REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8410040475 DOC.DATE: 84/09/28 NOTARIZED: NO DOCKET #
FACIL:50-315 Donald C. Cook Nuclear Power Plant, Unit 1, Indiana & 05000315
50-316 Donald C. Cook Nuclear Power Plant, Unit 2, Indiana & 05000316
AUTH.NAME AUTHOR AFFILIATION
ALEXICH,M.P. Indiana & Michigan Electric Co.
RECIP.NAME RECIPIENT AFFILIATION
DENTON,H.R. Office of Nuclear Reactor Regulation, Director

SUBJECT: Responds to Generic Ltr 84-15, "Proposed Staff Actions to Improve & Maintain Diesel Generator Reliability." Attempts made in planning & scheduling to reduce requred starts on opposite diesel generator.

DISTRIBUTION CODE: A056D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 10
TITLE: OR Submittal:Fast Cold Starts of Diesel Generators GL-83-41

NOTES: 05000315
OL:10/25/74
05000316
OL:12/23/72

	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL
	NRR ORB1 BC	01	3	3				
INTERNAL:	ADM/LFMB		1	0	AEOD	07	1	1
	IE/DEPER/EAB	08	1	1	NRR/DL/ORAB	09	1	1
	~~NRR/DSI/PSB~~	10	1	1	NRR/DST/SPEB	11	1	1
	~~REG FILE~~	04	1	1	RES/DRA/RRB	12	1	1
	RGN3	06	1	1				
EXTERNAL:	ACRS	13	6	6	LPDR	03	2	2
	NRC PDR	02	1	1	NSIC	05	1	1
	NTIS		1	1				

TOTAL NUMBER OF COPIES REQUIRED: LTTR 23 ENCL 22

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

INDIANA & MICHIGAN ELECTRIC COMPANY

P.O. BOX 16631
COLUMBUS, OHIO 43216

September 28, 1984

AEP:NRC:0896

Donald C. Cook Nuclear Plant Unit Nos. 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
GENERIC LETTER 84-15, PROPOSED STAFF ACTIONS TO IMPROVE
AND MAINTAIN DIESEL GENERATOR RELIABILITY

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

This letter is in response to your staff's Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability" dated July 2, 1984. Your staff requested specific information in the following three areas: 1) Reduction in number of fast start surveillance tests for diesel generators, 2) Diesel generator reliability data, and 3) diesel generator reliability.

Item #1 Reduction in the Number of Cold Fast Start Surveillance Test for Diesel Generators

We are attempting, through prudent planning and scheduling, to reduce the required starts on the opposite diesel generator when a diesel generator is removed from service for any reason. This program attempts to 1) ensure that all needed preventative maintenance and other maintenance items are completed when a diesel generator is out of service for any reason, and 2) minimize the time that any diesel generator is out of service so that the operable diesel will not be required to be started needlessly. In addition, we are planning to pursue a modification of commitments made to the NRC which currently require us to always start the opposite diesel when removing a diesel generator from service, (even though it is not required by Technical Specifications (T/S) in some modes).

With regard to cold fast start surveillance testing, it should be noted that we do not start our diesels in the cold condition. Although we do not start the plant's diesels in this manner, we would like to go on the record concurring in your staff's determination that cold fast starts do result in premature diesel degradation.

We have reviewed the Standard T/S attached to the Generic Letter 84-15 and have included an example T/S for D. C. Cook. After further development, we will submit a proposed T/S change which we believe will accomplish the intent of the Standard Technical Specifications goal of reducing fast starts.

8410040475 840928
PDR ADOCK 05000315
P PDR

A056
1/1

Item #2 Diesel Generator Reliability Data

The following table provides the D. C. Cook diesel generator reliability data.

Unit 1 AB (March 27, 1980 to August 20, 1984)

Five (5) Failures in the last 100 valid tests.

12/26/83	Overspeed Trip
12/26/83	Overspeed Trip

Three (3) Failures on the last 20 valid tests.

1/15/84	Overspeed Trip
1/15/84	Overspeed Trip
12/26/83	Overspeed Trip

Unit 1 CD (May 16, 1979 to August 20, 1984)

No Failures in the last 100 valid tests.

Unit 2 AB (March 2, 1981 to August 20, 1984)

Four (4) Failures in the last 100 valid tests.

11/16/83	Incomplete Start
04/16/84	Overspeed Trip
04/30/84	Overspeed Trip
05/16/84	Overspeed Trip

No Failures in the last 20 valid tests.

Unit 2 CD (July 17, 1981 to August 20, 1984)

No Failures in the last 100 valid tests.

We have kept records since June, 1982, which itemize the demands and failures experienced by each diesel generator. These records are kept in a manner similar to that outlined in Regulatory Guide 1.108 though we do not keep all the records, logs and data outlined in that Regulatory Guide. The data on demands and failures provided above for the period before June, 1982, was compiled from surveillance test records and LER's. It does not include data for starts occurring for any other reasons; also, this data is subject to filing errors though, we believe it to be reasonably correct.

Item #3 Diesel Generator Reliability

We have again reviewed the findings of NUREG/CR-0660 and evaluated the diesel generator operating conditions at D. C. Cook. We believe we meet or exceed the recommended corrective actions where applicable. Some recommendations such as wetting down the ground near the diesel air-intakes are not applicable because the D. C. Cook diesel air-intakes are well above ground level, and in an environment which has not introduced dirt or dust into the diesel generators. Additionally, an oil bath air cleaner is provided for the air-intake.

We have also reviewed the example T/S provided in the Generic Letter. We first performed a comparative evaluation of the example T/S with our current T/S. Then, using your example T/S as a guide , we wrote an example T/S for the D. C. Cook diesel generators. There are several differences between the two examples. However, the differences are plant specific and for the most part are necessary to match the actual performance requirements of the D. C. Cook diesel generators to perform their required safety function.

Attachment 1 to this letter is the example of the D. C. Cook performance T/S that we plan to refine and formally submit as a proposed T/S change in the near future (January, 1985). We believe that, while continuing an optimal surveillance and operability test program, this example T/S will eventually result in more reliable diesel generators at the D. C. Cook Units 1 and 2 .

Very truly yours,

M. P. Alexich 9/20/84
Vice President

dew

Attachment

cc: John E. Dolan
W. G. Smith, Jr. - Bridgman
R. C. Callen
G. Charnoff
E. R. Swanson, NRC Resident Inspector - Bridgman

STATE OF OHIO

COUNTY OF FRANKLIN

M. P. Alexich, being duly sworn, deposes and says that he is the Vice President of Licensee, Indiana & Michigan Electric Company, that he has read the foregoing response to the NRC Generic Letter No. 84-15, "Proposed Staff Actions To Improve And Maintain Diesel Generator Reliability", dated July 2, 1984 and knows the contents thereof; and that said contents are true to the best of his knowledge and belief.

Milton P. Alexich

Subscribed and sworn to before me the 28th day of September, 1984.

(Notary Public)

Commission expires 3-9-86
Franklin County
on the 28th Day of
September 1984

ATTACHMENT 1

to

AEP:NRC:0896

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be operable:

a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and

b. Two separate and independent diesel generators, each with:

1. Separate day fuel tanks containing a minimum volume of 70 gallons of fuel,

2. A separate fuel storage system containing a minimum volume of 42,000 gallons of fuel, and

3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With an offsite circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. offsite source by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours; restore at least two offsite circuits and two diesel generators to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With a diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours; restore diesel generators to OPERABLE status within 168 hours and an accumulated annual outage time of 576 hours exclusive of Modes 5 and 6 or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. At the number of failures for the inoperable diesel indicated in Table 4.8-2 perform the Additional Reliability Actions prescribed in Table 4.8-2 and its attachments.

Sample T/S Currently Undergoing Review For Formal Submittal. This Document Is Not To Be Interpreted As An Application For T/S Changes By American Electric Power or Indiana & Michigan Electric Company.

c. With one offsite circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. offsite source by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter and Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours; restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. With the diesel generator restored to OPERABLE status, follow Action Statement a. With the offsite circuit restored to OPERABLE status, follow action Statement b.

d. With two of the above required offsite A.C. circuits inoperable, demonstrate the OPERABILITY of two diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours unless the diesel generators are already operating; restore at least one of the inoperable offsite sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. With only one offsite source restored, follow Action Statement a.

e. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; restore at least one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the 30 hours. With one diesel generator unit restored, follow Action Statement b and d.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be:

a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments, indicated power availability, and

b. Demonstrated OPERABLE at least once per 18 months by transferring the unit power source automatically from the normal auxiliary source to the preferred reserve source and by transferring manually to the alternate reserve source.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

a. In accordance with the frequency specified in Table 4.8-1 on a STAGGERED TEST BASIS by:

1. Verifying the fuel level in the day fuel tank,

2. Verifying the fuel level in the fuel storage tank,

3. Verifying the fuel transfer pump can be started and transfers fuel from the storage system to the day tank,

Sample T/S Currently Undergoing Review For Formal Submittal. This Document Is Not To Be Interpreted As An Application For T/S Changes By American Electric Power or Indiana & Michigan Electric Company.

4. Verifying the diesel starts from ambient condition and accelerates to at least 514 rpm in <= 10 seconds.*

5. Verifying the generator is loaded to >= 1750 kw, and operates for >= 60 minutes and verifying that the generator output breaker to the emergency bus is operable.

6. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.

b. At least once per 31 days and after each operation of the diesel where the period of operation was greater than or equal to 1 hour by checking for and removing accumulated water from the day fuel tanks to below the fuel tank suction level.

c. At least once per 92 days and from new fuel oil prior to addition to the storage tanks by verifying that a sample obtained in accordance with ASTM-D270-1975 has a water and sediment content of less than or equal to .05 volume percent and a kinematic viscosity at 40°C of greater than or equal to 1.9 but less than or equal to 4.1 when tested in accordance with ASTM-D975-77.

d. At least once per 18 months, during shutdown, by:

1. Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service.

2. Verifying the generator capability to reject a load of greater than or equal to 600 kw while maintaining voltage at 4160 $\pm$ 420 volts and frequency at 60 $\pm$ 1.2 Hz.

3. Verifying the generator capability to reject a load of 3500 kw without exceeding 75% of the difference between nominal speed and the overspeed trip setpoint.

4. Simulating a loss of offsite power by itself, and

a) Verifying de-energization of the emergency busses and load shedding from the emergency busses.

b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 10 seconds, energizes the auto-connected shutdown loads through the load sequencer and operates

---

*The diesel generator start (10 seconds) from ambient conditions shall be performed at least once per 184 days in these surveillance tests. All other engine starts for the purpose of this surveillance testing may be at reduced acceleration rates as recommended by the manufacturer so that mechanical stress and wear on the diesel engine is minimized.

Sample T/S Currently Undergoing Review For Formal Submittal. This Document Is Not To Be Interpreted As An Application For T/S Changes By American Electric Power or Indiana & Michigan Electric Company.

for greater than or equal to 5 minutes while its generator is loaded with the shudown loads. After load sequencing is complete, the steady state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during the test.

5. Verifying that on an ESF actuation test signal (without loss of offsite power) the diesel generator starts on the auto-start signal and operates on standby for ≥ 5 minutes.

6. Simulating a loss of offsite power in conjunction with a Safety Injection actuation test signal, and

   a) Verifying de-energization of the emergency busses and load shedding from the emergency busses.

   b) Verifying the diesel starts on the auto-start signal, energeizes the emergency busses with permanently connected loads within 10 seconds, energizes the auto-connected emergency (accident) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After load sequencing is completed, the steady state voltage and frequency of the emergency busses shall be 4160 ± 420 volts and 60 ± 1.2 Hz after steady state has been reached. The voltage and frequency shall be maintained within these limits for the remainder of this test.

   c) Verifying that all diesel generator trips, except engine overspeed and generator differential, are automatically bypassed upon loss of voltage on the emergency bus and/or safety injection actuation signal.

7. Verifying the diesel generator operates for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded to 3650 kw and during the remaining 22 hours of this test, the diesel generator shall be loaded to 3500 kw. Within 5 minutes after completing this 24-hour test, perform Surveillance Requirement 4.8.1.1.2.d.4.

8. Verifying that the auto-connected loads to each diesel generator do not exceed the 2000-hour rating of 3650 kw.

9. Verifying the diesel generator's capability to:

   a) Synchronize with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power,

   b) Transfer its loads to the offsite power source, and

   c) Be restored to its standby status.

Sample T/S Currently Undergoing Review For Formal Submittal. This Document Is Not To Be Interpreted As An Application For T/S Changes By American Electric Power or Indiana & Michigan Electric Company.

10. Verifying that with the diesel generator operating in a test mode, connected to its bus, a simulated safety injection signal overrides the test mode by (1) returning the diesel generator to standby operation and (2) automatically energizing the emergency loads with offsite power.

Sample T/S Currently Undergoing Review For Formal Submittal. This Document Is Not To Be Interpreted As An Application For T/S Changes By American Electric Power or Indiana & Michigan Electric Company.