

Development and Field Trial of an Advanced Indirect Heating System for Metal heat Treating Applications.

Through this project, the partnering team is jointly proposing to finalize development and demonstration of a novel industrial indirect heating concept at the Ohio-based heat treating facility. This technology will provide energy, environmental and economic benefits to the end-user in ferrous heat treating applications.

Total project cost: \$764,780

Funding request: \$342,080

Project Lead: Ohio Department of Development

Project Participants: GTI Sustaining Membership Program, Akron Steel Treating Company, North American Manufacturing Company, University of Texas at Austin, Energy Solutions Center.

Start Date: June 1, 2006

End Date: December 1, 2007

Presentations/Publications

A draft Joint Press release (GTI and NAMCO) was approved by all partners in re this project and another project related to the RASERT technology, sponsored by the California Energy Commission.

Patents

None.

Progress in Past Quarter and Current Status

Activities performed during the reporting period

Weekly and bi-weekly conference calls between GTI, NAMCO and UTX were held to review modeling results and related project matters.

- Task 1 work was continued
- Task 2 work was initiated

Task 1: Optimization and Finalization of the AIHS (RASERT)

- a. Engineer and fabricate a pre-prototype AIHS
- b. Install the AIHS in GTI's full-scale heat treat furnace
- c. Test and evaluate AIHS performance
- d. Further modify and retest until design is finalized

Current Milestone and Status related to Task 1- (a.) A computer model of the prototype RASERT as a baseline; and nine additional model runs have been made. One change in an internal element of the burner has been identified for certain implementation, and two others may be implemented pending further analysis (See Attachment 1.) The selected changes will be implemented in a single modified design. (b.) GTI's full-scale heat treat furnace is being prepared for testing the RASERT; this requires thermocouple preparation and verification of the flow meters, and emissions analyzers. (c.) A test matrix has been prepared that will compare GTI's physical test results with analytical results from the RASERT model (See Attachment 1.).

Task 2: Field Trial

- a. Host site to determine field trial specifications
- b. Install on-site instrumentation package to record baseline data
- c. Fabricated prototype AIH Systems (estimate: 4 to 6)
- d. Remove existing radiant tubes and retrofit with AIH Systems
- e. Monitor heat treating operation and accumulate necessary data

f. Evaluate results and prepare a final draft technical report

Current Milestone and Status related to Task 2-(a.) Akron Steel Treating identified their typical operating temperature and types of loads. Five ‘recipes’ that accurately represent Akron Steel Treating’s typical furnace loads will be monitored for performance comparing the current metrics (baseline) with metrics after the RASERTs are retrofitted. Furnace drawings have also been provided to GTI and NAMCO so that the retrofit equipment may be properly sized. (b.) A natural gas meter (supplied by the Dominion gas company) for baseline natural gas use has been installed; information is currently being collected by Akron Steel Treating personnel.

Plans for Next Quarter:

For Task 1: A Joint Press release will be issued; The RASERT prototype will be installed in GTI’s full-scale heat treat furnace, and the first cycle of testing and analysis is projected to be completed. For Task 2: Baseline data collection will continue, and the design of the components of the furnace retrofit that do not depend on the RASERT design modifications will be initiated.