



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

October 3, 1988

MEMORANDUM FOR: Chairman Zech  
Commissioner Roberts  
Commissioner Carr  
Commissioner Rogers

FROM: Victor Stello, Jr., Executive Director for Operations

SUBJECT: CONTAINMENT ISSUE FOR THE MHTGR

- References:
1. Ltr. to Theodore J. Garrish, Assistant Secretary for Nuclear Energy, U.S. DOE, from Victor Stello, EDO, U.S. NRC dtd. August 17, 1988.
  2. Ltr. to Victor Stello, EDO U.S. NRC from Theodore Garrish, Assistant Secretary for Nuclear Energy, U.S. DOE, dtd. September 16, 1988.

In Reference 1, I asked DOE to provide a rationale for its apparently contradictory views with respect to requiring a containment structure for the new production reactor (NPR) version of the modular high-temperature gas-cooled reactor (MHTGR), whereas no containment structure was recommended on the commercial MHTGR concept provided for our review. In Reference 2, Mr. Garrish responded that the differences resided in "the incorporation of special target materials and that future missions could include other materials in quantities and core configurations not yet identified."

In reviewing this matter, we have had the benefit of other available DOE information on the MHTGR-NPR, including the DOE Energy Research Advisory Board Report - DOE/S-0064, "Assessment of Candidate Reactor Technologies for the New Production Reactor," July 1988, (Enclosure 1) and an August 3, 1988 memorandum from J. Salgado to the Secretary of Energy (Enclosure 2) which recommended the MHTGR-NPR, with a containment and located at DOE's Idaho site, be included in the NPR acquisition strategy. After reviewing this material, I believe a more in-depth evaluation of the differences (both policy and technical) between the commercial MHTGR and the MHTGR-NPR is required before I can recommend a course of action on the containment question for Commission consideration. Consequently, Mr. Beckjord and I plan to meet with Mr. Garrish, Mr. Wade and others from DOE on October 18, 1988 to discuss this matter.

Specifically, the items which need further discussion are:

Policy Items

It appears from the enclosed document that the NPR containment decision was based largely on the following policy considerations, which were established long before the NPR reactor technologies were selected:

- the desire to have enhanced safety,
- to promote public acceptance, and
- to contribute to the advancement of nuclear technology by proving a reactor concept that has potential merit in the market place.

Technical Items

Certain technical considerations also affect the need for containment on the NPR versus the commercial MHTGR. The most significant of these seem to be:

- the use of highly enriched Uranium fuel in the NPR (versus approximately 20% enriched in the commercial MHTGR) and its impact on:
  - ° reactivity coefficients
  - ° fuel performance and integrity,
- the production and retention of tritium in the NPR,
- maintaining NPR flexibility for additional missions, and
- the status of supporting R&D programs.

It is possible that there are technical considerations which could justify the different approaches to containment and our continued look at the MHTGR concept without a containment structure; however, I believe we need to more clearly understand both the policy and technical considerations and their role in this decision process before we proceed. I will keep you informed on this matter as further information becomes available.

Original signed by  
Victor Stello

Victor Stello, Jr.  
 Executive Director  
 for Operations

## Enclosures:

1. DOE Energy Research  
 Advisory Board Report
2. Memorandum from J. Salgado  
 to Secretary of Energy  
 dtd 8/3/88.

cc: SECY  
 OGC  
 ACRS

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Note: 9/16/88 DOE ltr include  
 as an attachment.

\*See previous concurrences

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