

Cementing Ecological Foundations

ABB has implemented Technical Information Systems (TIS) for St. Lawrence Cement Inc. in Canada. Christophe Krogmann, Andrew Wilson and Henning von Hoersten provide details.

Introduction

TIS, is a combination of production and laboratory information systems, which can be implemented in one step or in a phased approach.

ABB Switzerland signed the worldwide TIS agreement with Holcim Group Support (HGRS) in December of 2001. This agreement means that ABB will supply Technical Information Systems for all Holcim Plants worldwide including St Lawrence Cement's Mississauga and Joliette plants.

The ABB Standard TIS includes supply of hardware, software, project management, engineering, commissioning, training, warranty and support. The TIS standard application and implementation is a collaboration between ABB Switzerland and HGRS Corporate Engineering.

The commissioning of TIS at the St. Lawrence Cement Inc., in Canada, was initiated by the client's need to meet with Holcim reporting requirements. ABB Switzerland implemented TIS for environmental reporting providing automated, reliable environmental information. This allowed the customer to successfully replace the old unreliable, mainly manual reporting system.

St. Lawrence Cement Inc.

The company is a leading producer and supplier of products and services for the construction industry, namely cement, concrete, aggregates and construction. It operates in Canada and on the eastern seaboard of the United States, and serves around 9000 customers in Canada and the United States through its four cement plants, 21 cement distribution terminals, one slag granulator, two mineral components distribution terminals, a GranCem facility, 43 ready-mixed concrete plants, 22 quarries and sand pits, as well as its three construction companies.

TIS was introduced to the customer during a workshop in May 2003. After an audit carried out by HGRS an implementation plan was devised focusing initially on the environmental needs of the two plants. Improved environmental data quality and reduction of manual inputs were two of the goals of the initial TIS implementation.

The project is being implemented in two phases; the first for the Environmental report phase was carried out in 2003, with the second phase, incorporating production, process, energy and quality, planned for 2004/2005.

Environmental reports

St Lawrence Cement currently has three separate environmental sections:

- Federal/Provincial
- Holcim internal
- St. Lawrence internal.

Each of the sections has its own rules for normalising based on oxygen, pressure and temperature, kiln conditions, and CEM status for assessing whether or not to accept the current raw data. In Ontario there is an additional reporting requirement for the smog season (1 May - 30 September).

The engineering of the St Lawrence project was executed in September / October 2003 and was commissioned in November 2003. By February 2004 the project was already in the fine-tuning and training phase.

Emission monitoring technology (at Joliette)

St. Lawrence Cement operates four emission-monitoring systems at the Joliette plant. The company have chosen to use the ACF-NT of ABB Automation Products in Germany for this purpose. ABB also supplied the actual measuring equipment.

The new ACF-NT analyser system complies with the new emission monitoring requirements for plant flues, and is a further development of the highly successful Continuous Emission Monitoring (CEMAS) FTIR system. Fourier Transform Infra-Red (FTIR) spectrometers offer a measurement technology with the highest levels of accuracy, selectivity and reliability that reduce the need for frequent calibration.

The main part of the ACF-NT analyser system is the



The Mississauga plant.



ABB Emissions Monitoring Solution ACF-NT.

multi-component gas monitoring system installed in an electrical room close to the incinerator flue. A sample of the flue gas is drawn through a sampling probe and brought to the analyser system using a unique electronically controlled air injector.

The ACF-NT system is designed to expand with the future needs of the customer in that it can easily be expanded through software to measure additional infrared-active components. Compared with competitor solutions, the ACF-NT system offers:

- Continuous measurement of hydrochloric acid (HCl), hydrogen fluoride (HF), carbon monoxide (CO), nitrogen oxides (NO_x), Sulphur dioxide (SO₂), ammonia (NH₃) and unburned hydrocarbons (TOC).
- Continuous measurement of global warming gases such as carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) along with water vapour and oxygen.
- Proven hot wet extractive measurement technique.
- High stability, accuracy and reliability through proven FTIR analyser technology.
- Unique air-driven aspirator pump, no moving parts, low waste condensate to handle.
- Low ownership, maintenance and installation cost through multi-component measurement technology.



Four separate lines monitored by individual CEMS.

- Clear-text status messages and user friendly operator interface on a large back-lit display.
- Remote control and/or maintenance via Modbus, Ethernet or modem.

Feedback

Bill Williams, St. Lawrence Cement's Project Manager, reports that the installation and configuration from ABB were fine, and that all problems that occurred were solved quickly despite the six hr time difference.

In addition:

- The system has the flexibility to meet the current environmental reporting requirements of the government and has been designed for the potential changes over the next few years.
- Currently the TIS Environmental Report includes O₂, NO_x and SO₂, HCl, CO, CO₂, VOC, ammonia (all in terms of concentration and mass flow). The reports are being accessed by many users from environmental groups (corporate and plant) and production and maintenance. With the new system in place this information is easily accessible on the local intranet.
- Although the system has not been designed in its first phase for production and maintenance, they are still using the reports to detect the correct point at which they have to change bags in the filter bag-house.
- Mr. Williams foresees that other plants in the Saint Lawrence Cement Group will also look to implement TIS in the near future.

Through projects such as those at Mississauga and Joliette, ABB has once again the opportunity to exemplify its environmentally friendly capabilities and to establish a stronger relationship with Holcim, both within Europe and Worldwide. ◆



Location of the sample extraction equipment on the stack.