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PROPOSED MINUTES/SUMMARY OF THE
ACRS ADVANCED REACTORS SUBCOMMITTEE MEETING
SEPTEMBER 25, 1985
WASHINGTON, DC

Purpose: The purpose of the meeting was to discuss the proposed policy for regulation of advanced nuclear power plants.

Meeting Attendees:

ACRS

J. C. Mark, Acting Chairman
C. P. Siess, Member
M. El-Zeftawy, Staff

DOE

F. Gavigan
G. Sherwood

NRC Staff

T. King
C. Allen
S. Sands
C. Ader
P. Wood
K. Herring

Others

T. Henry, CE
C. Brinkman, CE
S. Watson, Bechtel
S. Gray, EPRI
L. Connor, Doc-Search Assoc.

Highlights, Agreements, and Requests

1. T. King, Advanced Reactor Group/NRR, overviewed the NRR advanced reactor activities since February 1985. The major milestones are:
 - ° On March 26, 1985, the Commission issued the proposed policy statement on the regulation of advanced reactors for public comments.
 - ° On April 26, 1985, DOE formally transmitted to NRC a plan and schedule for review of an HTGR.

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- ° On July 1, 1985, DOE formally transmitted to NRC a plan and schedule for review of two liquid metal reactors (LMRs).
- 2. DOE has been monitoring advanced LWRs and LMR/HTGR Program efforts in the U.S. and overseas. One of the major concerns is the issue related to severe-accidents.
- 3. The one HTGR concept currently under consideration by the NRC is a 350 Mwt (140 Mwe) modular design, with reactor vessel and steam generator located below grade. The designers are GA Technologies/Bechtel/CE/GE. It is an annular core design with prismatic fuel blocks similar to Ft. St. Vrain. There is one loop per module and one turbine-generator per 3-4 modules.

Mr. F. Gavigan, DOE, stated that the major reasons for selecting prismatic fuel versus the pebble bed are:

- ° Cost estimates showed that the prismatic fuel design has a considerable margin over pebble bed (\$100 to \$200 per Kilo-watt).
- ° In considering the major accidents, the prism has a major advantage over the pebble bed. The shutdown margins are larger and provides a better response.
- ° DOE is starting the prioritization process to limit the number of converter concepts that will be funded in the next couple of years.

There is no containment, the design has confinement building only to assure that no offsite dose consequences result from operation.

- 4. The two LMRs currently under consideration by the NRC are:

- ° Power Reactor Inherent Safety Module (PRISM), 425 Mwt (133 Mwe) modular design.
- ° Sodium Advanced Fast Reactor (SAFR), 900 Mwt modular design.

The PRISM designers are GE/Bechtel/United Engineers/Bryon-Jackson/Foster-Wheeler. It is a pool type LMR with reactor vessel located below grade. It has a homogeneous core design with oxide fuel versus metal fuel still under consideration. There is one loop per module and one turbine-generator per 3 modules. Reactor guard vessel will be used as containment boundary. The balance of plant (BOP) is completely disconnected from the primary loop safety considerations. The module's life is expected to be 40 years.

The SAFR's designers are Rockwell International/Bechtel/CE. Each SAFR unit is a pool-type LMR design with reactor vessel and steam generators above grade with passive DHR. It is a homogeneous core design with metal fuel as reference with capability retained to also use oxide fuel. Plant design life is given as 60 years. The BOP is completely decoupled from reactor safety consideration allowing conventional construction.

5. The overall DOE plan is to:

- ° have the NRC conduct over the next 2-3 years a review of the HTGR and LMR conceptual design. This includes issuance of a Preliminary Safety Information Document (PSID), SER, and licensability letter.
- ° 1989 thru late 1990s pursue standard design approval and certification of the design through rulemaking.

6. NRR will interact with the designers, licensees, etc., at an early stage in the process in order to minimize regulatory delay. The key points of the Advanced Reactors Group's (ARG) approach are to build upon the LWR framework, where practical, and to assure that advanced reactors are at least as safe as current generation LWRs.
7. T. King discussed the revised Commission Policy Statement on the regulation of advanced reactors (SECY-85-279), which was issued on August 21, 1985. The previously proposed policy statement (SECY-84-453A) was redrafted by the NRC Staff to provide better organization and clarification and also to incorporate the public comments. The main points included in the redraft are:
 - ° Encourages early interaction between NRC and Reactor designers on licensing criteria.
 - ° Encourages certain features and characteristics be included in advanced designs.
 - ° Encourages early discussion on the use of proven technology or technology development programs and their effect on regulatory requirements.
 - ° States that advanced reactors must provide the same degree of protection to the public and the environment as do current generation LWRs.
 - ° States that licensing guidance for advanced reactors will build upon the criteria and regulations developed for LWRs.
8. The public comments were received from 20 parties. Seven from utilities, six from vendors, two from national labs, and five from

others. The main points that were raised in the public comments are:

- ° Reduce prescriptive nature of NRC regulations.
 - ° Encourage greater inherent safety/safety margin than provided in LWRs but don't require it.
 - ° New set of GDCs for advanced reactors should be developed.
 - ° NRC should not favor any design, design feature or design approach over another.
 - ° NRC should not require a prototype demonstration plant.
9. The original draft policy statement presented six issues on which the Commission solicited public comments. The NRC Staff has prepared a proposed Commission response on the basis of the public comments.
10. A report in the form of a NUREG will be published shortly by the NRC Staff to discuss the revisions to the policy statement and will contain the abstract of public comments and the Commission's response to the six specific questions. This approach is intended to minimize the information contained in the Federal Register. The proposed NUREG will be prepared immediately following the Commission's approval of the policy statement.

11. As a result of the Subcommittee discussion and questions, a proposed NRR interaction with ACRS was suggested, as follows:

FY 86

- ° Present proposed containment/confinement design and design criteria, including Site Suitability Source Term (SSST), for HTGR and LMRs.
- ° Present proposed design basis accident envelopes for HTGR and LMRs, including how they were selected.

FY 87

- ° Provide description of key HTGR and LMR systems, based upon PSID.
- ° Provide staff evaluation of HTGR concept.
- ° Receive ACRS letter on the HTGR concept.

FY 88

- ° Provide staff evaluation of LMR concepts.
- ° Receive ACRS letter on LMR concepts.

12. Dr. C. Mark (Acting Subcommittee Chairman), and Dr. C. Siess will present the revised proposed policy statement to the full Committee on October 10, 1985 for further discussion with a possibility of preparing a report to the Commission. T. King will be present to answer any questions.

NOTE:

Additional meeting details can be obtained from a transcript of this meeting available in the NRC Public Document Room, 1717 H Street, N.W., Washington, D.C., or can be purchased from Ann Riley & Associates, Ltd., 1625 I Street, N.W., Suite 921, Washington, D.C. 20006, (202) 293-3950.