

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
UNITED STATES DEPARTMENT OF ENERGY)	Docket No. 50-537
PROJECT MANAGEMENT CORPORATION)	
TENNESSEE VALLEY AUTHORITY)	
(Clinch River Breeder Reactor)	
Plant))	

NRC STAFF TESTIMONY OF THOMAS L. KING AND
RICHARD M. STARK ON BOARD QUESTION 12,
CONCERNING ITEMS IDENTIFIED
FOR RESOLUTION AT THE OPERATING LICENSE STAGE

Q1. Please state your names, by whom are you employed, and the nature of your responsibilities regarding the Clinch River Breeder Reactor ("CRBR")?

A1. My name is Thomas L. King. I am employed by the U.S. Nuclear Regulatory Commission as Chief of the Technical Review Branch, Clinch River Breeder Reactor Program Office, in the Office of Nuclear Reactor Regulation. I am responsible for direction of the Technical Review Branch's review of the fast sodium-cooled-related aspects of the CRBR safety review.

My name is Richard M. Stark. I am employed by the U.S. Nuclear Regulatory Commission as Project Manager, Clinch River Breeder Reactor Program Office, in the Office of Nuclear Reactor Regulation. I am responsible for coordinating the construction permit ("CP") safety review.

Q2. Gentlemen, have you prepared statements of professional qualifications?

A2. Yes. Copies of our professional qualifications statements are attached to this testimony.

Q3. What is the purpose of your testimony?

A3. This testimony addresses the concern raised by the Atomic Safety and Licensing Board ("Board") in Board Question 12, which states as follows:

NUREG-0968 contains many references to items that are to be resolved at the OL review stage. In view of the apparently advanced stages of hardware design and procurement currently in being, the Board is concerned that said OL review (assuming a CP issues) may require substantive changes of a costly and time consuming nature, or in the alternative, result in a compromise of performance safety. The Staff is requested to offer comments upon this situation and to provide whatever insights it can now offer for avoiding such problems.

Q4. What types of items can be left for review at the OL stage?

A4. Pursuant to 10 CFR § 50.35(a), a construction permit may be issued where "an applicant has not supplied initially all of the technical information required to complete the application and support the issuance of a construction permit which approves all proposed design features," if the Commission finds as follows:

(1) the applicant has described the proposed design of the facility, including, not not limited to, the principal architectural and engineering criteria for the design, and has identified the major features or components incorporated therein for the protection of the health and safety of the public; (2) such further technical or design information as may be required to

complete the safety analysis, and which can reasonably be left for later consideration, will be supplied in the final safety analysis report; (3) safety features or components, if any, which require research and development have been described by the applicant and the applicant has identified, and there will be conducted, a research and development program reasonably designed to resolve any safety questions associated with such features or components; and that (4) on the basis of the foregoing, there is reasonable assurance that, (i) such safety questions will be satisfactorily resolved at or before the latest date stated in the application for completion of construction of the proposed facility, and (ii) taking into consideration the site criteria contained in Part 100 of this chapter, the proposed facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public.

These requirements are reiterated in 10 CFR § 2.104(b)(1)(i).

Q5. Please describe the types of items which have been left for review at the operating license (OL) stage for CRBR?

A5. The Staff has evaluated each of the items identified in the SER as requiring review at the OL stage. These items may be categorized as follows:

1. Items to justify design bases, limits, or analysis methodology. These items could have a potential impact on design.
2. Items which are inherently treated during the OL review and are considered to be actions required at the OL stage, such as:
 - Preoperational testing
 - Technical specifications
 - Operating procedures
 - Component testing

These items are expected to have only minor impacts on design.

3. Documentation and/or confirmation required to support design concepts presented in the PSAR or design commitments which can be completed at the OL stage, pursuant to standard light water reactor (LWR) practices. Included in this category are issues which would normally be listed as OL items in the Standard Review Plan (SRP) for LWRs.

Many of these items are similar to items normally reviewed at the OL stage for LWRs; the remaining items constitute more of a checklist for use at the OL stage to make up for the lack of an SRP in certain areas, and to ensure that certain commitments which have been made by the Applicants are tracked during further review of the CRBR.

- Q6. In the Staff's view, has sufficient information been provided by the Applicants at this time to permit the Commission to make the findings required by 10 CFR §§ 50.35(a) and 2.104(b)(1)(i), as set forth above?

A6. Yes.

- Q7. Among the items that have been left for resolution at the OL review stage, are there any items which could result in substantive changes of a costly or time consuming nature, or in the alternative, result in a compromise of performance safety?

- A7. The items included in the first category listed in response to question 5 above are, for the most part, those which have this potential. These items generally fall within the following areas:

- a) fuel design limits, methodology and bases;

- b) high temperature mechanical design limits and methodology;
- c) reactor vessel head structural capability;
- d) PRA/reliability analysis; and
- e) natural circulation.

The Staff is of the opinion that the potential is low for any of these items to result in a significant impact on cost or schedule. This opinion is based upon three considerations: (1) each of these items has been discussed with the Applicants in technical review meetings prior to issuance of the CRBR Safety Evaluation Report (NUREG-0968), and agreement with the Applicants has been reached on a course for completion of each item; (2) the Staff's (and Applicants') knowledge of the technical issues involved in each area supports a judgment that the required confirmation or resolution will not lead to major substantive changes in the CRBR design; and (3) the Applicants already have in place reasonably designed programs to address these issues.

The confirmation or resolution of these items will not result in any compromise of performance safety. Such a resolution is considered by the Staff to be unacceptable, and would not be approved at the OL stage of review.

- Q8. Has a course of action been identified which could help to ensure that resolution of these items will not require substantive

changes of a costly and time consuming nature, and will not result in a compromise of performance safety?

- A8. Yes. The Staff and Applicants are developing a reasonably designed program and schedule to review and resolve each item on a time frame which will support and minimize impacts on final design and construction. This program and schedule will help to ensure that all of the items identified for confirmation or resolution at the OL stage of review will be accomplished with a minimal impact and without any compromise of performance safety.
- Q9. Will the fact that many items of equipment for CRBR are currently in an advanced stage of design or procurement affect the Staff's conclusions described in response to questions 7 and 8 above?
- A9. No. Protection of the public health and safety is the fundamental concern of the Commission. In the event that replacement or modification of any equipment currently in an advanced stage of design, procurement or manufacture is found to be necessary at the OL stage of review, such replacement or modification will be required by the Staff. Such a requirement at the OL stage is in accordance with 10 CFR § 50.35(c). As stated above, the Staff does not believe that any major substantive changes will be necessary, and the Staff will work with the Applicants to find acceptable solutions in order to minimize cost and schedule impacts while appropriately addressing the Staff's public health and safety concerns.

Thomas L. King

PROFESSIONAL QUALIFICATIONS

I am presently Chief, Technical Review Branch in the CRBR Program Office, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission. In this capacity, I am responsible for the direction of the Branch's Review of those aspects of CRBRP related to a fast, sodium cooled reactor. This includes direction of the Branch's review of CRBRP sodium systems, fuel handling systems, CDA analysis, support systems, reliability program, safety criteria and analysis.

I received a Bachelor of Science degree in Mechanical Engineering from Drexel University. I also received a Master of Science degree in Mechanical Engineering from Stanford University.

I have over fourteen years of professional experience in the nuclear field. While I worked for the Department of Energy (DOE), I held various positions in the Division of Reactor Research and Technology. These included positions as a Reactor and Nuclear Engineer in the Core Design Branch, the Liquid Metal Systems Branch, and the Components Branch where I worked on the FFTF Project, the EBR-2 project and Facilities at the Engineering Technology Center in Santa Susana, California. In 1975 I was assigned to the DOE FFTF Project Office in Richland, Washington where I held positions as a Reactor Engineer in the Operational & Experimental Safety Division and Branch Chief for FFTF Engineering until April 1982 at which time I joined the NRC as a Reactor Engineer.

List of Publications

- 1) "FFTF Reactor Characterization Program" T. L. King (DOE) & J. Rawlins (HEDL)
ANS invited paper - 1981 Winter Meeting - San Francisco
- 2) "Reactor and Plant Performance During FFTF Nuclear Startup"
T. L. King & C. E. Moore - DOE
Ans Topical Meeting - September 1981 - Newport, RI
(Technical Basis for Nuclear Fuel Cycle Policy)

RICHARD M. STARK

PROFESSIONAL QUALIFICATIONS

I am a Project Manager in the Clinch River Breeder Reactor Program Office, U. S. Nuclear Regulatory Commission. In this capacity, I am responsible for the planning, integration, and management of the staff safety review of the Clinch River Breeder Reactor application for Construction Permit. I am also the staff's primary safety contact with the applicants. I develop recommendations for licensing actions and integrate the results of our reviews into the safety evaluation report.

I received a Bachelor of Science degree in Electrical Engineering from the Carnegie Mellon University. I also received a Master of Science degree in Nuclear Engineering from Carnegie Mellon University. I am a Professional Engineer registered in the Commonwealth of Pennsylvania.

I have over eighteen years of profession experience in the nuclear field. I worked for Westinghouse Electric Corporation and held positions in the nuclear field as a Reliability Engineer, Systems Engineer, Licensing Engineer, and Project Engineer. I was an Engineering Manager for Stone and Webster Engineering Corporation responsible for all engineering on a nuclear project. In addition, I have been the Project Manager for the USNRC for the Callaway, Wolf Creek and Susquehanna Steam Electric Station license reviews.