GA-C23333

DIRECT ENERGY CONVERSION FISSION REACTOR

**for the period
July 1, 2002 through September 30, 2002**

**by
L.C. BROWN**

**Prepared under
Nuclear Energy Research Initiative (NERI)
Program. DE-FG03-99SF21893
for the U.S. Department of Energy**

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**GENERAL ATOMICS PROJECT 30052
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Direct Energy Conversion Fission Reactor

**Nuclear Energy Research Initiative (NERI)
Program DE-FG03-99SF21893
Technical Progress Report
July 1, 2002 through September 30, 2002**

Highlights

- An extension of the project through December 2002 was requested by the lead laboratory, Sandia National Laboratories.

Introduction

Direct energy conversion is the only potential means for producing electrical energy from a fission reactor without the Carnot efficiency limitations. This project was undertaken by Sandia National Laboratories, Los Alamos National Laboratories, The University of Florida, Texas A&M University and General Atomics to explore the possibilities of direct energy conversion. Other means of producing electrical energy from a fission reactor, without any moving parts, are also within the statement of proposed work. This report documents the efforts of General Atomics. Sandia National Laboratories, the lead laboratory, provides overall project reporting and documentation.

Current Quarter Accomplishments

Magnetically Insulated Fission Electric Cell Reactor

No work was done on the Magnetically Insulated Fission Electric Cell Reactor during this period.

Fission Fragment Magnetic Collimator Reactor

No work was done on the Fission Fragment Magnetic Collimator Reactor during this period.

Vapor Core Reactor

No work was done on the Vapor Core Reactor during this period.

Planned Next Quarter Activities

The final report is all that remains unless any other tasks are assigned by Sandia.

Schedules and Budgets

The overall project is behind schedule, as previously reported by Sandia. An extension of the project through December 2002 was requested by the lead laboratory, Sandia. Status of all tasks of the combined project schedule is indicated in Table 1 and Fig. 1.

Expenditures to date and projected expenditures for the rest of Phase 2 are given in Fig. 2.

Table 1. Summary of NERI Tasks – Phases 1-3

Identification Number	Milestone/ Task Description	Planned Completion Date	Actual Completion Date	Comments
1A(i).	Preliminary critical review of previous work	Jan 2000	Jan 2000	Work completed
1A(ii).	Review foreign literature	Nov 2000	N/A	Task abandoned due to classification issues
1B.	Identify opportunities for improvement	Mar 2000	Mar 2000	Work completed
1C.	Develop new/alternate concepts	May 2000	May 2000	Work completed
1D.	Characterize/compare alternate concepts	Jun 2000	July 2000	Work completed
1E.	Screen to 3 promising concepts	Jul 2000	Sept 2000	Work completed
1F.	Final (annual) Report for Task 1	Nov 2000	Nov 2000	Work completed
2A.	Identify and develop 3 concepts	Apr 2001	Apr 2001	Work completed
2B(i).	Identify critical technology issues	May 2001	Apr 2002	Work completed
2B(ii).	Define key experiments	Jun 2001	Apr 2002	Work completed
2C.	Compare and assess conceptual designs	Jun 2001	Nov 2001	Work completed
2D.	Prioritize concepts	Aug 2001	Nov 2001	Work completed
2E.	Final (annual) Report for Task 2	Oct 2001	Jan 2002	Work completed
3A.	Preliminary design of most promising concept	Mar 2002	Apr 2002	Work completed
3B.	Analyze technical performance	Jul 2002		Initiated 11/01
3C.	Analyze economic performance	Jul 2002		Initiated 11/01
3D.	Identify manufacturability issues	Jun 2002		Initiated 4/02
3E.	Perform selected experiments	Sep 2002		Delayed indefinitely (new NERI proposal submitted)
3F.	Complete Phase 3 and project	Dec 2002		Phase 3
3F'.	Final Report for Phase 3 and project	Jan 2003		Phase 3

Fig. 1. Project Schedule.

Fig.2. Spending profile.