



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 175 TO FACILITY OPERATING LICENSE NO. DPR-46
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
DOCKET NO. 50-298

1.0 INTRODUCTION

By letter dated May 5, 1995, as supplemented by letters dated July 15, 1995, and March 5, 1996, Nebraska Public Power District (NPPD) (the licensee) requested a Technical Specifications (TSs) change for the Cooper Nuclear Station. The revision pertains to changes to the emergency diesel generator (EDG) action statements and surveillance requirements. After a preliminary review of the subject TS change, the staff contacted the licensee via a conference call on November 1, 1995, to discuss concerns regarding the wording of the subject amendment. By letter dated March 5, 1996, the licensee submitted minor changes to clarify the intent of the proposed change. This letter provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

2.0 EVALUATION

The staff's evaluation of the licensee's proposed changes to the TS follows.

2.1 Technical Specification 3.5.F.1

The subject action statement addresses the limiting conditions for operation (LCO) applicable when one EDG becomes inoperable during power operation. The current statement reads as follows:

...and the requirements of 3.9.A.1 are met. If this requirement cannot be met, the requirements of 3.5.F.2 shall be met.

The following replaces the current statement:

...and the requirements of 4.5.F.1 and the remaining requirements of 3.9.A.1 are met. If these requirements cannot be met, the requirements of 3.5.F.2 shall be met.

The subject TS change specifies that the test requirements associated with Surveillance Requirement (SR) 4.5.F.1 will be met during the subject LCO. Therefore, the redundant EDG and associated subsystem components are operable immediately and daily thereafter upon declaration that one EDG becomes inoperable. The staff finds that the subject TS change is consistent with the Standardized Technical Specifications (STs) and provides assurance that the

redundant EDG is operable if needed to perform its intended safety function. Therefore, the staff finds that the subject change is acceptable.

2.2 Technical Specification 3.5.F.2

The subject action statement addresses the LCO applicable when the two EDGs become inoperable during power operation. The proposed revision changes the allowable period from 24 hours to 2 hours.

The current statement reads as follows:

...and the reactor power level is reduced to 25% of rated power and the requirements of 3.9.A.1 are met.

The following replaces the current statement:

...and the remaining requirements of 3.9.A.1 are met.

The proposed revision also specifies that if this LCO cannot be met the reactor will be placed in the hot standby condition within 12 hours and in cold shutdown condition within 36 hours.

The requirement to reduce plant power to 25 percent of rated power upon the loss of two EDGs or when incoming power is not available from both the start-up and emergency transformers was established during the licensing process for Cooper Nuclear Station. The licensee contends that the requirement to reduce plant power to 25 percent of rated power forces the plant into an immediate transient. Instead of the plant power reduction, the subject change would permit the plant to remain at the existing power level for a 2-hour allowable outage period given the loss of the two EDGs.

According to the guidance for power operation outlined in Regulatory Guide (RG) 1.93, "Availability of Electric Power Sources," the decision for continued power operation should not be solely determined by a specific action statement in the TSs, rather it should be reviewed on each plant circumstances individually considering its risk factors. Therefore, the requirement for an immediate specified power level reduction during an LCO does not represent a condition necessary for safe power operation. The 2-hour allowable outage time (AOT) and the time to hot standby and cold shutdown conditions specified in the subject change is consistent with the STSs. Therefore, the staff finds that the subject TS change is acceptable.

2.3 Technical Specification 4.5.F.1

The licensee proposes to replace the existing surveillance requirement with one that addresses the new requirements separately for the EDG and for the Low Pressure Coolant Injection, Core Spray, and Residual Heat Removal Service Water subsystems. The new surveillance also adds a requirement that a determination must be made within 24 hours that the OPERABLE EDG is not inoperable due to a common cause failure or Surveillance 4.9.A.2.a.1 must be

performed. The licensee proposes to change the existing requirement such that the initial demonstration of EDG operability must be performed within 72 hours (vice immediately). The requirement that the demonstration of EDG operability be performed and every 72 hours thereafter is retained. The demonstration is to be performed if the inoperable EDG is not sooner declared operable.

The staff provided relaxation to EDG SRs by Generic Letter (GL) 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation." In this letter, the staff recommended deletion of the following requirement: "If either diesel generator has not been successfully tested within the past 24 hours demonstrate its OPERABILITY by performing SRs 4.8.1.1.2.a.5 and 4.8.1.1.2.a.6 for each such diesel generator, separately, within 24 hours." In addition, the licensee proposes to perform SR 4.9.A.2.a.1 (equivalent to SR 4.8.1.1.2.a.5) within 24 hours if the EDG became inoperable due to any cause other than an independently testable component, testing, or preplanned preventative maintenance unless the absence of any potential common mode failure for the remaining EDG is demonstrated by the licensee.

GL 93-05 recommends that the operability of the remaining EDGs be demonstrated when one EDG becomes inoperable. EDG operability has to be demonstrated only if the EDG became inoperable due to any cause other than an independently testable component, testing, or preplanned preventative maintenance. Based on the above information, the staff finds that the subject TS change is consistent with STSs and the intent of GL 93-05, and is therefore acceptable.

2.4 Technical Specification 3.9.B.1

The licensee proposes to delete the following text in action statement 3.9.B.1.a:

At the end of this period, provided the second source of incoming power has not been made immediately available, the NRC must be notified of the event and the plan to restore this second source.

The word "demonstrated" is replaced by "verified" to assure the operability of the two diesel generators and associated critical buses.

The licensee also proposes to replace text in Action Statement 3.9.B.1.b. This text currently reads as follows:

...provided the two diesel generators and associated critical buses are demonstrated to be operable, all core and containment cooling systems are operable, reactor power level is reduced to 25% of the rated and NRC is notified within 24 hours of the situation, the precautions to be taken during the period and the plans for prompt restoration of incoming power.

The following replaces the current text:

...only during the succeeding 24 hours unless one power source is sooner made operable, provided the two diesel generators and associated critical buses are verified to be operable, and all core and containment cooling systems are operable. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor placed in the cold shutdown condition within 24 hours.

The licensee requirement to notify the NRC of the event and their plans to restore the inoperable component(s) is unnecessary due to the existence of immediate notification requirements 10 CFR 50.72.

Based upon the rationale discussed above for Specification 4.5.F.1, the loss of one offsite power source does not imply that the EDGs will be unable to perform their safety function. Verification of operability rather than demonstration via test engine starts is the more appropriate requirement for the subject LCO. The subject change is consistent with the intent of GL 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," to reduce the number of unnecessary fast engine starts, thereby increasing overall EDG reliability.

According to the guidance for power operation outlined in RG 1.93, the decision for continued power operation should not be solely determined by a specific action statement in the TSs; rather, it should be reviewed on each plant circumstances individually considering its risk factors. Therefore, the requirement for an immediate specified power level reduction during an LCO does not represent a condition necessary for safe power operation. Further, the 24-hour AOT specified in the subject change for Action Statement 3.9.B.1.b is consistent with the STSs.

Based on the above discussion, the staff finds that the subject TS change is acceptable.

2.5 Technical Specification 3.9.B.2

- The text in Action Statement 3.9.B.2.a currently reads as follows:

...Specification 3.5.F.1 if Specification 3.9.A.1 is satisfied.

The licensee proposes to replace the previous text with the following:

...Specification 3.5.F.1 if the remaining requirements of Specifications 3.9.A.1 are satisfied.

The text in Action Statement 3.9.B.2.b currently reads as follows:

...during the succeeding 24 hours in accordance with Specification 3.5.F.2 if Specification 3.9.A.1 is satisfied.

The licensee proposes to replace the previous text with the following:

...during the succeeding 2 hours in accordance with Specification 3.5.F.2 if the remaining requirements of Specifications 3.9.A.1 are satisfied.

The licensee proposes to specify a 24-hour period for the AOT when one EDG and one offsite power source is inoperable for Action Statement 3.9.B.2.c. In addition, the proposed change removes the requirement to notify the NRC of the licensee's plans for restoration of the inoperable components.

The licensee proposed change for Action Statements 3.9.B.2.a and 3.9.B.2.b represents editorial changes made to clarify that the remaining requirements of Specification 3.9.A.1, which refers to other vital equipment, must be met for continued reactor operation. Given that this change is administrative in nature, the staff finds that it is acceptable.

The STSs and RG 1.93 specifies 12 hours AOT for the loss of an offsite power source and an EDG, and 24 hours AOT for loss of two offsite power sources. The staff rationale for the 12 hour AOT, in the case of the loss of an offsite power source and an EDG, is based upon the nature of the loss (i.e., two diverse power sources) and that the capability of the onsite AC power system has been degraded during this LCO. This position was discussed with the licensee during a conference call held on November 1, 1995. However, the licensee contended that its original licensing basis specifies 24 hours as the AOT for the subject LCO. Given the licensee's position, the staff recommends approval of the above deviation to the STSs because this change represents an improvement to the original TSs which now has an unspecified AOT when an offsite power source and an EDG are inoperable.

The licensee requirement to notify the NRC of the event and their plans to restore the inoperable component(s) is unnecessary due to the existence immediate notification requirements under 10 CFR 50.72.

Based on the above discussion, the staff finds that the subject TS change is acceptable.

2.6 Technical Specification 4.9.A.2.a

The licensee proposes to revise SR 4.9.A.2.a by splitting the TSs into two separate surveillance requirements for the EDGs.

SR 4.9.A.2.a.1 describes the monthly test requirements that specify a modified EDG start as recommended by the manufacturer. The modified EDG start procedures involve idling and gradual acceleration to synchronous speed that may be preceded by an engine prelube period prior to starting and a warmup period prior to loading. The proposed revision specifies that when the modified start procedures are not used the time, voltage, and frequency requirements of SR 4.9.A.2.a.2 must be met and the performance of

SR 4.9.A.2.a.2 satisfies SR 4.9.A.2.a.1. The proposed revision also deletes the requirement to log the EDG starting time to reach rated voltage and frequency parameters.

SR 4.9.A.2.a.2 describes the new 6-month testing requirement, which is identical to SR 4.9.A.2.a.1 except that the EDG start uses a fast start procedure where the time to reach rated voltage and frequency is logged during the test. The SR may be preceded by an engine prelude period prior to starting the EDG.

The licensee proposed the subject change in order to enhance the EDG reliability by incorporating test provisions to allow slow and gradual monthly EDG starts instead of the existing fast engine start requirements. In addition to an engine prelude period for both surveillance requirements and a warmup period prior to loading for SR 4.9.A.2.a.1, this change acts to reduce mechanical stress and wear on the diesel engine. The staff finds that the subject change is consistent with GL 84-15, and the guidance provided by the STSS. Therefore, the subject TS change is acceptable.

2.7 Changes to BASES Sections

The staff noted during the initial review that the following concerns regarding the wording for Bases Sections 3.5, 4.5 and 4.9 were noted:

1. Bases Section 3.5 included a statement which implied that an immediate plant shutdown may cause a power grid instability.
2. Bases Section 4.5 had a statement which implied that GL 84-15 specified 24 hours as a reasonable time to confirm that the operable EDG was not affected by the same problem as the inoperable EDG.
3. Discussion in Bases Section 4.9 caused some confusion regarding starting time requirements for SR 4.9.A.2.a.2.

After a conference call on November 1, 1995, the licensee submitted a revision by letter dated March 5, 1996, which addressed the concerns listed above.

2.7.1 3.5 Bases: Page 128

The licensee proposes to add the following text to Base Section 3.5.F:

The remaining requirements of 3.9.A.1 ensures that highly reliable and diverse power sources remain with one generator inoperable. It is necessary to verify that the required off-site sources are available and capable of supplying power to the emergency buses, and that loss of voltage and undervoltage relay circuits associated with the emergency buses are operable.

For a detailed explanation of the 4.5.F.1 requirements, see the BASES Section 4.5 on page 131 of these Technical Specifications.

(This specification...inoperable.) With two Diesel Generators (DGs) inoperable, there are no remaining standby AC sources. Thus, with an assumed loss of offsite electrical power, there are no standby AC sources available to power the minimum required ESF functions. Since offsite electrical power is the only source of AC power for majority of ESF equipment at this level of degradation, the risk associated with continued operation for a very short time could be less than that associated with an immediate controlled shutdown. However, since any inadvertent unit generator trip could also result in a total loss of offsite AC power, the time allowed for continued operation is severely restricted. The intent here is to avoid the risk associated with an immediate controlled shutdown and to minimize the risk associated with this level of degradation.

According to Regulatory [Guide] 1.93, with both DGs inoperable, operation may continue for a period that should not exceed 2 hours.

If the DGs cannot be restored to OPERABLE status within the 2 hour completion time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be in the HOT STANDBY CONDITION within 12 hours, and in the COLD CONDITION within 36 hours. The allowed completion times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner, and without challenging plant systems.

The proposed revision explains the requirements of Specification 3.9.A.1, which is referenced in Specification 3.5.F.1 and references the location of the explanation for SR 4.5.F.1 requirements. In addition, the licensee proposes to remove the following text:

The reduction of rated power to 25% will provide a very stable operating condition. The allowable repair time of 24 hours will provide an opportunity to repair the diesel and thereby prevent the necessity of taking the plant down through the less stable shutdown condition. If the necessary repairs cannot be made in the allowed 24 hours, the plant will be shutdown in an orderly fashion.

Except for the necessary typographical correction regarding "Regulatory" (should be "Regulatory Guide"), the subject TS change is administrative in nature clarifying Specification 3.9.A.1. The typographical error has been discussed with the licensee and that correction will be made concurrent with the implementation of the TS approved herein. Therefore, the staff finds that the change is acceptable.

2.7.2 4.5 Bases: Page 131

The licensee proposes to add the following text:

Verification of operability consists of verifying that the

surveillance is current, and that other available information does not indicate inoperability.

The requirements of 4.5.F.1 assure that adequate core cooling equipment associated with the OPERABLE diesel generator is available. This requirement provides confidence that diesel generator inoperabilities are investigated for common cause failures, regardless of how the diesel generator inoperability exists.

The requirements of 4.5.F.1, provides an allowance to avoid unnecessary testing of OPERABLE diesel generators. If it can be determined that the cause of the inoperable diesel generator does not exist on the OPERABLE diesel generator, then Surveillance Requirement 4.9.A.2.a.1, does not have to be performed. If the cause of inoperability exists on the other diesel generator, they are both declared inoperable and LCO 3.5.F.2 is entered. Once the failure is repaired, a common cause failure no longer exists, the required action of 3.5.F.2 is satisfied. If the cause of the initial inoperable diesel generator cannot be confirmed not to exist on the OPERABLE diesel generator, performance of Surveillance Requirement 4.9.A.2.a.1 suffices to provide assurance of continued OPERABILITY of that diesel generator.

The completion time of 24 hours for common cause is intended to allow the operator time to evaluate any common cause failures.

The LCO completion times of 7 days for one inoperable diesel generator, 72 hours for demonstrating the redundant diesel generator, and 2 hours for two inoperable diesel generators, begins on the discovery (declaration) that an inoperable diesel generator(s) exists. This information is provided to ensure that consistency among operators is utilized concerning the entrance and completion of Surveillance Requirement 4.5.F.1.

Demonstration of the diesel generator to be OPERABLE can be achieved by the performance of Surveillance Requirement 4.9.A.2.a.1 or 4.9.A.2.a.2.

The licensee proposed the subject change in order to clarify the requirements of SR 4.5.F.1. Given that the subject TS change is administrative in nature reflecting the proposed changes in SR 4.5.F.1, the staff finds that the change is acceptable.

2.7.3 Bases 3.9: Pages 199 and 200

The licensee proposes to revise 3.9 Bases section as follows:

- a. In Paragraph 6, Page 199, change "breakers" to "line breaks."

- b. In Paragraph 7, Page 199, change the referenced Specification 3.9.B.1.b.4 to 3.9.B.2.d.
- c. In Paragraph 1, Page 200, change the referenced Specification 3.9.B.1.b.5 to 3.9.B.2.e.

As stated above the subject change corrects previous editorial or grammatical errors in the BASES Section. Therefore, the proposed change is acceptable.

2.7.4 Bases 4.9: Page 200

The licensee proposes to add the following text:

Surveillance Requirements 4.9.A.2.a.1 and 4.9.A.2.a.2 help to ensure the availability of the standby electrical power supply to mitigate Design Basis Accidents and transients and maintain the unit in a safe shutdown condition. Testing is conducted up to equilibrium operating conditions to demonstrate proper operation at these conditions. The diesel generator will be manually started, synchronized and connected to the bus and load picked up. The diesel generator should be loaded to at least 50% of rated load to prevent fouling of the engine. It is expected that the diesel generator will be run for at least two hours.

To minimize the wear on moving parts that do not get lubricated when the engine is not running, Surveillance Requirements 4.9.A.2.a.1 and 4.9.A.2.a.2 allows for a engine prelube period. In addition, 4.9.A.2.a.1 allows a warmup period prior to loading as an additional measure to minimize wear.

For the purposes of this testing, the DGs are started from standby conditions. Standby conditions for a DG mean that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations.

In order to reduce the stress and wear on the diesel engines, the manufacturer recommends a modified start in which the starting speed of DGs is limited, warmup is limited to this lower speed, and the DGs are gradually accelerated to synchronous speed prior to loading. This is the intent of 4.9.A.2.a.1.

The licensee proposed the additional text in order to clarify the new Surveillance Requirements 4.9.A.2.a.1 and 4.9.A.2.a.2. Given that the subject TS change is administrative in nature, the staff finds that the change is acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Nebraska State official was notified of the proposed issuance of the amendment. The State official had no comment.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (60 FR 49939). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Section 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 amendment.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: R. Jenkins

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