LA-CRADA-98-3

Title: Thermoacoustic co-generation unit

Author(s): Greg W. Swift
MST-10, LANL

John Corey
CFIC
302 Tenth St.
Troy, NY 12180

Submitted as: CRADA LA96C10291
Final Report
December 9, 1997

RECEIVED
OCT 05 1998
OSTI

1st MASTER

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

Los Alamos

NATIONAL LABORATORY

Los Alamos National Laboratory, an affirmative action/equal opportunity employer, is operated by the University of California for the U.S. Department of Energy under contract W-7405-ENG-36. This report documents the technical results of work performed under a DOE-sponsored Cooperative Research and Development Agreement (CRADA) between Los Alamos National Laboratory and its industry partner(s).

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

**Portions of this document may be illegible
in electronic image products. Images are
produced from the best available original
document.**

FINAL ABSTRACT

CRADA TITLE: Thermoacoustic co-generation unit

CRADA NUMBER: LA96C10291

The combination of a thermoacoustic engine with a STAR alternator promises to comprise a simple, reliable combustion-powered electric generator. In this CRADA, we married these two technologies for the first time, to learn what technical issues arise in the combination. The results are encouraging, but the work is not yet complete.

**Thermoacoustic co-generation unit
Final Report
CRADA NUMBER: LA96C10291**

A. Parties

The project is a relationship between LANL, P.O. Box 1663, Los Alamos NM 87545 and CFIC, 302 Tenth St., Troy NY 12180.

B. Project Scope

The combination of a thermoacoustic engine with a STAR alternator promised to comprise a simple, reliable combustion-powered electric generator. In this CRADA, we married these two technologies for the first time, to learn what technical issues arise in the combination. The results are encouraging.

The CRADA was supposed to comprise 4 tasks: feasibility proof, system definition, component development, and prototype iteration. Difficulties encountered in the first task delayed subsequent tasks, so that the 3rd and 4th tasks were not completed on time. Hence, we are entering a second CRADA to complete these final tasks.

C. Technical

Feasibility proof: An existing LANL thermoacoustic engine was combined with an existing CFIC alternator at CFIC's site in Troy, as planned. LANL personnel assisted in testing at Troy, as planned. Most of the interface issues turned out well, but seal leakage around the piston between the engine and the alternator was found to be a much more serious issue than anticipated.

System definition: As planned, CFIC developed market knowledge in order to define the system specifications for a mature system. Going beyond what was planned for this task, CFIC also obtained a financial commitment from a larger company for the development of the mature system.

Component development: Debugging the seal leakage problem encountered in task 1 entailed unplanned, extensive hardware modifications and testing. As of the end of the CRADA, the resolution of the problem was not yet experimentally demonstrated, but two promising candidate methods had been identified.

Prototype iteration: Design of the mature system is nearly complete, but we have not built it.

D. Partner contributions

Progress on this project has been almost entirely due to "partner contributions," as planned.

No "subject inventions" have been created during the CRADA.

E. Documents/Reference List

No reports have been written. No patents are in progress or pending. No subject inventions have occurred. CFIC continues to negotiate toward? a developmental license for some of LANL background patents, but there is no need to complete these negotiations promptly.

F. Acknowledgment

Industrial Partner's signature on the final report indicates the following:

- 1) The Participant has reviewed the final report and concurs with the statements made therein;
- 2) The Participant agrees that any modifications or changes from the initial proposal were discussed and agreed to during the term of the project;
- 3) The Participant certifies that all reports either completed or in process are listed and all subject inventions and the associated intellectual property protection measures attributable to the project have been disclosed;
- 4) The Participant certifies that proprietary information has been returned or destroyed by LANL.

John Corey 1 DEC 97
John Corey, CFIC Date

Greg Swift 11-24-97
Greg Swift, LANL Date