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Timothy G. Mitchell Vice President, Operations Arkansas Nuclear One

1CAN030901

March 10, 2009

U.S. Nuclear Regulatory Commission Attn: Document Control Desk Washington, DC 20555

SUBJECT: License Amendment Request Technical Specification Change To Delete Low Pressurizer Level Limit Arkansas Nuclear One, Unit 1 Docket No. 50-313 License No. DPR-51

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Entergy Operations, Inc. (Entergy) hereby requests the following amendment for Arkansas Nuclear One, Unit 1 (ANO-1). Currently, Technical Specification (TS) 3.4.9, Pressurizer, contains a maximum and minimum level for the Pressurizer. Entergy proposes to delete the minimum level requirement. This change is consistent with NUREG 1430, Rev. 3.1, Standard Technical Specifications (STS) for Babcock & Wilcox Plants.

Limiting the maximum operating water level in the Pressurizer preserves the steam space for pressure control. The TS limit has been established to ensure the capability to establish and maintain pressure control for steady state operation and to minimize the consequences of potential overpressure transients. Requiring the presence of a steam bubble is also consistent with analytical assumptions.

However, the STS contain no minimum level requirement. During the conversion of the ANO-1 TSs to STS, the minimum level was retained because it was present in the original ANO-1 custom TSs. The TS Bases for this limit was simply to ensure sufficient volume was maintained in the Pressurizer above the minimum detectable level.

While maintaining level in the Pressurizer is preferred and controlled by procedures and automatic control systems, a minimum level is not required to prevent or mitigate an accident. Level and pressure control systems act to maintain Pressurizer level at a pre-determined setpoint. Station procedures provide immediate guidance for operators when level is found outside the control band, which include verification that automatic control systems are responding to restore level to within the normal range. Operators may also establish manual control of makeup and letdown systems to restore level. If control systems cannot restore level, the reactor is manually tripped. Rapid level reduction would result in an automatic reactor trip on Low RCS Pressure.

1CAN030901 Page 2 of 3

The ANO-1 Safety Analysis Report (SAR) credits the maximum Pressurizer level to protect against high Reactor Coolant System (RCS) pressures (overfill transients). Because the minimum level is not a SAR assumption to preclude or mitigate an accident, this limit does not meet the criteria of 10 CFR 50.36 for inclusion in the TSs.

A detailed explanation of the proposed change is provided in Attachment 1. A markup of the affected TS pages is contained in Attachment 2 of this submittal.

The proposed change has been evaluated in accordance with 10 CFR 50.91(a)(1) using criteria in 10 CFR 50.92(c) and it has been determined that the changes involve no significant hazards consideration. The bases for these determinations are included in the attached submittal.

The proposed change does not include any new commitments.

Entergy requests approval of the proposed amendment by April 1, 2010. Once approved, the amendment shall be implemented within 90 days.

If you have any questions or require additional information, please contact David Bice at 479-858-5338.

I declare under penalty of perjury that the foregoing is true and correct. Executed on March 10, 2009.

Sincerely,

TGM/dbb

Attachments:

- 1. Analysis of Proposed Technical Specification Change
- 2. Proposed Technical Specification Changes (mark-up)

1CAN030901 Page 3 of 3

cc: Mr. Elmo E. Collins Regional Administrator U. S. Nuclear Regulatory Commission Region IV 612 E. Lamar Blvd., Suite 400 Arlington, TX 76011-4125

> NRC Senior Resident Inspector Arkansas Nuclear One P. O. Box 310 London, AR 72847

U. S. Nuclear Regulatory Commission Attn: Mr. Alan B. Wang MS O-7 D1 Washington, DC 20555-0001

Mr. Bernard R. Bevill Arkansas Department of Health Radiation Control Section 4815 West Markham Street Slot #30 Little Rock, AR 72205 Attachment 1

1CAN030901

Analysis of Proposed Technical Specification Change

1.0 DESCRIPTION

This letter is a request to amend Operating License DPR-51 for Arkansas Nuclear One, Unit 1 (ANO-1).

Currently, Technical Specification (TS) 3.4.9, Pressurizer, contains a maximum and minimum level for the Pressurizer. Entergy proposes to delete the minimum level requirement. This change is consistent with NUREG 1430, Rev. 3.1, Standard Technical Specifications (STS) for Babcock & Wilcox Plants.

2.0 PROPOSED CHANGE

The proposed change will delete TS 3.4.9 minimum limit on Pressurizer level. As a result of this deletion, Surveillance Requirement (SR) 3.4.9.1 is revised to eliminate verification of the minimum level requirement. Both the TS and the SR will maintain requirements governing the maximum Pressurizer level limit.

A markup of the affected TS page is included in Attachment 2.

3.0 BACKGROUND

To maintain a constant Pressurizer water level, total makeup to the Reactor Coolant System (RCS) must equal that which is letdown from the system. Total makeup consists of the seal injection water through the Reactor Coolant Pump (RCP) shaft seals and makeup returned to the system through the Pressurizer level control valve. The Pressurizer level controller provides automatic control of the valve to maintain the desired pressurizer water level. RCS volume changes during plant load changes exceed the capability of the volume control valve, and thus result in variations in pressurizer level. The level is returned to normal as the system returns to steady state conditions.

Limiting the maximum operating water level in the Pressurizer preserves the steam space for pressure control. The TS limit has been established to ensure the capability to establish and maintain pressure control for steady state operation and to minimize the consequences of potential overpressure transients. Requiring the presence of a steam bubble is also consistent with analytical assumptions.

However, the STS contain no minimum level requirement. During the conversion of the ANO-1 TSs to STS, the minimum level was retained because it was present in the original ANO-1 custom TSs. The TS Bases for this limit was simply to ensure sufficient volume was maintained in the Pressurizer above the minimum detectable level. Furthermore, it is normal and expected for Pressurizer level to dip below the low-end of the level control band during some transients and following a reactor trip. The automatic level control system is designed to accommodate such level responses. In addition, operators may take manual action to restore level as needed. Pressurizer level indications are available on instruments and computer trends in various control room locations, and control room alarms alert operators when level deviates from control system setpoint.

Attachment 1 to 1CAN030901 Page 2 of 5

4.0 TECHNICAL ANALYSIS

While maintaining level in the Pressurizer is preferred and controlled by procedures and automatic control systems, a minimum level is not required to prevent or mitigate an accident. Level and pressure control systems act to maintain Pressurizer level at a pre-determined setpoint. Station procedures provide immediate guidance for operators when level is found outside the control band, which include verification that automatic control systems are responding to restore level to within the normal range. Operators may also establish manual control of makeup and letdown systems to restore level. If Pressurizer level cannot be restored, the reactor is manually tripped. Rapid level reduction would result in an automatic reactor trip on Low RCS Pressure.

In addition, it is not necessary for TSs to establish a minimum Pressurizer level limit solely to ensure level indications remain on-scale. As described above, automatic and/or manual action is taken immediately upon deviation from level setpoint and, if unsuccessful, the reactor will be manually tripped prior to Pressurizer level indication being lost. Again, for rapid transients, the reactor will automatically trip on Low RCS Pressure as RCS inventory is lost.

The ANO-1 Safety Analysis Report (SAR) credits the maximum Pressurizer level to protect against high Reactor Coolant System (RCS) pressures (overfill transients). Because the minimum level is not a SAR assumption to preclude or mitigate an accident, this limit does not meet the criteria of 10 CFR 50.36 for inclusion in the TSs. An evaluation of the 10 CFR 50.36 criteria is included below.

- 1. The minimum Pressurizer level limit is not installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary. Pressurizer level is a required control room indication governed by TS 3.3.15, Post Accident Monitoring (PAM) Instrumentation. While the indication itself can be used to detect an abnormal degradation in the RCS pressure boundary, no minimum level need be specified in order for the instrument to perform its design function. As discussed above, automatic or manual action is taken for any deviation in Pressure level, well in advance of level reaching a point where indication would be off-scale. Therefore, the minimum Pressurizer level limit does not satisfy Criterion 1.
- 2. The minimum Pressurizer level limit is not a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. Only high levels in the Pressurizer are of concern with regard to the safety analysis. Therefore, the minimum Pressurizer level limit does not satisfy Criterion 2.
- 3. The minimum Pressurizer level limit is not a structure, system or component that is part of the primary success path and which functions or actuates to mitigate a DBA or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. Pressurizer level losses that are beyond the capability of normal makeup and control systems are mitigated by actuation of the emergency core cooling systems. These systems will respond to prevent violation of any safety limit regardless of the initial Pressurizer level which existed prior to the event. Therefore, the minimum Pressurizer level limit does not satisfy Criterion 3.

4. The minimum Pressurizer level limit is not a structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety. As discussed above, automatic control systems and specific procedures are provided to maintain Pressurizer level within a normal operating band, dependent on the plant mode of operation. The existence of a minimum level requirement in the TSs does not alter these mechanisms, nor does the limit prevent reductions in Pressurizer level below setpoint during transients or following a reactor trip. In addition, rapid reduction of Pressurizer level is protected by the on Low RCS Pressure automatic reactor trip signal. Therefore, deletion of the minimum Pressurizer level limit from the TSs has no significant risk impact to plant systems or safe plant operation.

Note also that the TS Bases do not present a 10 CFR 50.36 criterion for minimum Pressurizer level:

In MODES 1 and 2, the maximum pressurizer water level limit satisfies Criterion 2 of 10 CFR 50.36 (Ref. 2). In MODE 3 and MODE 4 above the LTOP enable temperature, the maximum pressurizer water level limit satisfies Criterion 4 of 10 CFR 50.36.

Based on the above, Entergy believes it is acceptable to delete the TS minimum level requirement for the pressurizer.

5.0 REGULATORY ANALYSIS

5.1 Applicable Regulatory Requirements/Criteria

General Design Criterion (GDC) 10, 13, 15, 20, 23, and 24 govern the requirements for the reactor coolant system (RCS), instrumentation, and protective system design. Entergy Operations, Inc. (Entergy) proposes to delete minimum Pressurizer level requirements from Arkansas Nuclear One, Unit 1 (ANO-1) Technical Specification (TS) 3.4.9. Deletion of this requirement will not adversely affect any GDC. In addition, the proposed change is consistent with NUREG 1430, Rev. 3.1, Standard Technical Specifications for Babcock & Wilcox Plants (STS). Automatic control systems and manual operations specified in station procedures will continue to maintain a desired Pressurizer level. These functions are not dependent on the minimum Pressurizer level limit currently specified in the TSs. The maximum Pressurizer TS level limit, required to ensure appropriate pressure and inventory control during transients, is unaffected by this change.

In conclusion, Entergy has determined that the proposed change does not require any exemptions or relief from regulatory requirements, other than the TS, and does not affect conformance with any GDC differently than described in the Safety Analysis Report (SAR).

5.2 No Significant Hazards Consideration

A change is proposed to the Arkansas Nuclear One, Unit 1 (ANO-1) Technical Specification (TS) 3.4.9, Pressurizer. Specifically, the minimum Pressure level limit is proposed to be deleted from the TS. This change is consistent with NUREG 1430, Rev. 3.1, Standard Technical Specifications for Babcock & Wilcox Plants (STS). The minimum level specified in the TS is not an assumption contained in the accident analysis to preclude or mitigate an accident evaluated in the ANO-1 Safety Analysis Report (SAR).

Attachment 1 to 1CAN030901 Page 4 of 5

Entergy Operations, Inc. has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The minimum Pressure level limit currently specified in the TSs does not act to ensure specified fuel design limits are protected. Accident and transient analyses assume lowering or a loss of Pressurizer level. Safety systems are designed and maintained available to mitigate the consequences of an accident or transient that may involve a loss of Reactor Coolant System (RCS) inventory. None of these systems rely upon a predetermined minimum Pressurizer level in order to perform their intended function. Furthermore, the minimum Pressure level limit is unrelated to any anticipated accident initiator.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

No physical changes to the facility are initiated by the proposed change. In addition, the proposed change has no affect on plant configuration, or method of operation of plant structures, systems, or components.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

Installed automatic control systems will continue to maintain Pressurizer level at a predetermined setpoint and are independent of a prescribed minimum TS level limit. The deletion of the current TS limit has no impact on guidance or operational response to pressurizer level deviations. Furthermore, the minimum Pressure level limit is not an assumed value for accident prevention or mitigation in the ANO-1 SAR.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, Entergy concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

Attachment 1 to 1CAN030901 Page 5 of 5

5.3 Environmental Considerations

The proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 PRECEDENCE

A review of all other U.S. B&W commercial nuclear power plant TSs was performed. All other related plant TSs, with the exception of Three Mile Island, no longer contain a minimum level for Pressurizer level. Three Mile Island is a custom TS plant and has not yet converted to STS.

7.0 REFERENCES

None

Attachment 2

1CAN030901

Proposed Technical Specification Changes (mark-up)

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.9 Pressurizer

LCO 3.4.9 The pressurizer shall be OPERABLE with:

- a. Pressurizer water level \geq 45 inches and \leq 320 inches; and
- b. A minimum of 126 kW of Engineered Safeguards (ES) bus powered pressurizer heaters OPERABLE.

APPLICABILITY: MODES 1, 2, and 3, MODE 4 with RCS temperature > 262°F.

ACTIONS

| CONDITION | | REQUIRED ACTION | | COMPLETION TIME |
|-----------|---------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------|---------------------|
| A. | Pressurizer water level not within limits. | A.1 | Restore level to within limits. | 1 hour |
| B. | Required Action and associated Completion Time of Condition A not met. | B.1 <u>AND</u> B.2 | Be in MODE 3. Be in MODE 4 with RCS temperature $\leq 262^{\circ}$ F. | 6 hours 24 hours |
| C. | Capacity of ES bus powered pressurizer heaters less than limit. | C.1 | Restore pressurizer heater capacity. | 72 hours |
| D. | Required Action and associated Completion Time of Condition C not met. | D.1 <u>AND</u> D.2 | Be in MODE 3. Be in MODE 4. | 6 hours 12 hours |

SURVEILLANCE REQUIREMENTS

| | FREQUENCY | |
|------------|----------------------------------------------------------------------------|-----------|
| SR 3.4.9.1 | Verify pressurizer water level ≥ 45 inches and ≤ 320 inches. | 12 hours |
| SR 3.4.9.2 | Verify capacity of ES bus powered pressurizer heaters \ge 126 kW. | 18 months |