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2CAN100105

October 2, 2001

U. S. Nuclear Regulatory Commission
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Subject: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Proposed Technical Specification Change Concerning the 480 Volt Bus
Degraded Voltage Settings

Gentlemen:

Attached for your review and approval is a proposed change to the Arkansas Nuclear One - Unit 2 (ANO-2) Technical Specifications (TS) intended to provide a range of acceptable values for the 480 Volt (V) bus degraded voltage relays. TS 3.3.2.1 Table 3.3-4 provides allowable values and trip setpoint for the 480 V bus degraded voltage relay requirements. The proposed change modifies the existing range for the acceptable allowable values and relocates trip setpoint criteria to station procedures. The associated tolerance is consistent with the applicable safety analyses for degraded voltage protection. The proposed allowable values also account for channel uncertainties and calibration tolerances. The application of the tolerance values is consistent with Revision 1 of NUREG-1432, "Standard Technical Specifications for Combustion Engineering Plants." The proposed change is consistent with that recently approved for ANO - Unit 1 in Amendment 211, dated March 12, 2001 (1CNA030101).

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

No commitments are contained in this letter. Because it is desirable to implement the proposed change in conjunction with the calibration of the associated relays during the next ANO-2 refueling outage (2R15) currently scheduled to begin on April 12, 2002, Entergy Operations, Inc. requests that the effective date for this change be on or before April 1, 2002, with an implementation period within 60 days. Although this request is neither exigent nor emergency, your prompt review is requested.

Root

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I declare under penalty of perjury that the foregoing is true and correct. Executed on
October 2, 2001.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Craig H. ...".

CGA/dbb
Attachment

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ATTACHMENT

TO

2CAN100105

PROPOSED TECHNICAL SPECIFICATION

AND

RESPECTIVE SAFETY ANALYSES

IN THE MATTER OF AMENDING

LICENSE NO. NPF-6

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT TWO

DOCKET NO. 50-368

DESCRIPTION OF PROPOSED CHANGES

The proposed change to the Arkansas Nuclear One – Unit 2 (ANO-2) Technical Specifications (TS) affects the safety-related 480 Volt (V) bus degraded voltage relay allowable values and trip setpoint. TS 3.3.2.1 Table 3.3-4, “Engineered Safety Feature Actuation System Instrumentation Trip Values,” item 7, “Loss of Power,” includes item b, “460 V Emergency Bus Undervoltage” (Degraded Voltage), with a trip and allowable value of $423\text{ V} \pm 2\text{ V}$ with an 8.0 ± 0.5 second time delay and $423\text{ V} \pm 4\text{ V}$ with an 8.0 ± 0.8 second time delay, respectively.

This proposed change removes the trip value from this table and modifies the allowable value table entry to “ $429.6\text{ V} \pm 6.4\text{ V}$ with an 8.0 ± 1.0 second time delay.” Table 3.3-4, Note (4) was revised by Amendment 200 to the ANO-2 TSs, dated January 26, 1999, to read “The trip value for this function is listed in the surveillance test procedures. The trip value will ensure that adequate protection is provided when all the applicable calibration tolerances, channel uncertainties, and time delays are taken into account.” This proposed change will insert reference to Note (4) in the trip setpoint column of Table 3.3-4 for Functional Unit 7.b similar to the aforementioned change to Functional Unit 7.a in Amendment 200.

The reference to the affected bus within TS 3.3.2.1 Table 3.3-4 is additionally modified as the “480 V” bus. Although relay settings are based on a percentage of the motor rated voltage of 460 V, the buses are originally designed to operate at or near the 480 V range under normal conditions. The 480 V term is consistent with station procedures and with TS 3.8.2.1, AC Distribution – Operating.

BACKGROUND

Two levels of undervoltage protection are provided for the ANO-2 on-site power system. One level of protection consists of two inverse-time undervoltage relays on each of the 4160 V safety buses that act to detect loss-of-voltage, isolate the safety buses, initiate load shedding, and start the associated emergency diesel generator (EDG). The undervoltage relays initiate load shedding and the starting of the associated EDG within approximately one second of a total loss of voltage. The isolation of the safety related buses is delayed approximately two seconds (for a total of approximately three seconds) to permit the off-site power to supply the safety-related loads in the event of a fast transfer failure.

An additional level of protection consists of two definite time undervoltage relays provided on each safety related 480 V load center bus with a coincident trip logic (2 out of 2) for the purpose of detecting a sustained undervoltage condition. The 480 V bus undervoltage relay settings are based on long term motor voltage requirements plus the maximum feeder voltage drop allowance resulting in a nominal 92% setting of motor rated voltage of 460 V. Upon voltage degradation to nominal 92% of 460 V and after a delay of 8 seconds, both relays must operate to isolate the associated safety related 4160 V bus from offsite power, and start and

connect the associated EDG. The relays are delayed 8.0 seconds to prevent spurious operation of the relays when large motors start on the safety related 4160 V and 480 V buses. The loss of voltage and degraded voltage protection systems are further described in ANO-2 Safety Analysis Report (SAR) Section 8.3.1.1.8.

The ANO-2 4160 V electrical distribution system consists of four 4160 V buses: 2A1, 2A2, 2A3, and 2A4. The non-vital 4160 V buses (2A1 and 2A2) supply power to auxiliaries which are not engineered safety features (ESF) and to safety buses 2A3 and 2A4. The vital 4160 V ESF buses (2A3 and 2A4) supply power to the ESF equipment essential for safe shutdown and accident mitigation. These vital buses are capable of being supplied from either the Unit Auxiliary Transformer, Startup Transformer #3, or Startup Transformer #2 via buses 2A1 and 2A2. Each vital 4160 V bus is also capable of being supplied by its associated EDG. The alternate AC diesel generator (AACDG) is also capable of supplying 4160 V buses 2A1, 2A3, and 2A4 for ANO-2. 4.16 KV Loss of Voltage Relays are located on buses 2A3 and 2A4. Two relays per bus are connected in parallel, such that a single relay failure will not prevent isolation of the associated bus from offsite power. The acceptable allowable value range for these relays was revised by Amendment 200 to the ANO-2 TSs, dated January 26, 1999. No additional revisions associated with these relays are proposed in this submittal.

As stated above, the 480 V bus degraded voltage relays (2 each on safety related 480 V load center buses 2B5 and 2B6) are designed to detect a sustained undervoltage condition. The two relays on each bus are connected in series to provide the required coincidence logic to preclude spurious isolation from the offsite power source. Upon detection of the undervoltage condition exceeding the time delay setpoint, the 4160 V safety bus will be isolated from offsite power and the EDG will start. These actions will ensure no damage is sustained to the connected Class 1E loads, nor spurious trips of breakers or fuses are incurred, due to the low voltage conditions.

The 480 V bus relay allowable value and setpoint entries for TS 3.3.2.1 Table 3.3-4 Functional Unit 7.b are currently unchanged from the original issuance of the ANO-2 Operating License in 1978. In the years since initial license issuance, new insights, calculational methods, and a better understanding of plant response to undervoltage and loss-of-voltage events have developed. Therefore, Entergy Operations, Inc. requests a change to the allowable values of the aforementioned relays to support the changes that have developed throughout the industry. The following section provides the justification for the proposed change.

DISCUSSION OF CHANGE

As discussed above, the proposed change to the allowable values for the 480 V bus degraded voltage relays incorporate the recent evaluations and calculational revisions that support an increased range of values, while additionally incorporating uncertainties, tolerance, and other instrument margins to ensure the relays continue to provide the protection for which they are designed. Recent evaluations and calculational revisions indicate that a slightly increased range of values will continue to provide the necessary safety function for degraded voltage

protection. The degraded voltage relay setting allowable values are proposed to be revised from a range of $423 \text{ V} \pm 4.0 \text{ V}$ with an 8.0 ± 0.8 second time delay to a range of $429.6 \text{ V} \pm 6.4 \text{ V}$ with an 8.0 ± 1.0 second time delay. The proposed allowable values will allow adjustment of the existing setting of nominal 92% of motor rated voltage of 460 V in order to incorporate channel uncertainties, calibration tolerances, and margin per the guidance contained within the ANO-2 Design Guide, 2DG-001, "Instrument Loop Error Analysis and Setpoint Methodology Manual". While the degraded voltage change in allowable value range will afford additional protection of Class 1E components against the effects of low voltage, the results of ANO calculations demonstrate that the operability of the offsite power source is not jeopardized for the analyzed minimum normal grid condition. The slight increase in the range of allowable values for the degraded voltage time delay remains well within the assumption of the accident analysis.

Consistent with Amendment 200 to the ANO-2 TS, the degraded voltage relay setpoint values are removed from TS Table 3.3-4 and replaced with a reference to Note 4. The actual setpoint values will be maintained in station surveillance procedures. The setpoint values chosen will be equal to or conservative with respect to the allowable values listed in TS Table 3.3-4 for the 480 V bus relays, taking into account any additional margins that may be necessary. This may include margin for instrument drift and other conservative measures. In addition, the reference to the 460 V Emergency Bus within Table 3.3-4 is modified to read "480 V" Emergency bus. This change provides consistency with station procedures, actual bus design, and with TS 3.8.2.1, AC Distribution – Operating, as discussed previously in this submittal.

The proposed change to the allowable values for the 480 V bus degraded voltage relays incorporates industry guidance for setpoint uncertainty. In summation, the proposed change enhances the low voltage protection of the Class 1E equipment, while maintaining the assurance of the offsite power source for the transmission system's minimum normal condition. The proposed change contained within this submittal is similar to that approved by the NRC in TS Amendment 211, dated March 12, 2001, for ANO – Unit 1.

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

Based on recently completed design calculation revisions Entergy Operations, Inc. has determined that a slightly increased range of values will continue to provide the necessary safety function for degraded voltage protection for the Arkansas Nuclear One – Unit 2 (ANO-2) 480 Volt (V) vital buses. Therefore, Entergy Operations, Inc. is proposing a change to the ANO-2 Technical Specifications (TS) to incorporate a new range of values concerning the degraded voltage relay settings. The proposed change modifies the range of allowable values for the degraded voltage relays from $423 \text{ V} \pm 4.0 \text{ V}$ with an 8.0 ± 0.8 second time delay to a range of $429.6 \text{ V} \pm 6.4 \text{ V}$ with an 8.0 ± 1.0 second time delay.

An evaluation of the proposed change has been performed in accordance with 10 CFR 50.91(a)(1) regarding no significant hazards considerations using the standards in 10 CFR 50.92(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 two degraded voltage protection relays that are provided on each of the 480 V safety buses act to mitigate the consequences of an accident by detecting a sustained undervoltage condition, isolating the safety buses from offsite power, and starting the associated emergency diesel generator (EDG). This safety function is unchanged by the proposed allowable voltage setting revisions. The revised settings for the degraded voltage protection relays will continue to provide the safety function of protecting the associated Class 1E equipment from the effects of a low voltage condition. The time delays remain within those assumed in the ANO-2 safety analyses. Additionally, the revised allowable voltage settings will not result in any unnecessary isolation from the off-site power sources. The relocation of trip setpoint values to station surveillance procedures allows operational flexibility to account for additional margins, drifts, or uncertainties while ensuring that the relays are set to actuate within the acceptable range of allowable values denoted in the TSs. Since the proposed change does not adversely impact the mitigating function of the relays, the consequences of an accident previously evaluated remains unchanged.

The ANO-2 technical specifications will continue to require the 480 V bus degraded voltage functions to be surveillance tested at their present frequency without changing the modes in which the surveillance is required or the modes of applicability for these components. The technical specifications will continue to require the same actions as currently exist for the inoperability of one or more of the 480 V bus degraded voltage relays.

Therefore, this change 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 introduces no new modes of plant operation or new plant configuration that could lead to a new or different kind of accident from any previously evaluated being introduced. The 480 V bus degraded voltage relays are required to operate upon detection of a sustained undervoltage condition to protect the Class 1E components from damage from low voltage by initiating transfer of the 4160 V safety bus power source to the EDG. This safety function remains unchanged by the proposed allowable voltage setting revisions, and the proposed values continue to provide the required actions consistent with the ANO-2 safety analysis.

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 two degraded voltage relays located on each 480 V safety bus are provided to detect sustained undervoltage, isolate the safety buses, and start the EDGs. This safety function remains unchanged by the proposed revisions to the allowable values. The proposed changes to the allowable values for the degraded voltage relays incorporate channel uncertainties and calibration tolerances, while fully meeting their required safety functions of degraded voltage protection without resulting in undesired tripping of the offsite power source.

The slightly higher range of allowable values for the degraded voltage settings allows enhanced protection of the Class 1E components, but does not result in undesired tripping of the offsite power source for the analyzed grid minimum normal condition. In addition, the slight increase in the range of allowable values for the degraded voltage time delay remains well within the assumption of the accident analysis.

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

Therefore, based upon 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

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 basis 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 Basis 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 no change is made to the method of system operation or components necessary to prevent a radioactive release.

PROPOSED TECHNICAL SPECIFICATION CHANGES

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

| <u>FUNCTIONAL UNIT</u> | <u>TRIP SETPOINT</u> | <u>ALLOWABLE VALUES</u> |
|--|---|--|
| 4. MAIN STEAM AND FEEDWATER ISOLATION (MSIS) | | |
| a. Manual (Trip Buttons) | Not Applicable | Not Applicable |
| b. Steam Generator Pressure - Low | ≥ 751 psia (2) | ≥ 738.6 psia (2) |
| 5. CONTAINMENT COOLING (CCAS) | | |
| a. Manual (Trip Buttons) | Not Applicable | Not Applicable |
| b. Containment Pressure - High | ≤ 18.3 psia | ≤ 18.490 psia |
| c. Pressurizer Pressure - Low | ≥ 1675 psia | ≥ 1643.9 psia |
| 6. RECIRCULATION (RAS) | | |
| a. Manual (Trip Buttons) | Not Applicable | Not Applicable |
| b. Refueling Water Tank - Low | 54,400 \pm 2,370 gallons (equivalent to 6.0 \pm 0.5% indicated level) | between 51,050 and 58,600 gallons (equivalent to between 5.111% and 6.889% indicated level) |
| 7. LOSS OF POWER | | |
| a. 4.16 kv Emergency Bus Undervoltage | (4) | 2300 \pm 699 volts with a 0.64 \pm 0.34 second time delay |
| b. 480 volt Emergency Bus Undervoltage | (4) | 429.6 \pm 6.4 volts with an 8.0 \pm 1.0 second time delay |

MARKUP OF CURRENT ANO-2 TECHNICAL SPECIFICATIONS

(FOR INFO ONLY)

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

| <u>FUNCTIONAL UNIT</u> | <u>TRIP SETPOINT</u> | <u>ALLOWABLE VALUES</u> |
|--|--|--|
| 4. MAIN STEAM AND FEEDWATER ISOLATION (MSIS) | | |
| a. Manual (Trip Buttons) | Not Applicable | Not Applicable |
| b. Steam Generator Pressure - Low | ≥ 751 psia (2) | ≥ 738.6 psia (2) |
| 5. CONTAINMENT COOLING (CCAS) | | |
| a. Manual (Trip Buttons) | Not Applicable | Not Applicable |
| b. Containment Pressure - High | ≤ 18.3 psia | ≤ 18.490 psia |
| c. Pressurizer Pressure - Low | ≥ 1675 psia | ≥ 1643.9 psia |
| 6. RECIRCULATION (RAS) | | |
| a. Manual (Trip Buttons) | Not Applicable | Not Applicable |
| b. Refueling Water Tank - Low | 54,400 \pm 2,370 gallons (equivalent to 6.0 \pm 0.5% indicated level) | between 51,050 and 58,600 gallons (equivalent to between 5.111% and 6.889% indicated level) |
| 7. LOSS OF POWER | | |
| a. 4.16 kv Emergency Bus Undervoltage | (4) | 2300 \pm 699 volts with a 0.64 \pm 0.34 second time delay |
| b. 4860 volt Emergency Bus Undervoltage | (4) 423 \pm 2.0 volts with an 8.0 \pm 0.5 second time delay | 4239.6 \pm 46.04 volts with an 8.0 \pm 0.81.0 second time delay |