ARKANSAS POWER & LIGHT COMPANY
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August 7, 1981

ØCANØ881Ø6

Mr. Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: Arkansas Nuclear One - Units 1 & 2
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6
Seismic Qualification of Auxiliary
Feedwater Systems (Generic Letter 81-14)
(File: 4400, 2-4400)

Gentlemen:

Your letter of February 10, 1981 requested AP&L to respond to a list of concerns sent to all PWR licensees regarding the seismic qualification of Auxiliary Feedwater Systems. The purpose of this letter is to provide NRC with our attached responses for ANO-1 and 2 per this request. Please advise me should you have any questions.

Very truly yours,

David C. Trimble

David C. Trimble
Manager, Licensing

DCT:DCT:sl
Attachments

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STATE OF ARKANSAS)
) SS
COUNTY OF PULASKI)

I, DAVID C. TRIMBLE, being duly sworn, subscribe to and say that I am the Manager of the Licensing Section, for Arkansas Power & Light Company; that I have full authority to execute this oath; that I have read the foregoing Letter No. ØCANØ881Ø6 and know the contents thereof; and that to the best of my knowledge, information and belief the statements made in it are true.

David C. Trimble
DAVID C. TRIMBLE

SUBSCRIBED AND SWORN TO before me, a Notary Public in and for the County and State above named, this 7th day of August, 1981.

Sharon Kaye Hendrix
NOTARY PUBLIC

MY COMMISSION EXPIRES:

My Commission Expires 9/1/82

ARKANSAS NUCLEAR ONE - UNITS 1 & 2
SEISMIC QUALIFICATION OF EMERGENCY FEEDWATER (EFW) SYSTEMS
RESPONSES TO NRC'S 2-10-81 REQUEST FOR INFORMATION

This is to respond to Mr. Eisenhut's February 10, 1981 letter to all operating PWR licensees on seismic qualification of Auxiliary Feedwater Systems. As a result of NRC's continuing review of this issue, NRC determined that certain information should be requested from PWR licensees and that certain actions be taken.

Specifically, Mr. Eisenhut stated that the purpose of his February 10, 1981 letter was ". . . To obtain sufficient information that identifies the ex ent to which AFW systems are seismically qualified . . ." and to request that PWR licensees ". . .perform a walk-down of the non-seismica ly qualified portions of their AFW systems to identify apparent and practically correctable deficiencies that may exist." Mr. Eisenhut also indicated that for plants with AFW systems that are not qualified either in whole or in part, NRC's plan involves increasing the seismic resistance of the systems in a timely, systematic manner to ultimately provide reasonable assurance, where necessary, that they are able to function following the occurrence of earthquakes up to and including the design safe shutdown earthquake for the plant.

Enclosure 1 to Mr. Eisenhut's February 10, 1981 letter contained a request for information from all operating PWRs concerning AFW system seismic design. The specific information requested, along with our responses, is provided below:

ANO-1 Response

Enclosure 1, Item A: Request

Specify whether your AFW system is (a) designed, constructed and maintained (and included within the scope of seismic related Bulletins 79-02, 79-04, 79-07, 79-14 and 80-11, and IE Information Notice 80-21) in accordance with Seismic Category 1 requirements (e.g., conformance to Regulatory Guides 1.29 and the applicable portions of the Standard Review Plan or comparable criteria) or (b) designed, constructed and maintained (and included within the scope of seismic related Bulletins 79-02, 79-04, 79-07, 79-14 and 80-11, and IE Information Notice 80-21) to withstand a Safe Shutdown Earthquake (SSE) utilizing the analytical, testing, evaluation methods and acceptable criteria consistent with other safety-grade systems in your plant. To assist the staff in an expedious assessment of your plant, if your AFW systems or portions thereof is not qualified to withstand an SSE utilizing the analytical, testing and evaluation criteria consistent with other safety-grade systems in your plant, we request that you identify those components and structures not seismically qualified in the appropriate row of the attached Table 1.

Enclosure 1, Item A: ANO-1 Response

As stated in Section 5.A.2.1.2 of the ANO-1 FSAR, included in the list of Seismic Class 1 Systems and Equipment is the "Emergency Feedwater System Including the Service Water Pumps, Valves and Connecting Piping". Therefore, our response is yes, our ANO-1 emergency feedwater system is designed, constructed and maintained in accordance with Seismic Category 1 requirements in effect when the plant was constructed. Also, since it is planned that ANO-1 will not have any non-seismic emergency feedwater system components or equipment installed after the next refueling outage, Table 1 has been left blank to indicate our interpretation of compliance with the intent of Mr. Eisenhut's letter. For example, not all components of our Initiation and Control System are currently seismic, but they will be upgraded to seismic qualification after the next refueling outage. We are continuing our investigation into the issues of seismic qualification by performing walk-downs, documentation reviews and analyses as appropriate. Our goal is to meet or exceed the overall intent of Mr. Eisenhut's letter for ANO-1 after the next refueling outage.

Enclosure 1, Item B Request

Where seismic qualification is indicated by leaving Table 1 blank, provide a description of the methodologies and acceptance criteria used to support your conclusion of seismic qualification, including: Seismic analyses methods employed, seismic input, load combinations which include the SSE, allowable stresses, qualification testing and engineering evaluations performed.

In addition, where seismic qualification of a secondary water supply or path is relied upon, provide a summary of the procedures which would be followed to enable you to switch from the primary to secondary source.

Enclosure 1, Item B: ANO-1 Response

Our conclusion as to the seismic qualification of our Emergency Feedwater System is based upon the analyses documented in the ANO-1 FSAR Section 5A Appendix which address the design basis and seismic analyses for structures, systems and equipment for ANO-1. Specifically, Section 5.A.4 discusses the design criteria for all seismic analyses and considerations which support our conclusions. Basically, all seismic Class 1 systems and equipment (including the emergency feedwater system, electric motor-driven and steam turbine-driven pumps, valves and connecting piping) have been designed and analyzed, or test proven, to withstand applicable simultaneous seismic loadings in horizontal directions and the combination of gravity loads, operating loads, applicable operating temperatures and pressure, without loss of function. Each of the considerations above is addressed in ANO-1 FSAR Sections 2.7 (Seismology), 5.1.1.2 (Basis for Design Loads), 5.1.1.5 (Structural Design Analysis), 5.2 (Other Major Plant Structures), and Appendix 5A (Design Bases for Structures, Systems and Equipment). In short, all structures, systems and components important to safety have been designed to performance standards that will enable the facility to withstand, without loss of capability to protect the public, the forces or effects that might be imposed by natural phenomena (earthquake, floods,

tornadoes, etc.). Additionally, combinations of severe loadings have been considered. The designs are based upon the most severe natural phenomena recorded for the site, with an appropriate safety margin to account for uncertainties in the historical data, or upon the most severe conditions that are susceptible to synthetic analyses. See our response to the New General Design Criteria No. 2 in the FSAR.

Enclosure 1, Item C: Request

If a lack of seismic qualification is indicated for items 1, 2, 3, 4, 5 and 6, 7, or 8 in Table 1, provide additional information which specifies the level of seismic qualification afforded in the original design for each of these areas.

Enclosure 1, Item C: ANO-1 Response

We have determined that our Emergency Feedwater System for ANO-1 is presently Seismic Category 1 for all systems except the Control System. However, since we plan to upgrade the Control System to Seismic Category 1 after the next refueling outage, we have concluded that our EFW system meets the intent of your February 10, 1981 letter as it relates to seismic qualification, thus making the subject question not applicable to ANO-1.

Enclosure 1, Item D: Request

If substantial lack of seismic qualification is indicated for items 1, 2, 3, 4, 5 and 6, 7, or 8 in Table 1, provide the same information requested in A through C for any alternate decay heat removal system. The bounds of these systems shall be considered to a similar extent as that described for the AFW system. Provide a summary of the procedures by which operation of these alternate heat removal systems will be accomplished.

Enclosure 1, Item D: ANO-1 Response

We have determined that our Emergency Feedwater System for ANO-1 is presently Seismic Category 1 for all systems except the Control System. However, since we plan to upgrade the Control System to Seismic Category 1 after the next refueling outage, we have concluded that our EFW system meets the intent of your February 10, 1981 letter as it relates to seismic qualification, thus making the subject question not applicable to ANO-1.

Enclosure 2

This enclosure requested actions of Pressurized Water Reactor Licensees without a seismically qualified auxiliary feedwater system. Since we have determined that the emergency feedwater systems for ANO-1 and 2 are indeed seismically qualified, the basis of concern for this enclosure is not applicable.

ANO-2 Response

The ANO-2 EFW system is designed, constructed and maintained to withstand a safe shutdown earthquake (SSE). Analytical and testing evaluation methods and acceptance criteria that are consistent with the design of other safety-grade systems in the plant have been utilized.

The EFW system has been designated and designed to be Seismic Category 1 (as defined in Regulatory Guides 1.26 and 1.29) and is listed as such in Table 3.2-2 of Section 3.2 of the ANO-2 FSAR. Section 3.2 describes the established procedure used in the classification method, and Sections 3.7 and 3.10 describe in detail the methodologies and acceptance criteria used to support our conclusion of seismic qualification. These criteria include definement of the DBE (SSE) and OBE (½SSE) as the basic seismic input (refer to FSAR Section 3.7.1), and applicable design response spectra are illustrated therein. Section 2.5 of the FSAR provides the seismic event history of the ANO-2 site used as a basis in determining the seismic design requirements.

Specific details regarding load combinations, allowable stresses, seismic analysis methods employed, and qualification testing for mechanical and electrical components are described in FSAR Sections 3.7 and 3.10, respectively.

Detailed equipment specifications required that the supplier submit test data and/or seismic analysis for review as a condition of acceptance of the equipment for the installed function. These reports were reviewed for compliance with the criteria and, when necessary, the submittal and review procedure was repeated when questions as to conformance with the criteria were raised.

Conclusions for ANO-1 and 2

Mr. Eisenhut stated in his February 10, 1981 letter that his purpose was to obtain sufficient information that identifies the extent to which AFW systems are seismically qualified. We feel the information cited in the FSARs adequately describes the bases for our conclusions of seismic qualification. As the ANO-2 EFW system has been and is designed as a safety grade system, it has been designed, installed and operated the same as other safety grade systems. Given this and the above, we conclude that the ANO-2 EFW system meets or exceeds appropriate unit specific seismic requirements. Additionally, the actions taken to date and those planned to be taken before, during and after the next ANO-1 refueling outage will certainly enhance the plant's ability to withstand a seismic event.

In summary, we have concluded that the actions taken to date and those actions currently planned for implementation will meet the intent of Mr. Eisenhut's letter as it relates to the seismic qualification of our ANO-1 and 2 Emergency Feedwater Systems.