



February 24, 2000  
696-3199

# \_\_\_\_\_ RECD: 3-6  
2 JSM \_\_\_\_\_  
1 LBS \_\_\_\_\_  
3 MMD *mmd*  
4 BCM \_\_\_\_\_  
5 JOT \_\_\_\_\_  
LPP \_\_\_\_\_  
TGF \_\_\_\_\_  
FILE: *General Atomics*  
*file*

Mr. Jeffrey S. Merrifield, Esq.  
Commissioner  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

**Subject: Visit to General Atomics' Site and Gas Turbine-Modular Helium Reactor**

Dear Mr. Merrifield:

It was a pleasure to meet you, Ms. Stauss, and Ms. Doane, during your recent visit to General Atomics' site. We trust you found the site tour interesting and informative; and we hope enjoyable.

As Mr. Blue said at the time, we are very appreciative of the time you spent with us discussing the Gas Turbine-Modular Helium Reactor (GT - MHR) technology. Because of the interest expressed following Mr. Simon's brief presentation, enclosed are three (3) copies of his presentation.

If you should have any questions or would like more information regarding any of GA's activities, please do not hesitate to call me at (858) 455-2823.

Very truly yours,

*Keith E. Asmussen*

Keith E. Asmussen, Ph.D.  
Director, Licensing, Safety and  
Nuclear Compliance

Enclosure: "Presentation on Gas Turbine-Modular Helium Reactor (GT-MHR)"  
by Walter A. Simon

cc: Mr. Linden Blue, Vice Chairman, General Atomics  
Mr. Walter Simon, Senior Vice President, General Atomics

*H-1*

**Presentation  
on  
Gas Turbine-Modular Helium Reactor  
(GT-MHR)**

**By**

**Walter A. Simon  
Senior Vice President  
February 15, 2000**

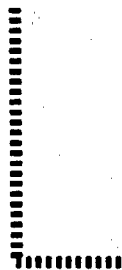
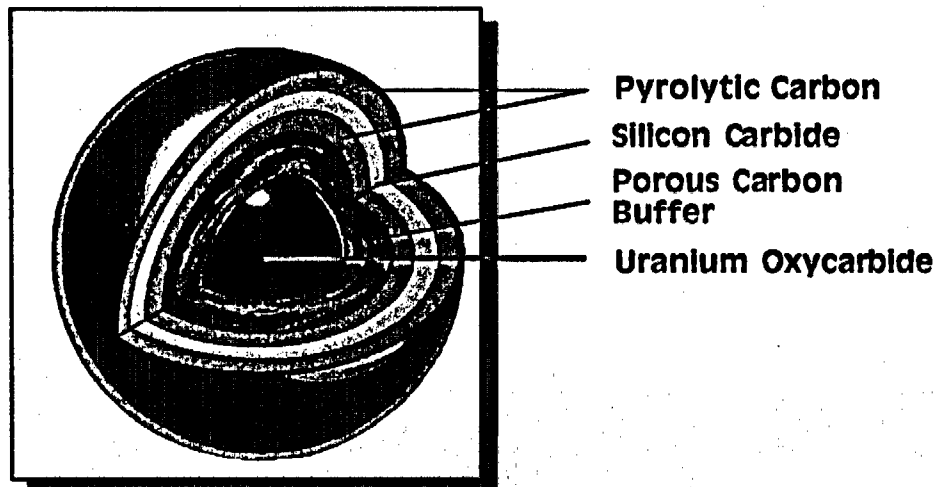


# ***Basic GT-MHR Design Selections***

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- **Coated Particle Fuel**
- **Graphite Core Configuration**
- **Low Power Density**
- **Helium Coolant**
- **Brayton Cycle**

# CERAMIC FUEL RETAINS ITS INTEGRITY UNDER SEVERE ACCIDENT CONDITIONS



**PARTICLES**

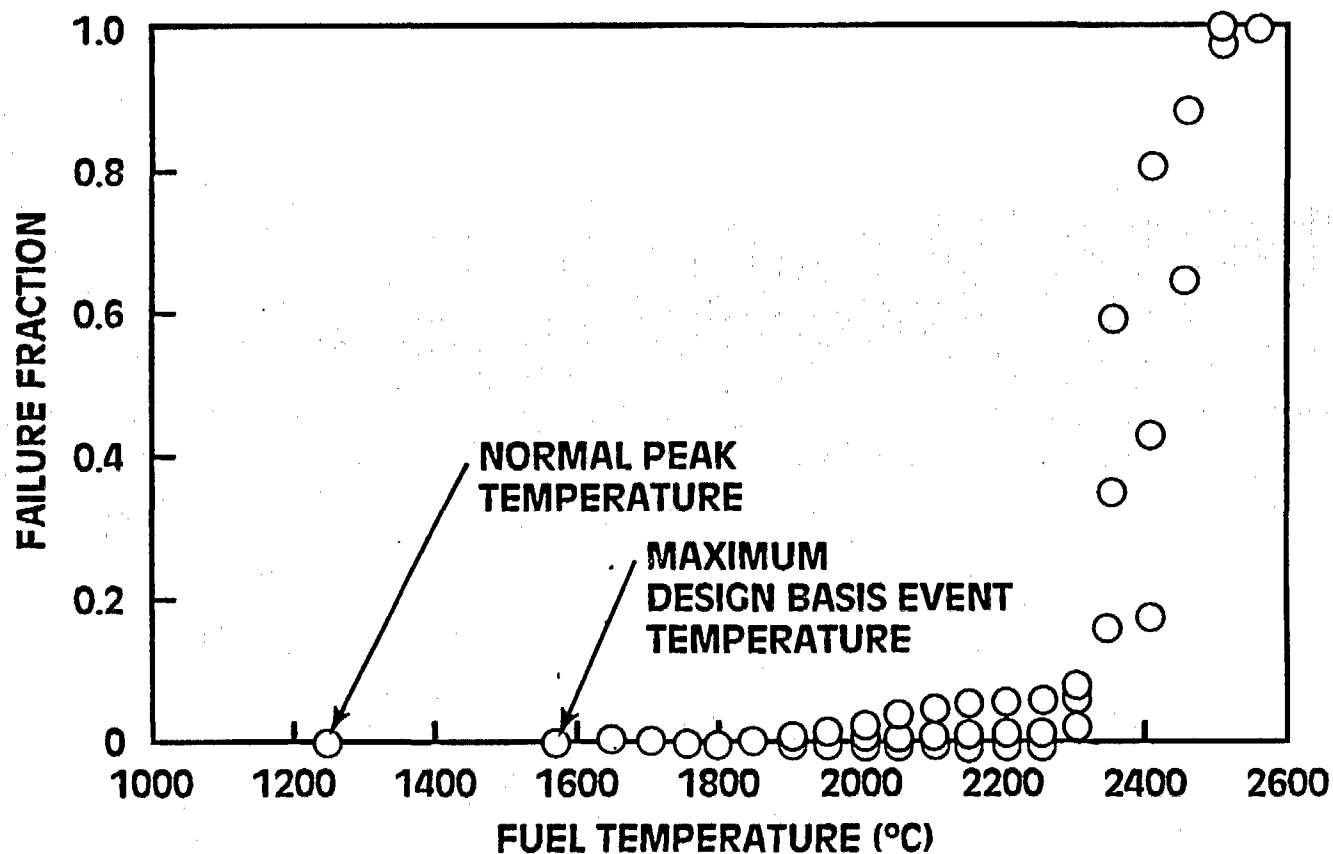


**COMPACTS**

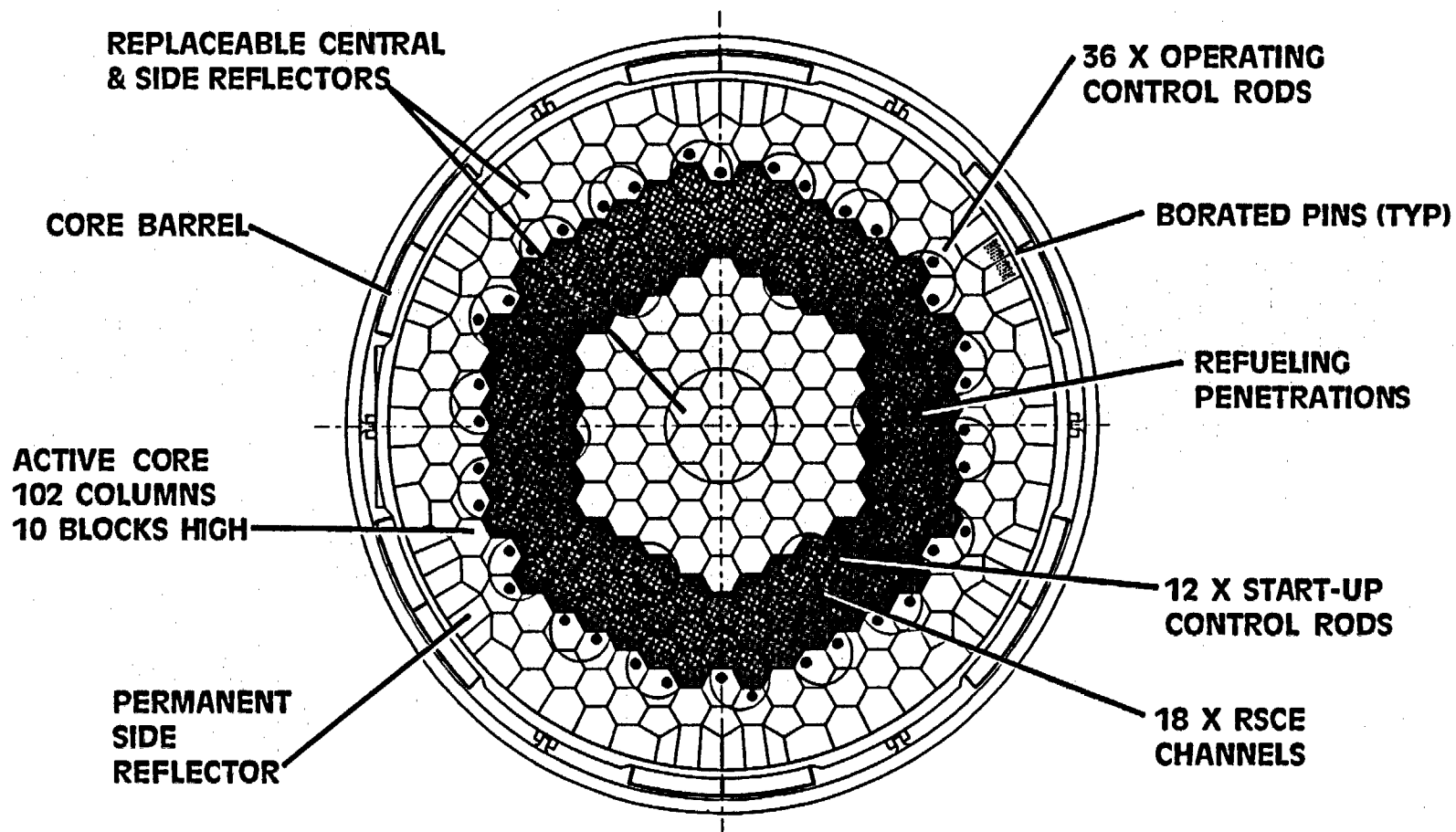


**FUEL ELEMENTS**

# COATED PARTICLES STABLE TO BEYOND MAXIMUM ACCIDENT TEMPERATURES

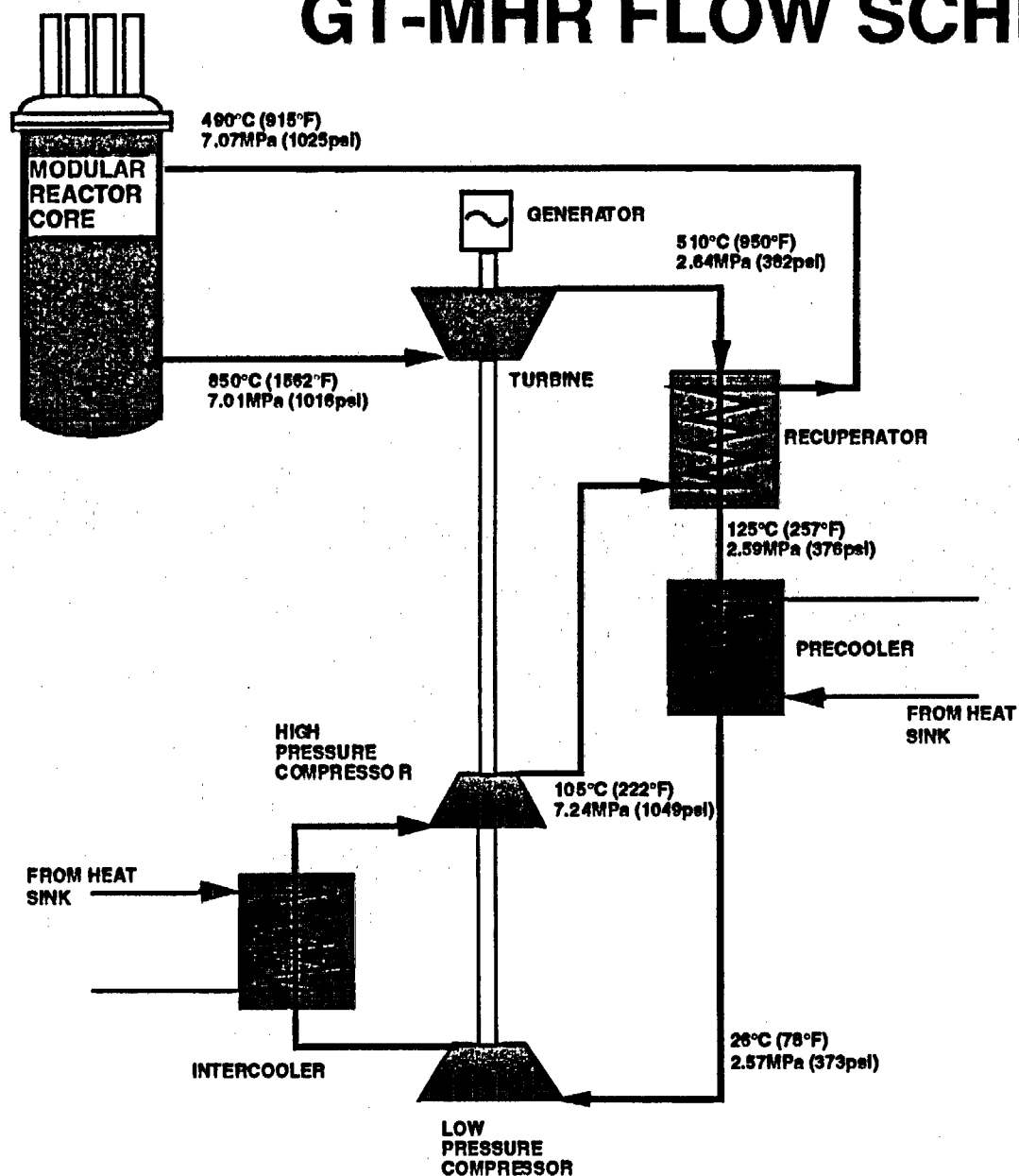


# ANNULAR REACTOR CORE LIMITS FUEL TEMPERATURE DURING ACCIDENTS

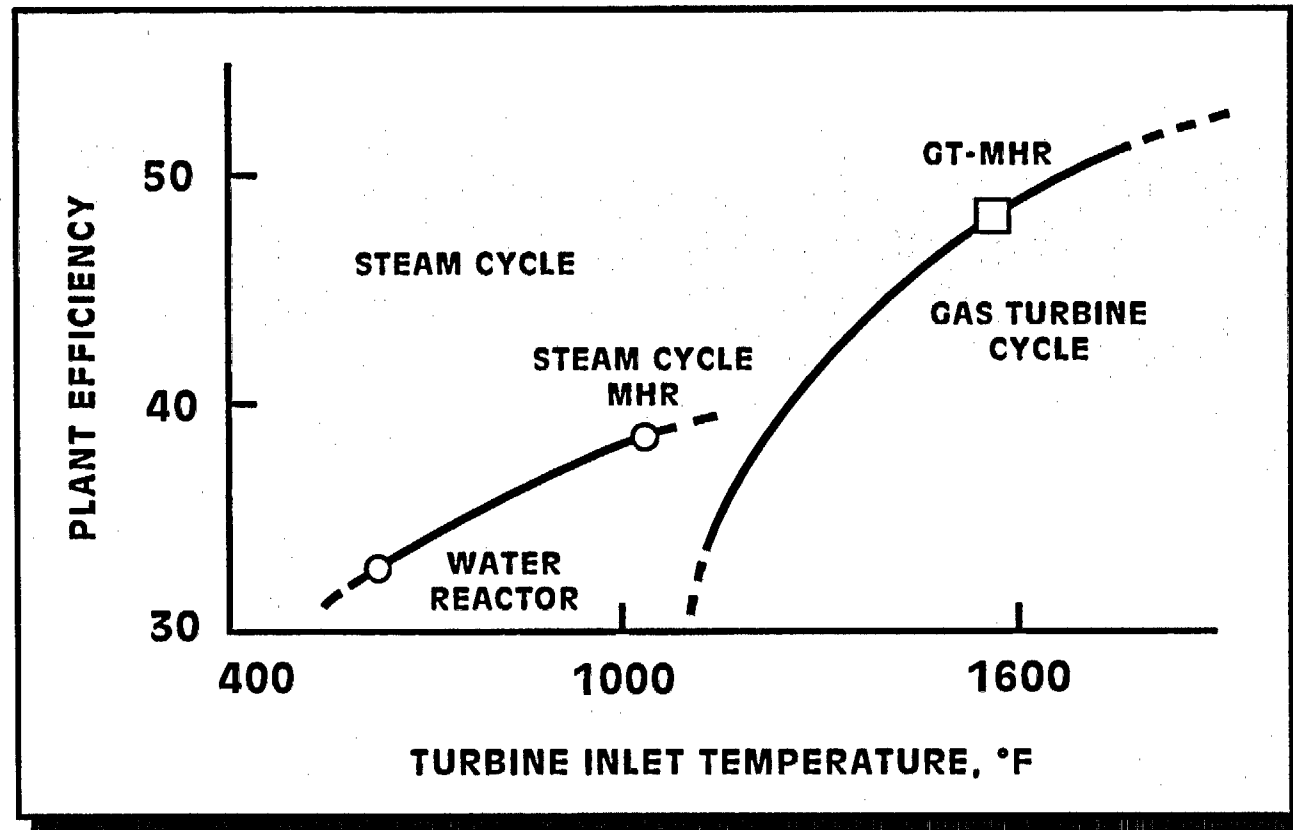


... ANNULAR CORE USES EXISTING TECHNOLOGY

# GT-MHR FLOW SCHEMATIC



# GAS REACTORS HAVE UNIQUE ABILITY TO USE BRAYTON CYCLE



...high temperatures mean high efficiency



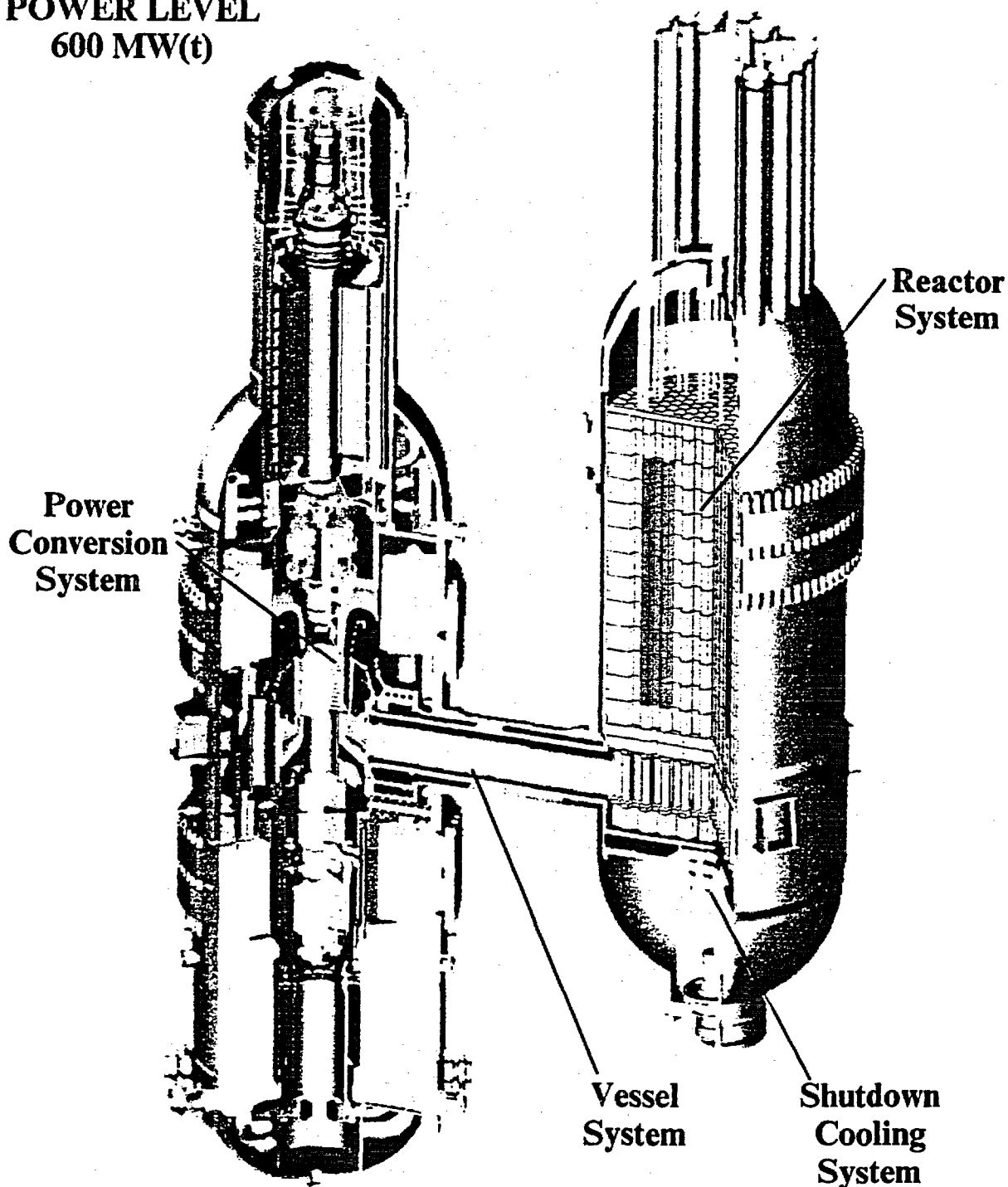
# THE RESULT

- MELTDOWN PROOF REACTOR
- HIGH EFFICIENCY
- PROLIFERATION RESISTANT FUEL CYCLE
- MAJOR ENVIRONMENTAL BENEFITS

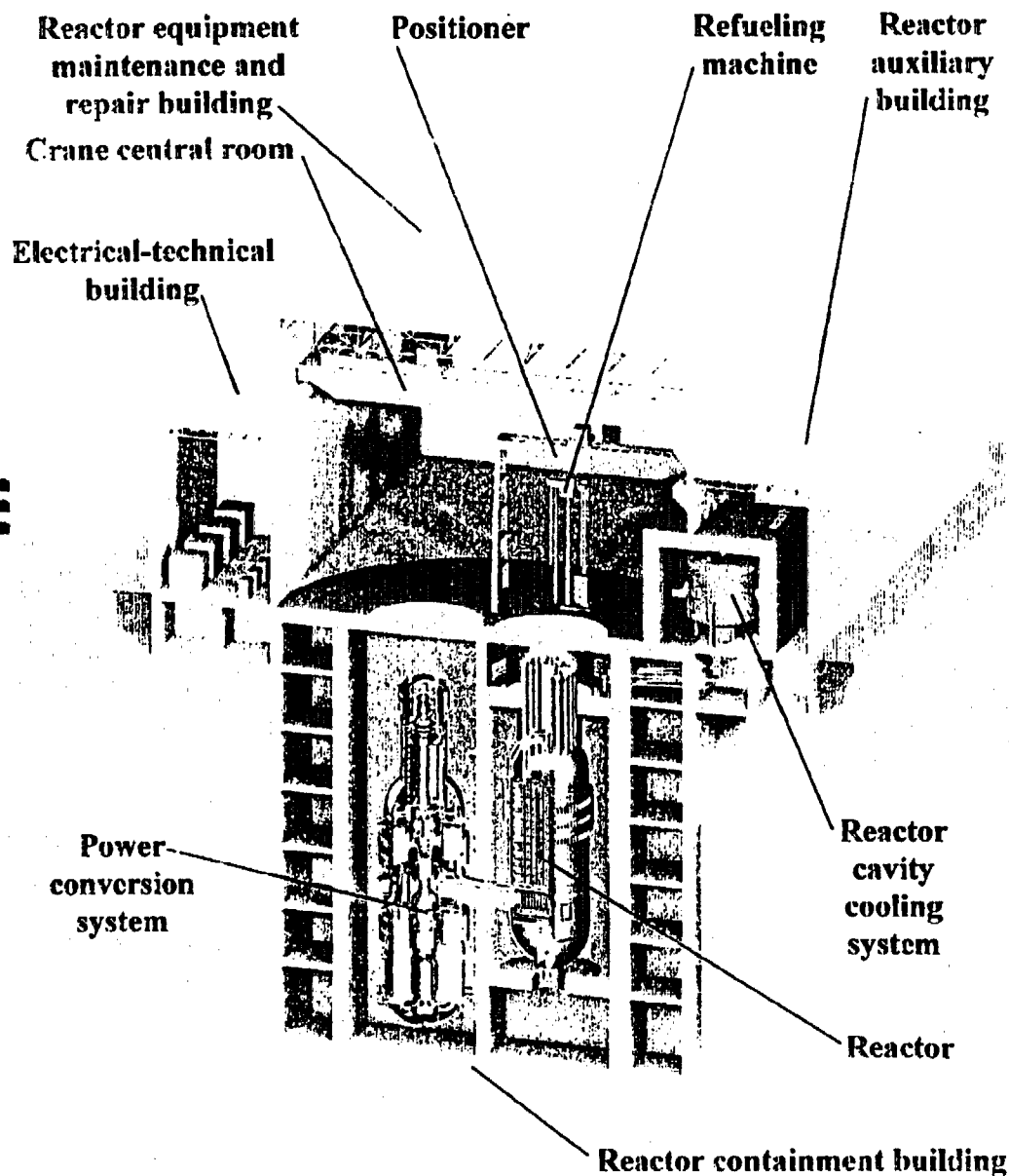


# GT-MHR COMBINES MELTDOWN-PROOF ADVANCED REACTOR AND GAS TURBINE

- POWER LEVEL  
600 MW(t)



# GT-MHR MODULE GENERAL ARRANGEMENT



## WHY THE GT-MHR?

- SAFETY (MELT DOWN PROOF)
- EFFICIENCY (48%)
- WPu DESTRUCTION (90% PU-239)



# GT-MHR DEVELOPMENT WITH RUSSIA

## 1994 to 1998

### RUSSIAN PARTICIPANTS

- OKBM, Kurchatov Institute,  
VNIINM, Lutch, SCC (Seversk)

### FUNDING

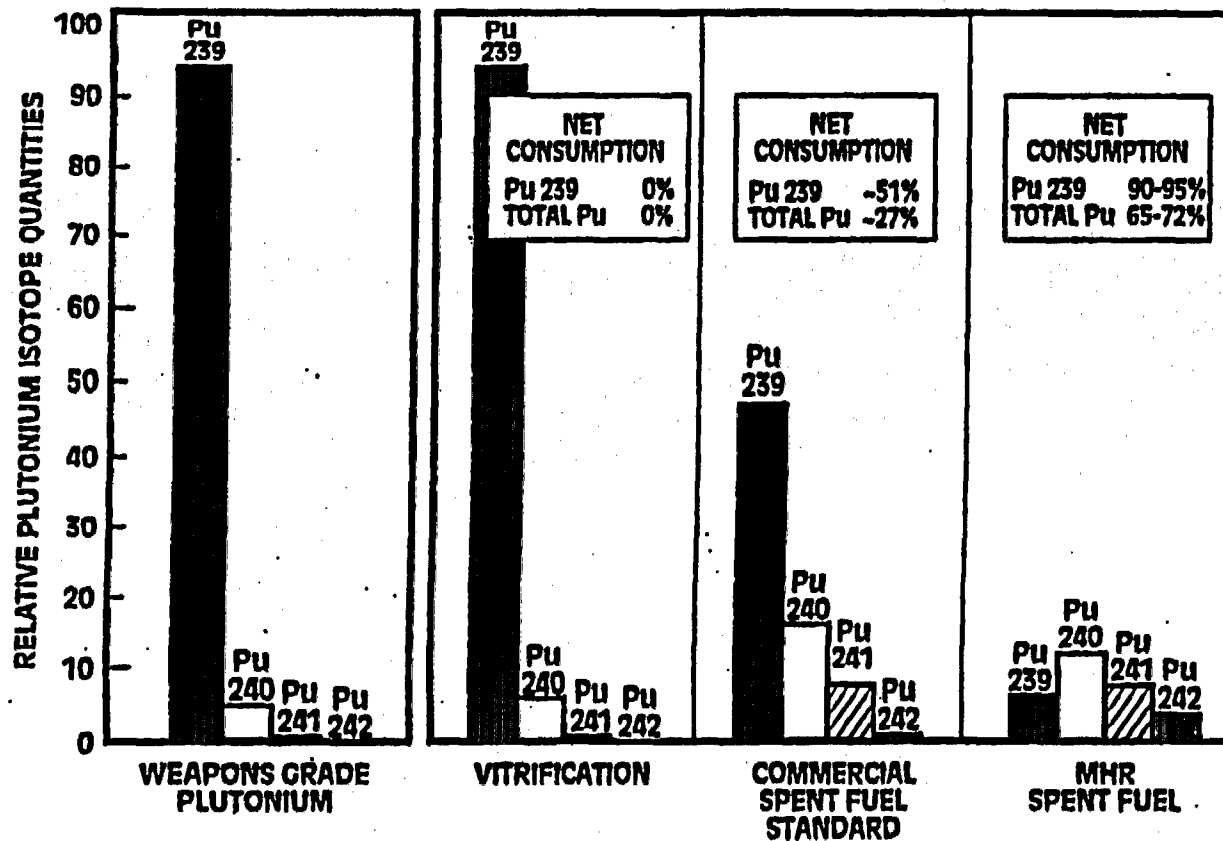
- MINATOM, General Atomics,  
Framatome, Fuji Electric

### PURPOSE

- Burn Russian Weapons Grade WPu
- Generate Electricity and District Heat



# THE GT-MHR ACHIEVES HIGH PU DESTRUCTION WITHOUT RECYCLE



L-125(18)  
8-22-95



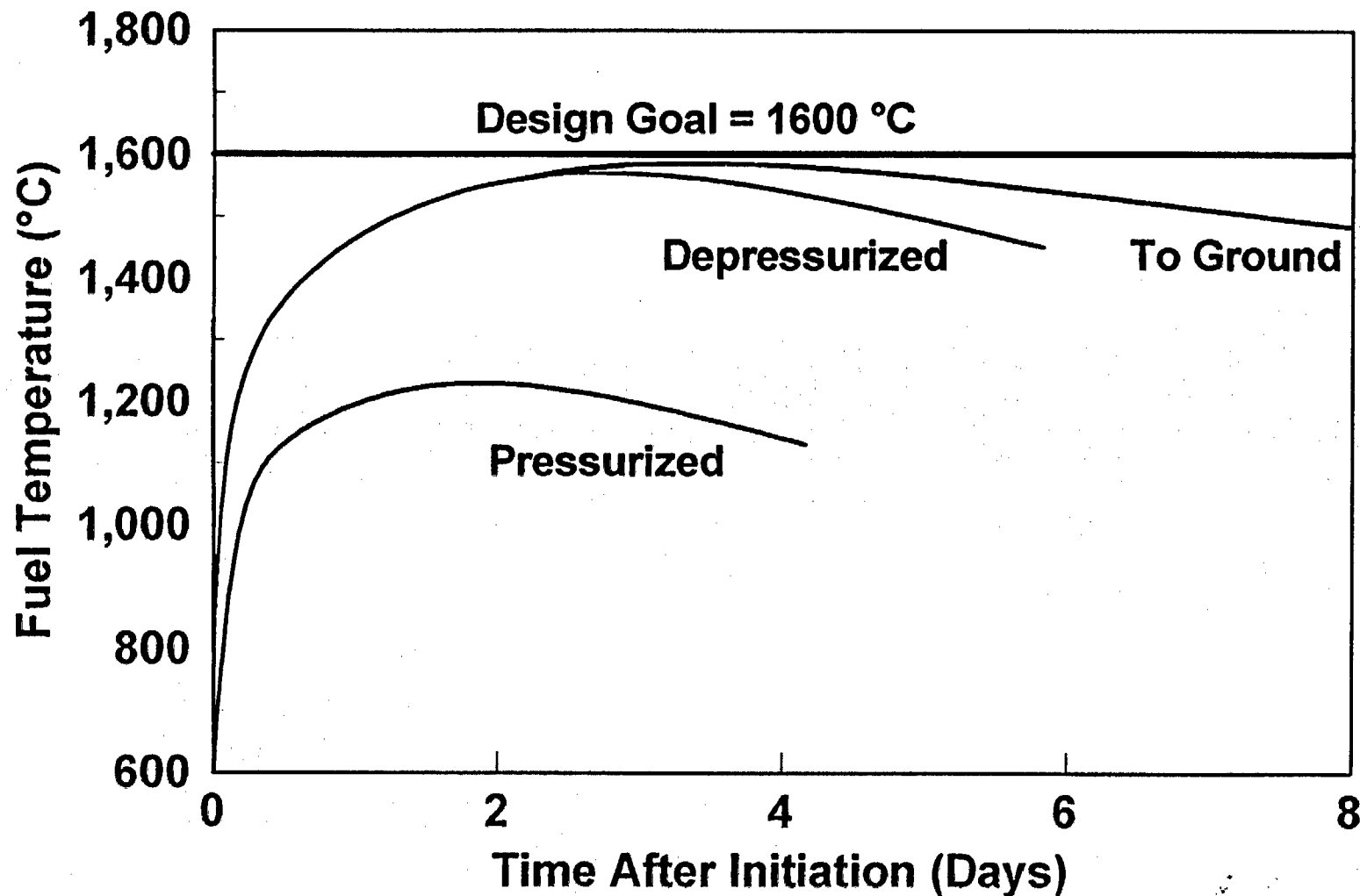
# ***Start of Preliminary Design***

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## **U.S. Government Support for GT-MHR**

- Congress authorized \$5M each for FY 1999 and FY 2000
  - \$3M for work in Russia
  - \$2M for work in U.S. (GA, ORNL)
- Russian matching funds or in-kind contributions required
- Future support contingent on
  - U.S./Russian agreement on WPu disposition
  - Cost sharing from other countries and/or private sources

# GT-MHR Fuel Temperatures Remain Below Design Limits During Conduction Cooldown Events



**...Passive Design Features Ensure Fuel Remains Below 1600 °C**



# GT-MHR OFFERS MAJOR ENVIRONMENTAL BENEFITS

