National Center for Advanced Combustion Engineering Research

Mission

To substantially improve the current combustion technologies needed to maximize the conversion of fuel values from low-cost, low-quality fuels in environmentally acceptable ways.

The Center

Burning low-cost domestic fuels, such as coal, shale-oil, and heavy petroleum liquids, increases pollution and complicates the task of reducing acid rain, smog, particulates, and carbon dioxide emissions. Current combustion technologies need substantial improvement to maximize the extraction of fuel values from these low-cost domestic fuels.

Advanced fuel mixture.

To address these problems, engineers and scientists from Brigham Young University and the University of Utah have joined with industry and state and federal governments to create the Advanced Combustion Engineering Research Center (ACERC) under the direction of Professor L. Douglas Smoot, BYU. Research is done principally at Brigham Young University and the University of Utah. Investigators from the University of North Dakota and the University of Kentucky also participate in the research activities.

ACERC OBJECTIVES ARE TO:

- Expand fundamental knowledge of combustion in order to improve related technology and practice.
- Educate students at all levels about ways to increase the all around efficiency of combustion, particularly in chambers fired by readily available, low–cost fuels.
- Transfer developed combustion technology to industry in order to help solve crucial combustion problems in the design and analysis of advanced combustion systems.

INDUSTRIAL COLLABORATION/ TECHNOLOGY TRANSFER

Students and faculty from various disciplines work closely with over 30 industrial, state, and federal organizations on an array of diverse research projects that have substantial practical applications in industry. Qualified ACERC professionals play key roles in software management, technology transfer, and industrial relations, and the creation of comprehensive computerized models for controlling combustion.

Center Research

- Understand mechanisms of fossil–fuel combustion and pollutant and soot formation.
- Understand the relationship between fuel properties and conversion.
- Develop robust, reliable computer models to control and record the performance of particular combustion chambers.
- Apply non–intrusive diagnostics for complex combustion systems.

ACERC RESEARCH PROJECTS ARE FOCUSED IN SIX AREAS:

- Fuel structure and reaction mechanisms.
- Pollutant formation/control and waste incineration.
- Fuel minerals, fouling, and slagging.
- Turbulent reacting fluid mechanisms and heat transfer.
- Comprehensive combustion model development.
- Model evaluation data and process strategies.

Each of the six research thrust areas has an active working group of ACERC researchers and national and international authorities, primarily from industry, who help identify research needs. At any one time, more than 150 ACERC participants (including faculty, professionals, and students) conduct about 35 coordinated research projects.

For more information please contact:

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