GA-A23811

GT-MHR COMMERCIALIZATION STUDY

Technical Progress and Cost Management Report for the Period
September 1 through September 30, 2003

by
GT-MHR Staff

Contact: A. S. Shenoy

Prepared under
Oakland Operations Office
Program DE-AC03-01SF22343
for the U.S. Department of Energy

General Atomics Project No. 30103
DATE PUBLISHED: October 2003

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.

GA-A23811

GT-MHR COMMERCIALIZATION STUDY

Technical Progress and Cost Management Report for the Period
September 1 through September 30, 2003

by
GT-MHR Staff

Contact: A. S. Shenoy

Prepared under
Oakland Operations Office
Program DE-AC03-01SF22343
for the U.S. Department of Energy

GENERAL ATOMICS PROJECT No. 30103
DATE PUBLISHED: October 2003

Table of Contents

	<u>Page</u>
Part1 - Technical Progress	1
Summary	1
Task 1 - Fuel Irradiation	1
Task 2 - Fuel Manufacturing Process Improvement	1
Task 3 - NRC Interaction	1
Task 4 - Plant Cost Evaluation	2
Task 5 - Waste Disposal Assessment	2
Task 6 - Final Report and Recommendations for Further Development Activities	2
Task 7 – DOE Fuel Plan	2
Task 8 – MHR-2 Fuel Specification	2
Task 10 – Advanced Fuel Plan	2
Task 11 – VHTR Materials Survey	2
Part 2 - Cost Management	3

**GT-MHR Commercialization Study
Monthly Technical Progress and Cost Management Report
for September 2003**

Contract No. DE-AC03-01SF22343
Submitted to: DOE - Oakland Operations Office
By: General Atomics

PART 1 – Technical Progress

Summary

- Efforts are in process with GA Contracts and DOE-ID Contracts to set up a new I-NERI contract for CY-2004 and beyond for this test. A decision has not yet been made by DOE-ID concerning if this new contract can be sole-sourced to GA.
- Work continued on preparation for comparative nuclear analyses of cores containing coated particles with TRISO (IPyC/SiC/OPyC) coatings and TRIZO (IPyC/ZrC/OPyC) coatings. Comparison of the nuclear characteristics for 600 MW (th) cores using these two fuels will determine the impact on the core nuclear design of using coated particles where ZrC has been substituted for the SiC layer in TRISO coatings and set an upper bound for the other fuel particle designs where ZrC is used.

Task 1 – Fuel Irradiation

Efforts are in process working with GA Contracts (Howard Burdick) and DOE-ID Contracts (K Osborne of DOE-ID) to set up a new I-NERI contract for CY-2004 and beyond for this test. This course of action was suggested by Ms Schuppner, the DOE-HQ I-NERI administrator. A new Statement of Work has been drafted and sent to GA Contracts. A decision has not yet been made by DOE-ID concerning this new contract being sole-sourced to GA.

Task 2 – Fuel Manufacturing Process Improvement

This task has been completed.

Task 3 – NRC Interaction

This task is not currently funded.

Task 4 – Plant Cost Evaluation

This task has been completed.

Task 5 – Waste Disposal Assessment

This task has been completed.

Task 6 – Project Management and Project Development

This task covers all of the commercialization study project management and project development activities. During September, routine reviews of project activities were performed and the monthly report for August was prepared.

Task 7 – DOE Fuel Plan

This task has been completed.

Task 8 – MHR-2 Fuel Specification

This task has been completed.

Task 9 – This task number not currently used***Task 10 – Advanced Fuel Studies***

Work continued on the setup for the comparative nuclear analyses for cores containing coated particles with normal TRISO (IPyC/SiC/OPyC) coatings and TRIZO (IPyC/ZrC/OPyC) coatings. Comparison of the nuclear characteristics for 600 MW (th) cores using these two fuels will determine the impact on the core nuclear design of using coated particles where ZrC has been substituted for the SiC layer in TRISO coatings and set an upper bound for the other fuel particle designs where ZrC is used.

Because the total absorption cross-section of Zr is higher than that for Si, it is necessary to adjust the core design when the Zr for Si substitution is made. This was done by maintaining the same uranium loading and adjusting the burnable poison loading to achieve equal end of cycle K_{eff} for both cases. Initial results indicate that about 12% less burnable poison is required for the Zr case.

Task 11 – VHTR Materials Survey

This task has been completed.

Part 2 - Cost Management

Item	Total Expenditures, K\$	
	September 2003	Inception to Date ¹ , Totals
Task 1 – MHR-1 Fuel Irradiation	2.9	153.8
Task 2 – Fuel Manufacturing Process Improvement	0.0	204.0
Task 3 – NRC Interaction	0.0	143.8
Task 4 – Plant Cost Evaluation	0.0	87.3
Task 5 – Waste Disposal Assessment	0.0	103.2
Task 6 – Project Management and Development	0.4	141.4
Task 7 – DOE Fuel Plan	0.0	140.6
Task 8 – MHR-2 Fuel Specification	0.8	56.7
Task 10 – Advanced Fuel Plan	14.8	194.1
Task 11 – VHTR Materials Survey	0.1	22.9
Totals	18.1	1,247.8

Note:

1. Work started October 18, 2001.