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March 19, 1990

2CAN039015

Mr. Robert D. Martin  
Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region IV  
611 Ryan Plaza Drive, Suite 1000  
Arlington, TX 76011

Subject: Arkansas Nuclear One - Unit 2  
Docket No. 50-368  
License No. NPF-6  
Request for a Temporary Waiver of Compliance

Dear Mr. Martin:

This letter provides the written documentation to follow-up Arkansas Power and Light Company's (AP&L) verbal request on March 16, 1990 regarding a temporary waiver of compliance from Arkansas Nuclear One (ANO) Unit 2 Technical Specification Limiting Condition for Operation (LCO) Section 3.6.3.1, "Containment Isolation Valves," Action b. The containment isolation valves 2CV-4690-2 (outboard) and 2CVC-78 (inboard check) for the quench tank makeup and demineralized water supply penetration are the subject valves for this waiver request. The ANO Plant Safety Committee has reviewed and approved the proposed actions discussed herein. Administrative controls are in place to ensure compliance with the time periods granted, i.e., a total of four cumulative hours from 1630 hours on March 16 through March 18, 1990 to open 2CV-4690-2 as needed to add water to the quench tank and an additional 30-hour duration to begin on March 19, 1990 upon disassembly of valve 2CV-4690-2 for inspection, repair if necessary, and post-maintenance testing.

The attached enclosure provides the information related to temporary waivers of compliance as discussed with Mr. Joe Callan of your staff.

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An Energy Company

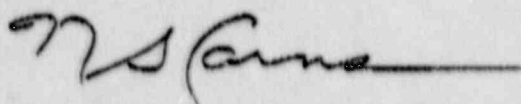
Mr. Robert D. Martin

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If you have further questions after review of the attached information, please contact Mr. Rick King at 501-964-7449.

Very truly yours,



NSC/sms

Attachment

cc:

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Attachment  
ANO-2 Temporary Waiver of Compliance  
For Technical Specification 3.6.3.1  
"Containment Isolation Valves"

Description of Condition

On March 15, 1990, while attempting to close the reactor makeup water (demineralized water) outboard isolation valve, 2CV-4690-2, after adding water to the quench tank, the control room position indicating lights for the valve extinguished, indicating a loss of power to the valve. The subject valve (2CV-4690-2) is a motor operated (MOV) outboard automatic containment isolation valve (CIV) for piping penetration 2P-39 (See Figure 1, page 8). The valve was immediately declared inoperable, verified to be in a closed position, and tagged out to prevent inadvertent opening. This action resulted in compliance with ANO-2 Technical Specification 3.6.3.1, Action b, which allows isolation of a penetration containing an inoperable isolation valve by closing and deactivating an automatic isolation valve. Subsequent investigations revealed that a limit switch in the valve actuator had failed causing the actuator torque switch to be bypassed which resulted in the inability of the torque switch to stop valve motion. The valve thrust was stopped by the tripping (opening) of the thermal overloads in the MOV power supply feeder breaker. Following occurrence of this event, additional engineering evaluations of the design of the actuator and valve concluded that under these conditions, the potential exists that some internal valve components could have been overstressed during subsequent reopening of the valve. At the present time, the valve is functionally capable of maintaining a leak tight isolation barrier for the piping penetration; however, due to this the potential overstress concern, it has been determined necessary to disassemble and inspect the valve internals.

The quench tank is located inside the ANO-2 containment building and functions primarily to receive any discharge from the code safety valves located on the pressurizer. In the event a safety valve should lift, discharged steam is directed to a sparger located inside the tank. A level of water is maintained above the sparger area such that steam entering the tank is condensed (quenched), thus minimizing the resulting pressure and temperature increase in the tank. Due to a slight amount of leakage past the seats on the pressurizer code safety valves during the present operating cycle, the pressure and temperature of the quench tank has been noted to gradually increase over several hours and can adversely affect the level instrumentation on the tank, which is monitored along with other plant parameters to determine Reactor Coolant System (RCS) leakage. Therefore, it has become necessary to periodically feed and bleed the tank contents (i.e., drain water from the tank and add a small amount of makeup water) to maintain acceptable tank temperature.



Additionally, without the capability to periodically cool the tank contents the pressure could increase in the quench tank and would eventually challenge the over-pressure protection devices (relief valve and rupture disc) installed on the tank. Adding makeup water to the quench tank requires the opening of 2CV-4690-2. Currently, the frequency for performing this evolution is approximately once every 30 to 35 hours. An extended loss of the capability to feed and bleed the quench tank due to a Technical Specification requirement prohibiting the opening of 2CV-4690-2 would necessitate a plant shutdown and cooldown.

Purpose for the Temporary Waiver Request and Associated Actions

ANO-2 Technical Specifications (TS) 3.6.3.1 specifies the operability requirements for ANO-2 containment penetration isolation valves (CIVs). The associated action statement requires that any open penetration containing an inoperable CIV be isolated within four hours, otherwise a plant shutdown is required. Upon identification of the problem with 2CV-4690-2 on March 15, 1990, the provisions of the action statement TS 3.6.3.1.b were initially satisfied by securing and deactivating 2CV-4690-2 in its closed position. As currently worded, TS 3.6.3.1 does not provide any allowance for reopening an isolation valve which has been closed to comply with Action b, until the redundant penetration isolation valve has been restored to an operable condition. The redundant CIV for this penetration is check valve 2CVC-78. Therefore, with 2CV-4690-2 in a closed position, the valve is not available to open to add makeup water to the quench tank unless the redundant isolation valve is utilized. Based upon detailed review and evaluation of the design basis for isolation provisions for this piping penetration and additional factors, AP&L concluded that in order to fully investigate the cause of the breaker thermal overload trip and perform required post maintenance testing of the valve, which would require opening of the valve, it would be acceptable and within the plant's design basis to rely upon the redundant isolation valve, 2CVC-78, to act as a deactivated automatic valve secured in its isolation position, and therefore, comply with the requirements of TS 3.6.3.1.b for the short period of time 2CV-4690-2 would be in an open position. Following the subsequent determination of the need to disassemble the valve for internal inspections, this position was reevaluated and concluded to be acceptable based upon the minimum amount of time anticipated to perform this activity. The details and circumstances related to this issue were discussed in a subsequent NRC staff teleconference on March 16, 1990. As a result of these discussions, it was mutually agreed upon that the action required to address the situation would be for AP&L to request a temporary waiver of compliance from the requirements of TS 3.6.3.1.b in lieu of reliance on check valve 2CVC-78 as an adequate isolation barrier for the piping system without absolute assurance the check valve was closed and secured.

On March 16, 1990, at approximately 1630 hours, AP&L requested and verbally received a temporary waiver of compliance from TS 3.6.3.1.b for the time periods stated in the cover letter to this attachment. The time period of four hours was requested based upon the anticipated need to utilize the reactor makeup water system to maintain quench tank conditions as previously described and to allow adequate time to prepare for the disassembly and inspection of 2CV-4690-2 planned to begin March 19, 1990.

An additional time period of 30 hours was requested based upon the time anticipated to complete disassembly and inspection of 2CV-4690-2, implementation of any necessary repairs, and restoration of the valve to an operable condition.

As committed verbally on March 16, 1990, AP&L has implemented, and will maintain in place, the following compensatory measures until 2CV-4690-2 is fully restored to an operable condition.

- Control room operators have been informed of the administrative restrictions on the opening of 2CV-4690-2 to add makeup water to the quench tank, and the limitation on the total cumulative hours the valve can be in an open position and/or disassembled beginning March 19, 1990. In addition, 2CV-4690-2 is deenergized after each valve opening to ensure isolation integrity.
- Prior to disassembly of 2CV-4690-2, the two motor operated valves located in the piping system inside the containment building, 2CV-4685 and 2CV-4693, will be closed and their associated handswitches red tagged while 2CV-4690-2 is disassembled for maintenance to provide an additional isolation barrier for the penetration piping. These valves do not receive any signal to automatically reposition. Additionally, manual isolation valve 2CVC-79 will be maintained in its normally closed position.
- No periodic filling of the quench tank will be performed during the valve testing and any required repairs.
- Should circumstances arise such that repairs to 2CV-4690-2 have not been completed, or it is anticipated that they cannot be completed prior to the expiration of the 30-hour waiver time period, ANO-2 will inform the NRC of the circumstances and if necessary will initiate a plant shutdown.

#### Preliminary Evaluation of Safety Significance and Consequences of Request

##### Overview

There is adequate assurance that while 2CV-4690-2 is in a closed position with its associated actuator deenergized, it is serving as an operable isolation valve. The request to dismantle the outboard containment



isolation valve 2CV-4690-2, which renders it incapable of functioning as an isolation barrier for 2P-39, offers low risk and is considered to be of low safety significance. This judgement is based on a review of the system in which the valve is installed, its normal and emergency modes of operation, and associated equipment.

The valve is utilized in normal modes as a closed valve in the containment makeup water supply. The valve is periodically opened to allow water addition to the quench tank so that level above the spargers can be maintained as part of the quenching process for various RCS reliefs to the quench tank. The time spent in the open position is relatively short in terms of plant operation. However, the valve and its system is exercised on a frequent basis.

The containment makeup water supply line is an ASME Section III piping system from 2CV-4690-2 into the containment. The penetration piping bounded by MOV 2CV-4690-2 outboard and check valve 2CVC-78 inboard is Section III Class 2. Continuing inboard to the quench tank is Section III Class III piping.

The penetration is classified as a GDC 56 penetration although not technically connected to the containment atmosphere as applicable to GDC 56. The classification is conservative in that the inboard check valve 2CVC-78 is tested for leakage as if it were open to containment and included in the cumulative totals for Appendix J type testing.

The quench tank is equipped with a pressure relief valve 2PSV-4696 piped to the containment sump, and a rupture disc 2PSE-4695. The relief valve setpoint is approximately 70 psig and the disc ruptures at approximately 90 psig.

Under accident or emergency conditions, 2CV-4690-2 is designed to close upon receipt of a containment isolation or safety injection actuation signal.

#### Determination of Safety Significance

The safety significance of a disabled or unqualified outboard isolation valve in the containment makeup water system is minimized by the conservative leakage testing performed on the redundant inboard isolation valve, 2CVC-78, resulting in low leakage and good measured performance as the inboard isolation. Furthermore, although not credited as containment isolation valves three normally closed ASME III valves, 2CV-4685 (quench tank supply valve), 2CV-4693 (reactor drain tank supply), and 2CVC-79 (D.I. water header supply), offer an additional code pressure boundary redundant to 2CVC-78 for isolation from sources of fluids inside the containment building. Should the quench tank be pressurized by significant releases of RCS from the pressurizer code safety valves, the pressure relief and rupture disc would limit pressurization of the quench tank supply piping to 70-90 psig. Quench tank pressurization would produce a maximum pressure of 70-90 psig on 2CVC-78.

The disassembly, inspection, and any required repair of 2CV-4690-2 has been preplanned and is anticipated to require a minimum amount of time. The activity will be performed under tight administrative controls with adequate preplanning for contingency situations during which 2CVC-78 and 2CV-4685, 2CV-4693, and 2CVC-79 might be challenged as isolation for RCS fluids or containment atmosphere. The probability of experiencing such a situation is extremely low.

If RCS fluid leakage into the quench tank were to occur, level, temperature, and pressure alarms are available. These parameters are monitored by the control room operators in normal modes of operation as part of Procedure 2103.07, "Quench Tank and Reactor Drain Tank OPS". Operators are familiar with system response and actions required to manage the system. If necessary, a plant shutdown will be initiated.

In conclusion, although 2CV-4690-2 will not be available as a containment isolation valve during testing and repairs, historical data indicates the redundant inboard containment isolation valve 2CVC-78 is in good working order having been leak tested during the last refueling outage. 2CVC-78 requires no change in state from its normally closed position to perform its safety function. 2CV-4685 and 2CV-4693 are normally closed MOV's and 2CVC-79 is a normally closed manual valve each in series with 2CVC-78 which could protect 2CVC-78 from experiencing gross pressurization from either containment atmosphere or RCS leakage. The system in its normally passive state is a low pressure system controlled in part by passive relief devices on the quench tank. The safety significance of having 2CV-4690-2 disabled for a short duration is considered to be low, with minimal risk.

#### No Significant Hazards Consideration

The conclusion that the repair of 2CV-4690-2 offers no significant hazards consideration is based on the following discussion. In accordance with 10CFR50.92(c), this consideration addresses the three criteria outlined therein. The criteria are addressed in numerical order.

Criterion 1: The repair of valve 2CV-4690-2 resulting in loss of the outboard containment isolation function for penetration 2P-39 in the containment makeup water supply will not significantly increase the probability of any accident previously analyzed. The normal state of the valve is closed, and its safety function is to close upon receipt of a Containment Isolation Actuation Signal (CIAS) or Safety Injection Actuation Signal (SIAS). It does not change state automatically except under actuation scenarios of CIAS and SIAS. The valve does not initiate system response post-accident or come into play either as an active failure in postulating an accident, or in mitigating an accident. In other words, the system in which 2CV-4690-2 is installed, is a passive system in terms of accident response or mitigating actions.



The system is not part of a redundant or diverse operating system required to respond to plant upset or emergency conditions. Nor does the repair lead to concern over system failure as an initiating condition or precursor to all accidents. Thus, the probability of any accident previously analyzed is not increased due to the short period of time that 2CV-4690-2 will be disabled.

Consequences of an accident previously analyzed are not significantly changed since 2CV-4690-2 functions only in mitigating those consequences associated with a LOCA as an outboard isolation valve for containment penetration 2P-39. This short-lived reduction in qualification of that piping through containment as an isolation barrier to release of containment atmosphere or process fluids is offset by the inboard isolation valve qualification. 2CVC-78 has been conservatively leak tested as a GDC 56 configuration valve. In addition, the piping inside containment connected downstream of 2CVC-78 is ASME Section III piping with Section III valves normally closed in series with 2CVC-78. The closed valves in series offer assurance that pressurization of the penetration is prevented. The leakage rate of 2CVC-78 has been added into the overall containment leak rate and its performance under containment leakage conditions is quantified.

Criterion 2: The repair of valve 2CV-4690-2 does not create the possibility of a new or different kind of accident. The repair does not require a change in the operating mode of the plant, nor does it induce any condition outside the boundaries of operator training or experience. The repair is identical to that done elsewhere in both nuclear and non-nuclear industries. The repair and the condition of the system during the repair will not violate any other operability criteria for safety related equipment. No other safety related equipment will be required to perform any active function or change of state specifically related to the repair or the condition of 2CV-4690-2 or its system during the repair.

After the repair, surveillance and system testing will be performed using normal procedures and practices for those activities. No operating or design bases are changed during or as a result of this repair except those associated with requirements for containment isolation for the short duration of the repair activity.

Criterion 3: The repair of valve 2CV-4690-2 does not offer a significant reduction in the margin of safety. Although there is a slight reduction in the margin of safety during the period of time that 2CV-4690-2 is disabled, the incremental reduction is not significant. The function of containment isolation can be performed by check valve 2CVC-78, a qualified code pressure boundary component, further supported by code valves in series downstream of 2CVC-78. The system will be secured and passive for the duration of the repair. Its normal and emergency state is primarily a passive system, except during periodic filling of the quench tank. This function will not be performed during the repair. Thus, 2CVC-78 will not change state during this period.



The repair is to restore the valve 2CV-4690-2 to its original condition. Neither its design basis, nor its operational requirements or characteristics will be changed in any way as a result of the repair.

Finally, the incremental reduction in the margin of safety is not significant in that (a) the reduction in containment isolation capability due to repair of 2CV-4690-2 is offset by the qualification and performance of 2CVC-78 and series valves, and (b) the system affected is passive during the repair and has no operating requirements with respect to accident prevention or mitigation which require active participation or change of state.

#### Basis for No Environmental Consequences

This request for a temporary waiver of compliance does not have a significant affect, impact, or change on the quality of the human environment at ANO. This request, when implemented, does not impact the ANO Unit 2 Operating License or the Environmental Report - Operating License (ER-OL) stage documents. Therefore, the request does not significantly involve irreversible environmental consequences.

