



**Entergy
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0CAN049107

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
Response to Station Blackout
Safety Evaluation Report
(TAC Nos. 68508 and 68509)

Gentlemen:

In letters 1CAN048908 and 2CAN048904 (both dated April 13, 1989), Entergy Operations submitted a response to station blackout (SBO) for Arkansas Nuclear One, Units 1 & 2 (ANO-1 & 2) respectively. These submittals provided information concerning the evaluation of ANO-1 & 2 in regards to the requirements of the SBO Rule (10CFR50.63). The evaluations were performed using the guidance provided in NUMARC 87-00 except where Regulatory Guide 1.155 took precedence.

These submittals described a proposed Alternate AC (AAC) system consisting of a unit cross-tie between the safety busses and utilizing the excess capacity in the existing Class 1E emergency diesel generators (EDGs). This information was supplemented in Entergy Operations' letters 0CAN049004 (dated April 3, 1990); 0CAN079006 (dated July 17, 1990); and 0CAN099008 (dated September 24, 1990).

The SBO Safety Evaluation Report (SER) for ANO-1&2 was transmitted to ANO by letter dated October 10, 1990 (0CNA109006). The SER concluded that ANO-1 & 2, with the proposed AAC Cross-tie method, did not conform with the SBO Rule and the guidance provided in Regulatory Guide 1.155, NUMARC 87-00 and the supplement to NUMARC 87-00. A revised response to the SBO Rule which addresses the areas of nonconformance identified in the SER was requested.

The purpose of this submittal is to provide a revised response to the SBO Rule for ANO-1 & 2. Details of this response are provided in Attachment 1. To address the NRC's concerns with our previous submittals Entergy Operations proposes to install an independent AAC power source capable of providing electrical power under blackout conditions to the affected unit.

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The proposed SBO duration remains as four hours. In the SBO SER, the staff agreed with the evaluation of a four hour SBO coping duration.

The AAC power source that will be utilized at ANO-1 & 2 will meet the criteria specified in Appendix B to NUMARC 87-00. The AAC power source will consist of an independent diesel or combustion turbine generator, complete with an air start system, and a cable network which will enable it to access any of the four safety buses in ANO-1 & 2 without any necessary actions outside of the Control Room. The source will be available within 10 minutes of the onset of the SBO event (i.e., within 10 minutes after the operators have procedurally determined that a SBO event has occurred) and will have sufficient capacity and capability to operate the necessary systems to bring the unit to a safe shutdown condition and maintain that condition for the duration of the event. The AAC power source will be "full size", meaning that it will be capable of supplying the license basis loss of offsite power (LOOP) loads of any one of the four safety buses. Figure 1 provides a simplified one-line diagram of this AAC power source.

Information concerning the overall design of the AAC power source will be submitted to the NRC as the conceptual design (i.e., P&IDs, Electrical one-line and three-line diagrams, site drawings, SAR drawings, equipment design criteria, logic diagrams, etc.) before the modification is completed in the Spring of 1992. Major design criteria, including the final decision of a diesel engine or a combustion turbine, will be included with the conceptual design. Entergy Operations requests a timely NRC review and approval of the conceptual design by Summer 1992.

ANO-1 tie-ins are scheduled to be performed during 1R11, with ANO-2 tie-ins performed during 2R10. The remaining scope of this modification will be completed by December 31, 1994. At that time, ANO will initiate quarterly surveillance testing of the AAC power source. A description of the AAC power source modifications and installation will also be maintained in the appropriate design records.

As part of the modification program, the AAC power source will be tested on a one-time basis to ensure that it can perform its AAC function. This test will be conducted during the appropriate unit outages occurring in 1995 and will be performed in accordance with the guidance of NUMARC 87-00, Appendix B, Item B.12.

As stated in our original submittals, the target EDG reliability, which will be maintained, for ANO is 0.95. This target reliability will also be applied to the AAC power source. Entergy Operations is currently participating in two EDG utility groups to develop the appropriate reliability programs for the EDGs used at ANO. (ANO-1 utilizes EMD EDGs and ANO-2 utilizes Fairbanks Morse EDGs.) The final ANO EDG reliability programs will meet as a minimum, the guidelines of Regulatory Guide 1.155.

It is recognized that technical specifications for the SBO equipment are currently being considered by the NRC in the context of the Technical Specification Improvement Program and remains an open item at this time.

However, based upon the proposed AAC system, Entergy Operations is evaluating the capability of the AAC power source to support the following Technical Specification changes:

- Extending the ANO-1 & 2 LCO for having only one Class 1E EDG operable while at power, provided the AAC power source is operable. The use of this provision would be limited to a specific interval for each of the EDGs without prior NRC approval.
- Allow the substitution of the AAC power source in lieu of an operable Class 1E EDG, for either unit, when the unit is in Modes 5 or 6.

These potential Technical Specification changes have been discussed with the NRR Project Managers for ANO.

If Entergy Operations pursues these Technical Specification changes, the following additional capabilities for the AAC power source will be considered by Entergy Operations:

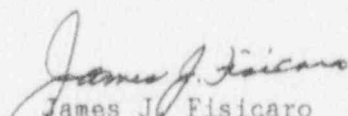
- The AAC power source would have the capacity and capability to supply one train of the loads required to mitigate any Design Basis Accident (DBA) and achieve safe shutdown for the affected unit.
- The AAC fuel oil storage tank and day tank would have sufficient capacity for four and one-half days operation at full capacity of the AAC power source. This is equivalent to the maximum run time for any one of the existing 1E EDGs from its respective fuel oil storage tank.
- AAC system would be designed and constructed to meet the Seismic Qualification Utility Group's (SQUG) criteria. This would help ensure that the AAC power source will be available during and after a seismic event.

These additional requirements are in excess of those requirements listed in NUMARC 87-00.

Entergy Operations will be in communication with the NRC Staff to further discuss the results of the evaluations. Entergy Operations believes the information provided in this submittal is sufficient for the NRC to prepare a SER for ANO's resolution of the SBO issue.

Should you have any questions regarding this issue, please contact me.

Very truly yours,


James J. Fisicaro
Director, Licensing

JJF:RWC:sgw
Attachment

U. S. NRC
April 15, 1991
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ARKANSAS NUCLEAR ONE UNITS ONE & TWO

Simplified Single Line Diagram for Station Blackout

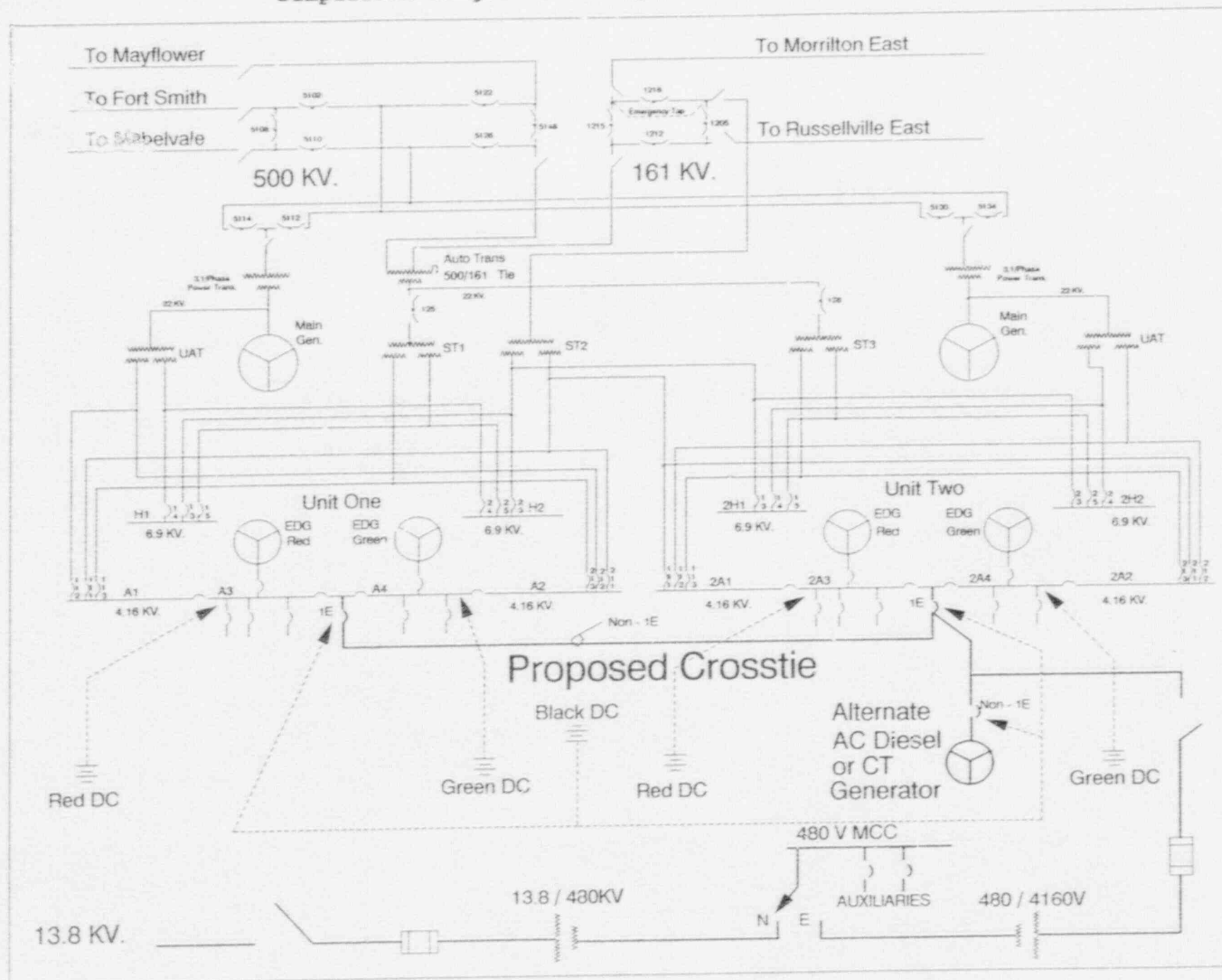


FIGURE 1

ATTACHMENT 1

RESPONSE TO THE STATION BLACKOUT SAFETY EVALUATION REPORT FOR ANO-1 & 2

The following information provides details of Entergy Operations' revised response to the Station Blackout (SBO) Rule.

A. Procedure Description

ANO and Arkansas Power & Light (AP&L) procedures have been reviewed and modified, if deemed necessary, to meet the guidelines of NUMARC 87-00, Section 4, in the following areas:

1. AC power restoration (Section 4.2.2):
 - a. ANO-1 Emergency Operating Procedure (EOP)
 - b. ANO-2 EOP
 - c. Coordination of ANO Switchyard and ANO Related Offsite Transmission Equipment
 - d. AP&L Emergency Restoration Plan, Rev. 0
2. Severe weather (Section 4.2.3):
 - a. ANO Administrative Procedure Plant Preparations for Tornado

Plant procedures have been reviewed and changes necessary to meet NUMARC 87-00 are planned to be implemented in the following areas:

1. Station Blackout response (Section 4.2.1)
 - a. ANO-1 EOP
 - b. ANO-2 EOP
 - c. Other station procedures (surveillances, testing, etc.) will require revision, depending on the specific modifications installed.

B. Proposed Modifications and Schedule

The modifications required to utilize the AAC power source (see Figure 1) are:

1. Cabling between each unit's safety buses and the AAC power source.
2. ANO-1 & 2 switchgear modifications to accommodate connection to the AAC power source.
3. Installation of the AAC power source and ancillary systems, including construction of the AAC power source building. This building will be constructed in conformance with the Uniform Building Code (UBC) requirements.

The ANO EOPs will require revisions to align the AAC power source to the desired safety bus upon determination of a SBO event. Also required will be the procedural changes necessary to re-align a Class 1E EDG or offsite power when either becomes available.

The AAC system modifications listed above are currently scheduled to be completed by December 31, 1994. The required procedure changes and operator training are also planned to be implemented by this time. It should be noted that implementation could occur later, depending on the timing and/or outcome of the NRC's assessment response.

C. Coping Assessment

As described above, the AAC power source will be available within 10 minutes of the onset of the SBO event and will support one train of the license basis LOOP loads of either unit. Therefore no coping assessment is required, per NUMARC 87-00, Section 7.1.2.

D. Quality Assurance (QA) and Technical Specifications (TS)

The proposed equipment and components required to cope with a SBO will be incorporated into a QA program that meets the guidance of Regulatory Guide 1.155, Appendix A.

It is recognized that technical specifications for the SBO equipment are currently being considered by the NRC in the context of the Technical Specification Improvement Program and remains an open item at this time. However, as noted above, plant procedures will be revised to reflect the appropriate testing and surveillance requirements to ensure the operability of the necessary SBO equipment.