PROJECT facts

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

Advanced Research

09/2004

DEVELOPMENT AND APPLICATION OF GAS SENSING TECHNOLOGIES TO ENABLE BOILER BALANCING

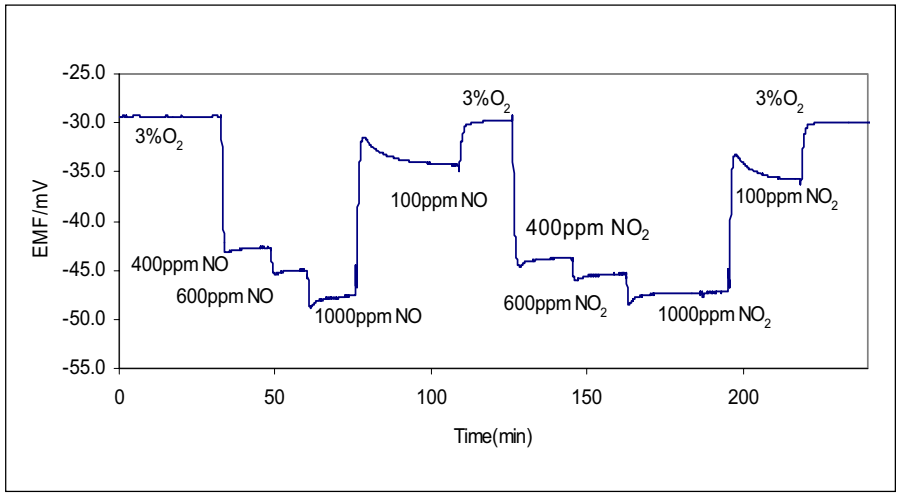
CONTACTS

Robert R. Romanosky
Advanced Research Technology Manager
National Energy Technology Laboratory
P.O. Box 880
Morgantown, WV 26507
304-285-4721
robert.romanosky@netl.doe.gov

Richard Dunst
Project Manager
National Energy Technology Laboratory
PO Box 10940
626 Cochrans Mill Road
Pittsburgh, PA 15236
412-386-6694
richard.dunst@netl.doe.gov

Description

The Center for Industrial Sensors and Measurements (CISM) at The Ohio State University and GE Reuter-Stokes (GERS), a part of GE Power 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 hot zones of the burner (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 boiler problems occur at local zone conditions rather than at the macro boiler level.



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

PARTICIPANT / PRINCIPAL INVESTIGATOR

Dr. Prabir K. Dutta
Professor of Chemistry
Department of Chemistry
The Ohio State University Research Foundation
1960 Kenny Road
Columbus, OH 43210
614-292-4532
614-688-5402 fax
dutta@chemistry.ohio-state.edu

TEAM MEMBERS

Dr. Sheikh A. Akbar
The Ohio State University
Department of Chemistry
Columbus, OH

Dr. Henk Verweij
The Ohio State University
Department of Chemistry
Columbus, OH

Dr. Carl Palmer
General Electric-Reuter Stokes
Cleveland, OH

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$204,603.00

PROJECT DURATION

36-48 Months

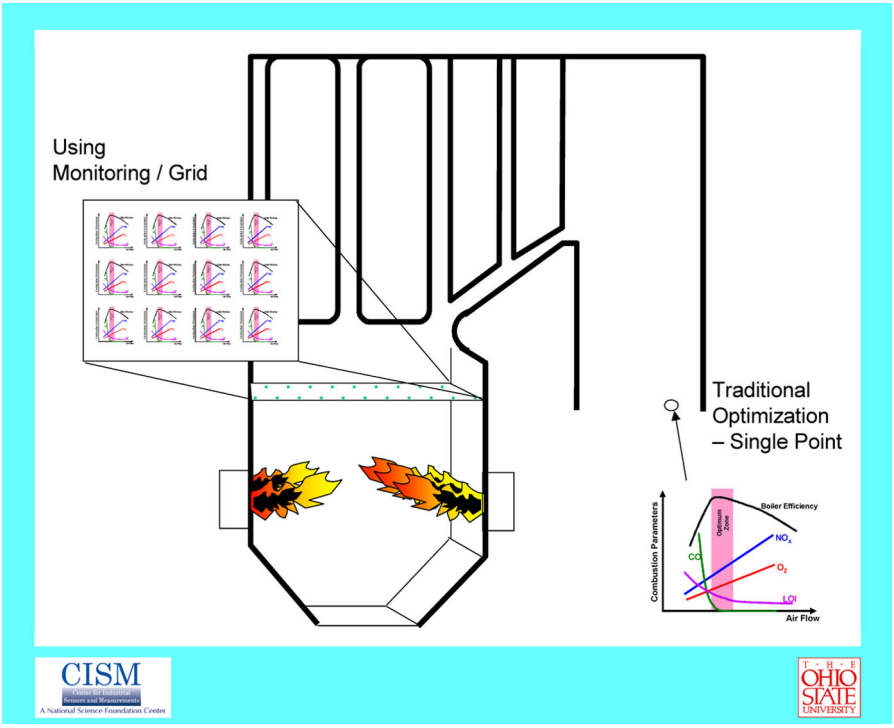
WEBSITES

www.netl.doe.gov/coal

The local state of the combustion will be determined by measuring O_2, CO and NO_X. These gases provide a measure of the completeness of combustion as well as the main controllable pollutant (NO_X) in the combustion.

Sensor systems with subsecond 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