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1CAN129013

U. S. Nuclear Regulatory Commission
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Subject: Arkansas Nuclear One-Unit 1
Docket No. 50-313
License No. DPR-51
Response to Generic Letter 90-06

Gentlemen:

Generic Letter 90-06, Resolution of Generic Issue 70, "Power-Operated Relief Valve and Block Valve Reliability," and Generic Issue 94, "Additional Low-Temperature Overpressure Protection for Light-Water Reactors" was issued on June 25, 1990 (0CNA069027), to advise licensees of the NRC Staff positions with respect to resolution of these Generic Issues. The Staff positions are delineated in Enclosures A and B to the Generic Letter.

With respect to the Staff positions delineated in Enclosure A, the Arkansas Nuclear One-Unit 1 Electromatic Relief Valve (or PORV) is not relied upon to perform any of the safety-related functions identified in Section 2 of Enclosure A. Therefore, Entergy Operations, Inc. does not commit to incorporate those improvements identified in Section 3 of Enclosure A for Arkansas Nuclear One-Unit 1. The detailed basis for this position is provided in the enclosed Attachment to this letter. However, a majority of the improvement actions identified in the Staff positions have been implemented at Arkansas Nuclear One-Unit 1 as described in the enclosed Attachment.

As indicated in the Generic Letter, the Staff positions delineated in Enclosure B to the Generic Letter are not applicable to Arkansas Nuclear One-Unit 1 since this plant is a Babcock & Wilcox designed plant which maintains a steam or gas volume in the pressurizer.

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This information is being provided under affirmation pursuant to 10 CFR 50.54(f). Please advise if you require any additional information.

Very truly yours,

James J. Fisicaro

James J. Fisicaro
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JJF/SAB/sgw
Attachments

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STATE OF ARKANSAS)
) SS
COUNTY OF LOGAN)

I, J. J. Fisicaro, being duly sworn, subscribe to and say that I am Manager, Licensing, ANO for Entergy Operations, Inc.; that I have full authority to execute this oath; that I have read the document numbered 1CAN129013 and know the contents thereof; and that to the best of my knowledge, information and belief, the statements in it are true.

J. J. Fisicaro

SUBSCRIBED AND SWORN TO before me, a Notary Public in and for the County and State above named, this 21st day of December, 1990.

Notary Public

My Commission Expires:
May 11, 2000

SAFETY FUNCTIONS OF PORVs AND BLOCK VALVES (GL 90-06, Enclosure A, Section 2):

Generic Letter 90-06 Enclosure A, Section 2 states that over a period of time the role of PORVs has changed such that PORVs are now relied upon by many plants to perform one, or more, of the following safety-related functions:

1. Mitigation of a design-basis steam generator tube rupture accident,
2. Low-temperature overpressure protection of the reactor vessel during startup and shutdown, or
3. Plant cooldown in compliance with Branch Technical Position RSB 5-1 to SRP 5.4.7, "Residual Heat Removal (RHR) System."

Section 2 further states that where PORVs are used or could be used to perform one, or more, of these safety-related functions or to perform any other safety-related function in the future, it is appropriate to reconsider the safety classification of PORVs and the associated block valves.

Arkansas Nuclear One-Unit 1 Response:

Although Arkansas Nuclear One-Unit 1 (ANO-1) is a Babcock & Wilcox designed plant with a single electromatic (power-operated) relief valve and associated block valve, the design of the plant does not rely upon the Electromatic Relief Valve (ERV) to perform any of the safety-related functions identified in Section 2 of Enclosure A. The following discussion provides justification for not depending upon the ERV for each safety-related function:

1. Mitigation of a design-basis steam generator tube rupture accident.

   Section 14.2.2.2 of the ANO-1 Safety Analysis Report (SAR) describes the analysis, the assumed sequence of events, and the results for the design-basis Steam Generator Tube Rupture accident. As described in the SAR, the initial primary-to-secondary leak rate from the tube rupture exceeds the normal makeup to the Reactor Coolant System (RCS). Consequently, primary system pressure decreases and a low RCS pressure trip will occur assuming no initial operator action. The analysis assumes that no operator action is taken until 20 minutes after the tube rupture.

   Following reactor trip, the RCS pressure continues to decrease until High Pressure Injection (HPI) is actuated. The capacity of HPI is sufficient to compensate for the leakage and maintains both pressure and volume control of the RCS. The turbine stop valves will also close following reactor trip; and since a primary-to-secondary leak has occurred, steam line pressure will increase and the steam bypass valves will open to the condenser. The steam bypass system and the condenser are both assumed to be available due to the availability of off-site power during the design-basis steam generator tube accident. Thereafter, the reactor is cooled down and depressurized at 100°F per hour in accordance with normal cooldown procedures.

After the RCS temperature has decreased to the value corresponding to the saturation pressure of the lowest set main steam safety valve, the affected steam generator is assumed to be isolated. Cooldown via the unaffected steam generator continues until the RCS temperature is reduced to 280°F where cooldown is continued using the Decay Heat Removal System.

The ERV is utilized in the ANO-1 Emergency Operating Procedures for a tube rupture accident as a means to depressurize the RCS. However, as indicated above, the ERV (or PORV) is not utilized in the assumed sequence of events and is therefore not relied upon to mitigate a design-basis steam generator tube rupture accident.

2. Low-temperature overpressure protection of the reactor vessel during startup and shutdown.

Low-Temperature Overpressure Protection (LTOP) concerns with respect to PORVs do not apply to ANO-1 since B&W designed plants maintain a steam or gas volume in the pressurizer (as indicated in Generic Letter 90-06). Analyses have shown that during low-temperature overpressure protection conditions, the operator has at least ten (10) minutes to respond to an overpressure event prior to exceeding the LTOP pressure limit.

The ANO-1 analyses supporting the ten minute operator response time was provided in Entergy Operations letter dated March 24, 1977 (1CAN037716). Subsequent reviews by the NRC and Entergy Operations resulted in the current Technical Specifications with respect to LTOP conditions. These specifications (see ANO-1 response to NRC Staff Position 3.1, Item 3 below) were provided in Entergy Operations letter dated August 15, 1984 (1CAN088401), which was issued as Amendment No. 95 to the Facility Operating License.

3. Plant cooldown in compliance with Branch Technical Position RSB 5-1 to SRP 5.4.7, "Residual Heat Removal (RHR) System."

Arkansas Nuclear One-Unit 1 was licensed prior to issuance of the Standard Review Plan and Branch Technical Position RSB 5-1. Therefore, the licensing basis for ANO-1 does not require compliance with Branch Technical Position RSB 5-1 to SRP 5.4.7, "Design Requirements of the Residual Heat Removal (RHR) System."

IMPROVEMENTS TO ALL PORVs AND BLOCK VALVES (GL 90-06, Enclosure A, Section 3):

Generic Letter 90-06 Enclosure A, Section 3 provides the NRC Staff position with respect to actions which should be taken by licensees to improve the reliability of PORVs and block valves. Even though the ANO-1 ERV and associated block valve are not relied upon to perform any of the safety-related functions identified in Section 2 of Enclosure A, the information provided below addresses the current status of ANO-1 with respect to the three separate actions which are presented in Section 3.

NRC Staff Position 3.1, Item 1:

Include PORVs and block valves within the scope of an operational quality assurance program that is in compliance with 10 CFR Part 50, Appendix B. This program should include the following elements:

a. The addition of PORVs and block valves to the plant operational Quality Assurance List.

b. Implementation of a maintenance/refurbishment program for PORVs and block valves that is based on the manufacturer's recommendations or guidelines and is implemented by trained plant maintenance personnel.

c. When replacement parts and spares, as well as complete components, are required for existing non-safety-grade PORVs and block valves (and associated control systems), it is the intent of this generic letter that these items may be procured in accordance with the original construction codes and standards.

Arkansas Nuclear One-Unit 1 Response:

The ERV and associated block valve are within the scope of the Arkansas Nuclear One Quality Assurance Manual Operations (QAMO). The QAMO meets the requirements of 10 CFR Part 50, Appendix B.

a. The ERV (PSV-1000) is included in the ANO-1 Component Level Q-List which is maintained current in the Station Information Management System (SIMS) Component Data Base. This valve is classified as a QA Category Q, Safety Class SR component with a Q-Function of C4 (RCS Pressure Boundary Integrity; Passive). The valve manufacturer (Dresser Industries, Inc.) is on the ANO Qualified Vendors List (QVL) and has an NRC approved 10 CFR Part 50, Appendix B program.

   The block valve (CV-1000) is also included in the ANO-1 Component Level Q-List in the SIMS Component Data Base. This valve is classified as a QA Category Q, Safety Class 1 component with a Q-Function of D4 (RCS Inventory; Passive). The valve manufacturer (Velan Engineering) is on the ANO QVL and has an NRC approved 10 CFR Part 50, Appendix B program.

b. Maintenance and repair activities which affect quality and safety at Arkansas Nuclear One are implemented through controlled procedures by trained plant personnel as described in the QAMO. Each procedure is sufficiently detailed such that a qualified individual may perform the required functions without direct supervision. Maintenance or refurbishment of the ERV is controlled through Mechanical Maintenance Procedure No. 1402.026. Maintenance or refurbishment of the associated block valve is controlled through the issuance of specific Work Plans in accordance with Administrative Procedure No. 1000.006. Work Plans meet the review and approval requirements of existing procedures. Maintenance activities for the block valve are also controlled through the Motor Operated Valve (MOV) Maintenance Program (Maintenance Administrative Procedure No. 1025.011).

c. Replacement parts and spares, as well as complete components for the ERV and block valve (and associated control systems) are procured in accordance with the applicable codes and standards as required by the QAMO.

NRC Staff Position 3.1, Item 2:

Include PORVs, valves in PORV control air systems, and block valves within the scope of a program covered by Subsection IWV, "Inservice Testing of Valves in Nuclear Power Plants," of Section XI of the ASME Boiler and Pressure Vessel Code. Stroke testing of PORVs should only be performed during Mode 3 (HOT STANDBY) or Mode 4 (HOT SHUTDOWN) and in all cases prior to establishing conditions where the PORVs are used for low-temperature overpressure protection. Stroke testing of the PORVs should not be performed during power operation. Additionally, the PORV block valves should be included in the licensees' expanded MOV test program discussed in NRC Generic Letter 89-10, "Safety-Related Motor Operated Valve Testing and Surveillance," dated June 28, 1989.

Arkansas Nuclear One-Unit 1 Response:

The ERV and associated block valve are within the scope of the Inservice Testing Program of pumps and valves for ANO-1 (Engineering Programs Procedure No. 1092.032). This program is in compliance with Subsection IWV, "Inservice Testing of Valves in Nuclear Power Plants," of Section XI of the ASME Boiler and Pressure Vessel Code with NRC approved exceptions.

The ERV is a pilot-operated relief valve and, as such, does not incorporate control air system valves for valve control. ERV PSV-1000 is classified as a Category B valve per Subsection IWV in the SIMS Component Data Base. PSV-1000 is exercised and stroke time tested in both open and close directions per Reactor Coolant System Operating Procedure No. 1103.005, Supplement 1 during plant startup after establishing a pressurizer bubble. This test is performed during cold shutdown conditions in accordance with IWV-3412(a) for Category B valves.

The method of stroke time testing of the ERV uses an acoustic monitor which requires that the associated block valve be in the open position. This test is not performed in hot standby or hot shutdown conditions. Exercising the ERV in hot standby or hot shutdown "prior to establishing conditions where the PORVs are used for low-temperature overpressure protection" is not considered necessary. Stroke testing of the ERV during cold shutdown conditions is considered to be sufficient since LTOP concerns with respect to PORVs do not apply to ANO-1 (see the above response to Item 2 of Section 2 of Enclosure A to the Generic Letter).

Block valve CV-1000 is classified as a Category A valve per Subsection IWV in the SIMS Component Data Base. CV-1000 is stroke time tested in the open and close directions once per quarter per Operations Periodic Tests Procedure No. 1305.007, Supplement 1. This valve is leak tested per Reactor Coolant System Operating Procedure No. 1103.005, Supplement 2 during hot shutdown conditions.

Block valve CV-1000 is included in the ANO Motor Operated Valve Testing and Surveillance (MOVATS) program (Maintenance Administrative Procedure No. 1025.011) in response to the expanded MOV test program discussed in NRC Generic Letter 89-10.

NRC Staff Position 3.1, Item 3:

For operating PWR plants, modify the limiting conditions of operation of PORVs and block valves in the technical specifications for Modes 1, 2, and 3 to incorporate the position adopted by the staff in recent licensing actions. Attachments A-1 through A-3 are provided for guidance. The staff recognizes that some recently licensed PWR plants already e technical specifications in accordance with the staff position. Such ts are already in compliance with this position and need merely state tha their response. These recent technical specifications require that plants that run with the block valves closed (e.g., due to leaking PORVs) maintain electrical power to the block valves so they can be readily opened from the control room upon demand. Additionally, plant operation in Modes 1, 2, and 3 with PORVs and block valves inoperable for reasons other than seat leakage is not permitted for periods of more than 72 hours.

Arkansas Nuclear One-Unit 1 Response:

The current ANO-1 Technical Specifications (TS) contain requirements for low-temperature overpressure protection (LTOP) as well as requirements for the ERV and associated block valve. TS 3.1.2.9 and 3.1.2.10 include requirements to ensure that the core flood tanks and high pressure injection are not potential sources for pressurizing the RCS during LTOP conditions; and TS 3.1.2.11 requires that the plant not be operated in a water solid condition when the RCS pressure boundary is intact to ensure that the RCS is not operated in a manner which would allow overpressurization due to a temperature transient.

TS Surveillance Requirements for the ERV flow monitor, block valve position indicator and an LTOP alarm logic (to ensure that the block valve is open when RCS temperature is reduced to LTOP conditions) are provided in TS 4.1, Table 4.1-1, Items 48, 49 and 60, respectively. A Surveillance Requirement to exercise the ERV at the end of each refueling outage is provided in TS 4.1, Table 4.1-2, Item 17.

Since the design of ANO-1 does not rely upon the ERV and associated block valve to perform any of the safety-related functions identified in Section 2 (see the above response to Section 2 of Enclosure A), additional Technical Specifications are not considered necessary.