

John D. O'Toole
Vice President

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October 30, 1984

RE: Indian Point Unit No. 2
Docket No. 50-247

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

Dear Mr. Eisenhut:

This is in response to your July 2, 1984 Generic Letter 84-15 entitled "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability" which requested information relative to the following three areas:

1. Reduction in Number of Cold Fast Start Surveillance Tests for Diesel Generators;
2. Diesel Generator Reliability Data; and
3. Diesel Generator Reliability Program.

Attachment A to this letter provides the requested information appearing in the three enclosures to the generic letter.

This information is being submitted pursuant to 10 CFR 50.54(f) as requested in your letter of July 2, 1984.

Should you or your staff have any questions, please contact us.

Very truly yours,

Richard P. Remshaw
for
John D. O'Toole

attach:

Subscribed and sworn to
before me this 30 day of
October, 1984.

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PDR ADOCK 05000247
PDR

(OK)
Notary Public
THOMAS LOVE
Notary Public, State of New York
No. 31-2409698
Qualified in New York County
Commission Expires March 30, 1985

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ATTACHMENT A

RESPONSE TO NRC
JULY 2, 1984 REQUEST
FOR INFORMATION (GENERIC LETTER 84-15)
REGARDING ACTIONS TO IMPROVE
AND MAINTAIN DIESELS GENERATOR RELIABILITY

ITEM 1. Reduction in Number of Cold Fast Start Surveillance Tests for Diesel Generators

This item is directed towards reducing the number of cold fast start surveillance tests for diesel generators which the staff has determined results in premature diesel engine degradation. The details relating to this subject are provided in Enclosure 1 to Generic Letter 84-15. Licensees are requested to describe their current programs to avoid cold fast start surveillance testing or their intended actions to reduce cold fast start surveillance testing for diesel generators.

RESPONSE:

Enclosure 1 of the July 2, 1984 letter discusses several steps to be taken to reduce cold fast starts on diesel generators to improve availability and reliability. Licensees have been asked to describe their proposed actions to reduce cold fast starts, and to submit changes to the Technical Specifications to accomplish a reduction of such starts.

The typical Technical Specification suggested by the NRC calls for verification of diesel start from ambient conditions and acceleration up to rated speed within 10 seconds once every 184 days. All other starts may be preceded by a prelube period and/or other warmup procedures recommended by the manufacturer.

These problems have been identified in a review of industry experience conducted several years ago and discussed in detail in NUREG/CR-0660. The specific problems which the recommendations of this letter address appear to be most applicable to the opposed piston Fairbanks Morris engines and the two-cycle Electro-Motive engines.

The ALCO engines in use at Indian Point already incorporate constant prelubrication and engine heaters, and therefore the specific recommendations and "suggested" Technical Specifications changes do not appear to be necessary or applicable.

The specifics of Generic Letter 84-15 as contained in Enclosure 1 and their applicability to the Indian Point diesel generators are listed below:

Generic Letter 84-15
(Enclosure 1) Ref.

Paragraph Sentence

1

2

Staff Concern/Comment

Response

"Many licensees use a method of testing which does not take into consideration those manufacturer recommended preparatory actions such as prelubrication of all moving parts and warmup procedures which are necessary to reduce engine wear..."

The testing methods used at Indian Point 2 do comply with the manufacturer's recommendations. The ALCO diesel is equipped with jacket water and lube oil heating to permit immediate application of load. Pre-Lube pumps operate continuously until the engine starts to maintain lubrication to required parts. As Stated in the ALCO manual, Bulletin MI-1713BA, the engines may be loaded as required, immediately upon starting.

2

1

"It is the staff's technical judgement that an overall improvement in diesel engine and availability can be gained by performing diesel generator starts for surveillance testing using engine pre-lube and other manufacturer recommended procedures to reduce engine stress and wear."

The ALCO diesels already incorporate automatic prelubrication and manufacturer's recommendations to reduce stress and wear.

Generic Letter 84-15

(Enclosure 1) Ref.

<u>Paragraph</u>	<u>Sentence</u>	<u>Staff Concern/Comment</u>	<u>Response</u>
3	1	"In view of the above the staff has concluded that the frequency of fast start tests from ambient conditions of diesel generators should be reduced."	The ALCO engines already incorporate provisions to allow startup and tests as currently performed without risk of undue wear and stress on the engine.
3	3	"Licensees are requested to described their current programs to avoid cold fast starts or their intended action to do so".	Since the ALCO engine incorporates pre-heating prelubrication, these concerns are not applicable and no test changes are anticipated.
3	Last	Licensees are encouraged to submit changes to their Technical Specification to accomplish a reduction in the number of such fast starts	No Technical Specification changes are required for the reasons stated above.
4	4	It is the staff's position that the Technical Specification requirements for testing diesel generators while emergency core cooling equipment is inoperable be deleted.	The Indian Point 2 Technical Specification does not have this requirement ,thus it is already in compliance

ITEM 2. Diesel Generator Reliability Data

This item requests licensees to furnish the current reliability of each diesel generator at their plant(s), based on surveillance test data. The reliability of diesel generators has been identified as one of the main factors affecting the risk of core damage from station blackout. Thus, attainment and continued maintenance of high reliability for diesel generators is necessary to the resolution of USI A-44. To assist the staff in assessing the current reliability of diesel generators at operating plants, 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 which itemizes the demands and failures experienced by each diesel generator unit, in the manner outlined in Regulator Guide 1.108 position C.3.a, for each diesel generator unit. Licensees should also indicate whether a yearly data report is maintained for each diesel generator's reliability. The criteria for determining the reliability of diesel generators is 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:

At Indian Point Unit No. 2, diesel generator reliability and starting data is maintained in accordance with Regulatory Guide 1.108. Indian Point committed to Regulatory Guide 1.108 as a result of confirmatory action orders. Each start is evaluated as successful or unsuccessful and each run is evaluated as either a valid test run or invalid per the definition in Regulatory Guide 1.108.

A detailed record of each reported start is maintained and this record is used to determine the number of failures in the last 100 starts and valid tests as required by the Regulatory Guide.

Since our commitment to Regulatory Guide 1.108 the records indicate the following for successful test starts:

<u>Year</u>	<u>21 Diesel</u>	<u>22 Diesel</u>	<u>23 Diesel</u>
	<u>Tests & Starts</u>	<u>Tests & Starts</u>	<u>Test & Starts</u>
1980 (starting 3/13/80)	62	30	35
1981 (see Note 1)	62	63	63
1982	57	52	57
1983	68	72	76
1984	<u>52</u>	<u>53</u>	<u>49</u>
	301	270	280

Note 1: One unsuccessful start occurred on 21 Diesel Generator on July 10, 1981.

Note 2: This tabulation represents valid demands which include the total number of starts and tests.

As indicated by the above data, the reliability of each diesel generator for the last 20 and 100 demands is 1.0

ITEM 3. Diesel Generator Reliability

In the staff's ongoing program to resolve USI A-44, Station Blackout, diesel generator reliability is one of the factors used to determine the length of time a plant should be able to cope with a station blackout. If all other factors are constant, the higher reliability of the diesel generator will result in the lower probability of a total loss of AC power. Maintaining diesel generators at or above specific reliability levels is assumed in the development of the resolution of USI A-44. The reliable operation of diesel generators should be assured by a reliability program designed to monitor, improve (if necessary), and maintain reliability at a specified level.

In view of the above, licensees are requested to describe their diesel generator reliability improvement program, if any, for attaining and maintaining a reliability goal. The program description should address the surveillance and testing the licensee performs to demonstrate the selected diesel generator reliability. All licensees have received the staff's previous letter transmitting the findings of NUREG/CR-0660, "Enhancement of Onsite Emergency Diesel Generator Reliability, February 1979" identifying areas where diesel generator operational problems were occurring in general. Licensees should consider the recommendations of NUREG/CR-0660 in their reliability program. The staff has developed an example for a diesel generator reliability at a specified level. The proposed performance specification encompasses certain aspects of the existing requirements for surveillance testing of diesel generators stipulated in Regulatory Guide 1.108 and the qualitative recommendations of NUREG/CR-0660. This performance specification is presented, as an example, in the attachment to Enclosure 3 of Generic Letter 84-15. Licensees are requested to comment on and/or compare their program with the performance specification and provide comments for staff consideration in finalizing surveillance testing requirements for diesel generators.

RESPONSE:

Enclosure 3 of the July 2, 1984 letter requests that each licensee describe their diesel generator reliability improvement program (if any), for attaining and maintaining a reliability goal and to comment on and/or compare the program with the sample performance specifications supplied.

The example performance specification which was provided along with the letter contains specified reliability goals and required remedial actions to be taken if reliability falls below the stated goals. In addition, as part of the proposed performance specification, each licensee has also been asked to specify yearly limits for total commulative time that a diesel may be inoperative.

A generator testing and reliability program is not addressed in detail within the existing plant Technical Specifications. However, this program is addressed in the February 11, 1980 Confirmatory Order which requires Indian Point Unit No. 2 to perform diesel generator testing in accordance with Regulatory Guide 1.108. The existing diesel testing and reliability program is in compliance with Reg. Guide 1.108, Rev.1 which does establish demonstrated reliability goals and corrective actions required if testing produces results which fall short of these goals. The existing Indian Point diesel generator reliability program appropriately includes preventative maintenance, performance of surveillance tests, incorporation of vendor recommendations, adhering to the Technical Specification operability requirements and appropriate record keeping to assure that the reliability and performance of the diesel generators are maintained. The provisions of the existing program are as follows:

- Daily - visual inspection of each diesel generator, verification of proper lube oil and fuel oil levels, air pressure, cooling water, and overspeed trip mechanism status.
- Weekly - Check for water accumulation in tanks, oil and water leaks, air compressor operation, and fuel oil storage tank levels.
- Monthly - Engines started and loaded on the bus. Run at rated load for at least one hour until stable engine condition is achieved.
- Quarterly - Test of overspeed trip and decontrol power automatic transfer switches.
- Annually - Major engine inspection and general overhaul performed in accordance with manufacturer's instructions.
- Each Refueling - Demonstration of engine operation to automatically start and load vital equipment by simultaneously simulating a loss of AC and a safety injection signal. Load tested for at least twenty-four hours, of which two hours are at the maximum two hour rating.
- Operating - Limits - If a diesel generator is unavailable, power operation may continue up to seven days provided designated off site power is available and the remaining two diesels are tested daily. Any two diesels operating at their continuous rating are sufficient to power the minimum safeguards loads.

The sample reliability improvement program provided in the NRC letter, together with our compliance status, is listed below.

<u>Sample Reliability Program</u>	<u>Compliance Status</u>
<p>1. <u>Reliability Goals</u> Establish a surveillance test program to maintain minimum reliability level (0.95)</p>	<p>Surveillance test program in accordance with Regulatory Guide 1.108 is established. Reliability demonstration is required.</p>
<p>2. <u>Remedial Actions</u> If reliability \geq 0.95, surveillance testing on a monthly basis. Increase surveillance testing if failures in the last 20 tests were 2.</p> <p>If reliability \geq 0.90 but less than 0.95, increase surveillance testing frequency</p> <p>If reliability $<$ 0.90, qualify diesel generators and requalify</p>	<p>Regulatory Guide 1.108 requires increased surveillance testing if the failures in the last 100 tests is 2 or more.</p> <p>If 7 failures in last 100 tests, special test summary report required to be submitted, describing corrective measures, reliability assessment, etc.</p> <p>Not addressed in existing program.</p>
<p>3. <u>Remedial Action Criteria</u> If reliability $<$ 0.95, submit report within 14 days describing reliability improvement program, including NUREG 0660 recommendations, reliability assessment, etc.</p>	<p>If 7 failures in last 100 tests similar report required per Regulatory Guide 1.108</p>
<p>4. <u>Requalification Criteria</u> To requalify diesel generator perform 7 successful tests within 30 days and 14 within 75 days of restoration to operable status.</p>	<p>Testing in accordance with failure rate as described in Item 2 above</p>

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| <p>5. <u>Failure to requalify</u>
If diesel does not re-qualify per above, declare inoperable and Tech. Spec. action statement is followed.</p> | <p>Not specifically addressed other than continued testing and reporting required as described above</p> |
| <p>6. <u>Inoperability Limits</u>

Annual limit for total cumulative time the plant may be operated with a diesel generator inoperative to be determined by plant for inclusion in Technical Specification</p> | <p>No annual limit currently in Technical Specification.</p> |
| <p>7. <u>Valid Demands and Failures</u>
Determine in accordance with Regulatory Guide 1.108, position C.2.e</p> | <p>Determined in accordance with the Regulatory Guide 1.108, Position C.2.e.</p> |
| <p>8. <u>Reliability Records</u>
Records to be maintained in accordance with Regulatory Guide 1.108</p> | <p>Program and records are in accordance with the Regulatory Guide.</p> |

The technical specification changes suggested by NRC would establish only two additional provisions above those that exist at Indian Point Unit No. 2 and in Reg. Guide 1.108. These provisions are in the area of declaring the diesel generator inoperable if the reliability is < 0.90 and establishing annual cumulative inoperability limits. We believe that cumulative limits should not be prescriptive. Each licensee should evaluate their actual plant/diesel generator experience and determine its impact on the over-all plant risk.