PROJECT facts

U.S. DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY

Clean Coal Power Initiative (CCPI)

01/2004

Development and Application of Gas Sensing Technologies to Enable Boiler Balancing

Project Desciption

The Center for Industrial Sensors and Measurements (CISM) at The Ohio State University and GE Reuter-Stokes (GERS), a part of GE Energy Systems have teamed up to develop a ceramic-based microsensor array to monitor total NO_x (0-1000 ppm), CO (0-1000 ppm) and O_2 (1-15%) within the convective pass of the boiler (480-815°C) to provide feedback for burner balancing and optimization. Successful creation of such sensor systems will dramatically alter how boilers are operated, since much of the emissions creation and other boiler problems occur at local zone conditions rather than at the macro boiler level.

PRINCIPAL CONTACT

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TEAM MEMBERS

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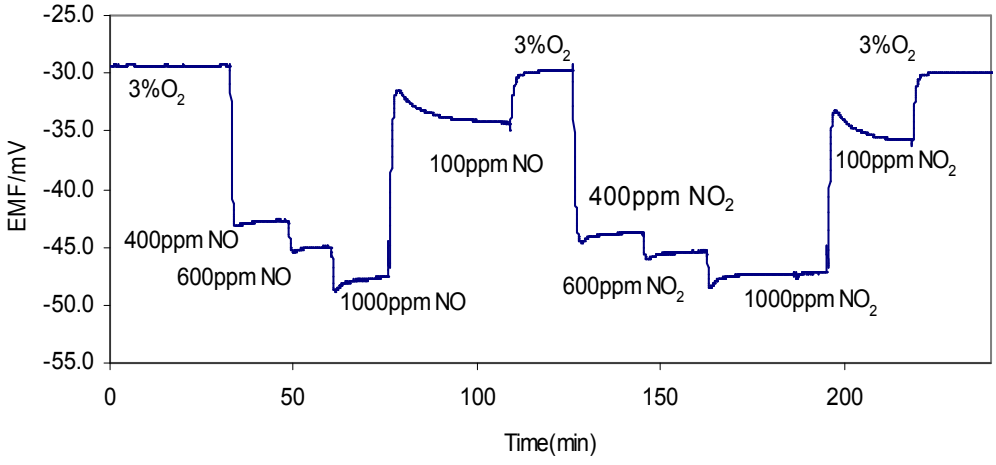
FUNDING FOR 2003-2004

$204,603.00

Transient Response for NO and NO_2 Sensor at 500°C, Filter at 600°C



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Development and Application of Gas Sensing Technologies to Enable Boiler Balancing

PARTICIPANTS

The Ohio State University
Department of Chemistry

GE - Reuter-Stokes

LOCATIONS

The Ohio State University
Department of Chemistry
Columbus, OH

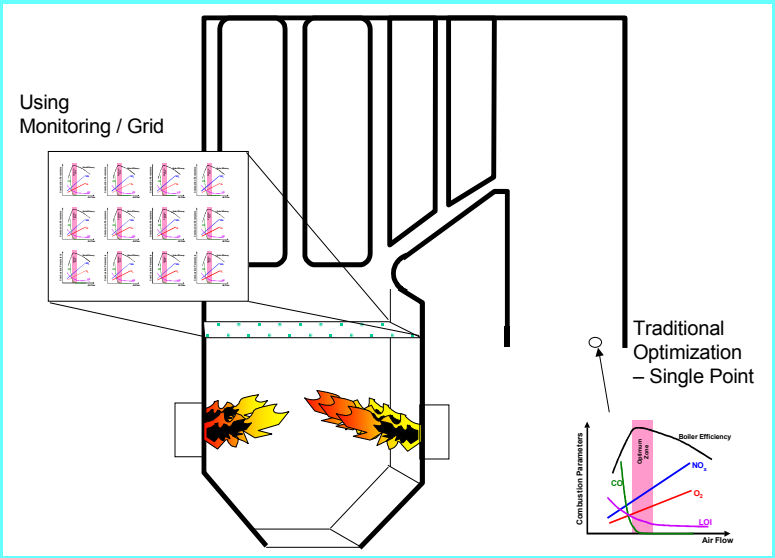
GE - Reuter-Stokes
Cleveland, OH

ESTIMATED PROJECT DURACTION

36-48 Months

The local state of the combustion will be determined by measuring O_2, CO and NO_x at a single point. This provides a measure of the completeness of combustion as well as the main controllable pollutant (NO_x) in the combustion. Sensor systems with sub-second response times should allow integration into neural nets and other controlling algorithms.

The real-time profiles of combustion parameters across the boiler will provide the operator with knowledge of the boiler's response characteristics to individual burner, air fuel, and other control settings.



GE Approach : Macro to Micro View on Combustion Optimization

CISM Center for Intelligent Sensors and Measurements
A National Science Foundation Center

THE OHIO STATE UNIVERSITY