ENVIRONMENTAL
Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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Continuous Emissions Monitoring of Air Permitted Facilities

Collecting emissions information from a stationary source can be accomplished on either a continuous or an intermittent basis. See Fact Sheet ARD-66 "Compliance Emissions Testing of Air Permitted Facilities" for more information about intermittent compliance emissions testing. If continuous monitoring is required, the facility can permanently install a continuous emission monitoring (CEM) system on a stack or process ductwork to measure the emissions of one or more pollutants. The emissions data is recorded, averaged and stored by a computer data acquisition system (DAS).

What is a CEM system?

A CEM system is used to demonstrate continuous compliance with an applicable emissions standard; calculate total emissions over a particular period of time; show the effectiveness of pollution control equipment; control a process; or monitor operations. Typically, the CEM system consists of a sampling probe; a sample conditioning system to remove moisture and particulate matter; a sampling pump; and one or more gas concentration analyzers for measurement of the pollutant concentrations. In some cases, a volumetric flow monitoring system may also be installed to provide a stack gas velocity measurement.

How is data collected from the CEM system?

The DAS collects the continuous stream of concentration measurements from the gas concentration analyzer(s), averages the data and stores the data. The DAS can calculate from the pollutant concentration and stack gas velocity a pollutant mass flow rate in pounds per hour (lb/hr) which can be averaged and stored. In some cases, the pollutant emissions are expressed as a ratio of pollutants emitted to the heat input (i.e. fuel combusted by the device or process), typically in the units of pounds of pollutant per million British thermal units (lb/MMBtu).

What are the advantages of using a CEM system?

A CEM system provides emissions data under all source operating conditions, including varying loads and operating scenarios; and during malfunctions, startups and shutdowns. Typical pollutants that can be monitored by CEM systems include the products of combustion (oxides of nitrogen, carbon dioxide and sulfur dioxide), diluent gases (carbon dioxide and oxygen), and less common gases and pollutants including, but not limited to mercury, total reduced sulfur, volatile organic compounds, and particulate matter.

Facilities which are required to comply with a pollutant cap-and-trade program or that choose to participate in an emissions trading program will usually install and operate a CEM system to measure the actual amounts of pollutants emitted and the number of credits (typically equivalent to one ton of a pollutant) that it needs to purchase or that it can trade, bank or sell.

What is a Continuous Opacity Monitor?

Continuous opacity monitors (COMs) are another kind of CEM system which monitors the opacity of a smoke plume. Opacity is a measure of the degree to which the smoke blocks visible light and, although it is not necessarily directly proportional to the amount of particulate matter emissions, it is an indicator of overall combustion efficiency or control of particulate emissions.

How do I know if my CEM system is accurate?

If the CEM system is required by a state or federal rule or program, the facility is required to follow the requirements of Env-A 808 *Continuous Emission Monitoring* to maintain the accuracy of its system. The facility is required to submit a CEM Monitoring Plan to NHDES for approval prior to its installation. The monitoring plan is required to describe the components of the system, the location for its installation, all calculations used in the determination of the emission rates from the monitored pollutant parameters, and a description of how periods of missing data will be handled. Once installed, the system is certified at least annually by comparing its measurements against the simultaneous measurements made by a reference method stack test system. The CEM system is required to undergo audits each calendar quarter and to be calibrated on a daily basis. The CEM system must meet the accuracy standards of these quality assurance procedures for the data collected by the DAS to be considered “valid.”

For more information on what you have to do if your facility is required to install, operate and maintain a certified CEM system, visit the NHDES Stack Testing and Monitoring website, send an email to testingmonitoring@des.nh.gov or contact the NHDES Air Resources Division by mail at 29 Hazen Drive, Concord, NH 03301 or by telephone at (603) 271-1370.