April 13, 1978

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Dockets Nos.: 50-313
and 50-368

Arkansas Power & Light Company
ATTN: Mr. William Cavenaugh, III
Executive Director, Generation
and Construction Department
P. O. Box 551
Little Rock, Arkansas 72203

Gentlemen:

Enclosed (Enclosures 1 and 2) are additional requests for information and staff positions that have been developed as a result of our review of the fire protection program for Arkansas Nuclear One - Units Nos. 1 and 2 (ANO-1/2). Enclosure 3 identifies regulatory staff positions resulting from our review of the administrative controls for fire protection for ANO-1/2.

With respect to the staff positions, you should provide a statement that you will implement the position as stated or provide a justification for your objection and submit an alternate solution to the concern. In either case, you are requested to provide a description of the resulting proposed modification or method.

To maintain our review schedule for your application for an operating license for ANO-2, we will need your response by April 28, 1978. It is requested that the response for ANO-1 also be provided by April 28, 1978. If development of the response for ANO-2 will cause a delay in submittal of the response for ANO-1, you are requested to submit the response for ANO-1 first.

Sincerely,

Original signed by

Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors

Original signed by

John F. Stolz, Chief
Light Water Reactor Branch #1
Division of Project Management

AP 3
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Enclosures and cc: See next page

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DATE ▶		4/12/78	4/12/78	4/13/78	4/13/78	4/ /78

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Enclosures:
1. Request for Additional Information
2. Staff Positions
3. Staff Positions on Administrative Controls for Fire Protection

cc w/enclosures:

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ENCLOSURE NO. 1

REQUEST FOR ADDITIONAL INFORMATION

ARKANSAS NUCLEAR ONE - UNITS 1 AND 2

DOCKET NOS. 50-313 AND 50-368

(ANO-2) 77. Zone 2096-M (proposed modifications) Identify the fire retardant material to be applied and the type of insulating board to be used. Provide test data which confirms the adequacy of these materials.

(ANO-1) 78. Various apparent safety related areas are identified in the fire hazards analysis as not containing any safety systems or class IE circuits. These areas include fire zones 86-G and 87H (diesel generator rooms), I-E and 2-E (diesel generator exhaust fan rooms), 95-O (north battery room), and 10-EE (east decay heat removal pump room). Revise the fire hazards analysis to correct these areas.

(ANO-1&2) 79. Provide a list of safe shutdown systems which were evaluated in the fire hazards analysis to assure that a fire would not preclude the capability to reach cold shutdown.

(ANO-2) 80. Describe the criteria used to divide fire areas into fire zones. Describe the measures taken to preclude a fire from being transmitted through penetrations, such as cable tray, doorway, or ventilation duct, or masonry walls separating fire zones.

(ANO-2) 81. Zone 2154-E. The fire hazards analysis for this zone states that no redundant safety circuitry or other systems for safe shutdown are located in this zone. During the site visit it was noted that this area contained redundant trip breakers and the remote shutdown panel. Revise the fire hazards analysis to describe the effects of fires on this safety equipment.

(ANO-2) 82. Describe the time allowable to manually operate valves which may be affected by fires in the following areas. Describe the criteria used to establish the allowable time.

2032-K, item #7

2111-T, 8

2073-DD, 11, 15

2084-DD, 3&4

2081-HH, 3

(ANO-2) 83. Zone 2094-Q. Describe how a fuel oil line break would be detected so that fuel pumps may be stopped.

(ANO-2) 84. Zone 2097-X. Acceptance criterion 6 is used for this zone indicating that affected systems are not required for safe shutdown. However, a fire in this zone may affect redundant battery chargers.

Describe how loss of the battery chargers on faults on the associated cables is precluded from affecting the batteries.

(ANO-2) 85. Zone 2100-Z, item 2.0. Identify those systems which would lose cooling water for a fire affecting valves 2CV1425-1 and 2CV1427-2.

(ANO-2) 86. Zone 2073-DD, item 8. Describe why the shutdown cooling suction valves are not required for safe shutdown. Identify the location of these valves.

(ANO-1&2) 87. Your response to position PF.5 states that cable penetration firestop tests will be performed. Provide the results of these tests to demonstrate that our position is met. Results of tests performed should cover Unit 1 and Unit 2 firestop designs.

(ANO-2) 88. Describe how penetrations of fire barriers are sealed including doorway, ventilation duct, and electrical cable penetrations. It is our position that these should be three-hour fire-rated.

(ANO-2) 89. Zone 2055-JJ. Describe why the ECCS pump room coolers are not required for the operation of the high pressure and low pressure injection pumps in these rooms when these pumps are used to achieve safe shutdown conditions.

(ANO-2) 90. Zone 2010-LL. Describe the redundant equipment that may be affected by fires in this zone. The equipment described in the "Redundant Safety Circuitry" section is only from one division.

(ANO-2) 91. Zone 2150-C. Describe why the coolers are not required but the condensers are required for the control room emergency ventilation system.

(ANO-1) 92. Describe the time allowable to manually operate valves which may be affected by fire in the following areas:

149-E, item #3

112-I, #1

98-J, #7, 8

99-M, #6

(ANO-1) 93. Identify the quantity of lube oil in the service water pumps at the Unit 1 intake structure.

(ANO-1) 94. Response 57 does not substantiate the conclusion that a hot short affecting associated circuits cannot effect more than one safety division. According to the information provided, it appears that it was permissable to route an associated circuit, connected to one safety division, in a non-safety related raceway. Redundant safety equipment could then be affected by a fire that involves this non-safety tray and a non-safety or safety tray containing the associated circuit of the corresponding redundant equipment. Describe any separation criteria which preclude such an event. Additionally, describe any isolation devices which would prevent a hot short in associated circuits from affecting operation of the safety equipment to which the associated circuit is connected.

(ANO-1&2) 95. Response 22 notes that the control switch for stopping the diesel transfer pumps is located on a motor control center near the diesel generator rooms. Describe the routing of the cable between the control switch and the transfer pumps, and whether the cabling passes through the diesel generator rooms.

(ANO-2) 96. Response 58 pertaining to the auxiliary building electrical penetration area pre-action sprinkler system argues that location of sprinkler heads or spray nozzles to provide coverage of lower trays is unnecessary. However, response 67 notes that pre-action systems for cable penetration areas inside containment will be combined pre-action and water spray systems.

(a) Describe why such a system is required inside of containment but considered unnecessary outside of containment.

(b) Provide drawings showing location of heads or spray nozzles where combined pre-action and water spray systems are to be used.

(c) Describe the method of actuation for diesel generator, containment and auxiliary building penetration area sprinkler systems.

ENCLOSURE NO. 2

STAFF POSITIONS

ARKANSAS NUCLEAR ONE - UNITS 1 AND 2

DOCKET NOS. 50-313 AND 50-368

PF.9 (ANO-1&2) During the site visit of November 2-4, 1976, we noted that portable air handling equipment was available. However, interconnecting ductwork was not provided. Since the normal ventilation systems may be unavailable due to damage to handle smoke removal functions, reliance must be placed on portable air handling equipment for smoke removal. These units should be provided with an adequate amount of portable ducting to facilitate their use during fire situations.

To assure adequate smoke removal capability, three portable exhausters should be provided with a minimum capacity of 15,000 cfm total. The portable air handling units should be strategically located to minimize the time required to place them in operation for smoke removal purposes.

PF.10 (ANO-1&2) To assure availability of suppression water to safety-related areas, all valves in the fire water system whose closure would cause loss of fire suppression water to safe-shutdown areas or areas presenting a hazard to safe-shutdown areas should be either: (1) electrically supervised; (2) under a management supervision program which includes locking valves open with strict key control; or (3) provided with tamper proof seals and periodic, visual check of all valves.

PF.11 (ANO-1&2) The sprinkler systems, in several areas containing safe shutdown equipment, are presently manually actuated suppression systems. Manual operation would allow a fire to involve significantly more systems than would be affected if the systems were automatic. To provide prompt response to fires, the fire suppression systems in the containment electrical penetration areas and diesel generator rooms of Unit 1 and the diesel fuel oil storage areas of both units should be changed to automatic operation.

PF.12 (ANO-1&2) Smoke detectors at ceiling level or in exhaust systems may not provide prompt detection of fires in the control room, and would allow fires to become larger and involve more systems than would be affected if prompt detection were afforded. Smoke detectors should also be located in each cabinet or console containing redundant safe shutdown equipment. In addition, on Unit 1, smoke detectors should be located below the ceiling in the area of any cabinets that are not vented directly to the ventilation ductwork.

PF.13 (ANO-1&2) Portable CO_2 extinguishers may not be effective in suppressing fires that have become deep-seated. A portable water or halon 1211 type extinguisher rated for fires in Class A combustibles should be provided in the control rooms.

PF.14 (ANO-1&2) Portable extinguishers would not provide adequate capability to suppress all fires. Manual hose stations should be provided in the containment building.

PF.15 (ANO-2) Our position PF.1 provided to you April 14, 1977 has not been responded to. Our position is unchanged. For detectors in containment located below grating or in open areas, smoke and heat collectors or solid panels should be provided over detectors.

PF.16 (ANO-2) Our position PF.3 is unchanged with respect to motor control centers and local control panels. Lack of protection from water sprays may increase the effects of a fire, causing additional safety systems to be disabled beyond those that are directly involved in the fire. Safety-related motor control center cabinets and local control panels in areas with sprinkler systems should be sealed on top and provided with shields which protect them from the water spray.

PF.17 (ANO-1&2) Your response to position PF.4 states that a barrier will be installed between the orange and green power cable trays in a certain manhole. The fire hazards analysis identifies several other manholes that contain redundant cables for service water or fuel transfer pumps. Barriers should be installed between redundant cables in manholes 1MH03 thru 1M06, 1MH09 and 1MH10, and 2MH01 thru 2MH03.

PF.19 (ANO-1&2) Your response to our position PF.6 concerning control of fire doors states that only where doors are required to be locked or alarmed for security reasons will such be done. Our position is that, as a minimum, fire doors in barriers separating redundant safe shutdown equipment or separating safe shutdown equipment from large fire hazards should be locked, or alarmed with a time delay to notify the control room if a door is left open.

PF.20 (ANO-1&2) It is our position that oil collection systems for reactor coolant pumps be provided. These systems would collect oil leaks from the lift pump, oil cooler (if external to reservoir), flanged or gasketed oil connections, oil level sight glasses, drain and fill connection points, and oil reservoirs. Provide details on the oil collection systems for the reactor coolant pumps.

PF.21 (ANO-1&2) Smoke detectors which alarm in the control room should be located in all safety-related areas containing combustibles.

PF.22 (ANO-1&2) Your response to NRC request for additional information number 15 indicates that the main distribution panels for the normal and emergency lighting systems could potentially be damaged by a fire at elevation 336 of the turbine deck of Units 1 and 2. It is our position that protection be provided at these panels, or that fixed sealed beam emergency lighting units with individual 8-hour minimum battery power supplies be located in the control room and areas providing access to safe-shutdown equipment areas.

PF.23 (ANO-1&2) To detect loss of ventilation flow to the battery rooms which is required to keep hydrogen concentrations below the combustible limit, loss of ventilation flow detection devices which alarm in the control room should be provided.

PF.24 (ANO-1) Response 9(c) discusses the ability of the Halon system to suppress surface fires, and the inability of a Halon system to totally extinguish a deep seated fire. Rate-of-rise type thermal detectors are currently used for actuation of the total flooding Halon system in the above-ceiling and below-floor spaces in the Unit 1 area of the control room. To provide prompt actuation of the Halon system to extinguish a fire in its early stages and preclude a fire from becoming deep seated, the thermal devices should be replaced with smoke type detection devices for actuation of the Halon system.

PF.25 (ANO-1&2) (a) During the site visit it was noted that the (ANO-2) detection system alarm panel in the control room appeared not to be approved or listed by a recognized testing laboratory. Response 61 addresses approved and non-approved components in the ANO detection and supervisory system. However, the alarm panel is not addressed. Since this panel is apparently non-approved, increased testing of this item should be performed. Tests to verify the operability of the alarm panel should be performed at least once per 31 days.

(b) Additionally, non-approved detection devices in safety-related areas referenced in response 61 should be replaced with approved detection devices.

ENCLOSURE NO. 3

STAFF POSITIONS

ADMINISTRATIVE CONTROLS FOR FIRE PROTECTION

ARKANSAS NUCLEAR ONE - UNITS 1 AND 2

DOCKET NOS. 50-313 AND 50-368

On February 28, 1978, Arkansas Power & Light Company submittal of Fire Protection Plan describing how our guidelines, contained in "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls, and Quality Assurance" dated June 20, 1977, would be met. Our review of this plan has identified several deficiencies as reflected by the following staff positions:

1.0 The plan or its supplement should be revised to contain the:

(a) Identification of the "offsite" management positions assigned the fire protection program responsibilities specified in Sections 1.0a and 1.0b of Attachment #1 of the NRC guidelines, "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance" dated June 20, 1977.

(b) Identification of the "onsite" management position which provides a single point of control and contact for all contingencies.

(c) Identification of the "onsite" positions assigned the responsibilities for fire protection program activities specified in Section 1.0-d, items (1), (5), (6), and 1.0-e of Attachment #1, of the NRC guidelines, "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance", dated June 20, 1977.

(d) Description of the measures which assure that: (1) personnel responsible for the maintenance and testing of the fire protection system are qualified by training and experience for such work; and (2) the recommendations in NFPA #27 and the standards contained in the associated Appendix were considered in organization, training, and functioning of the fire brigade.

(e) Qualification requirements of the consultant or fire protection engineer position responsible for the formulation and implementation and periodic review of the fire protection program.

(f) Qualification requirements of the fire brigade and emergency fire team instructor which demonstrate the knowledge, experience and training required to fight fires that could occur in windowless structures such as a nuclear power plant.

(g) Organizational chart of the ANO's fire brigade and the emergency fire team which includes:

(1) the size and composition of the brigade and emergency fire team for each shift, and the lines of communication and authority to onsite management and between these fire fighting units.

(2) identification of the lines of authority and responsibility of each position in the fire brigade and emergency fire team relative to fire protection, and the interaction between the brigade and emergency team during a fire emergency.

(h) Projected dates required to achieve 100% training for all emergency fire teams members in ANO's initial training courses.

(i) Information which assures that the fire fighting procedures identify:

(1) means of immediately alerting the fire brigade upon report of a fire or receipt of alarm on control room annunciator panel, such as: announcing location of fire over PA system, and sounding fire alarms and notifying the shift supervisor and the fire brigade leader of the type, size, and location of the fire.

(2) actions to be taken by the fire brigade after notification by the control room operator of a fire, including: location to assemble; directions given by fire brigade leader; and responsibilities of brigade members such as selection of fire fighting equipment and transportation to fire location, selection of protective equipment, use of fire suppression system operating instructions, and use of pre-planned strategies for fighting fires in specific areas.

(3) organization of fire fighting brigades and the assignment of special duties according to job title so that all fire fighting functions are covered by any complete shift personnel complement. These duties should include command control of the brigade, fire hose laying, applying the extinguishant to the fire, advancing support supplies to the fire scene, communication with the control room, coordination with outside fire departments.

(4) operations requiring control room and shift engineer coordination or authorization.

(j) The description of fire protection quality assurance program which complies with all the requirements of Attachment No. 6 of the NRC guidelines entitled "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance," dated June 20, 1977.

(k) A listing of all planned Fire Protection Program procedures with their effective dates of implementation.

2.0 The plan or its supplement should be revised to state that:

(a) The responsibilities of each fire brigade and emergency fire team positions correspond with actions required by the fire fighting procedures;

(b) The responsibilities to the operation of the plant of the fire brigade and emergency fire team members do not conflict with their responsibilities during a fire emergency;

(c) The fire brigade and emergency fire team members qualifications include satisfactory completion of a physical examination for performing strenuous activity. The staff has defined the intent of the phrase "strenuous activity" to recommend that a periodic physical examination be provided to screen out personnel with heart or respiratory disorders from service in the fire brigades or emergency fire teams.

(d) The emergency fire teams, in addition to the fire brigade, receive the training specified in Attachment #2, to the NRC guidelines, "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance," dated June 20, 1977.

(e) The minimum fire brigade size for each shift is five (5) trained onsite personnel whose normal duties do not conflict with their responsibilities during a fire emergency.

(f) Classroom instructions include the proper methods and techniques for fighting fires inside windowless structures.

(g) Personnel assigned as leaders of the fire brigades and emergency fire teams, and are directly responsible at the scene for fighting the fire, receive special leadership training for commanding a fire fighting unit;

(h) The area and type of fire chosen for the drill is varied such that brigade members are trained in fighting fires in all safety related areas containing significant fire hazards;

(i) The situation selected for drills simulates the size and arrangement of a fire which could reasonably occur in the area selected, allowing for fire development due to the time required to respond, to obtain equipment, and organize for the fire, assuming loss of automatic suppression capability;

(j) Drills are held at least once per year with offsite fire fighting organizations.

(k) Controls are established to prohibit the storage of combustibles in safety related areas.

(l) Controls are established for the handling and use of combustibles in safety related areas.

(m) All waste, debris, scrap, rags, oil spills or other combustibles resulting from the work activity is removed from the area following completion of the activity, or at the end of each work shift, whichever is sooner.

(n) Work requests involving plant systems in safety-related areas should be reviewed for fire protection impact by the Plant Fire Chief or a similarly qualified (by training and experience in fire prevention and fire fighting) individual.

(o) Provisions have been established for:

training offsite fire department personnel in basic radiation principles, typical radiation hazards, and precautions to be taken in a fire involving radioactive materials in the plant. Training should also include problems encountered and special techniques required in fighting fires in windowless structures, if such training has not been provided to the offsite fire department personnel.

(p) Strategies have been established for fighting fires in all safety related areas and areas presenting a hazard to safety related equipment.

(q) Prefire plans and procedures are used as:

(1) a basis for fire brigade and emergency fire team training and drills; and

(2) for joint training with the offsite fire departments.