NOV 19 1976

Docket No. 50-313

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Arkansas Power & Light Company
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Gentlemen:

RE: ARKANSAS NUCLEAR ONE - UNIT NO. 1

We are continuing our review of the radiological assessment of uneven tank drawdown in the Reactor Building Spray System and related Loss-of-Coolant Accident malfunctions and have determined that the additional information described in the enclosure is required.

To enable us to maintain our review schedule, please submit the requested additional information within 45 days of receipt of this letter.

Sincerely,

Original signed by
Dennis L. Ziemann

Dennis L. Ziemann, Chief
Operating Reactors Branch #2
Division of Operating Reactors

Enclosure:
Request for Additional Information

THIS DOCUMENT CONTAINS POOR QUALITY PAGES

OFFICE	DOR:ORB #2	DOR:EEB LOT	DOR:ORB #2	8004210 643
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DATE	11/18/76	11/18/76	11/19/76	

Form AEC-318 (Rev. 9-53) AECM 0240 ☆ U.S. GOVERNMENT PRINTING OFFICE: 1974-526-166

cc w/enclosure:
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ENCLOSURE

REQUEST FOR ADDITIONAL INFORMATION ON THE
ARKANSAS REACTOR BUILDING SPRAY SYSTEM UNEVEN TANK DRAWDOWN
AND RELATED LOSS OF COOLANT ACCIDENT MALFUNCTIONS

1. Provide a description and a time history of the different operating modes of the Reactor Building Spray Systems (RBSS) during injection. The operating modes should include the following: (1) the loss of a diesel, (2) the loss of a single low pressure injection system (LPIS) pump, (3) the loss of a single high pressure injection system (HPIS) pump and (4) the loss of a single spray pump within the RBSS. The time history should include the following: (1) when pumps are switched from the Borated Water Storage Tank (BWST) to the Reactor Building Emergency Sump (RBES), (2) the time of system initiation, and (3) the time of first and last chemical additive delivery through the nozzles during injection. Your response should include the results of any test performed relative to the chemical additive system.

2. Provide the spray pH, spray additive flow rates and thiosulfate concentrations as a function of time for each different operating mode in question #1. These calculations should include all conditions which would minimize or maximize the spray pH and minimize the thiosulfate concentrations, such as BWST volume and boron concentrations, RBSS and ECCS flow rates, sodium hydroxide concentration and thiosulfate tank concentration considering its degradation during storage. Only those operating modes and those conditions giving the minimum and maximum spray pH and the minimum thiosulfate concentrations need be considered.

3. Provide both a design basis and a realistic analysis of the radiological consequences of the design basis Loss-of-Coolant Accident using: (a) the X/Q values given in the NRC Safety Evaluation Report dated June 6, 1973, (b) the time that radioiodine is released to the containment atmosphere is coincident with the loss of NaOH from the RBSS injection spray, and (c) the current models of the fission product removal effectiveness of containment sprays, such as those reported in WASH-1329, "A Review of Mathematical Models for Predicting Spray Removal of Fission Products in Reactor Containment Vessels," June 15, 1974, and Standard Review Plan (SRP) 6.5.2.

4. Assume that in the event of a loss-of-coolant accident the ECCS or spray equipment outside containment is leaking at twice the maximum operational leakage rate (i.e., postulate a damaged seal, or packing, or some other leakage path in which leakage would be at a maximum but not great enough to cause the pump or equipment to be declared inoperable during routine testing). Calculate the radioactive release to the environment and resulting doses from the leakage over the 30-day period of operation. (See SRP 15.6.5, Appendices A and B.) Include the following parameters in your analysis:

a. Concentration ($\mu Ci/cc$) of iodine and noble gas activity in the primary containment sump water following a LOCA.

b. Temperature vs. time curve for water being circulated through pumps following a LOCA.

c. Expected maximum leak rate through pump seals, flanges, valves, etc.

d. Partition factor for iodine.

e. Adsorption and filtration efficiencies of the filter train used on the exhaust system for the engineered safety features area and whether these systems meet the requirements of Regulatory Guide 1.52.

5. Provide justification to support the exposure of paints and coatings in the ANO-1 containment to spray pH greater than 11 without damage for the periods of time which would result from operation of the as-built RBSS and ECCS.

6. Provide justification that safety-related systems will not be adversely affected (e.g., suffer stress-corrosion cracking) by pH greater than 11 which would result from operation of the as-built RBSS and ECCS.

7. Provide the following detailed information on the RBSS containment spray headers:

   a. Spray header design, including the materials employed, the number of nozzles per header, and the nozzle spacing and orientation (a plan view of the spray headers, showing nozzle location and orientation, should be included).

   b. Spray nozzle design, including the drop size spectrum produced by the nozzle. Source of the data, method of measurement, and expected accuracy should be discussed.

   c. The regions and free volumes of the containment covered by the spray. Estimate the volumes covered by each spray system separately and those covered by both. List the containment volumes not covered by the spray, and estimate the forced or convective post-accident ventilation of these unsprayed volumes. Indicate the extent to which credit is taken for the operability of duct work, dampers, etc. Provide drawings which show the location of floors, walls, and major equipment (e.g., spray headers, reactor vessel, steam generators, pressurizer, ventilation filter assemblies, coolers, accumulators, ESF sumps, etc.) within containment.