

Docket Nos. 50-390
50-391

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Tennessee Valley Authority
ATTN: Mr. James E. Watson
Manager of Power
818 Power Building
Chattanooga, Tennessee 37401

Gentlemen:

A copy of a letter to Chairman Schlesinger dated September 21, 1972, concerning the Advisory Committee on Reactor Safeguards' review of your application for a construction permit to build the Watts Bar Nuclear Plant, Units 1 and 2, is enclosed for your information.

Sincerely,

Original signed by R. C. DeYoung

R. C. DeYoung, Assistant Director
for Pressurized Water Reactors
Directorate of Licensing

Enclosure:
ACRS letter

cc w/enclosure:
Robert H. Marquis, Esq.
General Counsel
629 New Sprinkle Building
Knoxville, Tennessee 37919

Honorable Malcolm Gholdstone
County Judge
Rea County, Tennessee

Mr. Walter Lambert, Director
Office of Urban and Federal Affairs
321 Seventh Avenue, North

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DATE ▶		9/22/72	9/22/72	9/22/72	9/22/72

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
UNITED STATES ATOMIC ENERGY COMMISSION

WASHINGTON, D.C. 20545

September 21, 1972

Honorable James R. Schlesinger
Chairman
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: REPORT ON WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2

Dear Dr. Schlesinger:

At its 149th meeting, September 14-16, 1972, the Advisory Committee on Reactor Safeguards reviewed the application of the Tennessee Valley Authority to construct Units 1 and 2 of the Watts Bar Nuclear Plant. The project was considered at Subcommittee meetings at the plant site on July 7, 1972, and in Washington, D. C., on September 13, 1972. During its review, the Committee had the benefit of discussions with the representatives of the applicant, the Westinghouse Electric Corporation, the AEC Regulatory Staff, and their consultants. The Committee also had the benefit of the documents listed below.

The plant will be located on a 1770-acre site on the west shore of Chickamauga Lake on the Tennessee River, about 50 miles northeast of Chattanooga, Tennessee. The site is 1.9 miles downstream from the Watts Bar Dam and Hydroelectric Plant, and 0.65 miles from the Watts Bar Steam Plant. It is 31 miles upstream from the Sequoyah Nuclear Plant which is also on Chickamauga Lake.

The minimum exclusion distance is 3940 feet. The low population zone has a three mile radius. The 1970 census indicated that 570 people lived within this zone. The site is in a rural area. The nearest population center with a 1970 population greater than 25,000 people is Oak Ridge, Tennessee (1970 population 28,140), which is 40 miles from the site.

The Watts Bar units will include four-loop pressurized water reactors designed for initial core power levels up to 3411 MW(t). These reactors are substantially the same as those previously reviewed for the Sequoyah, Trojan, and McGuire plants.

The plant will employ two natural draft cooling towers. Makeup water for the towers and cooling water during emergencies will be taken from a canal about 900 feet long supplied from the Tennessee River. The stability of this canal under seismic conditions, and the adequacy of the water supply under emergency conditions, should be established to the satisfaction of the AEC Regulatory Staff.

Plant grade is 728.0 feet MSL. The probable maximum flood has a still water level of 737.5 feet. The applicant has agreed to protect safety-related structures and equipment against wave effects to elevation 743.5 feet with the understanding that further study may require this elevation to be increased. This matter should be resolved to the satisfaction of the Regulatory Staff.

In order to satisfy the AEC "Interim Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Power Reactors", the applicant proposes as one possibility a reduction in the maximum permissible linear power to 14.9 kw per foot at full power. However, the applicant is conducting an experimental and analytical program intended to provide improved understanding of phenomena entering into the loss-of-coolant accident, and is studying various possible improvements in ECCS design, including the addition of emergency core cooling water to the vessel upper head cavity. The Committee believes it important that improvements in ECCS design be included in the Watts Bar plant, and recommends that the final design of the Watts Bar ECCS be reviewed by the Regulatory Staff and the ACRS prior to fabrication and installation of major components.

The applicant stated that the fuel rod problem involving densification and subsequent movement of the fuel pellets is undergoing intensive investigation. The Regulatory Staff and the ACRS should review the resolution of this matter.

The applicant will submit the results of recent additional analytical studies of local and overall pressures in the ice-condenser containment for various postulated loss-of-coolant accidents. The Committee recommends that the Regulatory Staff obtain independent confirmation of containment accident pressures and assure itself that adequate margin exists to cover uncertainties.

The Committee believes that protection against pipe whip should be provided by the applicant in accordance with criteria being developed by the AEC Regulatory Staff.

September 21, 1972

Further studies are in progress with regard to the effects of a failure to scram on anticipated transients and of design features which would make tolerable the results of such an event. These studies should be expedited and the matter resolved during construction in a manner satisfactory to the Regulatory Staff and the ACRS.

Other problems related to large water-cooled and moderated reactors have been identified by the Regulatory Staff and the ACRS and cited in previous ACRS reports. The Committee believes that resolution of these items should apply equally to the Watts Bar Plant.

The ACRS believes that the above items can be resolved during construction and that, if due consideration is given to these items, the Watts Bar Nuclear Plant Units 1 and 2 can be constructed with reasonable assurance that they can be operated without undue risk to the health and safety of the public.

Additional remarks by Dr. H. S. Isbin are presented below.

Sincerely yours,



C. P. Siess
Chairman

Additional Remarks by Dr. H. S. Isbin

I believe that it is inappropriate to reduce the design peaking factor by 21% just in order to meet the AEC "Interim Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Power Reactors." Instead, increased efforts should be devoted to the experimental and analytical programs, together with possible improvements in the ECCS design. These matters were noted in the Committee's October 9, 1971 Report on McGuire Nuclear Station Units 1 and 2.

References

1. Tennessee Valley Authority letter dated May 14, 1971; License Application; Preliminary Safety Analysis Report (PSAR), Volumes 1, 2, 3 and 4
2. Amendments 1-5, 7, 9-11, and 13 to PSAR