



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

OCT 11 1978

NRC PDR

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Docket Nos. STN 50-566
and STN 50-567

APPLICANT: Tennessee Valley Authority (TVA)
FACILITY: Yellow Creek Nuclear Plant
SUBJECT: SUMMARY OF MEETING HELD DECEMBER 21, 1977

The subject meeting was held at the U. S. Nuclear Regulatory Commission offices in Bethesda, Maryland. The purpose was to address six of the unresolved issues on the Yellow Creek project review. The issues, and the positions of staff and applicant at the start of the meeting are described in Enclosure 1 to this summary. Enclosure 2 is a meeting attendance list.

The meeting was planned to work toward resolution of six issues that had proven difficult. Senior management personnel representing both the applicant and the NRC were present at the meeting. Each of the six issues was discussed, and the conclusions reached relative to each issue are reported in the following sections of this summary.

Design Basis Strength of Fly Ash Concrete Used For Missile Protection

TVA made a presentation to support the claim that TVA has the design and construction experience, as well as field and laboratory test data, to conservatively use a design basis concrete strength of 5000 pounds per square inch (compression) based on a one year curing (and test) time. The staff indicated doubts about the validity of the design margins claimed by TVA. The staff concluded that there could be an adequate technical justification for a TVA design basis based on the following staff position:

1. Testing to verify design basis concrete strength must be done within 90 days of pouring.
2. The test procedures must meet or exceed the requirements of N45.2.5, with additional controls on water, aggregate, fly-ash, and the number of samples to be tested.
3. The test samples should be cured in the field rather than in a laboratory.
4. The final concrete wall thickness used for missile protection should be in accordance with the table of concrete strength versus wall thickness previously transmitted to TVA.

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TVA representatives stated that the NRC position would be considered and a response would be submitted.

Main Steam Line Break

The issue, as described in Enclosure 1 to this summary, was discussed at length and a consensus position was established by the NRC technical staff. The staff position was that TVA should submit the following, which would provide sufficient justification for a staff finding that the Yellow Creek containment design was adequate at the construction permit stage of review:

1. A qualitative discussion that provides an adequate basis for concluding that the Yellow Creek containment design pressure is at least ten percent higher than the calculated maximum pressure would be assuming the single failure (to close) of a main steam isolation valve. This submittal should be transmitted to the NRC as soon as possible.
2. A commitment to qualify Class IE electrical equipment inside containment to the environmental conditions which result from a final design accident analysis of the Yellow Creek facility.
3. A commitment to submit, by September 1, 1978, quantitative confirmatory analyses verifying the qualitative assessment described in 1 above. These detailed analyses should include revised mass and energy release data based on steam generator inventories that are revised from the CESSAR-80 SSAR, revised main feedwater flow and feedwater isolation valve closure time, and the effects of integral flow restrictors if used. Pressures and temperatures for equipment qualification will be calculated.

TVA representatives agreed that the staff position could and would be met by TVA.

Appendix J Compliance

TVA representatives explained that the information requested by the staff was more in quantity and detail than had been required in prior applications, and that some of the requested information was not available at the construction permit stage of licensing. The staff agreed that greater detail is being sought with respect to Appendix J compliance because staff experience has shown that additional work is necessary at the construction permit stage to avoid problems of compliance with Appendix J at the operating license stage of staff review. TVA representatives agreed to reconsider the three questions posed in the staff letter of October 14, 1977, and to make a further attempt at supplying the information requested.

Instrumentation to Notify the Operator of a Loss of Component Cooling Water to the Reactor Coolant Pump

TVA representatives presented their rationale for relying on existing non-safety grade instrumentation to provide adequate warning to an operator.

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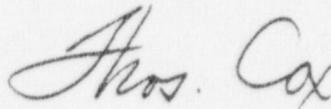
The staff reiterated its position that safety-grade instrumentation would be required and is being required of all applicants. At the close of these discussions, TVA representatives agreed that this issue would not be contested further by TVA at this time.

Plant Monitoring System

The staff reiterated its position that the Plant Monitoring System cannot be considered a non-safety grade system and that additional information would be needed from TVA to support the contention that the Plant Monitoring System should be considered a non-safety grade system. Staff representatives stressed that the type of information needed is preliminary design information as described in the staff letter of October 14, 1977. TVA and CE representatives concluded that additional preliminary design information could probably be submitted within a reasonable time span and that they would try to respond to the information request as they understood it following the discussions held in this meeting.

Intersystem Leakage

After a brief discussion concerning whether this issue was properly within the licensing scope of the applicant or the vendor (CE), further discussion and resolution was deferred pending further staff consideration of what response by the applicant could be considered adequate at the construction permit stage of review.



Thomas H. Cox, Project Manager
Light Water Reactors Branch No. 3
Division of Project Management

Enclosures:

1. Issues Discussed at 12/21/77 Meeting
2. Attendance List

cc w/enclosures:
See next page

ENCLOSURE 1

NRC POSITION

- (3) We require additional justification by the applicant that certain safety-related walls and roofs are of adequate thickness to resist missile penetration. This relates to applicant's planned utilization of concrete thicknesses which are based on a claimed concrete strength of 5000 pounds per square inch compressive strength after one year. Staff has action.

The applicant has committed to providing adequate structural barriers for protecting all safety-related systems against the effects of postulated tornado missiles. The missiles postulated by the applicant are acceptable. Our review indicates that the applicant's description of concrete wall and roof thicknesses is not complete with respect to a number of safety-related structures (e.g., control building, diesel generator building, and the emergency feedwater storage tanks).

The applicant has based structural designs of certain walls and roofs on a design basis concrete compressive strength of 5000 pounds per square inch. We find that there is inadequate justification for the applicant's design basis concrete strength and we consider that the applicant has justified a maximum design basis strength of 3,000 pounds per square inch. Based on this lower strength, we will require that the applicant provide at least 27 inches of concrete for the walls and 24 inches of concrete for the roofs of all the structures listed in Section 3.5.1.4 of the Yellow Creek Preliminary Safety Analysis Report and all other structures housing safety-related systems and equipment. The applicant submitted additional justification for concrete strength on October 14, 1977. We are reviewing this information.

TVA POSITION

TVA submitted additional justification for design basis concrete strength of 5000 psi based on a one year curing time for the fly ash concrete which will be used for the structures at the Yellow Creek Nuclear Plant on October 14, 1977. The utilization of earlier age strength requirements in these structures will provide no significant increase in missile protection, but would substantially increase the problems associated with hydration heat and subsequent cracking. Since TVA's fly ash concrete will have higher final in-place strengths than a 5000 psi, 28-day cement only type concrete we believe that this issue is resolved.

NRC POSITION

- (6) We require that the applicant provide a method for detecting intersystem leakage from high-pressure systems to low-pressure systems. Applicant has action.

TVA responded to this requirement in a letter dated October 7, 1977. However, the response was a reaffirmation of an earlier TVA position that intersystem leakage detection would not be addressed by TVA as the item was considered to be in the CESSAR scope of design responsibility. We continue to require that TVA respond to this issue by describing the methods by which intersystem leakage will be detected.

TVA POSITION

During the September 15, 1977, meeting the staff stated its position that before the issuance of a construction permit, TVA must demonstrate that there are means for detecting intersystem leakage from high-pressure systems to low-pressure systems during normal operation. All systems of concern (shutdown cooling system, chemical volume and control system, safety injection system, etc.) are within the scope of the CESSAR. Yellow Creek PSAR section 5.2.7, "Reactor Coolant Pressure Boundary Leakage Detection System," references CESSAR section 5.2.7. Together, these sections address reactor coolant pressure boundary leakage detection. In addition, the basic P&ID's provide other pertinent information, i.e., CESSAR figure 6.3-1b shows pressure instrumentation on the safety injection system to sense pressure upstream of the check valve adjacent to the reactor coolant system. We therefore reaffirm our position that this item falls within the scope of the standard reference design (CESSAR) and that any further information will be provided on that docket during the FDA review. TVA commits to address this issue in detail in the Yellow Creek FSAR following its resolution on the CESSAR docket. We would be pleased to discuss this issue further with the appropriate level of NRC management.

NRC POSITION

- (8) We require the applicant to explicitly describe the design basis main steamline break and to report the containment pressure and temperature resulting from the break, and to report the assumptions and analytical methods used to determine the design basis results. Applicant has action.

As stated in our letter of October 14, 1977, we continue to require that the preliminary design bases for your containment design be explicitly reported in the PSAR. We understand that your proposed containment design pressure for a main steam line break (MSLB) is based on existing CESSAR blowdown data which in turn is based on no main steam isolation valve (MSIV) failure and no steamline flow restrictors. We do insist that you provide the results and description of your MSLB analysis assuming:

- (a) The basic blowdown data in CESSAR,
- (b) The assumption of MSIV (single) failure, and
- (c) The necessity for a 10 percent margin between peak calculated pressure and the containment design pressure.

We recognize that the peak calculated pressure and temperature for the assumptions listed will probably be conservatively high, compared to your planned final design which would incorporate steam line flow restrictors. It is not our intent to restrict your options for a potential reduction in the final design peak calculated pressure and temperature. But at the preliminary design stage you are required to submit a proposed preliminary design and supporting analytical basis. The analytical basis must include the calculated peak pressure, temperature, and the methods and assumptions used to arrive at the calculated results. The TVA response to this issue in your letter of October 7, 1977 was inadequate to resolve this issue. We continue to require complete documentation as described above.

TVA POSITION

TVA has submitted on the Yellow Creek docket the results of a MSLB which is based on the current mass and energy release data from CESSAR. We understand that after the PDA for CESSAR was received the requirement for a MSIV failure was imposed by the NRC. Additionally, the requirement for a flow limiting device in the main steam line was imposed, as an interface requirement on CESSAR just before the PDA was issued.

CE has agreed to include in the CESSAR FDA application bounding mass and energy release data for the MSLB, accounting for the postulated failure of a single MSIV and the effects of flow limiting devices. TVA commits to provide in the Yellow Creek FSAR the results of the worst case MSLB analysis for Yellow Creek (including the effects of a single MSIV failure and flow limiting devices). TVA will use the peak temperature and pressure resulting from this analysis for equipment qualification.

We would be pleased to discuss this standardization matter further with the appropriate level of NRC management.

NRC POSITION

- (17) We require additional information on the applicant's preliminary design plans for compliance with Appendix J to 10 CFR 50. Applicant has action.

As stated in our letter of October 14, 1977, our position is that you must submit the information requested in the meeting of September 15, 1977, for review. For clarity, the required information was provided in our letter of October 14, 1977. We consider this information necessary to an adequate description, at the preliminary design stage, of how you intend to comply with Appendix J to 10 CFR 50.

TVA POSITION

TVA has committed to meet the requirements of 10 CFR 50 Appendix J and we have fully complied with the requirements of Regulatory Guide 1.70 and the Standard Review Plan 6.2.6 for an application for a construction permit. The information requested by the staff is not reasonably available at this stage of plant design. We would be pleased to discuss this issue further with the appropriate level of NRC management.

NRC POSITION

- (20) We will require the applicant to provide safety grade instrumentation to notify the plant operator of the loss of component cooling water to the reactor coolant pumps. Applicant has action.

As stated in our letter of October 14, 1977, unless you demonstrate that the non-safety grade detection and alarm equipment and instruments which you propose to provide are adequate with respect to considerations of both equipment failure and operator error, we will require that safety grade detection and alarm equipment are provided. Information that you provided in your letter of September 14, 1977 is inadequate to justify your position.

TVA POSITION

TVA will submit additional information on or about November 14, 1977.

Since the CCW system is non-safety grade, we believe that it is inappropriate to require safety grade instrumentation to monitor this system. Eleven parameters are monitored (non-safety grade) which all have the capability to indicate loss of component cooling water. In the event that the additional information which we will be submitting on or about November 14 does not provide the staff with the basis for resolution of this issue, we would be pleased to discuss it further with the appropriate level of NRC management.

NRC POSITION

- (23) We will require additional information on the Plant Monitoring System in order to complete our evaluation of the potentially safety-related aspects of this system. Applicant has action.

As stated in our letter of October 14, 1977, we continue to hold that you have not adequately demonstrated that the PMS should be accepted as a non-safety grade system. We feel that further effort on your part to support your position must include your submittal of information concerning the scope, objective, design bases, and design criteria for the PMS. We require the requested information to be submitted for review prior to our decision on the adequacy of the PMS at the construction permit stage of review. Your submittal should include the systems configuration, major functions, the performance requirements for each function, the test plan for verifying each function's operation, and the interfaces, if any, of each function with safety systems. Your letter of 10/07/77 stated that a response to our request was scheduled for 11/01/77.

TVA POSITION

On November 4, 1977, TVA submitted additional justification for our position that this system should be accepted as non-safety grade and that there is a sufficient level of isolation between the PMS and other safety systems. TVA is prepared to discuss this matter further with the appropriate level of NRC management.

ENCLOSURE 2

ATTENDANCE LIST

NRC

R. Boyd
R. Mattson
O. Parr
A. Mitchell
C. Hofmayer
H. Folk
R. Tedesco
V. Benaroya
D. Vassallo
T. Cox
T. Ippolito
G. Lainas
E. Ketchen

TVA

N. Perry
J. Gilleland
L. Mills
M. Wisenburg
T. Spink
S. Thickman
G. Beasley
J. Linehan

CE

J. Veirs
J. Goldberg
D. Graf
C. Brinkman