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2CAN070108

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Subject: Arkansas Nuclear One – Unit 2
Docket No. NPF-6
Supplement to Amendment Request for One Time Technical Specification Change Request Regarding Emergency Diesel Generator Allowed Outage Time Extension

Gentlemen:

By letter dated June 12, 2001 (2CAN060101), Entergy Operations, Inc. (Entergy) proposed a change to the Arkansas Nuclear One, Unit 2 (ANO-2) Technical Specifications (TSs) for a one time extension of the allowable outage time (AOT) for the emergency diesel generators (EDGs). On July 6, 2001, Entergy and members of your staff held a follow-up call to discuss specific questions regarding the risk assessment portion of the submittal. In Attachment 1, please find Entergy's response to those questions. In Attachment 2, please find a modified markup of the proposed TS pages, which more appropriately reflect the revision bars. The text of the pages is identical to those proposed in our June 12, 2001 submittal.

No new or additional commitments are contained in this letter.

I declare under penalty of perjury that the foregoing is true and correct. Executed on July 31, 2001.

Very Truly Yours,

Jimmy D. Vandergrift
Director, Nuclear Safety Assurance

JDV/dm
Attachments

A001

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Response to NRC RAIs on Risk Assessment of ANO-2 EDG AOT Extension

QUESTION 1:

PRA Quality – What changes have been made? Who put it together originally? Have any additional contractors been involved? Who has installed the changes? Has there been an expert panel review? Has there been a CEOG peer review? What is the current status of the model?

RESPONSE TO QUESTION 1:

The ANO-2 IPE model was developed by Arkansas Nuclear One Safety Analysis Design Engineering personnel with support from SAIC (now DS&S), other Design Engineering groups, and Operations. As part of the IPE development process, an expert panel review was performed on the results. This panel was composed of experienced personnel from these groups. In addition, ERIN Engineering performed an external review of the IPE model and results.

The ANO-2 PSA model has been updated several times since the IPE in an effort to maintain it consistent with the as-built/as operated plant, to incorporate improved thermal hydraulic results, and PSA methodology improvements. The updates have involved a cooperative effort involving both Entergy personnel and PSA consultant support. In each of the updates, all of the elements of the PSA are independently reviewed and revised, as appropriate. The PSA model and results have been maintained as plant calculations or engineering reports. As part of each major update, an internal review of PSA model results is performed by utilizing a team of experts (i.e. Operations, System Engineering, Design Engineering, Safety Analysis, and PSA engineers) to ensure adequacy of the model. No owners group peer review has been conducted on the ANO-2 model to date. However, a peer review is being scheduled early in 2002.

A review of previous models and the subsequent updates indicate the results are generally consistent from model to model.

QUESTION 2:

Clarify ΔCDF and ΔLERF. Table 2 in the letter references ΔCDF/rx –yr. How does this relate to a one time request? Table 3 has no units. Clarify units and explain basis for numbers.

RESPONSE TO QUESTION 2:

Table 1, Case 1 indicates that the baseline internal events ANO-2 CDF is 2.08E-5/rx-yr. This is an annual average value. Case 2 of the Table indicates that removing an EDG from service for 3 days increases the annual average CDF to 2.10E-5/rx-yr and Case 3 of the Table indicates that removing an EDG from service for 10 days increases the annual average CDF to 2.14E-5/rx-yr.

Therefore, the effect of the one-time EDG AOT extension from 3 days to 10 days is expected to increase the annual average CDF from 2.10E-5/rx-yr to 2.14E-5/rx-yr, or only an additional 4.0E-7/rx-yr, during the year that the EDG extension is used.

The units for LERF values reported in columns 1, 2 and 3 of Table 3 should be "/rx-yr" and the heading in Table 3 for change in LERF should be labeled "Change in LERF from 3 to 10 days." As the submittal indicates, the IPE estimated the LERF to be about 3% of the CDF. Using this proportionality and the baseline LERF of 6.30E-7/rx-yr, the effect of removing an EDG from service for 3 days increases the annual average LERF to 6.35E-7/rx-yr and removing an EDG from service for 10 days increases the annual average CDF to 6.47E-7/rx-yr. Therefore, the effect of the one-time EDG AOT extension from 3 days to 10 days is expected to increase the annual average LERF from 6.35E-7/rx-yr to 6.47E-7/rx-yr, or only an additional 1.21E-8/rx-yr, during the year that the EDG extension is used. Table 3 provides this value for the annual average increase in LERF.

QUESTION 3:

Make a clear statement related to the assumptions in the analysis. Did we assume corrective or preventative maintenance in the CDF & LERF values? If we assumed corrective, provide the values assumed and/ or provide the predictive maintenance values.

RESPONSE TO QUESTION 3:

Corrective maintenance was assumed in the analysis. This assumption conservatively increases the risk estimate associated with removing an EDG from service, because when corrective maintenance is assumed, the unaffected EDG is assumed to have an increased probability of failure due to a potential common cause failure mechanism. This is not the case, if the maintenance is preventative.

Assuming preventative only in the analysis, increasing the EDG AOT from 3 to 10 days results in an increase in CDF and LERF of 2.40 E-7/rx-yr and 6.9E-9/rx-yr respectively.

ATTACHMENT 2

REVISED MARKUP OF TECHNICAL SPECIFICATION PAGES

REACTOR COOLANT SYSTEM

PRESSURIZER

LIMITING CONDITION FOR OPERATION

3.4.4 The pressurizer shall be OPERABLE with a water volume of ≤ 910 cubic feet (equivalent to ≤ 82% of wide range indicated level) and both pressurizer proportional heater groups shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

(a) With the pressurizer inoperable due to water volume ≥910 cubic feet, be in at least HOT SHUTDOWN with the reactor trip breakers open within 12 hours.

(b) With the pressurizer inoperable due to an inoperable emergency power supply to the pressurizer heaters, either restore the inoperable emergency power supply ~~within 72 hours~~ as required by TS 3.8.1.1 action b.3 or be in at least HOT SHUTDOWN within 12 hours.

SURVEILLANCE REQUIREMENTS

4.4.4.1 The pressurizer water volume shall be determined to be within its limits at least once per 12 hours.

4.4.4.2 The pressurizer proportional heater groups shall be determined to be OPERABLE.

(a) At least once per 12 hours by verifying emergency power is available to the heater groups, and

(b) At least once per 18 months by verifying that the summed power consumption of the two proportional heater groups is ≥ 150 KW.

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system and

b. Two separate and independent diesel generators each with:

1. A day fuel tank containing a minimum volume of 280 gallons of fuel (equivalent to 50% of indicated tank volume),

2. A separate fuel storage system containing a minimum volume of 22,500 gallons of fuel (equivalent to 100% of indicated tank level), and

3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

~~a. With one offsite A.C. circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. Restore the offsite A.C. circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Startup Transformer No. 2 may be removed from service for up to 30 days as part of a preplanned preventative maintenance schedule. The 30-day allowance may be applied not more than once in a 10-year period. The provisions of Specification 3.0.4 are not applicable to Startup Transformer No. 2 during the 30-day preventative maintenance period.~~

a. With one offsite A.C. circuit of the above required A.C. electrical power sources inoperable, perform the following:

1. Demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter, and
2. Restore the offsite A.C. circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Startup Transformer No. 2 may be removed from service for up to 30 days as part of a preplanned preventative maintenance schedule. The 30-day allowance may be applied not more than once in a 10-year period. The provisions of Specification 3.0.4 are not applicable to Startup Transformer No. 2 during the 30-day preventative maintenance period.

~~b. With one diesel generator of the above required A.C. electrical power source inoperable, demonstrate the OPERABILITY of both the offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. Demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours unless it is determined that a common cause failure does not exists or, unless it is currently in operation or has been demonstrated OPERABLE within the previous 24 hours. Restore the diesel generator to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.~~

b. With one diesel generator of the above required A.C. electrical power source inoperable, perform the following:

1. Demonstrate the OPERABILITY of both the offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter, and
2. Demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours except when:
   i. A common cause failure has been determined not to exist, or
   ii. The remaining diesel generator is currently in operation, or
   iii. The remaining diesel generator has been demonstrated OPERABLE within the previous 24 hours, and

Note -For Fuel Cycles 15 and 16 Only
The requirement for diesel generator (EDG) restoration to OPERABLE status may be extended to ten days if the Alternate AC diesel generator (AACDG) is verified available. If the AACDG is found unavailable during this period, the 72 hour restoration period of condition b.3 below is immediately applicable until either the AACDG or the EDG is returned to operable status (not to exceed ten days from the initial diesel generator inoperability). The 10-day allowance may be applied only once for each EDG.

3. Restore the diesel generator to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

ACTION (Continued)

~~c. With one offsite A.C. circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and, if the diesel generator became inoperable due to any cause other than preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours (unless it is already operating or has been tested within the last 8 hours). Restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore both offsite circuits and both diesel generators to OPERABLE status within 72 hours of the initiating event or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.~~

c. With one offsite A.C. circuit and one diesel generator of the above required A.C. electrical power sources inoperable, perform the following:

1. Demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and,
2. If the diesel generator became inoperable due to any cause other than preplanned preventive maintenance or testing, then
   i. Demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours except when:
      a. The remaining diesel generator is currently in operation, or
      b. The remaining diesel generator has been demonstrated OPERABLE within the previous 8 hours, and
3. Restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours, and
4. If the required A.C. electrical power sources are restored to OPERABLE status to satisfy action c.3, then restore the inoperable diesel generator as required by action b.3.
5. If both diesel generators are restored to operable status to satisfy action c.3, then restore both A.C. electrical power sources as required by action a.2.

~~d. With two offsite A.C. circuits of the above required A.C. electrical power sources inoperable perform Surveillance Requirement 4.8.1.1.2.a.4 on the diesel generators within the next 8 hours (unless the diesel generators are already operating or have been successfully tested within the past 8 hours). Restore one of the inoperable offsite A.C. circuits to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore both A.C. circuits within 72 hours of the initiating event or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.~~

d. With two offsite A.C. circuits of the above required A.C. electrical power sources inoperable, perform the following:

1. Perform Surveillance Requirement 4.8.1.1.2.a.4 on the diesel generators within the next 8 hours except when:
   i. The diesel generator is currently in operation, or
   ii. The diesel generator has been demonstrated OPERABLE within the previous 8 hours, and
2. Restore one of the inoperable offsite A.C. circuits to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours, and
3. Restore both A.C. circuits as required by action a.2

~~c. With two diesel generators of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. Restore one of the inoperable diesel generators to OPERABLE status within 2 hours or be in a least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore both diesel generators within 72 hours of the initiating event or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.~~

e. With two diesel generators of the above required A.C. electrical power sources inoperable, perform the following:

1. Demonstrate the OPERABILITY of the two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter, and
2. Restore one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours, and
3. Following restoration of one diesel generator follow ACTION statement b.3 with the time requirements of that ACTION statement based on the time of initial loss of the remaining inoperable diesel generator.