May 17, 1984

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Docket No. 50-313

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Mr. John M. Griffin, Senior Vice President
of Energy Supply
Arkansas Power & Light Company
P. O. Box 551
Little Rock, Arkansas 72203

Dear Mr. Griffin:

This is to respond to your letter of November 17, 1983, (1CAN118306) in which you requested a basis for our position regarding the need for tornado protection of your proposed new Condensate Storage Tank (CST) and our basis concerning our position on the need for parallel suction valves from the CST or valve position indication in the control room from the existing single valve.

With regard to tornado protection for your proposed new CST, we have reviewed your submittal of September 20, 1983(1CAN098311). We conclude that your probabilistic rationale concerning tornado missile damage to the proposed CST is unacceptable. Our discussion concerning this issue is included in the enclosed Staff Positions.

With regard to the basis concerning the need for parallel valves from the CST or valve position indication in the control room from the existing single valve, our position results from the acceptance criteria of NUREG 0737 Item II.E.1.1, Emergency Feedwater Evaluation.

You requested by letter dated April 18, 1984 (1CAN948404), our concurrence that tornado protection of 21,300 gallons of water in a new proposed CST would be sufficient to resolve the GL-4 concerns. We agree that partial tornado protection for the proposed CST would mean protection for a 30 minute supply of EFW suction for ANO-1. However, you have not provided a satisfactory basis for the amount of CST water that you propose to protect from tornadoes. In particular, you have by letter dated July 29, 1983, indicated that both ANO-1&2 would be drawing suction off of the proposed CST. Yet you only propose to protect enough water for ANO-1. Also, it is not clear to us by your letter of April 18, 1984, how you calculated the amount of water needed for a 30 minute supply for ANO-1.

We have provided our position regarding GL-2 and GL-4 in the enclosed Staff Positions. We request that you respond to the issues in the enclosed Staff Positions within 30 days from receipt of this letter. The staff is available for further discussions or meeting with you to resolve these concerns.

The reporting and/or recordkeeping requirements of this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,

/s/

John F. Stolz, Chief
Operating Reactors Branch No. 4
Division of Licensing

Enclosure:
As stated

cc w/enclosure:
See next page

ORB#4 NPK	BC:ASB:DSI	BC:ORB#4:DL
GVissing	OParr	JFStolz
5/14/84	5/15/84	5/16/84

cc w/enclosure(s):

Mr. John R. Marshall
Manager, Licensing
Arkansas Power & Light Company
P. O. Box 551
Little Rock, Arkansas 72203

Mr. James M. Levine
General Manager
Arkansas Nuclear One
P. O. Box 608
Russellville, Arkansas 72801

Mr. Leonard Joe Callan
U.S. Nuclear Regulatory Commission
P. O. Box 2090
Russellville, Arkansas 72801

Mr. Robert B. Borsum
Babcock & Wilcox
Nuclear Power Generation Division
Suite 220, 7910 Woodmont Avenue
Bethesda, Maryland 20814

Mr. Nicholas S. Reynolds
Bishop, Liberman, Cook, Purcell & Reynolds
1200 17th Street, NW
Washington, DC 20036

Honorable Ermil Grant
Acting County Judge of Pope County
Pope County Courthouse
Russellville, Arkansas 72801

Regional Radiation Representative
EPA Region VI
1201 Elm Street
Dallas, Texas 75270

Mr. John T. Collins, Regional Administrator
U. S. Nuclear Regulatory Commission, Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Mr. Frank Wilson
Director, Division of Environmental
Health Protection
Department of Health
Arkansas Department of Health
4815 West Markham Street
Little Rock, Arkansas 72201

Enclosure 1

ARKANSAS NUCLEAR ONE, UNIT 1 (ANO-1)
STAFF POSITIONS FOR
IMPLEMENTATION OF RECOMMENDATIONS GL-2 AND GL-4
EMERGENCY FEEDWATER SYSTEM UPGRADE
AUXILIARY SYSTEMS BRANCH

Long term Recommendations GL-2 and GL-4: In our SER input of October 6, 1983 regarding implementation of recommendations for emergency feedwater systems (TMI Task Action Plan NUREG-0737, Item II.E.1.1) for the ANO-1 Emergency Feedwater Systems (EFWS), we stated that the licensee should install a redundant parallel flow path (piping and valves) from the condensate storage tank (the primary EFW water supply), or install safety-related valve position indication in the control room for the single existing flow path in order to comply with Recommendation GL-2. We further stated in the SER that the licensee should provide EFW pump protection by means such as automatic switchover of the pump suction to the alternate safety-related source of water (the service water system) or upgrade the primary source of water to meet the seismic Category I and tornado missile protection requirements in order to satisfy Recommendation GL-4.

To meet the above recommendations, by previous letter dated July 29, 1983 the licensee proposed a new seismic Category I condensate storage tank (CST) which will provide the primary water supply path to the EFW pump suction. At present the new tank does not meet tornado missile protection nor will it include redundant parallel flow paths. The design incorporates a remote manual switchover to the tornado missile protected service water system in the event of loss of the CST.

By letter dated September 20, 1983, the licensee submitted a discussion of the probability of a tornado missile strike for the unprotected condensate storage tank at ANO Unit 1 in order to demonstrate compliance with the Recommendation GL-4. The licensee stated that installing positive tornado protection for the new seismically qualified CST would have no significant effect on the overall reliability of the EFW system.

Because the licensee has not provided sufficient information on the wind speed required to damage or destroy the condensate storage tank, the staff has made an independent evaluation of wind speed exceedance probabilities (Enclosure 1). Based on the staff evaluation, we have determined the tornado strike frequency at ANO-1 to be 1.5×10^{-5} per year. Because of this high tornado strike probability, we remain concerned that manual switchover to the safety-related service water system following loss of the condensate storage tank by tornado missiles may not occur soon enough to prevent loss of EFW pump suction and subsequent pump damage. Therefore, it is our position that the licensee demonstrate that there is sufficient time for remote manual action in the control room compatible with the EFW pump protection requirements.

During recent phone conversations with the licensee, we discussed our concern that manual switchover following loss of the CST by tornado missile may not occur soon enough before loss of EFW pump suction and subsequent pump damage occurs. We have also discussed with the licensee the above reservations

regarding a probabilistic argument for tornado missile considerations at the ANO-1 site and our preference for their suggestion regarding possible installation of a partial tornado missile barrier around the tank which will provide sufficient time for remote manual action to transfer EFW pump suction supply to the service water system from the control room in a time compatible with the EFW pump protection requirements.

The licensee should provide a detailed discussion of the indications to the operator, and actions the operator will take to transfer EFW pump supply to the service water system on detection of CST failure. The discussion should include the time for operator action provided by the tornado missile protected water volume and a summary of the procedural steps required to align the alternate water source. It is our understanding that the level transmitters on the new CST will be tornado missile protected. The above discussion should confirm that sufficient time for this action is available.

The second remaining concern discussed in the recent phone converation was Recommendation GL-2 which concerns the potential adverse consequences resulting from inadvertent closure of the single flow path valve at the new CST. We have again stated our position that the licensee provide parallel suction valves from the CST or provide safety-related valve position indication in the control room for the single valve.

The licensee is requested to respond to the above concerns as soon as possible in order that the design for the ANO-1 EFWS upgrades may be finalized in conformance with recommendations GL-2 and GL-4. We are available for further conversations or a meeting with the licensee as necessary to resolve these concerns.

Principal Contributors:
Raj Anand and Earl Markee

Evaluation of Tornado and High Wind Frequencies at Arkansas Nuclear One, Unit No. 1

Introduction

By letter dated September 20, 1983, Arkansas Power & Light Company provided an assessment of the probability a tornado strike on the proposed condensate storage tank of 5 x 10 -6.

Since the licensee gives no information on the wind speed required to damage or destroy the condensate storage tank, we have made an independent evaluation of wind exccedance probabilities.

Evaluation

A probability distribution of high winds without tornadoes was taken from Simiu, et al, 1979 ("Extreme Wind Speeds of 129 Stations in the Contiguous United States, " NBS Building Science Series 118). This distribution is based on analysis of 35 years of fastest mile wind data from Little Rock, AK.

For tornadoes, a probability distribution of tornado winds was calculated using the combined methodologies of WASH-1300 and of Thom 1963 ("Tornado Probabilities," Mon. Wea. Rev., pp. 730-736). This distribution is based on 28 years of tornado data within a one degree latitude-longitude "square" (area = 3870 mi2 centered on the Arkansas Nuclear One site. Based on these data, the probability of a tornado strike is 1.5×10^{-3} yr^{-1} and the magnitude of a tornado at the 10^{-7} yr^{-1} probability level is 360 mph.

The expected value probability distributions of non-tornado and tornado winds are shown in the enclosure. These distributions show that tornado winds produce higher speeds than non-tornado winds at probability levels less than about 7×10^{-3} yr-1 and that non-tornado winds are most important at higher probability levels.

Once the wind speed(s) at which the condensate storage tank is damaged or destroyed is determined, the enclosed graphical analysis can be used to determine the probabilty of damage or destruction due to high winds.

ARKANSAS NUCLEAR ONE - HIGH WIND PROBABILITY