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

MAY 1 5 1979

Docket No: 50-368

LICENSEE: Arkansas Power & Light Company

FACILITY: Arkansas Nuclear One, Unit 2 (ANO-2)

SUBJECT: SUMMARY OF MEETING FOR ARKANSAS NUCLEAR ONE, UNIT 2 (ANO-2) REGARDING THE EMERGENCY FEEDWATER SYSTEM

A meeting was held on May 9, 1979, regarding the subject as noted above. The purpose of the meeting was to evaluate the Emergency Feedwater System (EFS) for ANO-2 in light of the Three Mile Island incident. A list of attendees is provided in Enclosure 1, and a list of questions sent to the licensee by the staff on May 4, 1979 by way of telecopy is provided in Enclosure 2.

The licensee stated that the EFS for ANO-2 is designed to automatically initiate as part of the Engineered Safety Features Actuation System. The system is designed to the latest revision (Rev. 1) of Branch Technical Position ASB 10-1.

The EFS is designed to provide a means of supplying water to the intact steam generator(s) following a postulated main steam line rupture or loss of main feedwater to remove reactor decay heat and provide cooldown of the Reactor Coolant System to the temperature and pressure at which the Shutdown Cooling System can be placed in operation.

Redundancy is provided for components of the EFS to assure operation in the event of a single failure of a mechanical or electrical component within the system.

The EFS system employs one turbine driven pump, one motor driven pump, and two independent feedwater trains each capable of supplying either of the two steam generators. The pumps and piping system, except for the condensate water supply and flush and recirculation lines downstream of the first isolation valves are designed to meet ASME Section III, Class 3 and Seismic Category I requirements. The isolation valves are designed to meet ASME Section III, Class 2 and meet Seismic Category I requirements. At rated flow, each pump is capable of providing sufficient makeup water to the steam generators for removing a decay heat load of 3.5 percent of full reactor power at maximum steam generator pressure.

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The EFS discharge piping and valving arrangement is designed to allow either pump to supply cooling water to either or both generators. Each supply line to each steam generator is provided with redundant control valves in accordance with single failure criteria to ensure isolation of the steam generators and feeding of the remaining intact steam generator as required during an engineered safety features actuation of the EFS following a postulated main steam or feedwater line break.

The EFS is provided with the necessary controls for local or remote and automatic or manual operation of the system. Local controls are mounted on a panel near the pumps and the remote controls are in the main control room. All controls and control signals for the steam turbine - driven pump and the electric motor driven pump are channelized. Physical separation between the electrical components is provided in accordance with IEEE 279-1971 Standard Criteria for Protection Systems for Nuclear Power Generating Stations.

The design basis events which will cause automatic emergency feedwater actuation are: (1) steamline break inside containment, (2) steamline break outside containment and (3) loss of main feedwater. The parameters which are monitored to indicate these events are (1) steam generator pressure and (2) steam generator level.

The staff itemized in detail the licensees response to the questions provided in Enclosure 2 and indicated to the licensee that the results of the staff's evaluation on the ESF for ANO-2 would be provided in a document to be issued in the near future.

Leon B Engle

Leon B. Engle, Project Manager
Light Water Reactors Branch No. 1
Division of Project Management

Enclosures:
1. Attendance List
2. Request for Information,
   dated May 4, 1979

cc:
See next page

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ENCLOSURE 1

ATTENDANCE LIST

FOR

MEETING, MAY 9, 1979

ARKANSAS NUCLEAR ONE, UNIT 2

ARKANSAS POWER & LIGHT COMPANY

AP&LCo.

P. L. Almond

B. A. Baker

R. Cook

J. T. Enos

E. Ewing

G. Young

Sandia Corporation

G. Kolb

NRC Staff

L. B. Engle

J. Calvo

M. Greenberg

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ENCLOSURE 2, MAY 4, 1979

REQUEST FOR ADDITIONAL INFORMATION

As part of its on-going review of the Three Mile Island Unit 2 accident, the staff finds that it needs additional information regarding the auxiliary feedwater systems (AFWS). This information as outlined below, is required to evaluate AFWS reliability for Combustion Engineering (CE) and Westinghouse designed pressurized water reactors. The requested information is in addition to that requested in the IE Bulletins, and should be brought to the meeting scheduled with the staff on May 8 thru May 12, 1979.

Written system description (as built) including:
- List of Support Systems for Auxiliary Feed System Operation (Both Electric and Steam)
- Water Supplies for AFWS (primary and backup)

Current operating procedures and test and maintenance requirements including:
- All LCO's for AFWS, main FW system and related support systems.
- Listing of operator actions (local and/or control room) and timing requirements for such actions.
- Procedures for reinitiating main feedwater flow.

As Built P&IDs with symbol keys including condensate and steam side

Ledgible Equipment layouts drawings including:
- Isometrics, if available
- Identification of inhibits preventing accessibility to AFWS components and related electrical equipment

Relevant control systems description including:
- Schematic or logic control diagrams
- Listing of actuation signals/logic and control
  - MSIS logic for isolating AFWS, if installed
  - electric power dependences
  - All "readouts" available in control room for AFWS operation

AC & DC Power
- One line diagrams (normal and emergency power supplies)
- Divisional designation e.g., Train A, Train B, requirements on all AFWS components and support systems
- List of normal valve states and loss-of-actuation power failure position

Operating Experience, including
- Number of main feedwater interruptions per year experienced to date for each unit
- Number of demands on AFWS per year to date (test and actual) for each unit
- Summary of AFWS malfunctions, problems, failures

Provide Available reliability analyses

Steam Generator dry-out times (assuming loss of all feedwater flow, with 100% initial power, with Reactor trip, no line breaks)

System design bases including:
- Seismic and environmental qualification
- Code and Quality, QA

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Provide written responses to the following set of questions by 5/8/79

Describe backup systems available (to auxiliary feedwater) for providing feedwater to steam generators. Discuss actions and time required to make these systems available. Are procedures available? If so, provide.

Provide the following procedures:
- loss of offsite power
- loss of feedwater
- LOCA (small and large)
- Steam Line Break

Provide following information for PORV's:
- Number
- capacity
- setpoints (open and close)
- manufacturer and model
- indications of position
- record of periods isolated (isolation valve shut)
- challenges during life of plant (from plant records) including performance of valve, cause of challenge.
- experience of two-phase or subcooled discharge of PORVs and safety valves with description of valve performance

Provide indications of PORV isolation valve in the control room.

Provide the following information on ECCS:
- initiation setpoints
- system description
- pump performance characteristics (head curves)

Provide reactor protection system trip setpoints.

Provide information on charging pumps, how they relate to ECCS including:
- number
- flow vs. pressure
- power sources and backup
- water sources
- seismic qualification

List all challenges (and cause) to ECCS as indicated on plant records.

List and discuss all instances during which your plant has undergone natural circulation.

Describe all automatic and manual features which can stop the reactor coolant pumps.

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