GA-A23811

GT-MHR COMMERCIALIZATION STUDY

Technical Progress and Cost Management Report for the Period
April 1 through April 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
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Monthly Technical Progress and Cost Management Report
for April 2003

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

PART 1 – Technical Progress

Summary

- Petten is currently working on the HFR-EU2 irradiation test Safety – Design Report and GA is currently working on the Pre-irradiation Data Report. All documentation for the HFR-EU2 test is scheduled for completion in August 2003.

- An initial draft of the MHR-2 Fuel Product Specification was completed and is currently undergoing internal review.

- Drafts were prepared of the text for several of the beginning sections for the Advanced Coated Particle Fuel Development Plan.

Task 1 – Fuel Irradiation

Petten was contacted (Dr. Fuetterer) to obtain an update of the progress being made on the preparations for the HFR-EU2 irradiation test. Petten is currently working on the Safety / Design Report for the EU2 test and irradiation test rig. This report is needed by the Petten Safety committee to allow the irradiation test to be performed.

The EU2 irradiation test is to start in December 2003. The EU1 test (of German & Chinese fuel spheres) is to start in Oct 2003. Another EU1 test, identified as an EU1 bis test, of GLE-4 type German spheres (AVR reload 21, UO2 with 17% U235 enrichment) (no Chinese fuel) will start in July 2003 to provide irradiated fuel spheres for PIE heatup tests at Karlsruhe. As a result of these EU1 irradiation tests, the sweep gas R/B system will have been demonstrated before its use with the EU2 test.

All documentation for the EU2 irradiation test is due in August of 2003. Petten has all the input they need from us on the EU2 fuel irradiation specification. We are currently preparing the EU2 Pre-irradiation Data Report. Dr. Fuetterer was advised the report will be completed and send to him by August. He will send the Safety report on the EU2 test to us when completed. The graphite sleeves for the

EU2 test have not yet been machined.

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 April, routine reviews of project activities were performed and the monthly report for March was prepared.

Task 7 – DOE Fuel Plan

This task has been completed.

Task 8 – MHR-2 Fuel Specification

An initial draft of the MHR-2 Fuel Product Specification was prepared. The specification defines the product requirements applicable to demonstration test capsule fuel samples, the process specifications and characterization methods for the reference fuel and fuel variants. The initial draft is undergoing review by GA fuel experts preparatory to completion of a final draft, which will be submitted for formal review and approval.

Task 9 – This task number not currently used

Task 10 – Advanced Fuel Studies

The scope of this task is to prepare a draft plan for the development of advanced coatings to enable core outlet coolant temperatures above 850 ^{o}C in High Temperature Gas-Cooled Reactors (HTGRs) to expand their commercialization potential and to support GEN IV program objectives. The latter objective

emphasizes the development of advanced fuel systems for Very High Temperature Reactors (VHTRs) with core outlet temperatures of $\geq$1000 ^{o}C for highly efficient electricity production and for process heat applications, including nuclear hydrogen production.

The literature search for advanced, high-temperature fuels was continued and preparation of the text of the Advanced Coated Particle Fuel Development Plan was started. Drafts of the text for several of the beginning sections were completed in rough form.

Task 11 – VHTR Materials Survey

This task has been completed.

Part 2 - Cost Management

Item	Total Expenditures, K$	
	April 2003	**Inception to Date[1], Totals**
Task 1 – MHR-1 Fuel Irradiation	5.3	142.0
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	138.8
Task 7 – DOE Fuel Plan	0.0	140.6
Task 8 – MHR-2 Fuel Specification	4.5	41.6
Task 10 – Advanced Fuel Plan	15.8	82.6
Task 11 – VHTR Materials Survey	0.0	22.8
Totals	**26.0**	**1,106.7**

Note:
1. Work started June 18, 2001.