Regents of the University of California, DE-FC26-05NT42652
(University of California Irvine, UCI)

FACT SHEET

I. PROJECT PARTICIPANTS

A. Prime Participant: UCI, 300 University Tower, Irvine, CA 92697-7600

B. Sub-Award Participants: None

II. PROJECT DESCRIPTION

A. Objectives.

Characterize advanced Brayton Cycles for coal derived fuels to be candidates for executing conceptual designs (systems studies). Develop conceptual plant designs for near term technologies followed by conceptual designs that integrate advanced technologies. In these studies identify key variables for purpose of sensitivity analysis used in a quest for establishing optimal cycles. Some examples of variables are firing temperature, pressure ratio, combustion techniques, inter-cooling, fuel or combustion air augmentation, enhanced blade cooling schemes.

Relevancy. The system studies will provide important insights for designing advanced coal based near zero emission H2 coproducing systems and while achieving a competitive cost of electricity.

B. Period of Performance; 10/01/05 thru 9/30/07

Project Summary.

Conceptual Design Methodology The systems study methodology or procedure will explain the rationale for choosing plant size, arranging and interconnecting major equipment items and plant units, for executing materials and energy balances, for labeling streams, indicting stream compositions and conditions, for setting major equipment specifications, and defining unique plant units.

Plant Conceptual Designs In the first year two IGCC plant designs will begin. The first design will completed in FY 2006 and will represent a reference case consisting of an “H technology” steam cooled gas turbine based near zero emission IGCC plant. Pittsburgh No. 8 coal will be gasified in GE type slurry fed high pressure total quench gasifiers followed by sour gas shifting and Selexol acid gas removal units. The 2nd case will examine the implication of advanced compression impacts.

Turbine/Fuel Cell Hybrid Plant. In parallel to the more traditional approaches to developing an IGCC plant design, with Fuel Cell Program funding UCI is developing, in parallel, a Turbine-Fuel Cell IGCC plant design. The design will be refined based on dynamic modeling of the turbine and fuel cell interface initially defined by the first steady state plant design.

Subsequent Cases – Screening Study To assist NETL in deciding the most important subsequent systems studies to execute, UCI is preparing a Screening Study that will lay out alternatives to be considered. Planned delivery of the Study is fourth quarter FY06.

Summary. UCI will document the rationale for choices made in configuring the plants. Using the literature and turbine industry sources, UCI will explain particular Brayton cycle improvements anticipated. UCI will follow the best available engineering standards for executing and documenting this series of systems studies to among other things, make it as easy as practical for third parties to validate this important body of work. UCI hopes that this body of work will be useful to decision makers who have the onerous task of a future low or zero emissions coal based power generation infrastructure.

III. PROJECT COSTS $703K DOE, $182.7K Share, $885.7K Total

IV. MAJOR ACCOMPLISHMENTS SINCE BEGINNING OF PROJECT (None)

V. MAJOR ACTIVITIES PLANNED

- Complete Reference Case (07/06))
- Complete Screening Study (09/06)
- Complete Case for Advanced Compression (09/06)
- Complete Subsequent Cases (TBD)

VI. ISSUES None

VII. ATTACHMENTS – None.