60, PS-16 requirements for PEMS certification?

The minimum data required for a SmartCEM PEMS model is from 24 hours to 72 hours of data to build a successful model. The entire range of operations at various loads and including a startup and/or shutdown is typically required. The initial certification under PS-16 requires a 27-run relative accuracy test audit and statistical analysis of the data. CMC provides a certification guarantee with each SmartCEM product such that the initial testing will meet the requirements of PS-16 and CMC remains involved with the required submittals and reports until notification is received by the appropriate regulatory agencies.

What other statistical analyses are required to certify SmartCEM-75 PEMS under 40CFR Part 75, Subpart E?

The minimum data required to validate a SmartCEM PEMS model for compliance with 40 CFR Part 75 is 720 operating hours. There is an additional requirement to provide at least 24 hours under each type of fuel combusted as part of the 720 hour demonstration required of Part 75, Subpart E. The statistical analysis includes the F-test, t-test, correlation, and variance analysis along with a bias test of the 720 hour Subpart E demonstration dataset. CMC provides a Subpart E package that guarantees Part 75 Subpart E certification results that are successful and includes all statistical analyses, data quality assurance, and onsite support along with the required submittals and reports. The final decision for approval of all Part 75, Subpart E petitions resides with the Administrator of U.S. EPA.

Is the first correlation valid for a long time or should we tune SmartCEM PEMS each year?

The validity of the SmartCEM PEMS model is entirely dependent on the training dataset and the quality assurance program in place at the site. If a comprehensive model is developed initially, there would be no reason to limit the range of time that it would be valid. An initial model that includes all normal operations, startups, shutdowns, and transitional operating states

is deemed 'robust' and will provide valid predictions for compliance purpose for many years. The model can easily be retrained if required for any extreme ambient or other operating conditions not encountered during the initial training data collection. The system keeps track of when the model is valid for a given set of process data in real-time and provides alarms for tracking excursions from the established model envelope and records the status of the model prediction automatically.

Requirements for a periodic or annual recertification test would be dependent on the local regulatory requirements and the facility quality assurance program. We would recommend retraining the PEMS model (and recertification if required) following any major process change or the addition of pollution controls or for changes in fuel and fuel quality. Validation of the PEMS model can be conducted following tuning or annual maintenance activities (such as an extensive overhaul), but this would not be mandatory. The PEMS can be retuned at any time (periodically or continuously) using existing CEMS equipment or by mobilizing temporary or mobile emission monitoring equipment and collecting the process data concurrently with the target pollutant emission rates.

Is the prediction just valid for NOx? Does the model work for CO? What other process and emission parameters can be predicted with SmartCEM PEMS?

The prediction is valid for any emission or process data that can be continuously measured and included in the initial training dataset that can be correlated with the available process data. The model is initially developed with NOx, CO, CO2, O2, SO2, and total hydrocarbon data. Particulate, H2S, NH3, PM10, PM2.5, opacity and other emission parameters can also be predicted with the statistical hybrid engine.

The accuracy of the prediction for NOx mass emission rates from gas turbines and gas-fired boilers have been the most extensively studied and demonstrated to date. Other pollutant emission rates that have been established to be accurately modeled by SmartCEM-60 including CO, SO2, and hydrocarbon emission rates, as well as, exhaust gas diluent O2 and CO2. Other turbine or boiler parameters such as exhaust temperature and flow rate have also been evaluated and show good accuracy. Hydrocarbon, CO, SO2, NOx, and O2 have also been demonstrated to be accurately modeled from sewage sludge incinerators and industrial boilers.

Which process inputs are needed to develop the PEMS model?

Any process input parameter that correlates with emission data is acceptable for developing the PEMS model. As an example, from 6-12 parameters are needed to create a gas-fired boiler model - more parameters would be needed for additional air pollution controls.

Interfacing with existing control and emission monitoring systems can be accomplished using serial communications, Ethernet connectivity, or through hardwiring to remote I/O devices. CMC can provide the hardware and equipment required or the system can be configured to utilize any standard 'Windows' based technology such as OPC, ODBC, OLE, DDE, Modbus, etc. to extract the data from the turbine control system. This interface between existing control and monitoring systems with the PEMS server deployed onsite can eliminate the need for hardwiring I/O to the SmartCEM system. Hardwire interfaces range from economical Ethernet-ready devices to a custom programmable controller with data-loggers and data buffering with uninterrupted power supply guaranteeing near 100% data availability.

Is the SmartCEM PEMS also valid during start-up and shutdown of the unit?

The model is valid during normal operation of the turbine or boiler, during start-ups and during shutdowns, as well as, trips, interruptions, etc. Each of the deployed SmartCEM PEMS to date has been certified to continuously monitor emissions during all normal operations including startups and shutdowns. The accuracy of the model during startups and shutdowns is demonstrated, however, the accuracy is improved as more transition data is included in the historical training dataset. It is important to include startup and shutdown data along with other data from transient operations in the initial historical training dataset to ensure accuracy of predictions for these operating conditions.

What process or source maintenance potential does the PEMS offer?

Unit operating conditions and history can be used to determine maintenance activities. Combustion process optimization and tracking noncompliance emissions offers clear insights into equipment conditions.