

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
UNITED STATES ATOMIC ENERGY COMMISSION  
WASHINGTON, D.C. 20545

August 14, 1973

Honorable Dixy Lee Ray  
Chairman  
U. S. Atomic Energy Commission  
Washington, D. C. 20545

Subject: REPORT ON ARKANSAS NUCLEAR ONE-UNIT 1

Dear Dr. Ray:

During its 160th meeting, August 9-11, 1973, the Advisory Committee on Reactor Safeguards completed its review of the application of the Arkansas Power and Light Company for a license to operate Arkansas Nuclear One-Unit 1 (formerly Russellville Nuclear Unit) at power levels up to 2568 MW(t). The site was visited by a Subcommittee on May 4, 1973, and the project considered during a Subcommittee meeting held in Washington, D. C., on July 26, 1973. In the course of the review, the Committee had the benefit of discussions with representatives and consultants of the Arkansas Power and Light Company, the Babcock and Wilcox Company, the Bechtel Corporation, and the AEC Regulatory Staff, and of the documents listed. The Committee last reported to the Commission on the construction of this unit in its letter of September 12, 1968, and on Unit 2 in its letter of February 10, 1972.

Arkansas Nuclear One is located about six miles from Russellville, Arkansas, on a peninsula formed by the Dardanelle Reservoir on the Arkansas River.

The application for a construction permit proposed initial operation at power levels up to 2452 MW(t), the same as the construction permit power level of Oconee Nuclear Station Unit 1 which employs a similar reactor. Safety studies and performance analyses have been made for a power level of 2568 MW(t) for Arkansas Nuclear One-Unit 1. The Committee believes that review of the operation of Oconee Nuclear Station Unit 1 by the Regulatory Staff should be completed and satisfactory performance of Oconee Nuclear Station Unit 1 should be demonstrated before Arkansas Nuclear One-Unit 1 is operated at full licensed power.

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The hot functional testing of Oconee Nuclear Station Unit 1 which was conducted in 1972 caused damage of some components, including reactor vessel internals. The design changes which were made for Oconee Nuclear Station Unit 1 have been applied to Arkansas Nuclear One-Unit 1. The Committee believes that these changes are acceptable.

The applicant has been responsive to the Committee's recommendation that suitable instrumentation be sought to monitor for loose parts and for vibration; such instrumentation has been designed and will be utilized.

The applicant stated that he will propose appropriate additional operating limitations if, at any time during operation, the moderator temperature coefficient of reactivity is positive. This matter should be resolved in a manner satisfactory to the Regulatory Staff.

The Regulatory Staff has been investigating on a generic basis the problems associated with a potential reactor coolant pump overspeed in the unlikely event of a particular type of rupture at certain locations in a main coolant pipe. Some additional protective measures may be warranted and this matter should be resolved to the satisfaction of the Regulatory Staff. The Committee wishes to be kept informed.

The Committee reiterates its previous comments on the need for further study of means for preventing common mode failures from negating reactor scram action, and of design features to make tolerable the consequences of failure to scram during anticipated transients. The Committee believes it desirable to expedite these studies and to implement in timely fashion such design modifications as are found to improve significantly the safety of the plant in this regard. The Committee wishes to be kept informed of the resolution of this matter.

The applicant should assure himself that instrumentation for determining the course of potentially serious accidents, on a time scale that will permit appropriate emergency action, is provided at the station and that appropriate calibration methods and calculated bases for interpreting instrument responses are available.

In view of the important role of the applicant's Safety Review Committee in providing continuing reviews, and in updating and implementing safety measures, the ACRS recommends that the Safety Review Committee include additional experienced personnel from outside the corporate structure as voting members.

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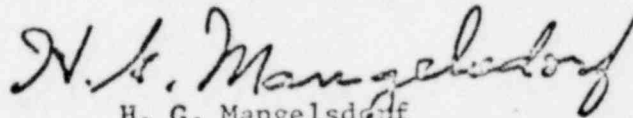
The applicant has proposed measures, including alarms and administrative procedures, to prevent operating under conditions which might result in exceeding acceptable fuel limits established from accident studies and other considerations. The current review has been confined to the first fuel cycle and the analyses have been based on the as-built fuel. The ACRS recommends that the Regulatory Staff establish suitable criteria for these measures, and provide suitable bases for evaluating future loadings. The Committee wishes to be kept informed.

The Committee recognizes that re-evaluation of operating limits may be necessary as a result of possible changes in the acceptance criteria for emergency core cooling systems. The Committee wishes to be kept informed.

Other problems relating to large water reactors which have been identified by the Regulatory Staff and the ACRS and cited in previous reports should be dealt with appropriately by the Regulatory Staff and the applicant as suitable approaches are developed.

The Advisory Committee on Reactor Safeguards believes that, if due regard is given to the items mentioned above, and subject to satisfactory completion of construction and preoperational testing, there is reasonable assurance that Arkansas Nuclear One-Unit 1 can be operated at power levels up to 2568 MW(t) without undue risk to the health and safety of the public.

Sincerely yours,

  
H. G. Mangelsdorf  
Chairman

References attached.

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References - Arkansas Nuclear One-Unit 1

1. Final Safety Evaluation Report, Volumes I through IV
2. Amendments 21 through 39 to the Application
3. Arkansas Power and Light Company (AP&L) letters dated October 2 and 25, 1972, transmitting lists of B&W Topical Reports for ANO-1
4. AP&L letter dated February 28, 1973, notifying AEC of its intent to incorporate the Winter 1972 Addenda of ASME Section III into the requirements of a valve purchase order for ANO-1
5. AP&L letter dated March 13, 1973, regarding requirements in electrical instrumentation and control systems at ANO-1
6. AP&L letter dated April 11, 1973, furnishing information regarding engineered safeguards control circuits
7. AP&L report dated April 1973, "Interim Report on Fuel Densification for ANO-1"
8. AP&L letter dated April 23, 1973, furnishing information on stress profiles for the main steam and main feedwater lines
9. AP&L letter dated May 11, 1973, furnishing responses to AEC requirements for electrical instrumentation and control systems
10. AP&L letter dated May 11, 1973, furnishing responses to AEC requirements to modify design of emergency cooling reservoir at ANO-1
11. DL Safety Evaluation for ANO-1, dated June 6, 1973
12. DL Technical Report on Densification of B&W Reactor Fuels, dated July 6, 1973
13. Letter from Mrs. Robert H. Douglass, Russellville, Arkansas, dated July 17, 1973, regarding ANO-1 and Subcommittee Meeting July 26, 1973