Docket

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

November 29, 1988

Docket No. 50-313

NOTE TO: Files

FROM: C. Craig Harbuck, Project Manager
Project Directorate - IV
Division of Reactor Projects - III,
IV, V and Special Projects

SUBJECT: SUMMARY OF MEETING WITH ARKANSAS POWER AND LIGHT COMPANY ON NOVEMBER 18, 1988, AT ROCKVILLE, MARYLAND, TO DISCUSS ARKANSAS NUCLEAR ONE, UNIT 1, (ANO-1) STARTUP ISSUES (TAC NO. 71137)

The purpose of the meeting was to resolve NRC staff concerns regarding four startup issues: Decay Heat Removal (DHR) system shutdown cooling mode of operation; operability of the Penetration Room Ventilation system; operability of nozzles in safety-related piping systems; and whether any of the licensee's corrective action system open items were operability or safety concerns that needed to be resolved before startup. The meeting to discuss these issues had been requested by Region IV in a November 7, 1988, Confirmation of Action Letter (Enclosure 1). The agenda for the meeting and a list of attendees are in Enclosure 2. A summary of the discussion for each issue follows:

1. Safety-related pipe nozzle issue

This issue concerned 84 nozzles identified in a December 1985 Bechtel report which either had not met vendor allowables, Bechtel Power Corporation (BPC) allowables, or were indeterminate for as-built calculated stresses. The licensee had previously been unable to provide documentation to support an operability determination of these nozzles. The licensee stated in their presentation that they had expanded the scope of their review to a total of 236 nozzles, including the 84 from the BPC report. This included all Q-nozzles. The licensee gave three criteria they had used for assessing operability. These were: (1) stresses were within the vendor allowable values; (2) the design net BPC design guidelines empirically developed in the early 1970's; or (3) stresses were determined to be acceptable by an AP&L calculation, or if not, an evaluation which concluded the system was operable even with an inoperable component. A breakdown of the disposition of the 236 nozzles was provided:

84 These were excluded from the review right off because they were in piping of size 2 inches or less. Piping of this size was usually excluded from detailed specific stress analysis due to the standard conservative design guidelines used.

DF01
1/1

5 These were excluded from the review because they were subsequently determined to be non-Q.

118 These were assessed to be operable based on Criteria (1)

14 These were assessed to be operable based on Criteria (2)

15 These were assessed to be operable based on Criteria (3)

The 29 items under Criteria (2) and (3) were discussed in detail. The licensee stated that pending additional documentation and/or analysis, it was assumed that 2 nozzles under Criteria (2), could be stressed beyond the yield point; however, both were connections on top of the Sodium Hydroxide tank, T-10. Even if they failed, the tank would still perform its safety function of supplying NaOH to the reactor building spray system; thus T-10 would remain operable.

The other 12 nozzles under Criteria (2) were not attached to active components. It was stated that based on a bounding calculation done by Bechtel, the potential stresses on these 12 nozzles were less than that allowed by the ASME Code.

Based on the licensee's presentation the staff concluded that the concerns regarding operability of safety-related piping nozzles had been adequately addressed to permit startup.

For final resolution, the licensee committed to resolve the assumed potential overstress situation on the vent and makeup line nozzles on T-10, within 2 months (on or about January 18, 1989). The licensee also committed to complete the reconstitution of the design basis of the 118 nozzles under Criteria (1) and the 15 nozzles under Criteria (3) within 9 months (on or about August 18, 1989). This means that each nozzle will be verified to be in conformance with the design basis (code requirements), vendor allowables (if they exist), or the equivalent (obtained by stress analysis).

The staff informed the licensee that an inspection of the documentation to support the licensee's operability assessments would be performed in December, 1988.

The licensee indicated that a similar design basis review of Unit 2 had been started. Preliminary indications were that the supporting documentation was more readily available than for Unit 1.

The slides used by the licensee in their presentation are in Enclosure 3.

2. Operability of Penetration Room Ventilation System (PRVS)

The licensee described the results of the November 31, 1988 as-found functional test of the PRVS. Three problems were found. The most significant one was air out leakage at the entry door from the lower south electrical penetration room. This was caused by the adjacent electrical equipment room being at a lower pressure than the penetration room. That was due to an open suction air-register in ventilation ductwork in the electrical equipment room. The air-register was returned to its correct closed position, and this corrected the problem.

Other improvements such as doing preventive maintenance on the suction check valves and the drain backwater valves, and installing new penetration room entry door seals had been completed.

The licensee committed to verify the functionality of the PRVS and to complete a successful 18-month surveillance test prior to declaring the system operable and prior to startup.

Based on the improvements made and the licensee's commitment, the staff concluded that the concerns regarding PRVS operability had been adequately addressed to permit startup.

The slides used by the licensee in their presentation are in Enclosure 4.

3. Decay Heat Removal (DHR) System long-term post accident cooling and shutdown cooling modes of operation

The staff's concerns regarding this system were derived from an October 26, 1988 event in which shutdown cooling flow was lost while the reactor coolant system was in partial loop operation, drained down to the reactor coolant pump seal (RCP) replacement level. When a licensee technician deenergized the RCP seal parameter recorders he incorrectly removed an additional fuse which removed normal power to the electric-to-pneumatic controllers for both shutdown cooling flow control valves, CV-1428 and CV-1429. Removal of this single fuse caused both valves to shut and the loss of shutdown cooling flow through both decay heat exchangers. Because both trains of the DHR system in the shutdown cooling mode of operation were vulnerable to a single failure (loss of power), the staff was concerned about the overall adequacy of the design of the DHR system.

Following a presentation on the design of the DHR system, the licensee stated that the following actions had been completed to resolve the single failure criteria concern of the staff.

The loss of power failure mode of the DHR system flow control valves was changed to fail open as originally designed. In the case of partial loop operation, where this failure mode could quickly result in vortexing, pump cavitation and possible pump damage and loss of flow, the low pressure injection block control valves CV-1400 and CV-1401 will be used for flow control. These are independently powered motor operated valves and fail as is. To address a related concern which resulted from the October 26 event, the licensee committed to lower the shutdown cooling low flow alarm setpoint to 1000 gpm from 1600 gpm. This 1600 gpm set point was near the maximum flow achievable without pump cavitation when the RCS is drained to the RCP seal replacement level. This flow rate near the alarm setpoint had resulted in intermittent actuation of the low flow alarm, which had become a nuisance to the operators, and was therefore ineffective.

The licensee also planned other short term and long term actions as noted in Enclosure 5.

Based on the licensee's actions and plans noted above, the staff concluded that the concerns regarding the shutdown cooling and long term cooling modes of operation of the DHR system had been adequately resolved to permit startup.

The slides presented in the meeting are in Enclosure 5.

4. Corrective action systems - review of open items for operability and safety issues needed to be resolved prior to startup

The list of open items to be reviewed was drawn from all of the various tracking systems currently in use by the licensee in addition to past systems that have been superseded. As defined in Enclosure 6, three criteria were used to screen each open item.

A total of 4750 open items were identified. Of these about 1200 were judged to potentially meet the review criteria. At the time of the meeting, about 70 items remained to be resolved. Resolution was being accomplished by 1) closure, because they were deemed to be a heatup restraint, or 2) documention of the basis for operation pending final closure.

The licensee committed to complete resolution of these 70 items prior to startup.

Based on the above and the licensee's commitment, the staff concluded that this concern had been adequately addressed to permit startup.

A copy of the slides used in the presentation are in Enclosure 6.

In summary, the staff concluded that the licensee could restart ANO-1 once the pre-startup commitments are completed.

/s/

C. Craig Harbuck, Project Manager
Project Directorate - IV
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosures:
As stated

cc w/enclosure:
See next page

DISTRIBUTION
Docket File
NRC PDR
Local PDR
PD4 Reading
J. Calvo
C. Harbuck
OGC-Rockville
E. Jordan
B. Grimes
ACRS (10)
T. Martin (Region IV)
PD4 Plant File

PD4/PM	PD4/D
CHarbuck:sr	JCalvo
11/28/88	11/29/88

Based on the above and the licensee's commitment, the staff concluded that this concern had been adequately addressed to permit startup.

A copy of the slides used in the presentation are in Enclosure 6.

In summary, the staff concluded that the licensee could restart ANO-1 once the pre-startup commitments are completed.

C. Craig Harbuck

C. Craig Harbuck, Project Manager
Project Directorate - IV
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosures:
As stated

cc w/enclosure:
See next page

cc:

Mr. Dan R. Howard, Manager
Licensing
Arkansas Nuclear One
P. O. Box 608
Russellville, Arkansas 72801

Mr. James M. Levine, Executive Director
Nuclear Operations
Arkansas Nuclear One
P. O. Box 608
Russellville, Arkansas 72801

Mr. Nicholas S. Reynolds
Bishop, Cook, Purcell & Reynolds
1400 L Street, N.W.
Washington, D.C. 20005-3502

Mr. Robert B. Borsum
Babcock & Wilcox
Nuclear Power Generation Division
1700 Rockville Pike, Suite 525
Rockville, Maryland 20852

Resident Inspector
U.S. Nuclear Regulatory Commission
1 Nuclear Plant Road
Russellville, Arkansas 72801

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
Office of Executive Director
for Operations
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Honorable William Abernathy
County Judge of Pope County
Pope County Courthouse
Russellville, Arkansas 72801

Ms. Greta Dicus, Director
Division of Environmental Health
Protection
Arkansas Department of Health
4815 West Markam Street
Little Rock, Arkansas 72201