



CASE STUDY: Mountain Cement



Company Overview

Mountain Cement Company, located two miles south of Laramie, is Wyoming's only producing site of portland cement.

Mountain Cement operates 2 limestone quarries, 2 shale quarries and a gypsum quarry. The Laramie plant operates 2 kiln systems. Both kilns are coal fired but are capable of burning coke or gas.

Raw materials are processed into a variety of cement products through a series of manufacturing processes which require constant monitoring for quality and environmental emissions control.

Background

In 2003, Mountain Cement began the arduous process of designing and implementing a new automated control system for their cement manufacturing operations. As part of this process, Canary Labs trending had been installed and implemented at Mountain Cement to help with production operations.

After using Canary Labs software for a few months it was quickly apparent how powerful the software was. Not only was the information useful for managing production, it could also be used for emissions recording and reporting.

In 2006, Canary Labs worked with Mountain Cement and consultants from Fishbeck, Thompson, Carr & Huber, Inc to develop a set of programs to address

the environment reporting needs of the plant.

The Challenge

Raw data was stored and managed by an older historian system that had not been upgraded and was increasingly becoming unreliable. For example, the opacity 6-minute averages and hourly SO₂ and NO_x lb/hr values were printed daily and, if a problem arose, it was difficult to replicate the daily printouts. Data was then entered, by hand, into a spreadsheet, from which exceedances, rolling averages, and mass emissions were calculated. Often, when using this outdated system, emission limit exceedances were not detected until data was entered into the database. There was no redundancy, resulting in several reporting quarters with less than 95 percent data recovery. Mountain Cement personnel had to hand-record the reasons for excess emission events and corresponding corrective actions on a log maintained in the control room and reconcile these notes in the quarterly reports months later.

Mountain Cement's operating permit included various emission limits. In order to meet compliance each kiln system has a set of sensors. These sensors measuring sulphur dioxide (SO₂) and nitrous oxide (NO_x) are continuously monitored. An opacity monitor, oxygen sensor and ultrasonic flow meter are also utilized.

"Canary is providing real-time environmental compliance data trends and rolling averages for the first time in history. It has also greatly simplified data management and reporting activities for the plant."

- Michele Buckler, Environmental Consultant
Fishbeck, Thompson, Carr & Huber

Configuration Overview

- Trend Historian
- Trend Link
- Trend Calc
- Custom program for generating Environmental Reports

Canary Labs Integration:

- Wonderware InTouch
- RSLinks OPC Server



10,000 Implementations in over 24 Countries, and growing.

www.canarylabs.com

Sales 814.793.3770



However compliance is based upon a complex set of averages and calculations. For example, the opacity limit was based on a six-minute block average, SO₂ limits on a 3-hour rolling average and a 30-day rolling average (30 operating days, not calendar days), and NO_x limits on the same 30-day rolling averaging period. Cement kilns also must establish a control device inlet temperature limit based on a 180-minute rolling average.

Additionally, the plant is required to record monitor downtime, process up time, and excess emissions to satisfy reporting requirements. All of this data was entered daily, by hand, usually taking more than one hour per day. Compiling the data needed for the quarterly emissions reports generally required three to five full days of the environmental managers time.

Results

An evaluation was done to find a solution. Mountain Cement already had Wonderware and the Canary Labs software running. Could a solution be found with this software, or would an expensive environmental DAHS system be required? All of the emissions data had to have a process trigger (kiln turned on or operating). These parameters needed to be appropriately identified (i.e. fuel or feed to the system) and signals from the correlating equipment (i.e. weigh scales) established in the Mountain Cement control system.

A group project involving Mountain Cement's instrumentation group, FTC&H's regulatory knowledge, and Canary Labs resulted in a custom application utilizing Canary software already in place that provided a cost effective solution.

This application:

- Met the raw and calculated data storage requirements of Mountain Cement's air permit.
- Provided real-time values and trends of the instantaneous and averaged data to operations personnel.
- Alerted control-room operators to excess emission events and provided the ability to simultaneously record the causes and corrective actions taken into the database.
- Provided on-demand reports detailing excess emission events, kiln operating time, calculated percentage of time in excess, etc.
- Allowed Mountain Cement to export data in a customized form to an Excel spreadsheet.

"Canary Labs trending package has provided innovative real time techniques for tracking quality control and production - this has resulted in increased productivity and equipment reliability. The bottom line is the software helps to ensure a safe work environment for our employees."

- Nathan Morris, Automation Engineer



10,000 Implementations in over 24 Countries, and growing.

www.canarylabs.com

Sales 814.793.3770