50-298

Nebraska Public Power District

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NLS8400021

October 1, 1984

Mr. Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

Subject: Response to "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability" (Generic Letter 84-15)

Dear Mr. Eisenhut:

In accordance with 10CFR50.54(f), the Nebraska Public Power District submits the attached response to Generic Letter 84-15.

Should you have any questions or comments regarding this response, please contact me.

Sincerely,

L. G. Kuncl

L. G. Kuncl
Assistant General Manager - Nuclear
Nebraska Public Power District

LGK:JRF:sn1/9
Attachment

A056
1/1

STATE OF NEBRASKA)
) ss
PLATTE COUNTY)

L. G. Kuncl, being first duly sworn, deposes and says that he is an authorized representative of the Nebraska Public Power District, a public corporation and political subdivision of the State of Nebraska; that he is duly authorized to submit this information on behalf of Nebraska Public Power District; and that the statements contained herein are true to the best of his knowledge and belief.

L. G. Kuncl

L. G. Kuncl

Subscribed in my presence and sworn to before me this 1st day of October, 1984.

Colleen M. Kuta

NOTARY PUBLIC

COLLEEN M. KUTA
GENERAL
NOTARY
COMMISSION
EXPIRES
AUG. 4, 1985
STATE OF NEBRASKA

1. REDUCTION IN NUMBER OF COLD FAST START SURVEILLANCE TESTS FOR DIESEL GENERATORS

Licensees are requested to describe their current programs to avoid cold fast start surveillance tests or their intended actions to reduce cold fast start surveillance tests from ambient conditions for diesel generators.

RESPONSE

The two diesel generators at Cooper Nuclear Station (CNS) were installed with several support systems recommended by the manufacturer. These included cooling water and lube oil bypass pumps and heaters to continuously maintain fluid temperatures near normal operating conditions. Also included was a prelubrication pump designed to operate five minutes every hour when the diesel generator is in standby. These support systems are always available for service so demonstrations of cold fast start testing from ambient conditions are never actually performed at CNS.

Various suggestions for operational improvement have also been incorporated into station procedures. Prior to, and after normal surveillance testing, the prelubrication pump is briefly operated to ensure the engine components are well lubricated. The surveillance procedure also specifies recommendations for loading and unloading the diesel generator to ensure proper warmup and cooldown. As described above, CNS has taken advantage of a majority of manufacturer recommendations in an effort to reduce unnecessary engine stress and wear.

In response to additional testing presently being performed at some earlier licensed operating facilities, CNS currently requires the diesel generators to be tested and proven operable whenever an emergency core or containment cooling subsystem or a standby gas treatment system is made or found to be inoperable. This has added significantly to the number of fast start tests that have been performed on the station diesel generators over the past several years. In order to reduce this number, and as recommended in Enclosure 1 of your letter, Nebraska Public Power District will submit proposed Technical Specification changes by approximately December, 1984, to delete testing the diesel generators when an emergency core or containment cooling subsystem or standby gas treatment system is inoperable.

In reference to the Attachment to Enclosure 1 describing acceptable Typical Technical Specifications, the applicable CNS Technical Specifications have been reviewed and determined to be generally equivalent. At present, CNS does not normally perform a test which verifies the ability to transfer unit power from the normal supply to the alternate supply regarding the off site transmission network and the on site Class 1E distribution system. Consideration will be given to implementing this test into our annual (vice 18 month) surveillance testing procedures.

2. DIESEL GENERATOR RELIABILITY DATA

Licensees are requested to report the reliability of each diesel generator at their plant for its last 20 and 100 demands. This should include the number of failures in the last 20 and 100 valid demands indicating the time history for these failures. Licensees are requested to indicate whether they maintain a record itemizing the demands and failures for each diesel generator unit and whether a yearly data report is maintained for each diesel generator's reliability in the manner outlined in Regulatory Guide 1.108 position C.3.a. Criteria for determining diesel generator reliability are as follows:

a. Valid demands and failures are to be determined in accordance with the recommendations of Regulatory Guide 1.108 position C.2.e.

b. The reliability of each diesel generator will be calculated based on the number of failures in the last 100 valid demands.

RESPONSE

Reliability of the Cooper Nuclear Station (CNS) diesel generators is reported in the attached Table 1 as well as the requested information on demands, failures, and time history. All determinations of valid demands and failures in Table 1 were based on recommendations of Regulatory Guide 1.108 position C.2.e. The CNS diesel generators, when evaluated in this manner and compared to the reliability information of the subject letter Enclosure 3, would indicate a need for increased surveillance testing.

However, as indicated in the response to Item 1, CNS Technical Specifications currently require the diesel generators to be tested and proven operable when core or containment cooling or standby gas treatment systems are made or found to be inoperable. For other than monthly tests, such as these, the station surveillance procedure only requires operability to be proven with a thirty minute run at fifty percent of rated load. These tests do not meet the criteria of Regulatory Guide 1.108 position C.2.e. They do contribute significantly (nearly double) to the number of additional tests performed on the CNS diesel generators and are reported in Table 2 for comparison. The reliability figures illustrated are more realistic than the Table 1 data in spite of the abbreviated test duration and are more in-line with the reliability levels presently being attained throughout the industry. Changes will be made to existing diesel generator surveillance test procedures which will require all operability runs to be a minimum of one hour to at least fifty percent of rated load in accordance with the criteria of Regulatory Guide 1.108.

CNS does not currently maintain an itemized record of demands and failures experienced by each diesel generator nor is a formal yearly data report compiled which could be continuously updated. However, a study was conducted by Nebraska Public Power District which evaluated the performance and availability of the station diesel generators and recommended economical, feasible solutions to correct any problems. In addition, the study included a survey of other nuclear station diesel generator experience and a comparison to the CNS diesels. Several improvements have been made, or are in the process of being made, to the station units. It is acknowledged that establishing an effective trend program would be very beneficial; therefore, a trend program will be established.

TABLE 1

Demands and Failures Based on Regulatory Guide 1.108 C.2.e Criteria
(> 50% Continuous Rating for > 1 Hour)

	Starts	Failures	Reliability* (1-P)	Time History	Starts	Failures	Reliability* (1-P)	Time History Short	Time History Long	Time History Average
DG-1	20	1	.95	6.1 hr.	100	9	.91	1 hr.	17.8 hr.	6.6 hr.
DG-2	20	1	.95	59.5 hr.	100	6	.94	1.7 hr.	381.2 hr.	69.4 hr.**

TABLE 2

Demands and Failures Based on All CNS Diesel Runs
(> 50% Continuous Rating for > ½ Hour)

	Starts	Failures	Reliability* (1-P)	Time History	Starts	Failures	Reliability* (1-P)	Time History Short	Time History Long	Time History Average
DG-1	20	1	.95	6.1 hr.	100	5	.95	2.2 hr.	17.8 hr.	9 hr.
DG-2	20	0	1.		100	4	.96	1.7 hr.	11.5 hr.	7.9 hr.

* Where "P" is defined as the probability of failure per demand per diesel.
** Only 7 hours without the 381.2 hours (16 days) failure.

3. DIESEL GENERATOR RELIABILITY

Licensees are requested to describe their diesel generator reliability improvement program, if any, for attaining and maintaining a reliability goal. Licensees are requested to comment on, and compare their existing program or any proposed program with the enclosed example performance specification.

RESPONSE

Cooper Nuclear Station (CNS) does not currently have a structured, goal oriented reliability improvement program similar to the the example Performance Technical Specification provided in your Enclosure 3 attachment. The method utilized at CNS for maintaining and upgrading the diesel generator reliability is by assignment of two engineers, one electrical and one mechanical, to review all recorded performance data, perform periodic inspections both operating and shutdown, review current industry practices, and make design improvements and procedure changes as needed to enhance system performance.

Recommendations for improvement have been obtained from several industry sources. NUREG/CR-0660 made several recommendations which have been or, are still being, implemented into the diesel generator system. A copy of the preventative maintenance program being performed on new diesel generators has been obtained from the manufacturer to use in a comparison to the current station program and ensure all the latest philosophies and practices are being used.

Nebraska Public Power District requested a study to evaluate the performance and availability of the station diesel generators and to survey the performance of diesel units at other nuclear stations. The study indicated that the CNS units have shown continuous improvement in availability since they were originally installed. Several suggestions from this study have been, or are being, incorporated in an effort to increase the reliability even further.

Additionally, awareness of current problems and industry practices is maintained through INPO Operation and Maintenance Reminders and Information Exchanges. These, as well as NRC Information Notices, are evaluated for applicability and further action. The INPO Nuclear Plant Reliability Data System has been extremely useful in tracking failure information on the diesel generators.

The example Performance Technical Specification provided for review has merit. Although stringent reliability criteria are being proposed, they do appear to be attainable. Regarding the diesel generator inoperability limits, it is agreed that an increase in the current Technical Specification limit would be necessary and will be pursued along with the Technical Specification change discussed in Response No. 1. The overall actions being proposed to improve and maintain diesel generator reliability as outlined in the subject letter are considered to be generally acceptable, however, some flexibility would be needed in establishing site specific programs.

CNS does not presently perform any 18 month surveillance testing to verify the proper operation of the diesel generator during load shedding of either the largest single emergency load or of a continuous rating load. During any actual operating condition requiring the diesel generators, single loads are started and secured contingent on plant needs, including the largest single load. Any additional testing specifically designed for that same purpose is considered to be excessive and to contribute to increased degradation of the diesel generators which appears to be contrary to the recommendations being proposed. Full load reject of the diesel generators is considered to be even more unnecessary and impractical by station engineering personnel. The benefit gained from this test is minimal compared to the additional stress and wear the diesel generators would be subjected to.