

May 2, 1996

OCAN059603

U. S. Nuclear Regulatory Commission  
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Subject: Arkansas Nuclear One - Units 1 and 2  
Docket Nos. 50-313 and 50-368  
License Nos. DPR-51 and NPF-6  
Technical Specification Change Request Regarding Emergency Diesel  
Generator Allowed Outage Time Extension

Gentlemen:

Attached for your review and approval is a proposed Arkansas Nuclear One-Unit 1 and Unit 2 (ANO-1, ANO-2) Technical Specification (TS) amendment revising ANO-1 TS 3.7.2 and ANO-2 TS 3.4.4 and 3.8.1.1. This proposed amendment supplements the previous amendment request submitted in letter 2CAN059501. The purpose of this proposed amendment is to extend the allowed outage time for each unit's Emergency Diesel Generators from seven days on ANO-1 and ANO-2 (as proposed by 2CAN059501), to include a once per cycle extension of an additional seven days per machine considering the availability of the Alternate AC Diesel Generator that was installed for the Station Blackout Rule.

The proposed change has been evaluated in accordance with 10CFR50.91(a)(1) using criteria in 10CFR50.92(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.

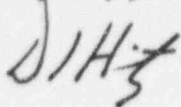
Entergy Operations requests that the effective date for this change be within 30 days of NRC issuance of the amendment to allow for distribution and procedural revisions necessary to implement this change. Although this request is neither exigent nor emergency, your prompt review is requested.

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Very truly yours,




Donald C. Hintz  
President and CEO

DCH/lgm/rdc  
Attachments

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 Hinds  
County and the State of Mississippi, this 2nd day of May, 1996.



Notary Public

My Commission Expires

NOTARY PUBLIC STATE OF MISSISSIPPI AT LARGE  
MY COMMISSION EXPIRES: August 10, 1997  
BONDED THRU HEIDEN-MARCHETTI, INC.

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ATTACHMENT

TO

OCAN059603

PROPOSED TECHNICAL SPECIFICATION

AND

RESPECTIVE SAFETY ANALYSES

IN THE MATTER OF AMENDING

LICENSE NOs. DPR-51 and NPF-6

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNITS ONE & TWO

DOCKET NOs. 50-313 and 50-368

## DESCRIPTION OF PROPOSED CHANGES

- Extend the allowed outage time (AOT) for an inoperable Arkansas Nuclear One-Unit 1 (ANO-1) emergency diesel generator (EDG), per Technical Specification (TS) 3.7.2.C, from seven days per month, to seven days with a once-per-refueling cycle extension to 14 days, per EDG.
- Extend the AOT for an inoperable Arkansas Nuclear One-Unit 2 (ANO-2) EDG, per TS 3.8.1.1, from seven days with a once-per-refueling cycle 10 day AOT for one EDG (as proposed by 2CAN059501), to seven days with a once-per-refueling cycle 14 day AOT, per EDG.
- Correct a typographical error in TS 4.8.1.1.1.b from “be” to “by”. Revise ANO-2 TS 4.8.1.1.2.c by removing the words “during shutdown”. This will allow for portions of the EDG preventative and corrective maintenance programs to be performed on line.
- Revise ANO-2 TS 3/4.4.4, addressing pressurizer operability, to modify the action associated with an inoperable emergency power supply and to remove the surveillance requirement 4.4.4.2.a. The reference to emergency power supplies in 3.4.4.b has been removed and the requirement for a proportional heater group has been inserted in its place.
- Revise ANO-1 and ANO-2 TS 3.0.5 bases to eliminate the specific AOT for the EDGs. The associated electrical Specifications contain the AOTs for the EDGs, and the example does not require the specific AOT reference for clarity.
- Revise ANO-1 TS 3.7.2.B, 3.7.2.C, 3.7.2.D, and 3.7.2.F to eliminate the requirement to immediately test the operable EDGs and to remove the associated daily testing requirement. TS 3.7.2.B was modified to explain a course of action if the offsite power source is not returned to service within 24 hours. TS 3.7.2.C was modified to allow the remaining EDG to be demonstrated operable within 8 hours. A second footnote was added to give two options on how the remaining EDG can be demonstrated operable. TS 3.7.2.C was also modified to explain a course of action if the EDG is not returned to service within 7 days.
- Remove accelerated testing and reporting requirements for the ANO-2 EDGs from TS 3/4.8.1.1 with its bases and Administrative Controls section 6.9.1.5.d.

## **BACKGROUND**

ANO-1 and ANO-2 are each equipped with two seismically qualified, class 1E, diesel engine driven generators which supply emergency electrical power to the 4160 volt (V) vital AC busses. Each engine is designed to automatically start and tie-on to its respective 4160V engineered safety features (ESF) bus in the event of a bus undervoltage condition on either the 4160V bus or its associated 480V load center. The EDGs also receive an auto start command on a safety injection actuation signal, but will not load unless a bus undervoltage condition exists.

Each EDG is designed to start automatically upon receipt of a start demand, attain rated speed and voltage within 15 seconds, and sequentially accept ESF loads. Each ANO-1 EDG is sized to accommodate loads up to all anticipated ESF actuated equipment with a continuous load rating of 2600 kilowatts (kW) and an intended service rating of 2750 kW. Each ANO-2 EDG is sized to accommodate loads up to all anticipated ESF actuated equipment with a continuous load rating of 2850 kW and a 7-day rating of 3250 kW.

The EDGs are designed for manual operation from either the local control panel or the control room operating panel. This provision allows operation for surveillance testing and manual start and load operations as well as local operations in an event which renders the control room inaccessible.

The EDGs are described in chapter 8.3.1.1.7 of the ANO-1 and ANO-2 Safety Analysis Reports.

In addition to the EDGs, ANO has installed a fifth diesel generator pursuant to the requirements of 10CFR50.63, Loss of All Alternating Current Power, paragraph (c) (2), Alternate AC Source. The Alternate AC Diesel Generator (AACDG) is a 16 cylinder, four stroke, turbocharged, diesel engine driven generator rated at 4400 kW continuous output and 5320 kW overload. The AACDG is capable of supplying 4160V power to either unit's vital and/or non-vital 4160V electrical distribution system. The design consideration for the AACDG assumed the engine would be started from the control room and be available to power the safety buses within 10 minutes of the diagnosis of a station blackout condition.

The AACDG is completely independent from off-site power and the EDGs. The AACDG, all support systems and attendant electrical buses are housed in a dedicated building located outside the power block, inside the protected area fence.

The AACDG is a non-Q, manually started and loaded alternate source of AC power of sufficient capacity to carry either unit's minimum loads required for safe shutdown. Operation and loading of the AACDG is possible from the Unit 2 Control Room or locally. All operations involving the AACDG are procedurally directed. The AACDG is described in letter dated December 18, 1992 (OCNA129208) from the NRC to ANO.

On May 19, 1995, ANO-2 submitted to the NRC a proposed TS amendment, by letter 2CAN059501, requesting an extended AOT for an inoperable EDG. This request was made

as part of a joint effort of participating Combustion Engineering Owners Group (CEOG) members and was based on the conclusions of CEOG "Joint Applications Report for Emergency Diesel Generators AOT Extension," CE NPSD-996. The requested amendment extended the AOT for a single inoperable EDG from 72 hours, to seven days with a once per cycle 10 day AOT for the purpose of corrective or preventative maintenance. This extension is supported and justified by the report, with no credit taken for the installed AACDG.

ANO's original strategy was to participate with the owners group in acquiring the proposed extension based on the CEOG report, then follow with a site specific amendment request based on the risk offset considering the AACDG. In September 1995, the CEOG presented the joint submittal to the NRC in a meeting at NRR headquarters in Rockville, Md. This meeting resulted in a significant change to the original plan for review and approval of the participating owners group submittals. Instead of reviewing and evaluating the group submittal jointly, the NRC decided to review the submittals of Millstone and ANO-2 as lead plants, with the others to follow, based on the success of these reviews.

On January 25, 1996, the NRC made a site visit to ANO to discuss three proposed ANO-2 TS amendments dealing with AOT extensions. One of these proposed TS amendments was the EDG AOT extension as proposed by the CEOG. During the course of the meeting, ANO outlined the strategy to follow this proposed amendment with another site specific submittal which would address AOT extensions, for both units, considering the availability of the AACDG. It was suggested that a more efficient approach might be to prepare and submit the additional site specific amendment request in conjunction with the submittal based on the joint applications report. This suggestion led to the preparation of this submittal that addresses EDG AOT extensions, for both units, considering the availability of the AACDG.

The response to the request for additional information on the ANO-2 application of CEOG Joint Applications Reports on Allowed Outage Time Extensions (2CNA029603) did not specifically include references to the ANO-1 EDGs. However, the ANO-1 management philosophies on risk management, scheduling and performance of on-line maintenance, the Probabilistic Safety Analysis (PSA) process, and controls on the AACDG are essentially identical to that of ANO-2.

### DISCUSSION OF CHANGE

The current ANO-1 TS 3.7.2.C requires that should an EDG be determined inoperable, the EDG be restored to an operable status within seven days, or the unit brought to hot shutdown within the next 12 hours. If the EDG is not restored to operable status within the next 24 hours, the unit will be placed in cold shutdown within the next 24 hours. The proposed amendment would make provisions for each EDG to be removed from service for up to 7 days with a once each refueling cycle extension of the AOT up to 14 days, for the purpose of either corrective or preventative maintenance.

The current ANO-2 TS 3.8.1.1 requires that should an EDG be declared inoperable, the EDG must be restored to an operable status within 72 hours or place the plant in at least hot standby within the following six hours and in cold shutdown within the following 30 hours.

The May 19, 1995 submittal, 2CAN059501, would allow up to seven days to restore operability to an EDG and makes provisions for a once-per-refueling cycle allowance for a ten day AOT for a single EDG for the purpose of performing corrective or preventative maintenance necessary to restore operability or improve reliability. The proposed amendment included in this letter would make provisions for each EDG to be removed from service once each refueling cycle for up to 14 days, for the purpose of either corrective or preventative maintenance.

ANO-2 TS 4.8.1.1.2.c was revised by the removal of the words "during shutdown". This will allow for portions of the EDG preventative maintenance programs to be performed on line.

The desire to perform select corrective and preventative maintenance on-line is based on a number of expected enhancements to the maintenance process. Some examples are:

- Allow for increased flexibility in the scheduling and performance of preventative maintenance.
- Reduction in the number of individual entries into limiting conditions for operation action statements by providing sufficient time to perform related maintenance tasks within a single entry.
- Allow better control of resource allocation. During outage maintenance windows, plant personnel and resources are spread across a large number and wide variety of maintenance tasks. Allowing on-line maintenance gives the plant the flexibility to focus more quality resources on any required or elected EDG maintenance.
- Avert unplanned plant shutdown and minimize potential for requests for notice of enforcement discretion. Risks incurred by unexpected plant shutdowns can be balanced against the risk of continued power operation and performing the maintenance while the plant is at power.
- Improve EDG availability during shutdown modes by performing many of the corrective and preventative maintenance items at power.

The Combustion Engineering Owners Group (CEOG) "Joint Applications Report for Emergency Diesel Generators AOT Extension," CE NPSD-996 explored and evaluated the various risk contributors associated with EDG AOT extensions. This evaluation included a consideration of risk associated with "at power", "transition" and "shutdown" operations. This report and the details associated with these risk factors are included with the ANO-2 proposed amendment (2CAN059501) dated May 19, 1995. While this report was prepared and presented by CE for participating CE plants, the conclusions of the report have generic applications. These conclusions when coupled with the calculations of risk considering the AACDG availability, result in a negligible change in overall plant risk.



To ensure risk is managed to an acceptable level, ANO will implement administrative controls to ensure the AACDG is available prior to entry into the AOT for the inspections performed on the EDGs in accordance with the procedures prepared in conjunction with the manufacturers recommendations. The risk assessment accounts for the random unavailability of the AACDG while the plant is in the AOT for EDG maintenance.

The following tables summarize the risk contributions associated with the proposed AOT extensions. With credit taken for the AACDG, the CDF for both units is slightly less than that previously calculated in CE NPSD-996 for ANO-2. The format of the following tables is also consistent with that used in CE NPSD-996. These values only consider the change in risk based on the extended AOTs and assume the entire 14 days per cycle, per machine is used. No credit is taken in these numbers for the mitigating effect of avoided risks by performing maintenance on line nor the expected improvements in reliability due to this maintenance.

Table 6.3.2-1 AOT CONDITIONAL CDF CONTRIBUTIONS FOR EDGs - Corrective Maintenance		
PARAMETER	ANO-1	ANO-2
EDG Success Criteria	1 of 2	1 of 2
Present AOT, days	7	3
Proposed AOT, days	14	14
Conditional CDF, per yr (1 EDG unavailable)	4.874E-05	7.871E-05
Conditional CDF, per yr (1 EDG never out for T/M)	1.402E-05	2.994E-05
Increase in CDF, per yr	3.472E-05	4.877E-05
Single AOT Risk, Current	6.659E-07	4.008E-07
Single AOT Risk, Proposed	1.332E-06	1.871E-06
Downtime Frequency, per yr per diesel	0.125	0.625
Yearly AOT Risk, Current, per yr/diesel	8.324E-08	2.505E-07
Yearly AOT Risk, Proposed, per yr/diesel	1.665E-07	1.169E-06
Actual Duration, hrs/event	20	15.12
Single AOT Risk (based on actual data)	7.927E-08	8.418E-08
Yearly AOT Risk/yr/diesel (based on actual data)	9.909E-09	5.261E-08

Table 6.3.2-2 AOT CONDITIONAL CDF CONTRIBUTIONS FOR EDGs - Preventive Maintenance		
PARAMETER	ANO-1	ANO-2
EDG Success Criteria	1 of 2	1 of 2
Present AOT, days	7	3
Proposed AOT, days	14	14
Conditional CDF, per yr (1 EDG unavailable)	2.848E-05	7.538E-05
Conditional CDF, per yr (1 EDG never out for T/M)	1.402E-05	2.994E-05
Increase in CDF, per yr	1.446E-05	4.544E-05
Single AOT Risk, Current	2.773E-07	3.735E-07
Single AOT Risk, Proposed	5.546E-07	1.743E-06
Downtime Frequency, per yr per diesel	2	2
Yearly AOT Risk, Current, per yr/diesel	4.160E-07	7.470E-07
Yearly AOT Risk, Proposed, per yr/diesel	1.109E-06	3.486E-06
Proposed Downtime, hrs/train/yr	192	192
Actual Duration, hrs/event	96	96
Single AOT Risk (based on actual data)	1.585E-07	4.980E-07
Yearly AOT Risk/yr/diesel (based on actual data)	3.170E-07	9.960E-07

Table 6.3.2-3 ANO PROPOSED AVERAGE CDFs		
PARAMETER	ANO-1	ANO-2
EDG Success Criteria	1 of 2	1 of 2
Present AOT, days	7	3
Proposed AOT, days	14	14
Unavailability Target Values		
Proposed Downtime, hrs/yr	219	219
Average CDF (base), per yr	1.404E-05	3.002E-05
Proposed Average CDF	1.458E-05	3.124E-05
Change factor from baseline CDF	1.038	1.041
14 Day AOT Values		
Proposed Downtime, hrs/yr	336	336
Average CDF (base), per yr	1.404E-05	3.002E-05
Proposed Average CDF	1.489E-05	3.194E-05
Change factor from baseline CDF	1.061	1.064

The CEOG "Joint Applications Report for Emergency Diesel Generators AOT Extension," CE NPSD-996, provided assessments of transition risk, shutdown risk and large early release frequency. The submittal under review at this time (2CAN059501) determined that extending the EDG AOT to 7 days with a once per cycle 10 day AOT for one EDG was acceptable from the aforementioned perspectives. An engineering review of the proposed AOT extension to 14 days for ANO-1 and ANO-2 has determined that the original assessments are applicable to this submittal.

It is proposed that ANO-2 TS 3.4.4.b be modified to delete the action requirements associated with an inoperable emergency power supply to the pressurizer heaters and to insert the action requirements for an inoperable proportional heater group in its place. The surveillance requirement 4.4.4.2.a has also been removed due to the modification of TS 3.4.4.b. The EDG loading tables already consider the EDGs as emergency power sources for the pressurizer proportional heaters. The TS limiting condition for operation for EDGs, and action statements for inoperable EDGs, are contained in TS 3.8.1.1. Additional operability requirements for the EDGs located in other specifications is redundant and unnecessary. The change to TS 3.4.4.b will also allow appropriate actions to be taken for an inoperable proportional heater group. These changes are consistent with the requirements of NUREG-1432, "Standard Technical Specifications Combustion Engineering Plants."

The revision to the bases for both units 3.0.5 bases eliminates the specific AOT for the EDGs. The associated electrical TS contain the AOTs for the EDGs. The removal of this redundant depiction of the EDG AOT is considered an administrative change.

The revision to ANO-1 TS 3.7.2.B, 3.7.2.C, 3.7.2.D, and 3.7.2.F eliminates the requirement to immediately test the operable EDGs and the associated daily testing requirement thereafter. The operability verification on the remaining EDG is proposed to be performed within 8 hours instead of the current requirement of immediately. The 8 hour requirement will allow additional time for performing a more orderly operability verification, by allowing more time for completing evolutions in progress, coordinating with the additional personnel, and performance of personnel briefings. The second footnote for TS 3.7.2.C also allows running the EDG or determining if there is a common cause failure. These changes are in accordance with the recommendations of Generic Letter 84-15, "Proposed Staff Action to Improve and Maintain Diesel Generator Reliability" and/or Generic Letter 93-05, "Line-Item Technical Specifications Improvements To Reduce Surveillance Requirements For Testing During Power Operation." In accordance with the NRC and industry findings, reducing the overall number of unnecessary start demands on the EDGs can improve their reliability.

ANO correspondence dated January 9, 1985 (OCAN18506), provided the ANO follow-up response to Generic Letter 84-15. In this letter it was concluded that no additional TS changes were needed to respond to the Generic Letter. After further review, Entergy Operations has determined that these changes would result in improved diesel generator reliability.

The requirement to demonstrate the operability of the EDGs was removed from the action in ANO-2 TS 3.8.1.1.a and 3.8.1.1.d in accordance with Generic Letter 93-05. The staff has found that, while the majority of the testing at power is important, safety can be improved, equipment degradation decreased, and unnecessary burden on personnel resources eliminated by reducing the amount of testing that the TS require during power operation. These changes were two of the surveillance enhancements listed in Generic Letter 93-05.

ANO-1 TS 3.7.2.B was modified to explain a course of action if the offsite power source is not returned to service within the 24 hour period of time. ANO-1 TS 3.7.2.C was also modified to explain a course of action if the EDG is not returned to service within the 7 day period of time. These actions are not a change in how these TSs are currently implemented but inserted only for clarity. These changes are considered to be administrative.

The EDG accelerated testing and reporting requirements have been removed from ANO-2 TS 3/4.8.1.1 with its bases and Administrative Controls section 6.9.1.5.d. These requirements have been removed in accordance with Generic Letter 94-01, "Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators." Generic Letter 94-01 allows removal of these requirements as long as the utility commits to implement, within 90 days of the license amendment, a maintenance program for monitoring and maintaining EDC performance. The maintenance program will be in accordance with the provisions of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," and the guidance contained in Regulatory Guide 1.160,

"Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." These changes are in accordance with Generic Letter 94-01 and ANO-2 will have the maintenance rule in effect on the EDGs within 90 days of issuance of this TS amendment.

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

An evaluation of the proposed change has been performed in accordance with 10CFR 50.91(a)(1) regarding no significant hazards considerations using the standards in 10CFR 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 emergency diesel generators (EDGs) are backup alternating current power sources designed to power essential safety systems in the event of a loss of offsite power. The EDGs are not accident initiators in any accident previously evaluated. Probabilistic Safety Analysis (PSA) methods were utilized in order to fully evaluate the EDG allowed outage time (AOT) extension proposed in this submittal. The results of these analyses indicate there is not a significant increase in the probability of an accident previously evaluated. Therefore, this change does not involve an increase in the probability of an accident previously evaluated.

The EDGs provide backup power to components that mitigate the consequences of accidents. The current TSs allow for an EDG to be removed from service for an AOT. The proposed amendment extends the current AOT for an EDG. The proposed change does not allow any more equipment to be removed from service at one time. The proposed changes to the AOTs do not affect any of the assumptions used in deterministic safety analysis. By extending the EDG AOT, the consequences of an accident previously evaluated will remain unchanged.

The proposed change removes redundant requirements associated with an inoperable emergency power supply from the TS for the pressurizer proportional heaters. The operability requirements for emergency power supplies and actions to be taken if an EDG is inoperable are already addressed in the ANO-2 TS 3.8.1.1.

The associated changes that remove the requirements to test the EDGs if one or both offsite power supplies are inoperable, for an inoperable station battery, for an inoperable component in the two ESF electrical distribution systems, the accelerated testing requirements of the EDGs, and the daily testing requirements for the operable EDGs improve the reliability for the operable EDGs by reducing the number of unnecessary starts and stops. By improving the EDG reliability, this change will not increase the consequences of the accidents previously evaluated.

The other changes in this submittal associated with the bases are considered administrative in nature and have no effect on the consequences of an accident previously evaluated.

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.**

This proposed change does not alter the design, configuration, or method of operation of the plant. 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 changes do not affect the Technical Specification limiting conditions for operation or their bases which support the deterministic analyses used to establish the margin of safety. Calculations performed to analyze the change in risk based on these changes produced acceptable values which are included in the tables located in the description of changes section. These calculated changes in risk fall well within that which is normally considered acceptable. When the additional benefit of maintaining the Emergency Diesel Generators available during shutdown cooling operations associated with refueling outages is considered, the overall change in risk is further reduced.

The remaining proposed changes are either associated with increasing EDG reliability or considered administrative in nature.

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 has determined that the requested change does not involve a significant hazards consideration.