

Date: 9/11/2010  
Ref: 2010-07

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## **Thermo Scientific Development of SO3 CEMS**

Coal-fired power plants have many undesirable consequences from the formation of SO<sub>3</sub> to their equipment and emissions. This presents the requirement for a reliable and accurate monitoring method. Corrosion, fouling and plugging of plant equipment is a direct outcome from high concentrations of SO<sub>3</sub>. SO<sub>3</sub> also reacts with moisture to form fine droplets of sulfuric acid at the stack exit which leads to a blue plume from the stack exit and leads to an adverse perception of the plant's environmental impact.

This adverse perception has led Thermo Scientific to carry out studies on various SO<sub>3</sub> detection techniques both in the laboratory and in the field to determine the measurement method that yields the best detection limit and optimum selectivity. The outcome from the studies conducted revealed that the best method is an SO<sub>3</sub> absorption gas analyser which utilises a Quantum Cascade (QC) Laser.

There will be a variety of sample handling and measurement configurations for the SO<sub>3</sub> analyser such as extraction, cross-duct and in-situ but after the evaluation of the results and challenges associated with each sampling method, Thermo Scientific believe that the approach of extraction, dilution and controlling the temperature and pressure of the sample will allow them to meet the requirements of the industry.

Thermo Scientific will continue to develop their SO<sub>3</sub> CEMS through to the end of 2010 with prototype designs comprising of an extraction probe, SO<sub>3</sub> calibrator and a QC Laser Gas analyser. They plan to achieve their goal of developing a reliable and sensitive SO<sub>3</sub> CEMS by evaluating the design on full scale boilers while burning different types of fuels and positioning the system downstream of various control devices.

As soon as this SO<sub>3</sub> CEMS becomes available Lear Siegler will bring it to its Australian and New Zealand customers.

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