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U. S. Nuclear Regulatory Commission  
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Subject: Arkansas Nuclear One - Unit 1  
Docket No. 50-313  
License Nos. DPR-51  
Proposed Technical Specification Change Revising Engineered Safeguards  
Actuation System Low Reactor Coolant System Pressure Setpoint

Gentlemen:

Attached for your review and approval are proposed changes to the Arkansas Nuclear One – Unit 1 (ANO-1) Technical Specifications (TS). The proposed changes affect ANO-1 Limiting Conditions for Operation and associated bases applicable to the Engineered Safeguards Actuation System (ESAS) low reactor coolant system (RCS) pressure setpoint. The revised setpoint is currently being administratively controlled at ANO-1. The proposed TS setpoint change is necessary to ensure the ANO-1 TS adequately bounds the safety analysis.

ANO-1 TSs currently require the actuation of high and low pressure safety injection, reactor building cooling, and reactor building isolation at a RCS pressure of  $\geq 1526$  psig. However, ANO-1 has discovered that although this setpoint included instrument uncertainties, it did not adequately include uncertainties associated with cable insulation resistance (IR) effects. In addition to IR effects, a projection of the number of ANO-1 steam generator tubes that would be removed from service in future outages was also evaluated with respect to the impact tube plugging efforts would have on the low RCS pressure ESAS setpoint. The new setpoint, that includes both of the aforementioned effects, has been subsequently established for use at ANO-1. The associated plant equipment utilizing this ESAS RCS pressure setpoint has been calibrated to the new setpoint value of  $\geq 1585$  psig. This value is greater than 1526 psig and, therefore, is more conservative than the limits required by the current TS.

This 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 this change involves no significant hazards considerations. The bases for these determinations are included in the attached submittal.

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The proposed changes are necessary to maintain the required level of control concerning ESAS actuation setpoints. The low RCS pressure ESAS setpoint currently established at ANO-1 is conservative relative to existing TS requirements and is presently under administrative control.

Energy Operations requests prompt NRC review and approval of the proposed changes. Since the proposed setpoint is currently being administratively controlled in the plant operating procedures, no implementation period is required.

Very truly yours,



CRH/dbb  
Attachment

To the best of my knowledge and belief, the statements contained in this submittal are true.

SUBSCRIBED AND SWORN TO before me, a Notary Public in and for Johnson County and the State of Arkansas, this 18 day of August, 1999.

Juana M. Tapp  
Notary Public  
My Commission Expires 8-11-2000



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ATTACHMENT 1

TO

1CAN089903

PROPOSED TECHNICAL SPECIFICATION

AND

RESPECTIVE SAFETY ANALYSES

IN THE MATTER OF AMENDING

LICENSE NO. DPR-51

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT ONE

DOCKET NO. 50-313

## **DESCRIPTION OF PROPOSED CHANGES**

The proposed changes to the Arkansas Nuclear One, Unit 1 (ANO-1) Technical Specifications (TS) increase the Engineered Safeguards Actuation System (ESAS) setpoint for low reactor coolant system (RCS) pressure from  $\geq 1526$  psig to  $\geq 1585$  psig. The following changes are proposed:

- Low RCS pressure ESAS setpoints of Specification 3.5.3 associated with high pressure injection, low pressure injection, and the start of reactor building cooling and reactor building isolation are changed from  $\geq 1526$  psig to  $\geq 1585$  psig.
- Where referenced in the bases on Page 50 of the ANO-1 TS, the ESAS setpoint for low reactor coolant system pressure is changed from 1526 psig to 1585 psig.

The following sections will provide the bases for the aforementioned changes.

## **BACKGROUND**

The current low RCS pressure ESAS setpoint TS limit is derived from a safety analysis limit of 1480 psig to which 46 psi is added. This 46 psi accounted for steam generator tube plugging effects of up to 1000 plugged tubes total for both ANO-1 steam generators and for known instrument loop errors. However, ANO-1 found that the loop error did not adequately include the effects of cable insulation resistance (IR). Revised calculations were performed and an additional loop error of 16 psi was ascertained. The resulting value of 1542 psig was found to be more restrictive than the current TS limit of  $\geq 1526$  psig.

In addition to the above IR effects, it became evident that the 1000-tube plug value assigned to ANO-1 steam generators would be exceeded during a near-future refueling outage. As a result, an evaluation was performed that applied additional margin to the low RCS pressure ESAS setpoint to allowing plugging efforts to continue up to a limit of 1200 tubes per steam generator. The evaluation was required to include the effects of the minimum RCS pressure response as a function of tube plugging. The additional conservatism resulted in increasing the overall low RCS pressure ESAS setpoint to a value of 1585 psig. This additional margin (approximately 40 psi) was included in the final setpoint analysis.

As a result, approval was obtained to increase the ESAS bistable comparator card setpoints for low RCS pressure from the existing TS limit to a new value of  $\geq 1585$  psig. Once the new setpoint was physically installed, testing was completed to ensure proper channel response. Additionally, Operations, I&C, and EOP related procedures were changed to capture the modification.

During controlled plant maneuvers, it is necessary for Operations to bypass the low RCS pressure ESAS setpoint to prevent spurious actuation when purposely depressurizing the RCS below 1585 psig. Procedures, panel alarm, and computer alarms are available to alert the Operator that an ESAS low RCS pressure actuation is imminent, if not bypassed within a reasonable amount of time. Previously, the RCS Pressure LO LO alarm setpoint was approximately 1550 psig. Raising the low RCS pressure ESAS setpoint to  $\geq 1585$  psig would render this alarm and associated computer-generated alarms ineffective. Therefore, an evaluation was completed and the alarm setpoints were raised to 1640 psig. Associated procedures were also changed to alert the Operator of the new alarm setpoint and provide guidance to place the actuation path in the bypassed state prior to RCS pressure reaching the alarm setpoint of 1640 psig. The ANO-1 TS allows bypassing of this actuation path below 1750 psig. As a result, the operator has been provided sufficient time to establish the desired bypassed condition, thus inhibiting the unlikely possibility of an unwanted actuation.

ANO-1 has established and implemented a new limit for the low RCS pressure ESAS setpoint. This setpoint remains controlled by on-site administrative procedures.

### **DISCUSSION OF CHANGE**

As addressed in the previous background discussion, a setpoint of  $\geq 1585$  psig is currently utilized at ANO-1 as the low RCS pressure ESAS setpoint. The setpoint was increased using existing plant equipment and is well within the design specifications of the trip bistable comparator cards located within the ESAS circuitry. The new setpoint was calculated to more accurately include the instrument loop errors associated with cable insulation resistance (IR) effects. Additionally, the overall impact of the minimum expected RCS pressure response as a function of projected steam generator tube plugging activities was evaluated and, as a result, supplementary margin was included. As mentioned previously, the evaluation assumed the maximum allowable tubes to be plugged in each steam generator of 1200 tubes per generator.

With a higher actuation setpoint, associated ESAS equipment will start or reposition at an earlier time during a transient that results in the depressurization of the RCS. Such events include steam line failures, steam generator tube failures, and loss of coolant accidents. The low RCS pressure ESAS setpoint acts to initiate high and low pressure injection, reactor building cooling systems, and to isolate the reactor building. The higher setpoint will result in earlier actuation for the high pressure injection, reactor building cooling systems, and reactor building isolation during a depressurization event. Since the shut off head of the low pressure injection system is well below the new setpoint, this change has no effect on its performance. The remaining systems will actuate at an earlier time during a depressurization event allowing a more timely response to the event, therefore, potentially decreasing the consequences of the accident.

The high pressure injection (HPI) system could potentially have a negative effect during an inadvertent actuation event. In such an event, assuming no operator action, the inadvertent HPI initiation could pressurize the RCS to the safety relief setpoint resulting in the lifting of a pressurizer safety valve. Should the valve fail to reseat, a loss of coolant accident could be inadvertently initiated. However, this scenario, having been previously evaluated, exists irrespective of the actual setpoint for ESAS low RCS pressure actuation. Other events could result due to the isolation of the reactor building during power operations, such as the loss of cooling medium to the reactor coolant pumps. Again, these and any other events have been previously evaluated and remain unchanged by the increase of the low RCS pressure ESAS setpoint. Because the RCS Pressure LO LO alarm setpoint has been raised to a value of 1640 psig and associated procedures changed accordingly (as previously discussed), no new, unevaluated scenario has been introduced by increasing the low RCS pressure ESAS setpoint. Based on the above, the operator retains sufficient time and guidance to bypass the ESAS low RCS pressure actuation, and therefore, scenarios relating to the inadvertent actuation of the ESAS components are not significantly affected.

In summary, no reduction in equipment redundancy or independence needed for accident mitigation is evident as a result of raising the low RCS pressure setpoint. In addition, the setpoint change has no impact on the emergency diesel generator loading sequences. The actuation of related ESAS components at an earlier point during an event acts to enhance response capability and potentially decrease the consequences of an accident. Available procedural guidance and alarm setpoints allow the operator ample opportunity to bypass the low RCS pressure actuation, resulting in a negligible impact to inadvertent ESAS scenarios. Therefore, the proposed change to the low RCS pressure setpoint does not present a new accident initiator or failure mode, nor decrease the ability for accident mitigation at ANO-1.

Based on the above discussion, ANO-1 requests the aforementioned changes to TS 3.5.3 and its associated bases to ensure the ANO-1 TS adequately bounds the safety analysis.

#### **DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION**

Entergy Operations, Inc. is proposing that the Arkansas Nuclear One, Unit 1 (ANO-1) Operating License be amended to revise the Engineered Safeguards Actuation System (ESAS) setpoint for low reactor coolant system (RCS) pressure. The new setpoint more accurately includes allowances required for instrument uncertainties associated with cable insulation resistance (IR) effects and the effects of projected steam generator tube plugging on RCS transients. The proposed change is necessary to ensure the ANO-1 Technical Specifications (TS) adequately bound the safety analysis.

An evaluation of the proposed change has been performed in accordance with 10CFR50.91(a)(1) regarding no significant hazards considerations using the standards in 10CFR50.92(c). A discussion of these standards as they relate to this amendment request follows:

**Criterion 1 - Does Not Involve a Significant Increase in the Probability or Consequences of an Accident Previously Evaluated.**

The proposed change to raise the current technical specification (TS) ESAS setpoint for low RCS pressure does not require new hardware or physical equipment modifications to the plant design. By raising the setpoint, a more prompt actuation of associated safeguards equipment will be achieved for the accident scenarios previously analyzed in the ANO-1 Safety Analyses Report (SAR). A more expeditious actuation will ensure a more timely response to the accident and serve to potentially decrease the consequences of an accident. The RCS Pressure LO LO alarm setpoint has also been raised and applicable procedures revised to provide the operator sufficient time to bypass the actuation during controlled plant maneuvers.

Therefore, the raising of the low RCS pressure ESAS setpoint from  $\geq 1526$  psig to  $\geq 1585$  psig does not involve a significant increase in the probability or consequences of any accident previously evaluated.

**Criterion 2 - Does Not Create the Possibility of a New or Different Kind of Accident from any Previously Evaluated.**

The proposed change is relevant to accident response and mitigation and has no effect on accident initiation. An inadvertent actuation of the HPI system could result in pressurizing the RCS to the point where a pressurizer safety valve could open and subsequently fail to close, resulting in a loss of coolant accident. However, this event remains unaffected for normal power operations and requires discussion of depressurization events only, such as a planned cooldown, when an inadvertent actuation could occur earlier due to the proposed higher setpoint. This concern is mitigated by the increase of the RCS Pressure LO LO alarm setpoint from approximately 1550 psig to 1640 psig, thus providing the operator ample time to bypass the low RCS pressure ESAS setpoint prior to inadvertent actuation. Therefore, no new, previously unevaluated event has been introduced relating to the inadvertent actuation of HPI components due to the proposed change.

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

**Criterion 3 - Does Not Involve a Significant Reduction in the Margin of Safety.**

The proposed change conservatively raises the existing low RCS pressure ESAS setpoint to a new value using existing installed equipment. The new value provides protection for the entire spectrum of break sizes based on applicable evaluations and considers the effects of projected steam generator tube plugging activities. The setpoint is also sufficiently below normal operating pressure to aid in preventing spurious initiation.

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

Therefore, based on the reasoning presented above and the previous discussion of the amendment request, Entergy Operations, Inc. has determined that the requested change does not involve a significant hazards consideration.

### **ENVIRONMENTAL IMPACT EVALUATION**

10 CFR 51.22(c) provides criteria for and identification of licensing and regulatory actions eligible for categorical exclusion from performing an environmental assessment. A proposed amendment to an operating license for a facility requires no environmental assessment if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant hazards consideration, (2) result in a significant change in the types or significant increase in the amounts of any effluents that may be released off-site, or (3) result in a significant increase in individual or cumulative occupational radiation exposure. Entergy Operations, Inc. has reviewed this license amendment and has determined that it meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the proposed license amendment. The bases for this determination is as follows:

1. The proposed license amendment does not involve a significant hazards consideration as described previously in the evaluation.
2. As discussed in the significant hazards evaluation, this change does not result in a significant change or significant increase in the radiological doses for any Design Based Accident. The proposed license amendment does not result in a significant change in the types or a significant increase in the amounts of any effluents that may be released off-site.
3. The proposed license amendment does not result in a significant increase to the individual or cumulative occupational radiation exposure because this does not modify the method of operation of systems and components necessary to prevent a radioactive release.