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1CAN118202

Director of Nuclear Reactor Regulation
ATTN: Mr. J. F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

SUBJECT: Arkansas Nuclear One - Unit 1
Docket No. 50-313
License No. DPR-51
Low Temperature Overpressurization

Gentlemen:

Your letters of February 23, 1982, (1CNA028207) and March 29, 1982, (1CNA038207) requested information on Low Temperature Overpressure Protection (LTOP). A partial response to your February 23, 1982 letter was submitted on May 17, 1982 (1CAN058207). Attachment 2 contains the remainder of that response. Your March 29, 1982 letter is addressed in Attachment 3.

Also, as a result of AP&L's review of this subject, a modification to the LTOP system has been initiated. This modification as well as corrections of two discrepancies discovered during our review are discussed in Attachment 1.

Very truly yours,

John R. Marshall
Manager, Licensing

JRM:MCS:rd

Attachments

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Attachment 1

As a result of our review of Low Temperature Overpressure Protection (LTOP), AP&L has initiated a modification to the overpressure protection system that will cause the case of inadvertent actuation of high pressure injection (HPI) causing an LTOP event to be improbable. The modification will provide indication of HPI isolation valve position in the reactor control room when the HPI valve breakers are racked out. This change will provide a means to alert the operator to any change in the position of the HPI isolation valves even with the valve breakers racked out. This modification is felt to be necessary due to the possibility that HPI flow indication instrumentation could be out of service during shutdowns for calibration or repair and not provide the operators with HPI valve position indication.

In our review of the previous AP&L submittals on LTOP, we have also discovered two discrepancies. First, in our May 16, 1978 (1CAN057801) letter we stated: "In the case of locking out breakers of pumps and valves, tags are placed on both the control room control-selector switches and at the breaker location". Presently we do not tag the breakers and handswitches to the HPI valves when they are racked out. The change described above will make tagging of the valves unnecessary as the operators will be provided with indications that will show any change in the valve position. Also, AP&L's letter of March 24, 1977 (1CAN037716) states: "Administrative controls and procedures to be utilized during testing of the HPI System will prescribe that only one train will be tested at a time with the other HPI trains racked out (i.e., pumps)." This is restated in our May 16, 1978 letter (1CAN057801). A review of ANO-1 operating procedures shows this not to be the case. A further review of the ANO-1 Technical Specifications indicate that the action of racking out the HPI pump breaker would in fact be a violation of Technical Specification 3.3.2.a.

Attachment 2

NRC Letter of February 23, 1982

Concern #1

This concern was addressed in AP&L's letter May 17, 1982 (1CAN058207).

Concern #2

"The OPS is required to function assuming any single active component failure. ANO-1 overpressure protection system does not meet this criterion for the case of inadvertent actuation of the high pressure injection (HPI) system with the PORV failing closed. You discussed several procedural and administrative controls used to prevent this scenario from occurring and the Branch Technical Position allows for such cases, if reviewed and approved on an individual basis, and if adequate controls to prevent the event are included in the plant Technical Specifications."

- a. "Provide a copy of all Technical Specifications that deal with this subject, or propose appropriate ones."
- b. "List all procedural and administrative controls used during HPI system tests to prevent violating Appendix G limits."
- c. "Could the HPI isolation valves (CV-1219, CV-1220, CV-1227, and CV-1228) be manually opened locally? Would the control room operators have positive valve position indication in light of the proposal to remove power to the valve operators?"

Response #2

- a. AP&L has performed a review of the Low Temperature Overpressure Protection System (LTOP) and the ANO-1 procedures associated with it. As a result of this review, it has been determined that the controls appropriate to the LTOP system are presently contained in the ANO-1 operating procedures and no Technical Specifications are proposed at this time.
- b. When the Reactor Coolant System is $<275^{\circ}$ during heatup and $\leq 230^{\circ}$ during cooldown, the HPI injection block valves are closed and de-energized. This is directed in the operating procedures for heatup (1102.02) and cooldown (1102.10) and is noted in the Makeup and Purification System Operation procedure (1104.02). Also, in the Makeup and Purification System Check Valve and CV-Stroke Test (1104.02 Supplement V), which is performed at $\leq 150^{\circ}$, there is a caution to monitor RCS pressure and pressurizer level to prevent RCS overpressurization.
- c. This item was initially addressed in our May 17, 1982 response. However, it should be noted that the LTOP system modification outlined in Attachment 1 of this letter will provide positive valve position indication in the control room.

Concern #3

"Relative to the OPS testing, please respond to the following:"

- a. "How is the PORV and its control circuitry functionally tested?"
- b. "At what frequency are these tests performed?"
- c. "How do you ensure that these valves actually open during testing?"

Response #3

- a. A voltage source simulates a signal from the pressure sensing device and makes the PORV control circuitry see a RCS pressure of ≥ 525 psig. This tests the control circuitry and the PORV solenoid.
- b. This test is performed at a refueling frequency of 18 months.
- c. The control circuitry is functionally tested as described in (a) and (b) above. During plant startup, operations vents the pressurizer to insure the formation of a steam bubble and the release of any nitrogen trapped in the pressurizer. This venting is performed using the PORV and thus it provides a functional test.

Concern #4

This concern was addressed in AP&L's May 17, 1982 letter.

Concern #5

"You take credit for operator action to mitigate a pressure transient for all analyzed events when a failure-closed of the PORV is considered. No credit can be taken for operator action until 10 minutes after the operator is aware that a pressure transient is in progress. For the most severe event that you analyzed, what audible alarm will alert the operators that a pressure transient is occurring (alarms associated with the PORV cannot be used because it is assumed failed closed)? We require that acceptable technical specification changes or system modifications be proposed to increase your calculated operator time from 4.4 minutes to at least 10 minutes."

Response #5

In this concern you refer to a calculated operator time of 4.4 minutes. Although you do not state the source of this time period, our review of the previous correspondence and evaluation indicates this time to be based upon actuation of HPI. As a result of our review of this event, AP&L has initiated a modification to the LTOP system which is outlined in Attachment 1. This modification will provide the operator with indication of HPI isolation valve position when these valve breakers are racked out. This indication will preclude any position change of the HPI isolation valve being undetectable from the control room. Thus, the case of inadvertent actuation of HPI resulting in a LTOP event is considered improbable. No

other analyzed event postulates a failure-closed of the PORV and therefore this concern is not applicable. Therefore, the described modification should eliminate this concern.

Concern #6

"What training has been conducted at ANO-1 to make the operating personnel aware of overpressure incidents at other facilities and possible overpressure situations at ANO-1? How do you ensure that an emphasis is placed on this problem during your licensing and retraining programs?"

Response #6

The ANO Operations Assessment group reviews all industry events and determines which of these events are applicable to ANO. Based on the Operations Assessment group's recommendations, the events which occur at other facilities, including overpressure events, are presented to the operations personnel. However, there is no special training at ANO-1 specifically dedicated to overpressurization.

Concern #7

As stated in our May 17, 1982, response the overpressure protection modifications were electrical and therefore are not shown on a P&ID.

Concern #8

"You stated that when the PORV is out of service, the makeup tank level is to be lowered to limit the water that can be added to the RCS."

- a. "Where is this requirement stated in ANO-1 operating and control documentation?"
- b. "Are there alternate sources of makeup water, on which HPI pumps could be lined-up to take suction which contain a larger inventory of water than the lowered makeup tank? If so, what controls are in place to control those alternate sources?"

Response #8

A review of current operation procedures indicates no requirement for lowering the makeup tank level. However, as discussed in Attachment 1, HPI initiation resulting in a LTOP event is considered improbable. Therefore, although alternate sources of makeup water are available, all other events allow greater than 10 minutes for operator action and thus eliminate this concern.

Concern #9

This item was addressed in our letter of May 17, 1982.

Attachment 3

NRC Letter of March 29, 1982

Your letter of March 29, 1982 (1CNA038207) contained a report on the ANO-1 LTOP system. In section 3.1.2 of this report you stated "The OMS consists of a single, dual setpoint, power-operated relief valve (PORV). The valve has a high overpressure setpoint of 2255 psig for reactor operation and low temperature overpressure setpoint of 550 psig for reactor cooldown and heatup. A manually operated switch under administrative control is provided to change the PORV setpoint. AP&L does not provide an enabling alarm to alert the operator to switch to the lower setpoint when the RCS temperature and pressure are below 500 psig and 280°F respectively". Some of these statements are incorrect. The PORV high and low setpoints are 2450 psig and 525 psig respectively. Also, AP&L does provide an enabling alarm to alert the operator to switch to the lower setpoint when the RCS temperature and pressure are below 500 psig and 280°F respectively. This was addressed in item 4 of our May 17, 1982, (1CAN058207) letter.

As previously stated in our response to Concern 2(a) in Attachment 2 in the NRC letter of February 22, 1982 (Attachment 2), AP&L has reviewed the LTOP system and has determined that no Technical Specifications are needed at this time.