February 12, 2002

MEMORANDUM TO: Ashok C. Thadani, Director
Office of Nuclear Regulatory Research

FROM: Farouk Eltawila, Director ***/RA/***
Division of Safety Analysis and Regulatory Effectiveness
Office of Nuclear Regulatory Research

SUBJECT: MEETING WITH GENERAL ATOMICS COMPANY, DEPARTMENT OF ENERGY, AND OTHER INTERESTED STAKEHOLDERS REGARDING THE GAS TURBINE MODULAR HELIUM REACTOR

On December 3, 2001, the Nuclear Regulatory Commission (NRC) staff met with representatives of General Atomics Company (GA), the Department of Energy (DOE), and other interested stakeholders to discuss the gas turbine modular helium reactor (GT-MHR) preapplication review initiatives. This was the first formal meeting with GA related to GT-MHR to discuss preapplication activities. Attachment 1 contains the meeting agenda. Attachment 2 contains the attendees. Attachment 3 contains the slides used for the presentations.

Jose Ibarra (NRC) opened the meeting by stating the purpose of the meeting which was to discuss proposed preapplication activities of the GT-MHR, GA expectations of the preapplication activities, and NRC expectations of the preapplication activities. It was important for GA to state its intent and propose a schedule for a pre-application of the GT-MHR so the staff can begin its planning. Opening remarks were provided by Thomas Miller of DOE, Walter Simon of GA, and Thomas King of NRC.

In his opening remarks, Thomas Miller (DOE) provided a brief history of DOE involvement on the modular high-temperature gas-cooled reactor (HTGR) work and the current initiatives that relate generically to the current GA's GT-MHR design. He stated that DOE is committed to work on advanced reactors. Walter Simon (GA) discussed briefly GA's operating and design experience with HTGR and their intent to commercialize the GT-MHR design. He stated that GA intends to familiarize the staff with the new technology and to help support the resolution of any licensing and safety issue. Thomas King (NRC) stated that the NRC wanted to hear GA plans on the preapplication initiatives, especially the proposed schedule. The NRC approach to preapplication review of the GT-MHR is expected to be similar to the approach currently being used for the pebble bed modular reactor (PBMR). The plan for PBMR is described in SECY-01-0070, Plan for Preapplication Activities on the Pebble Bed Modular Reactor.

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The following briefly summarizes each of the subsequent presentations:

GT-MHR Utility Advisory Board (UAB)

Dan Keuter provided an overview of the UAB. UAB is a group of power generators formed to (1) generate industry guidance on the development and deployment of GT-MHR, (2) coordinate their activities with industry to maximize efficiency, and (3) incorporate lessons learned from earlier gas reactor licensing and operational experience into their strategy. UAB is structured to review and evaluate the specific areas of Licensing, Engineering Design, Construction and Operation, Fuels, and Near Term Deployment. Members of UAB include Nuclear Management Company, Dominion, Omaha Public Power District, PSE&G, Constellation, and others. The current UAB membership represents more than 30 percent of the nuclear power industry. Ten universities provide advice to UAB including Massachusetts Institute of Technology, University of California Berkeley, Purdue, and Penn State.

Overview of GT-MHR

Arkal Shenoy (GA) provided an overview of the GT-MHR technology. The GT-MHR current design is expected to have an electrical output of 265 MW(e) per module. Each site would consist of four identical reactor modules located below grade, and each module would include a reactor and it's own power conversion system. The reactor designed includes hexagonal prismatic blocks similar to Fort St. Vrain, TRISO ceramic particle fuel, and redundant reactivity control system.

GA is currently designing a GT-MHR in Russia that uses plutonium fuel in order to dispose of plutonium in surplus weapons. The project is sponsored jointly by the U.S. Department of Energy and Russia's Minatom and supported by Japan and the European Union. The preliminary design is scheduled to be completed by early 2002. The plan is to build a prototype in Russia by 2009 and operate the first 4-module GT-MHR by 2015.

GA intends to utilize the Russian project to facilitate the commercialization of the GT-MHR. The Russian design is similar to the commercial design, although it would use plutonium instead of uranium fuel. GA will also capitalize on its past HTGR operating and design experience. The commercial plant requirements, safety and licensing requirements, and new performance assessment requirements would have to be developed. GA believes it may be possible that the commercial deployment can closely follow the prototype in Russia.

Safety Approach And Preapplication Plan

Laurence Parme (GA) provided an overview of the GT-MHR safety approach, emphasizing the benefits of the design which keeps the radionuclides at the source during all accidents, and minimizes reliance on active and complex engineering systems. GT-MHR utilizes a passive safety design. Additional safety features are described in the Attachment 3 slides.

Laurence Parme (GA) also provided an overview of the GA preapplication plan. GA's preapplication objective is to obtain an assessment of the GT-MHR design and associated safety and licensing approach. Meeting this objective will establish the foundation for the future applications of a combined construction and operating license for the first module followed by a design certification for the GT-MHR plant.

There are five areas that GA needs NRC feedback: (1) programmatic and process topics, (2) licensing approach, (3) technology development of fuel, graphite, and metals, (4) design description, and (5) accident analyses. GA requests that GA and NRC engage in periodic meetings to discuss issues in each of those areas, and proposed a schedule made up of two phases - Preapplication Phase and Application Phase. The Preapplication Phase would begin between January and March 2002, and end by June 2004. The Application Phase would begin around July 2004 when GA would submit a draft Safety Analysis Report to be used as the bases for the application of a combined license application and a design certification for the GT-MHR design. Staff findings would then be used to support a combined license to be issued in June 2007 and the design certification to be issued at an indeterminate date.

NRC Work Status of Generic Gas-Cooled Reactor Issues

Amy Cubbage (NRC) of the Office for Nuclear Reactor Regulation provided the status on generic gas-cooled reactor issues. The issues were raised in the preapplication activities of the pebble bed modular reactor, but could be applicable to the GT-MHR design. The issues are being addressed in two Commission papers:(1) SECY-01-0207, on financial and legal issues (currently before the commission) and (2) PBMR licensing approach currently with the Office of the Executive Director for Operations. The specific issues contained in the Commission Papers were not discussed, however GA was advised to review the two SECYs once they become available.

In conclusion, GA agreed to submit a letter outlining GA's plan and expanding on the meeting presentations including the proposed schedule. This letter is expected to be submitted to the staff by the end of January. (As of the date of this memorandum, this letter has not been received). NRC will subsequently use the letter for planning activities, resources, and schedule, in preparing a SECY for the Commission similar to SECY-01-0070, Plan for Preapplication Activities on the Pebble Bed Modular Reactor.

Attachments: As stated

ADAMS Package # ML020440009

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AGENDA

NRC Meeting with General Atomics and DOE on the GT-MHR
December 3, 2001, 8:30 am – 4:00 pm;
ASLBP Hearing Room T3B45

8:30–8:45 am	Introductory Remarks (J. Ibarra)	NRC
8:45–8:50 am	DOE Opening Remarks (T. Miller)	DOE
8:50–9:00 am	GA Opening Remarks (W. Simon)	GA
9:00–9:15 am	Interest by Potential Applicants (D. Keuter)	UAB
9:15–10:00 am	Overview of GT-MHR (A. Shenoy) • Design Summary	GA
10:00–12:00 pm	Break	
12:00–12:45 pm	Overview of GT-MHR continued (A. Shenoy) • International Program • U.S. Commercialization	GA
12:45–1:00 pm	Questions and Answers	All
1:00–1:15 pm	NRC Work Status on Generic Gas-Cooled Reactor Issues (A. Cubbage)	NRC
1:30–1:45 pm	Break	
1:45–2:00 pm	GT-MHR Safety Approach (L. Parme)	GA
2:00–2:15 pm	Preapplication Plan (L. Parme)	GA
2:15–2:45 pm	Open Discussion/Plan for Next Meeting	NRC/GA
2:45–3:15 pm	Questions and Answers	All
3:15–4:00 pm	Closing Comments	NRC/GA

DOE - Department of Energy
GA - General Atomics Company
GT-MHR - Gas Turbine Modular Helium Reactor
NRC - Nuclear Regulatory Commission
UAB - GT-MHR Utility Advisory Board

Attachment 1