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SUBJECT: Responds to station blackout rule for plants using AC
 independent station blackout response power.

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Donald C. Cook Nuclear Plant Units 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
GENERIC RESPONSE TO STATION BLACKOUT RULE FOR PLANTS
USING AC INDEPENDENT STATION BLACKOUT RESPONSE POWER

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

Attn: T. E. Murley

April 14, 1989

Dear Dr. Murley:

On July 21, 1988, the Nuclear Regulatory Commission (NRC) amended its regulations in 10 CFR, Part 50. A new section, 50.63, was added which requires that each light-water-cooled nuclear power plant be able to withstand and recover from a station blackout (SBO) of a specified duration. Utilities are expected to have the baseline assumptions, analyses and related information used in their coping evaluation available for NRC review. It also identifies the factors that must be considered in specifying the station blackout duration. Section 50.63 requires that, for the station blackout duration, the plant be capable of maintaining core cooling and appropriate containment integrity. Section 50.63 further requires that each licensee submit the following information:

1. A proposed station blackout duration including a justification for the selection based on the redundancy and reliability of the onsite emergency AC power sources, the expected frequency of loss of offsite power, and the probable time needed to restore offsite power;
2. A description of the procedures that will be implemented for station blackout events for the duration (as determined in 1 above) and for recovery therefrom; and
3. A list and proposed schedule for any needed modifications to equipment and associated procedures necessary for the specified SBO duration.

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The NRC has issued Regulatory guide 1.155 "Station Blackout" which describes a means acceptable to the NRC Staff for meeting the requirements of 10 CFR 50.63. Regulatory Guide (RG) 1.155 states that the NRC Staff has determined that NUMARC 87-00 "Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout At Light Water Reactors" also provides guidance that is in large part identical to the RG 1.155 guidance and is acceptable to the NRC staff for meeting these requirements.

Table 1 to RG 1.155 provides a cross-reference between RG 1.155 and NUMARC 87-00 and notes where the RG takes precedence.

Indiana Michigan Power has evaluated the Cook Nuclear Plant, Units 1 and 2, against the requirements of the SBO rule using guidance from NUMARC 87-00 except where RG 1.155 takes precedence. The results of this evaluation are detailed below.

A. Proposed Station Blackout Duration

NUMARC 87-00, Section 3 was used to determine a proposed SBO duration of four hours. No modifications were required to attain this proposed coping duration category.

The following plant factors were identified in determining the proposed station blackout duration:

1. AC Power Design Characteristic Group is P2 based on:
 - a. Expected frequency of grid-related loss-of-offsite-power events (LOOPs) - does not exceed once per 20 years;
 - b. Estimated frequency of LOOPs due to extremely severe weather (ESW) places the plant in ESW Group 2;
 - c. Estimated frequency of LOOPs due to severe weather (SW) places the plant in SW Group 2;
 - d. The offsite power system is in the Group 11/2.
2. The emergency AC power configuration group is "C" based on:
 - a. There are two emergency AC power supplies per unit not credited as alternate AC power sources;
 - b. One emergency AC power supply per unit is necessary to operate safe shutdown equipment following a loss of offsite power.

3. The target emergency diesel generator (EDG) reliability is 0.975. A target EDG reliability of 0.975 was selected based on having a nuclear unit average EDG reliability for the last 20 demands greater than 0.90 consistent with NUMARC 87-00, Section 3.2.4.

B. Procedure Description

Plant procedures have been reviewed and, where necessary, will be modified by July 31, 1989, to meet the guidelines in NUMARC 87-00, Section 4 in the following areas:

1. Station blackout response per NUMARC 87-00, Section 4.2.1;
2. AC power restoration per NUMARC 87-00, Section 4.2.2;
3. Severe weather per NUMARC 87-00, Section 4.2.3;

Procedures reviewed and/or revised are listed below:

- o 1,2-OHP 4023.ECA-0.0 Loss of All AC Power;*
- o 1,2-OHP 4023.001.020 Response to Loss of Offsite Power to Both Units and Any One Diesel Starts;
- o OHI-4011 Conduct of Operations (Shift Staffing);
- o 1,2-OHP 4021.056.002 Operation of Auxiliary Feedwater System During Startup and Shutdown;
- o 1,2-OHP 4030.STP.017T Turbine Driven Auxiliary Feedwater System Test;
- o 1,2-OHP 4022.055.003 Loss of Condensate to Auxiliary Feedwater Pumps;
- o 1-OHP 4030.STP.039 Security Diesel Generator Operability Test;
- o 1,2-OHP 4023.001.001 Remote Shutdown Procedures;
- o OHI-5030 Preventive Maintenance;
- o 1,2-OHP 4023.001.006 Loss of Control Air;
- o 1,2-OHP 4023.ECA-0.1 Loss of All AC Power Recovery Without SI Required;
- o 1,2-OHP 4023.ECA-0.2 Loss of All AC Power Recovery With SI Required;

- o PMP 2080.EPP.111 Natural Emergency Guidelines;
- o PMI 4010 Plant Operations Policy;*
- o Load Restoration Plan, Indiana Michigan Power Company System Operation Department, August, 1988.
- o 1,2-OHP 4030.STP.043 Safety Related Manual Valve Cycling;*
- o 1-THP 6030.IMP.146 (.246 for Unit 2) Emergency Plant Shutdown and Cooldown Indication Local Shutdown Indication
- o 1-THP 6030.IMP.327 (.427 for Unit 2) Steam Generator Atmosphere Steam Relief Control Calibration/Alignment

*Procedures requiring modification.

C. Proposed Modifications and Schedule

The ability of Cook Nuclear Plant, Units 1 and 2, to cope with a station blackout for four hours in accordance with NUMARC 87-00, Section 3.2.5 and as determined in Section "A" above; was assessed using NUMARC 87-00, Section 7 with the following results:

1. Condensate Inventory For Decay Heat Removal (Section 7.2.1)

It has been determined from Section 7.2.1 of NUMARC 87-00 that approximately 90,000 gallons of water per unit are required for decay heat removal, as well as for primary/secondary side pressure reduction, for the four hour blackout event. The minimum permissible condensate storage tank level per technical specifications provides 175,000 gallons of water per unit, which exceeds the required quantity for coping with a four-hour station blackout.

2. Class 1E Battery(ies) Capacity (Section 7.2.2)

The Class 1E batteries were determined to be inadequate to meet station blackout loads for four hours. The following procedure change is necessary to provide a four-hour capacity: various loads not required to mitigate the station blackout event will be stripped. These loads will be identified in plant procedures.

3. Compressed Air (Section 7.2.3)

Procedure changes are necessary to ensure that air-operated valves required for decay heat removal

during a station blackout of a four-hour duration have sufficient backup sources for operation or will be manually operated. Valves requiring manual operation or that need backup sources (i.e., steam generator power-operated relief valves) for operation will be identified in plant procedures.

4. Effects of Loss of Ventilation (Section 7.2.4)

The calculated steady state ambient air temperature for the steam driven auxiliary feedwater pump room (the dominant area of concern for a PWR) during a station blackout induced loss of ventilation is 133.6°F.

The assumption in NUMARC 87-00, Section 2.7.1 that the control room will not exceed 120°F during the station blackout has been assessed.

The control room at Cook Nuclear Plant, Units 1 and 2, does not exceed 120°F during a station blackout. Therefore, the control room is not a dominant area of concern.

Reasonable assurance of the operability of station blackout response equipment in the above dominant area(s) of concern has been assessed using Appendix F to NUMARC 87-00 and/or the NUMARC 87-00 Topical Report. No modifications or associated procedures are required to provide reasonable assurance for equipment operability.

5. Containment Isolation (Section 7.2.5)

The plant list of containment isolation valves has been reviewed to verify that valves which must be capable of being closed or that must be operated (cycled) under station blackout conditions can be positioned (with indication) independent of the preferred and blacked-out unit's Class 1E power supplies. No plant modifications and/or associated procedure changes were determined to be required to ensure that appropriate containment integrity can be provided under SBO conditions.

6. Reactor Coolant Inventory (Section 2.5)

The ability to maintain adequate reactor coolant system inventory to ensure that the core is cooled has been assessed for four hours. A plant-specific analysis was used for this assessment. The expected rates of reactor coolant inventory loss under SBO conditions do not result in core uncover in a SBO of four hours. Therefore, makeup systems in addition to those currently

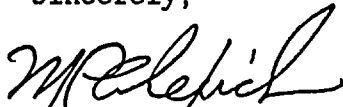
available under SBO conditions are not required to maintain core cooling under natural circulation (including reflux boiling).

The procedure changes identified in Parts A, B and C above will be completed by July 31, 1989.

The framework for this response letter was generically prepared by NUMARC and was concurred with by the NRC staff. Plant specific parameters were provided where needed and paragraphs selected as they applied to Cook Nuclear Plant from the generic response. format. NRC staff concurrence for the framework was provided in an October 7, 1988, letter from Mr. A. S. Thadani, Assistant Director for Systems, Nuclear Reactor Regulation, to Mr. W. H. Rasin of NUMARC.

This document has been prepared following Corporate procedures that incorporate a reasonable set of controls to ensure its accuracy and completeness prior to signature by the undersigned.

Sincerely,



M. P. Alexich
Vice President

ldp

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