TITLE: **NOVEL CORROSION SENSOR FOR VISION 21 SYSTEMS**

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ABSTRACT

Objectives

The overall objective of this proposed project is to develop a new technology for on-line corrosion monitoring based on an innovative concept. The specific objectives and corresponding tasks are to: (1) develop the sensor and electronic measurement system; (2) evaluate and improve the system in a laboratory muffle furnace; and (3) evaluate and improve the system through tests conducted in a pilot-scale coal combustor (~1 MW).

Accomplishments to Date

The task for the first year is planned mainly for the development and fabrication of the sensor and the measurement system. The effort in the first six month included the preparation and assembly of a corrosion probe, on which the corrosion sensor can be mounted, and the electronic measurement system with computer data acquisition in the laboratory. The probe temperature, or the temperature of the sensing element, is controlled with compressed air cooing to a set value. The control system is being tested in laboratory muffle furnace to assess the control parameters and fluctuation range of the probe temperature.

In addition, more experience is gained at a coal-fired power plant in terms of setting up the corrosion measurement system with the probe being developed. Such experience has a direct impact on the design of the sensor and measurement system, with the information on the practical requirement during the operation of the system in a plant environment.

Future Work

(1) Completion of the laboratory development effect and integrate the sensors, the probe, and the control and electronic measurement system for use in the laboratory and pilot-scale measurements.

(2) Laboratory evaluation and improvement of the system using a muffle furnace to prepare the system to be tested at the pilot-scale furnace and possible power plant sites.

(3) Test the system at a pilot-scale furnace and possibly in the coal-fired boiler to ensure that (a) the system works in a combustion environment, (b) the results can be confirmed by direct metal-loss measurements, and (c) the system is rugged enough for the plant environment.

List of Paper Published

Li, Z.P., Lin, B.C., and Ban, H., A Novel Sensor for Fireside Corrosion Monitoring, The Proceedings of the 20th Annual International Pittsburgh Coal Conference, 2003.

Student Supported under This Grant

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