SENSORS & CONTROLS

Technologies to Improve Efficiency, Availability, and Reliability of Existing Coal-Fired Power Plants

OBJECTIVES

Develop sensors and controls technologies that will enable higher efficiency, improved availability, increased reliability, lower electricity costs, and ability to respond to load cycling.

Demonstrate the ability to realize the improvements to existing power plants through cost-effective efficiency and reliability research and development.

Opto Knowledge · EPRI · FERCo · University of California Irvine · West Virginia University · Los Alamos National Laboratory · KWJ Engineering · Longview Power · The University of Utah · PacifiCorp · sparkcognition · Southern Company · EPRI

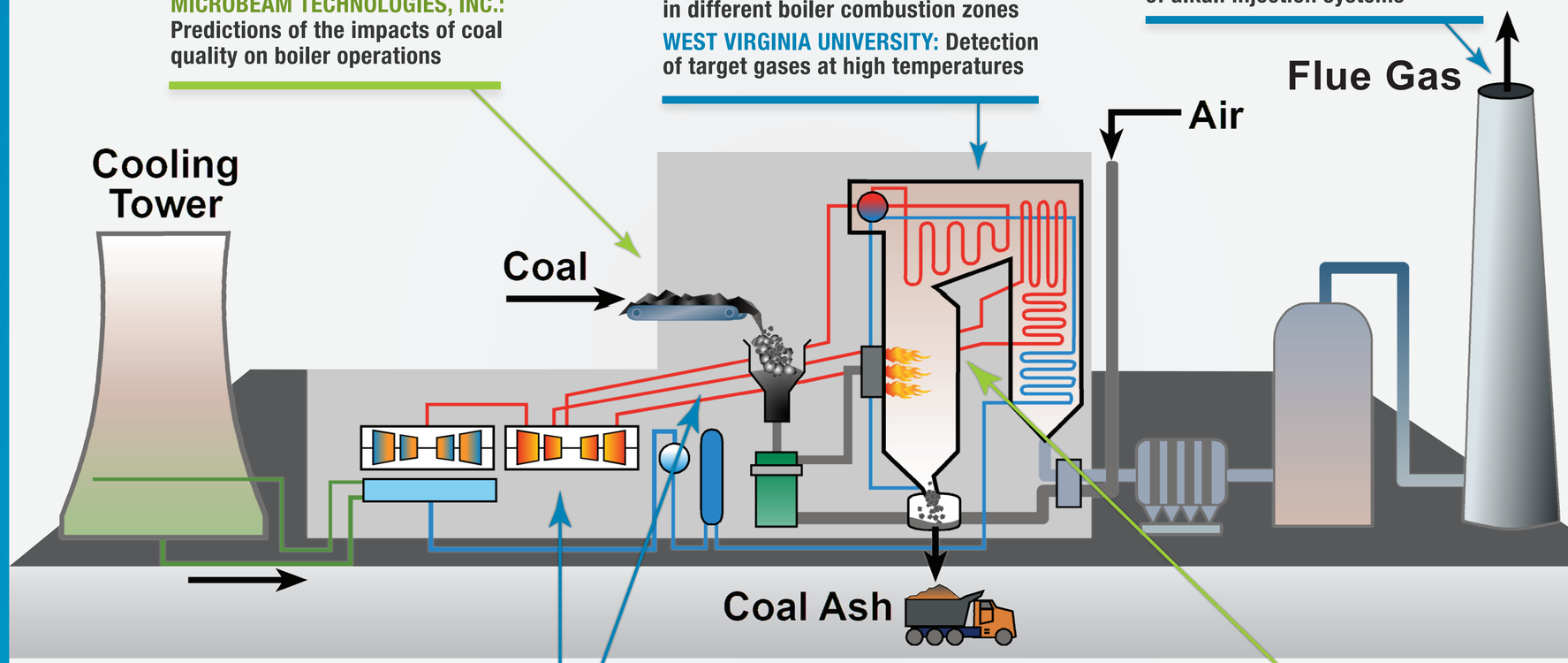
West Virginia University · Longview Power · Aspinity · The University of Maine · Environetix · ERC · Duke Energy · Microbeam Technologies, Inc. · UND University of North Dakota · Otter Tail Power Company · North American Coal Corporation · Great River Energy

MICROBEAM TECHNOLOGIES, INC.: Predictions of the impacts of coal quality on boiler operations

UNIVERSITY OF UTAH: Real-time measurement of temperature profiles in different boiler combustion zones

WEST VIRGINIA UNIVERSITY: Detection of target gases at high temperatures

OPTO-KNOWLEDGE SYSTEM, INC.: SO_3 monitoring for optimal control of alkali injection systems



SPARKCOGNITION: Machine-learning algorithms to detect and diagnose premature equipment failure

UNIVERSITY OF MAINE: Wireless harsh-environment sensor technology

WEST VIRGINIA UNIVERSITY: Electrochemical high-temperature corrosion sensor

Develop Sensors and Controls Technologies to Improve Power Plants

- **TITLE:** ImPOWER—Improvements to Coal Combustion Power Plants
- **PERFORMERS:** University of Utah, West Virginia University, SparkCognition, and Opto-Knowledge Systems, Inc.
- **TOTAL AWARD VALUE ACROSS ALL PROJECTS:** $2,592,152
- **SUMMARY:** Laser Sensor for Continuous SO_3 Monitoring, Artificial Intelligence Techniques, Ultrasonic Measurements of Temperature Profile and Heat Fluxes, High-Temperature Gas Sensor for Coal Combustion System

Demonstrate Power Plant Improvement through R&D

- **TITLE:** Advanced Combustion Coal Power Plant Improvement Technologies
- **PERFORMERS:** Microbeam Technologies, Inc., University of Maine, and West Virginia University
- **TOTAL AWARD VALUE ACROSS ALL PROJECTS:** $6,003,602
- **SUMMARY:** Integrated, Predictive and Condition-Based Monitoring Tools; Wireless Harsh-Environment Sensors for Improved Condition-Based Monitoring

Accomplishments

- √ Host power plant sites for demonstration have been identified
- √ Initial negotiations have been completed
- √ Technical scope and milestones have been established
- √ Project kick-offs coming soon

Technology Managers – Briggs White
John Rockey
Team Supervisor – Patricia Rawls

U.S. DEPARTMENT OF ENERGY | NETL NATIONAL ENERGY TECHNOLOGY LABORATORY