GCRA GAS-COOLED REACTOR ASSOCIATES

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ACRS Subcommittees on Containment Systems
and Structural Engineering
Advisory Committee on Reactor Safeguards
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Gentlemen:

I had only a few minutes to collect my thoughts prior to my remarks at the September 12 meeting on possible future containment criteria. After the meeting, several thoughts came to mind that I would like to have expressed. I have summarized these below in addition to restating the main points I touched on at the meeting.

- The utility industry and the process for adding new generating capacity remain in a period of fundamental structural change. In addition, current experience indicates a high level of stress and risk (not safety risk) for individuals and organizations involved in owning and operating nuclear power plants in comparison with other generation options. These factors introduce major uncertainties regarding the future marketplace for new generating capacity additions, and its capability to incorporate nuclear options. In the face of such uncertainty, we believe it is imperative to maintain a diversity of options for future nuclear generation.

- With the active involvement of its constituent utilities, GCRA studies in the early 80s led to design requirements, initially documented in 1984, that were instrumental in shaping the MHTGR design. The requirements were focused in large part on the closely related topics of public health and safety, and plant ownership risks. The most demanding has been a requirement to meet EPA Protective Action Guidelines without evacuation and sheltering, at a distance of 425 meters.

- The MHTGR development and review to date, spanning over four years at an expenditure exceeding $100 million, continues to show great promise. For the most limiting event, the 30 day mean whole body dose is comparable to natural background dose for the same period. This includes the following events identified by the NRC staff during the course of the review:

  - Withdrawal of all control rods without reactor trip

  - Loss of pressure (coolant) with loss of forced cooling and total blockage of the Reactor Cavity Cooling System

  - Simultaneous failure of 25% of the steam generator tubes with coincident failure of mitigation systems

  - A 22 square foot hole in the pressure boundary with air access unlimited by the reactor cavity enclosure

  We recognize that these results are highly preliminary and subject to confirmation by future technology and design development, and, ultimately, operating experience. Nonetheless, they have been partially confirmed by NRC contractor analyses, and indicate the potential for an unprecedented degree of assurance of radionuclide retention.

- Some of the discussion at the meeting centered around a total reliance on a containment structure for radionuclide retention. One proposed benefit was the simplicity of representing the concept of a box preventing releases in discussions with the public. Actual containments, as we know them, incorporate complex systems of penetrations, isolation valves, cooling systems, hatches, etc. These in turn impose demanding administrative requirements on the plant operator for proper operation, maintenance, inspection, and testing. Representing such a system as a simple box to the general public leaves us open to damaging criticism for oversimplifying the situation.

- We are not challenging the efficacy of a containment structure or its appropriateness for a given design. However, we believe the safety benefits can be strongly design dependent. Further, we do not view the imposition of a robust containment structure as a panacea for public acceptance. We view the issue of public acceptance to be an imponderable best left to the public. We remain hopeful that when all the dust settles, public opinion will be guided by common sense. If this is true, we in the nuclear industry should be guided by the results of detailed technical assessments, and our own common sense and technical judgement, not by speculation as to what the public will accept. I believe the majority of the public expects no less.

- The MHTGR represents a fundamentally different technology and approach to nuclear power plant design, particularly in comparison to current generation LWRs. As such, it offers the promise of unique operating characteristics and risk profiles for an owner/operator. Much design, technology development, regulation development, and initial plant construction and operation remains before the promise could become a reality. If the early projections are not born out, the risk of subsequent major modifications or cancellation must be born by the organizations supporting development and initial deployment. However, to impose a major design feature such as a containment structure would fundamentally alter the concept, perhaps destroying its viability. Taking such a step in the light of the exceedingly benign results of the safety review to date appears irrational.

- With regard to incorporation of recently developed understandings of severe accident phenomena into containment design criteria, we find the preponderance of this information to be specific to LWR technology, with little relevance to the MHTGR. Thus we believe it would be appropriate to focus this activity on LWR technology. This could be done within a more general framework applicable to all technologies, such as that proposed by the NRC staff in SECY-88-203.

Thank you for the opportunity to express our views. For your information, I am enclosing a copy of GCRA 89-003, "MHTGR Licensing Review Summary and Status". This report was developed to summarize our perspective on the MHTGR review. Please contact me if you have questions or comments.

Sincerely,

J. M. Kendall
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JMK:mdwc
Enclosure

cc (w/o Enclosure):
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