

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8410300232 DOC. DATE: 84/10/22 NOTARIZED: YES DOCKET #
 FACIL: 50-305 Kewaunee Nuclear Power Plant, Wisconsin Public Service 05000305
 AUTH. NAME: HINTZ, D.C. AUTHOR AFFILIATION: Wisconsin Public Service Corp.
 RECIP. NAME: EISENHUT, D.G. RECIPIENT AFFILIATION: Division of Licensing

SUBJECT: Forwards response to Generic Ltr 84-15 re diesel generator reliability, per 840702 Ltr. Description of each diesel generator failure & corrective measures taken to prevent recurrence included.

DISTRIBUTION CODE: A056D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 58
 TITLE: OR Submittal: Fast Cold Starts of Diesel Generators GL-83-41 (GL-84-15)

NOTES: See "84 Reports"
 OL: 12/21/73

05000305

RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR 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/GIB	2 2
NRR/DST/SPEB 11	1 1	<u>REG FILE</u> 04	1 1
RES BARANOWSKI	1 1	RES/DRA/RRB 12	1 1
RGN3 06	1 1		
EXTERNAL: ACRS 13	6 6	LPDR 03	1 1
NRC PDR 02	1 1	NSIC 05	1 1
NTIS	1 1		

WISCONSIN PUBLIC SERVICE CORPORATION



P.O. Box 1200, Green Bay, Wisconsin 54305

October 22, 1984

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

Dear Mr. Eisenhut:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
TAC #55869
Diesel Generator Reliability (Generic Letter 84-15)

Reference: Letter from D. G. Eisenhut, dated July 2, 1984
(Generic Letter 84-15)

This letter provides the information requested in Generic Letter 84-15 concerning the reliability of nuclear plants' emergency diesel generators. The diesel generator data requested in response to item two (Diesel Generator Reliability Data) has August 12, 1984 as a cutoff date. This date is arbitrary but necessary for the collection and evaluation of the data.

We have provided background information and design requirements for the emergency diesel generators used at the Kewaunee Nuclear Power Plant. Our response to generic letter items 1, 2 and 3 is provided in attachments 1, 2, and 3. Attachment 2 contains two appendices; Appendix A contains our interpretation of Regulatory Guide 1.108, (revision 1, August 1977) position c.2.e. Appendix B contains a description of each diesel generator failure and the corrective measures taken to prevent a recurrence.

This submittal was delayed as discussed with our NRC Project Manager. The extension was requested in order to allow my staff to perform a more comprehensive review. In keeping with your request of providing additional copies of

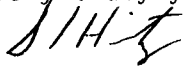
8410300232 841022
PDR ADOCK 05000305
F PDR

A056
11

Mr. D. G. Eisenhower
October 22, 1984
Page 2

responses that contain 20 pages or more, enclosed please find 25 copies of our response to Generic Letter 84-15.

Very truly yours,



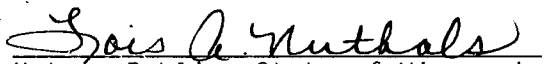
D. C. Hintz
Manager - Nuclear Power

DJM:jks

Enc.

cc - Mr. S. A. Varga, US NRC
Mr. Robert Nelson, US NRC

Subscribed and Sworn to
Before Me This 19th Day
of October 1984


Notary Public, State of Wisconsin

My Commission Expires:
May 8, 1988

50-305

RESPONSE TO GENERIC LTR 84-15 RE DIESEL
GENERATOR RELIABILITY

Docket # 50-305
Control # 8410300232
Date 10/22/84 of Document:
REGULATORY DOCKET FILE

— NOTICE —

THE ATTACHED FILES ARE OFFICIAL RECORDS OF THE
DIVISION OF DOCUMENT CONTROL. THEY HAVE BEEN
CHARGED TO YOU FOR A LIMITED TIME PERIOD AND
MUST BE RETURNED TO THE RECORDS FACILITY
BRANCH 016. PLEASE DO NOT SEND DOCUMENTS
CHARGED OUT THROUGH THE MAIL. REMOVAL OF ANY
PAGE(S) FROM DOCUMENT FOR REPRODUCTION MUST
BE REFERRED TO FILE PERSONNEL.

DEADLINE RETURN DATE

RECORDS FACILITY BRANCH

RESPONSE PACKAGE
FOR
GENERIC LETTER 84-15
DIESEL GENERATOR RELIABILITY

WISCONSIN PUBLIC SERVICE CORPORATION
KEWAUNEE NUCLEAR POWER PLANT

INTRODUCTION

The Emergency Diesel Generator System at the KNPP is the final emergency power source to provide electrical power for the engineered safeguards equipment. Two diesel generators are provided, one connected to 4160-V Bus 1-5 and one connected to 4160-V Bus 1-6. Each diesel generator is a General Motors Corporation, Electro-Motive Division, Model 999-20, diesel engine-generator unit rated at 2600-KW (2850-KW, 110 percent Overload, two-thousand hours per year) 0.8 pf, 900 rpm, 4160-V, 3 phase, 60 Hertz. The generator has an emergency rating of 3050-KW for thirty minutes, or 2950-KW for seven days continuous.

Service water for the diesel engine cooling water heat exchanger is supplied from separate service water headers for Diesel Generator 1A and 1B. The cooling water heat exchanger is an engine mounted water-to-water heat exchanger providing cooling for the engine jacket water and for the engine oil heat exchanger. Vent fans for each room provide a supply of combustion air into the diesel room. Separate startup air receivers and compressors are located just external to the rooms. Primary and reserve tanks of the air receivers supply compressed air to the dual air start system (four air motors per engine).

Two 850-gallon "day" tanks are located in enclosures within each diesel generator room. The two tanks provide capacity for over eight hours' operation for one generator at full load. Two 35,000-gallon underground storage tanks supply fuel oil through immersion pumps to either pair of day tanks. Combined fuel of one storage tank and two day tanks provides up to 170 hours of continuous operation of one diesel generator at full load. Total on-site storage of diesel oil provides over seven days of full load capability on both diesel generators.

For additional information pertaining to emergency power see the Kewaunee Nuclear Power Plant Updated Final Safety Analysis Report Section 8.2.3.

Attachment 1

FAST START TESTING

Your letter of July 2, 1984 (Generic Letter 84-15) required licensees to provide a description of their program to avoid cold fast starts or their intended action to reduce the number of cold fast start surveillance tests from ambient conditions for diesel generators.

The diesel generators at the Kewaunee Nuclear Plant are equipped with a continuous "Keep Warm" lubrication system. This system provides warm lube oil to main engine bearings at all times. This continuous lubrication system was supplied as original equipment and eliminates cold fast starting concerns. Therefore, we feel this item is not applicable.

Attachment 2

DIESEL GENERATOR RELIABILITY

Item 2 of the Generic Letter requests licensees to furnish current reliability data for each diesel generator based on surveillance test data. Enclosure 2 to that letter requests the licensees to report the last 20 and 100 demands for each diesel as defined by Regulatory Guide 1.108, (August 1977) position c.2.e.

In applying the guidance from Regulatory Guide 1.108 for determining valid diesel generator tests and failures, it was noted that the guidance tended to skew the data, resulting in the reliability of the diesel generator unit appearing worse than it really is. Regulatory Guide 1.108 Section c.2.e, items three and four state the following:

- (3) Successful starts, including those initiated by bona fide signals, followed by successful loading (sequential or manual) to at least 50% of continuous rating and continued operation for at least one hour should be considered valid successful tests.
- (4) Successful starts that are terminated intentionally without loading, as defined in (3) above, should not be considered valid tests or failures.

Item three requires that the diesel generator be started and loaded to at least 50% of continuous load for one hour before it can be considered a valid successful test. Item four states that even though the diesel generator is successfully started, if it is not 50% loaded and run for at least one hour, the test cannot be considered a valid test. Guidance items one and five state that attempted starts of the diesel generator unit that result in a failure to start or a failure to load must be considered a valid test and failure.

Therefore, even though the intended start of the diesel generator was to demonstrate operability; should it fail to start, it must be considered an attempted test and subsequent failure. However, if during the operability test the diesel generator unit does start but is not loaded and run for at least one hour, it cannot be considered a valid, successful test. For the KNPP, this guidance severely skews the data since it eliminates the successful short non-loaded diesel generator runs that occur in conjunction with removing the opposite train diesel generator from service. It also eliminates those additional tests that start and load the diesel generator but don't require a one hour long test run. Hence, the KNPP 1A Diesel Generator, in the same time period required to obtain the 100 valid tests (as defined by Regulatory Guide 1.108), had a total of 542 starts. This shows that the failure frequency for 1A Diesel Generator should NOT be 5 out of 100 demands but instead 5 out of 542 demands. The same holds true for the 1B Diesel Generator: the failure frequency should NOT be 6 out of 100 demands but instead 6 out of 551 demands. We feel that the appropriate method for interpreting this data is to consider total diesel generator reliability as the combination of the probability for successful start and probability for successful loading, given start.

The tables included with this attachment provide the requested last 20 and 100 valid demands as defined in Regulatory Guide 1.108. We have included an additional table which provides all diesel generator starts and failures, to display a more realistic overall statistical reliability of each diesel generator. A brief discussion of each table is provided below. Each table is divided into two sub-tables in order to avoid confusing the data between the individual diesel generators. The tables are organized in the following manner. The first

column "OBS" represents the sequential demand number. The next column identifies whether the start met the NRC requirements (i.e. Regulatory Guide 1.108, Section c.2.e) for being considered a valid demand. If the start met the NRC requirements it will have "NRC" printed in this column. The "Date of Start" column identifies the date in which the diesel was started. Please note that the diesel generators were in some cases started more than once per day. The next two columns identify the reason the diesel was started, and whether any failure occurred. If a failure occurred, an explanation of the failure is included in Appendix B and is identified by the associated "LER" number.

Table 1 provides the last 20 demands which meet the criteria stated in Regulatory Guide 1.108, section c.2.e.

Table 2 provides the last 100 demands which meet the criteria stated in Regulatory Guide 1.108, section c.2.e.

Table 3 has been submitted in an attempt to provide a more accurate failure analysis for each diesel. To the best of our knowledge this table contains all documented diesel generator starts, regardless of the length of run or load condition. The starting and ending dates used to develop Table 2 (the last 100 valid NRC demands) are the same starting and ending dates used to develop Table 3. Please note that all NRC defined failures identified in Table 3 also show up in Table 2. The reason for the additional starts identified in Table 3 can be attributed to the common practice at the Kewaunee Nuclear Plant of starting a diesel to demonstrate operability, but not necessarily running it for an extended period of time or loading it, prior to removing the

opposite train diesel generator from service. A number of surveillance tests also require the start of one or both of the diesel generators, but do not require an extensive run and therefore does not meet the criteria set forth in position c.2.e of Regulatory Guide 1.108. In our opinion, including the failures during these brief runs, and not the successes of these runs decreases the statistical reliability for each diesel.

To assist you in interpreting the enclosed data, a brief description of the information sources follows:

1. Surveillance Procedure SP 42-109, Diesel Generator Manual Test

This is a monthly test in which the diesel is run continuous for two hours with a load of 2600 KW and an additional two hours at 2950 KW. This surveillance procedure meets the criteria set forth in Regulatory Guide 1.108, position c.2.e as valid test data and is included in Tables 1 and 2.

NOTE: This procedure is also used for the Load Rejection Test, which is performed during the annual refueling outage. The Load Rejection Test requires an electrical load of 3050 KW to be obtained but does not require the load to be maintained for a duration of one hour; hence, the Load Rejection Test does not meet the valid test criteria of Regulatory Guide 1.108 and thus only appears in Table 3.

2. Surveillance Procedure SP 33-110, Diesel Generator Automatic Test

This surveillance procedure is performed during the annual refueling outage. The purpose of this procedure is to test the diesel generators' ability to automatically start, load shed the bus, and restore the emergency electrical equipment. This is done by simulating a voltage loss to one safeguard bus concurrent with Safety Injection initiation. This procedure requires each diesel generator to be loaded and run for six minutes; however, this run time is not long enough to meet the valid test criteria set forth in the Regulatory Guide 1.108 and therefore this test only appears in Table 3.

3. Surveillance Procedure SP 42-152, Automatic Load Sequences Test

This surveillance procedure is performed on a monthly basis. The procedure requires each diesel generator to run for a short duration while indicating lights and Sequence of Events Recorder points are verified; thus, this surveillance procedure does not meet the valid test criteria of Regulatory Guide 1.108, and therefore only appears in Table 3.

4. Surveillance Procedure SP 08-186, CO₂ System Inspection and Dry Test

This surveillance procedure is performed semi-annually during normal plant operation. The procedure requires an operability test be performed on the opposite train diesel generator prior to performing the CO₂ dry test on one of the diesel generator rooms. An operability

test is performed to demonstrate the diesel generators can be started and run for a brief period; however, no electrical load is applied. Since at no time during the performance of this procedure are the diesel generators loaded, this surveillance procedure does not meet the requirements of Regulatory Guide 1.108 and therefore this test only appears in Table 3.

5. Surveillance Procedure SP 47-062, Reactor Protection Logic Channel Test

This surveillance procedure is performed on a monthly basis. During certain portions of this surveillance procedure the diesel generator for the train under test may be placed in the pull out position or may be allowed to automatically start. If the diesel generator is automatically started, the duration of the run is approximately 3 to 10 minutes thus; the duration of the run is less than the one hour criteria set forth in Regulatory Guide 1.108 and therefore the starts associated with this surveillance procedure can only be included in Table 3.

6. Operating Procedure N-DGM-10, Diesel Generator Manual Operation

This procedure describes the manual startup, continuous operation and shutdown of the diesel generator. On two occasions in the past this procedure has met the criteria set forth in Regulatory Guide 1.108, position c.2.e as valid test data and is included in all three tables. Included in the procedure is a Diesel Generator Operation Log

for recording instrumentation readings when the diesel's temperature has stabilized and every two hours thereafter. This procedure is used to record power requests and special tests which require operations to load the diesel for an extended run.

7. Control Room Log

Control room operator logs were reviewed for additional diesel generator starts or runs which were not recorded under any of the surveillance procedures or operating procedure described above. These additional starts include those made in conjunction with removing the opposite train diesel generator from service, starts associated with reactor trip/turbine trips and various other miscellaneous starts. This additional data is critical in our attempt to accurately provide the statistical reliability of each diesel generator. Of these additional starts and runs, only those that met the criteria of Regulatory Guide 1.108, position c.2.e, were included in Tables 1 and 2.

The "Control Room Operator Logs" and surveillance procedures are the primary means of recording diesel generator out of service time histories. Diesel generator failures at the Kewaunee Nuclear Plant are tracked using the Incident Report System. A safety evaluation is performed for every Incident Report and presented to the Plant Operations Review Committee for approval before the incident is closed out. The Incident Report System has served as a useful tool in trending diesel generator problems. Through the use of incident reports (including Licensee Event Reports) and maintenance work requests, the history of critical failure mechanisms, human error and common mode failures can be

trended. WPS has not developed a specific program to trend diesel generator failures due to the minimal number of incidents resulting in actual failures.

No formal yearly data report is generated for each diesel generator; however, data sheets for the diesels are maintained in the KNPP QA Vault. These data sheets include all surveillance procedure testing results, all preventative maintenance procedure data sheets including the diesel generator overhaul maintenance report performed during the refueling outage with the Engine Service Representative and all non-routine maintenance performed using the maintenance work request forms. Presently we have no plans of generating a formal data report. The importance of the diesel generators is realized and the appropriate action is taken (as with all safety related equipment) to ensure their proper performance at all times.

In performing this evaluation we have found that our diesel generator units maintain a very reliable performance record; however, this is not clearly visible using the criteria of Regulatory Guide 1.108, position c.2.e. Our disagreement in data compilation results from the fact that in order for a test to be considered valid, the diesel generator must be run for at least one hour with at least a 50% continuous rating load. In the tables provided below, column one makes a comparison between the number of failures that occurred in the last 20 valid demands versus the number of failures that occurred for all diesel generator demands taking place within that same time period. Column two of the table provides a comparison between the number of failures that occurred in the last 100 valid demands versus the number of failures that occurred for all diesel generator demands taking place within that same time period.

Diesel Generator 1A	Time Period For Last 20 Valid Demands	Time Period For Last 100 Valid Demands
Failure Rate Using Reg. Guide 1.108 Position c.2.e Criteria	$\frac{1 \text{ Failure}}{20 \text{ Demands}} = 95.0\% \text{ reliable}$	$\frac{5 \text{ Failures}}{100 \text{ Demands}} = 95.0\% \text{ reliable}$
Total Failure Rate Using all Identified D/G Demands	$\frac{1 \text{ Failure}}{84 \text{ Demands}} = 98.81\% \text{ reliable}$	$\frac{5 \text{ Failures}}{542 \text{ Demands}} = 99.08\% \text{ reliable}$

Diesel Generator 1B	Time Period For Last 20 Valid Demands	Time Period For Last 100 Valid Demands
Failure Rate Using Reg. Guide 1.108 Position c.2.e Criteria	$\frac{0 \text{ Failure}}{20 \text{ Demands}} = 100\% \text{ reliable}$	$\frac{6 \text{ Failures}}{100 \text{ Demands}} = 94.0\% \text{ reliable}$
Total Failure Rate Using all Identified D/G Demands	$\frac{0 \text{ Failure}}{79 \text{ Demands}} = 100\% \text{ reliable}$	$\frac{6 \text{ Failures}}{551 \text{ Demands}} = 98.91\% \text{ reliable}$

As one can clearly see the statistical reliability is improved when all diesel generator starts are used.

Following the general plan previously used in the report by the U.S. Atomic Energy Commission Office of Operations Evaluation, June 1974, OOE-ES-002, each failure is classified in an expanded list of categories (see Table 4). Examination of Table 4 indicates that starting failures and related problems are the most prevalent failures at the KNPP. Engine and engine related problems account for 7 of the 11 reported failures. All starting failures occurred prior to the 1982 refueling outage, before the air dryers were installed on the air start system. Since the 1982 refueling outage no starting failures have

occurred. In our opinion the starting problems experienced in the past (i.e., moisture in the air start system) have been resolved and are no longer a valid concern. Since this is no longer a recurring problem we feel these failures should not be considered a part of this diesel generator reliability report. Of the remaining problems, two dealt with the electrical bus and the other two problems remain unknown.

Prior to preparing this response we were unaware of the exact number of starts our diesel generators were subjected to in the last eight years. We subsequently plan to investigate our current practices that call for starting the diesel generators as well as a review of our Technical Specifications to determine a method in which to reduce the number of diesel generator starts.

The Typical Technical Specifications (Appendix A to Generic Letter 84-15) are unwarranted as long as we are able to maintain or, if possible, improve our present diesel generator statistical reliability status. We feel that the suggested technical specifications would increase the administrative burden without a commensurate increase in safety.

TABLE 1A

DIESEL GENERATOR 1A RELIABILITY DATA

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?	
1	NRC	JUL 20, 1984	SP 42-109	NO	
2	NRC	JUN 23, 1984	SP 42-109	NO	
3	NRC	MAY 21, 1984	SP 42-109	NO	
4	NRC	APR 21, 1984	SP 42-109	NO	
5	NRC	APR 13, 1984	OPER TEST	NO	
6	NRC	MAR 26, 1984	SP 42-109	NO	
7	NRC	FEB 21, 1984	SP 42-109	NO	
8	NRC	JAN 20, 1984	SP 42-109	NO	
9	NRC	DEC 21, 1983	SP 42-109	NO	
10	NRC	NOV 21, 1983	SP 42-109	NO	
11	NRC	OCT 21, 1983	SP 42-109	NO	
12	NRC	SEP 21, 1983	SP 42-109	NO	
13	NRC	AUG 22, 1983	SP 42-109	NO	
14	NRC	JUL 21, 1983	SP 42-109	NO	
15	NRC	JUN 21, 1983	SP 42-109	NO	
16	NRC	MAY 10, 1983	SP 42-109	NO	
17	NRC	MAY 03, 1983	PWR REQUEST	NO	
18	NRC	APR 01, 1983	OPER TEST	NO	
19	NRC	MAR 31, 1983	SP 42-109	YES	IR #83-38
20	NRC	MAR 16, 1983	SP 42-109	NO	

TABLE 1B

DIESEL GENERATOR 1B RELIABILITY

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
1	NRC	JUL 20, 1984	SP 42-109	NO
2	NRC	JUN 23, 1984	SP 42-109	NO
3	NRC	MAY 21, 1984	SP 42-109	NO
4	NRC	APR 30, 1984	SP 42-109	NO
5	NRC	APR 18, 1984	SP 42-109	NO
6	NRC	APR 14, 1984	OPER TEST	NO
7	NRC	APR 13, 1984	OPER TEST	NO
8	NRC	MAR 26, 1984	SP 42-109	NO
9	NRC	FEB 21, 1984	SP 42-109	NO
10	NRC	JAN 20, 1984	SP 42-109	NO
11	NRC	DEC 21, 1983	SP 42-109	NO
12	NRC	NOV 21, 1983	SP 42-109	NO
13	NRC	OCT 21, 1983	SP 42-109	NO
14	NRC	SEP 21, 1983	SP 42-109	NO
15	NRC	AUG 22, 1983	SP 42-109	NO
16	NRC	JUL 21, 1983	SP 42-109	NO
17	NRC	JUN 21, 1983	SP 42-109	NO
18	NRC	MAY 10, 1983	SP 42-109	NO
19	NRC	MAY 03, 1983	PWR REQUEST	NO
20	NRC	APR 04, 1983	SP 42-109	NO

TABLE 2A

DIESEL GENERATOR 1A RELIABILITY DATA

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
1	NRC	JUL 20, 1984	SP 42-109	NO
2	NRC	JUN 23, 1984	SP 42-109	NO
3	NRC	MAY 21, 1984	SP 42-109	NO
4	NRC	APR 21, 1984	SP 42-109	NO
5	NRC	APR 13, 1984	OPER TEST	NO
6	NRC	MAR 26, 1984	SP 42-109	NO
7	NRC	FEB 21, 1984	SP 42-109	NO
8	NRC	JAN 20, 1984	SP 42-109	NO
9	NRC	DEC 21, 1983	SP 42-109	NO
10	NRC	NOV 21, 1983	SP 42-109	NO
11	NRC	OCT 21, 1983	SP 42-109	NO
12	NRC	SEP 21, 1983	SP 42-109	NO
13	NRC	AUG 22, 1983	SP 42-109	NO
14	NRC	JUL 21, 1983	SP 42-109	NO
15	NRC	JUN 21, 1983	SP 42-109	NO
16	NRC	MAY 10, 1983	SP 42-109	NO
17	NRC	MAY 03, 1983	PWR REQUEST	NO
18	NRC	APR 01, 1983	OPER TEST	NO
19	NRC	MAR 31, 1983	SP 42-109	YES
20	NRC	MAR 16, 1983	SP 42-109	NO
21	NRC	FEB 21, 1983	SP 42-109	NO
22	NRC	JAN 28, 1983	OPER TEST	NO
23	NRC	JAN 21, 1983	SP 42-109	NO
24	NRC	DEC 21, 1982	SP 42-109	NO
25	NRC	NOV 22, 1982	SP 42-109	NO
26	NRC	OCT 21, 1982	SP 42-109	NO
27	NRC	SEP 21, 1982	SP 42-109	NO
28	NRC	AUG 20, 1982	SP 42-109	NO
29	NRC	JUL 21, 1982	SP 42-109	NO
30	NRC	JUN 21, 1982	SP 42-109	NO
31	NRC	MAY 28, 1982	SP 42-109	NO
32	NRC	APR 25, 1982	SP 42-109	NO
33	NRC	MAR 19, 1982	SP 42-109	NO
34	NRC	FEB 19, 1982	SP 42-109	NO
35	NRC	JAN 21, 1982	SP 42-109	NO
36	NRC	DEC 21, 1981	SP 42-109	NO
37	NRC	NOV 19, 1981	SP 42-109	NO
38	NRC	OCT 22, 1981	SP 42-109	NO
39	NRC	SEP 21, 1981	SP 42-109	NO
40	NRC	AUG 21, 1981	SP 42-109	NO
41	NRC	JUL 22, 1981	SP 42-109	NO
42	NRC	JUN 22, 1981	SP 42-109	NO
43	NRC	MAY 26, 1981	SP 42-109	NO
44	NRC	APR 29, 1981	SP 42-109	NO
45	NRC	APR 16, 1981	SP 42-109	NO
46	NRC	MAR 24, 1981	SP 42-109	NO
47	NRC	FEB 20, 1981	SP 42-109	NO

IR #83-38

TABLE 2A (CONT.)

DIESEL GENERATOR 1A RELIABILITY DATA

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?	
48	NRC	JAN 21, 1981	SP 42-109	NO	
49	NRC	DEC 22, 1980	SP 42-109	NO	
50	NRC	DEC 05, 1980	SP ON VALVES	NO	
51	NRC	NOV 21, 1980	SP 42-109	NO	
52	NRC	OCT 21, 1980	SP 42-109	NO	
53	NRC	SEP 22, 1980	SP 42-109	NO	
54	NRC	AUG 22, 1980	SP 42-109	NO	
55	NRC	JUL 21, 1980	SP 42-109	NO	
56	NRC	MAY 21, 1980	SP 42-109	NO	
57	NRC	APR 21, 1980	SP 42-109	NO	
58	NRC	MAR 21, 1980	SP 42-109	NO	
59	NRC	FEB 21, 1980	SP 42-109	NO	
60	NRC	FEB 06, 1980	24 HR TEST	NO	
61	NRC	JAN 27, 1980	OPER TEST	NO	
62	NRC	DEC 27, 1979	SP 42-109	NO	
63	NRC	NOV 21, 1979	SP 42-109	NO	
64	NRC	OCT 22, 1979	SP 42-109	NO	
65	NRC	SEP 21, 1979	SP 42-109	NO	
66	NRC	AUG 22, 1979	SP 42-109	NO	
67	NRC	JUL 13, 1979	SP 42-109	NO	
68	NRC	MAY 22, 1979	SP 42-109	NO	
69	NRC	APR 20, 1979	SP 42-109	NO	
70	NRC	MAR 21, 1979	SP 42-109	NO	
71	NRC	MAR 17, 1979	OPER TEST	NO	
72	NRC	MAR 05, 1979	OPER TEST	NO	
73	NRC	FEB 28, 1979	OPER TEST	NO	
74	NRC	FEB 28, 1979	OPER TEST	NO	
75	NRC	FEB 21, 1979	N-DGM-10	NO	
76	NRC	FEB 16, 1979	OPER TEST	YES	LER 79-04
77	NRC	JAN 22, 1979	SP 42-109	NO	
78	NRC	DEC 21, 1978	SP 42-109	NO	
79	NRC	NOV 21, 1978	SP 42-109	NO	
80	NRC	OCT 19, 1978	SP 42-109	YES	LER 78-32
81	NRC	SEP 21, 1978	SP 42-109	NO	
82	NRC	AUG 21, 1978	SP 42-109	NO	
83	NRC	JUL 21, 1978	SP 42-109	NO	
84	NRC	JUN 21, 1978	SP 42-109	NO	
85	NRC	MAY 23, 1978	SP 42-109	NO	
86	NRC	MAY 04, 1978	OPER TEST	NO	
87	NRC	APR 22, 1978	SP 42-109	NO	
88	NRC	MAR 21, 1978	SP 42-109	NO	
89	NRC	FEB 21, 1978	SP 42-109	NO	
90	NRC	JAN 21, 1978	SP 42-109	NO	
91	NRC	DEC 21, 1977	SP 42-109	NO	
92	NRC	DEC 14, 1977	SP 42-152	YES	LER 77-36
93	NRC	NOV 20, 1977	SP 42-109	NO	

TABLE 2A (CONT.)

DIESEL GENERATOR 1A RELIABILITY DATA

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?	
94	NRC	OCT 25, 1977	OPER TEST	YES	LER 77-30
95	NRC	OCT 20, 1977	SP 42-109	NO	
96	NRC	SEP 23, 1977	SP 42-109	NO	
97	NRC	SEP 22, 1977	OPER TEST	NO	
98	NRC	AUG 20, 1977	SP 42-109	NO	
99	NRC	JUL 20, 1977	SP 42-109	NO	
100	NRC	JUN 20, 1977	SP 42-109	NO	

TABLE 2B

DIESEL GENERATOR 1B RELIABILITY

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
1	NRC	JUL 20, 1984	SP 42-109	NO
2	NRC	JUN 23, 1984	SP 42-109	NO
3	NRC	MAY 21, 1984	SP 42-109	NO
4	NRC	APR 30, 1984	SP 42-109	NO
5	NRC	APR 18, 1984	SP 42-109	NO
6	NRC	APR 14, 1984	OPER TEST	NO
7	NRC	APR 13, 1984	OPER TEST	NO
8	NRC	MAR 26, 1984	SP 42-109	NO
9	NRC	FEB 21, 1984	SP 42-109	NO
10	NRC	JAN 20, 1984	SP 42-109	NO
11	NRC	DEC 21, 1983	SP 42-109	NO
12	NRC	NOV 21, 1983	SP 42-109	NO
13	NRC	OCT 21, 1983	SP 42-109	NO
14	NRC	SEP 21, 1983	SP 42-109	NO
15	NRC	AUG 22, 1983	SP 42-109	NO
16	NRC	JUL 21, 1983	SP 42-109	NO
17	NRC	JUN 21, 1983	SP 42-109	NO
18	NRC	MAY 10, 1983	SP 42-109	NO
19	NRC	MAY 03, 1983	PWR REQUEST	NO
20	NRC	APR 04, 1983	SP 42-109	NO
21	NRC	MAR 16, 1983	SP 42-109	NO
22	NRC	FEB 21, 1983	SP 42-109	NO
23	NRC	JAN 21, 1983	SP 42-109	NO
24	NRC	DEC 21, 1982	SP 42-109	NO
25	NRC	NOV 22, 1982	SP 42-109	NO
26	NRC	OCT 21, 1982	SP 42-109	NO
27	NRC	SEP 21, 1982	SP 42-109	NO
28	NRC	AUG 20, 1982	SP 42-109	NO
29	NRC	JUL 21, 1982	SP 42-109	NO
30	NRC	JUN 21, 1982	SP 42-109	NO
31	NRC	MAY 28, 1982	SP 42-109	NO
32	NRC	APR 22, 1982	SP 42-109	NO
33	NRC	MAR 19, 1982	SP 42-109	NO
34	NRC	FEB 19, 1982	SP 42-109	NO
35	NRC	JAN 21, 1982	SP 42-109	NO
36	NRC	DEC 21, 1981	SP 42-109	NO
37	NRC	NOV 19, 1981	SP 42-109	NO
38	NRC	OCT 22, 1981	SP 42-109	NO
39	NRC	SEP 21, 1981	SP 42-109	NO
40	NRC	AUG 21, 1981	SP 42-109	NO
41	NRC	JUL 22, 1981	SP 42-109	NO
42	NRC	JUN 22, 1981	SP 42-109	NO
43	NRC	MAY 26, 1981	SP 42-109	NO
44	NRC	MAY 02, 1981	SP 42-109	NO
45	NRC	APR 16, 1981	SP 42-109	NO
46	NRC	MAR 24, 1981	SP 42-109	NO
47	NRC	FEB 20, 1981	SP 42-109	NO

TABLE 2B (CONT.)

DIESEL GENERATOR 1B RELIABILITY

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?	
48	NRC	JAN 21, 1981	SP 42-109	NO	
49	NRC	JAN 13, 1981	OPER TEST	YES	LER 81-02
50	NRC	DEC 22, 1980	SP 42-109	NO	
51	NRC	DEC 05, 1980	SP ON VALVES	NO	
52	NRC	NOV 21, 1980	SP 42-109	NO	
53	NRC	OCT 21, 1980	SP 42-109	NO	
54	NRC	SEP 23, 1980	OPER TEST	NO	
55	NRC	SEP 22, 1980	SP 42-109	NO	
56	NRC	AUG 22, 1980	SP 42-109	NO	
57	NRC	JUL 21, 1980	SP 42-109	NO	
58	NRC	JUN 21, 1980	SP 42-152	YES	LER 80-27
59	NRC	MAY 26, 1980	SP 42-109	NO	
60	NRC	APR 21, 1980	SP 42-109	NO	
61	NRC	MAR 21, 1980	SP 42-109	NO	
62	NRC	MAR 05, 1980	OPER TEST	YES	LER 80-16
63	NRC	FEB 21, 1980	SP 42-109	YES	LER 80-12
64	NRC	JAN 25, 1980	SP 42-109	NO	
65	NRC	JAN 19, 1980	8 HR LOAD	NO	
66	NRC	JAN 18, 1980	OPER TEST	NO	
67	NRC	JAN 17, 1980	RX TRIP	NO	
68	NRC	JAN 15, 1980	24 HR TEST	NO	
69	NRC	DEC 26, 1979	SP 42-109	NO	
70	NRC	NOV 21, 1979	SP 42-109	NO	
71	NRC	OCT 23, 1979	SP 47-062	YES	LER 89-27
72	NRC	OCT 22, 1979	SP 42-109	NO	
73	NRC	SEP 21, 1979	SP 42-109	NO	
74	NRC	AUG 22, 1979	SP 42-109	NO	
75	NRC	JUL 13, 1979	SP 42-109	NO	
76	NRC	MAY 22, 1979	SP 42-109	NO	
77	NRC	APR 20, 1979	SP 42-109	NO	
78	NRC	MAR 21, 1979	SP 42-109	NO	
79	NRC	FEB 23, 1979	SP 42-109	NO	
80	NRC	FEB 21, 1979	OPER TEST	NO	
81	NRC	JAN 22, 1979	SP 42-109	NO	
82	NRC	JAN 11, 1979	OPER TEST	NO	
83	NRC	DEC 21, 1978	SP 42-109	NO	
84	NRC	NOV 21, 1978	SP 42-109	NO	
85	NRC	OCT 19, 1978	SP 42-109	NO	
86	NRC	SEP 21, 1978	SP 42-109	NO	
87	NRC	AUG 21, 1978	SP 42-109	NO	
88	NRC	JUL 21, 1978	SP 42-109	NO	
89	NRC	JUN 21, 1978	SP 42-109	NO	
90	NRC	MAY 23, 1978	SP 42-109	NO	
91	NRC	MAY 06, 1978	OPER TEST	NO	
92	NRC	APR 22, 1978	SP 42-109	NO	

TABLE 2B (CONT.)

DIESEL GENERATOR 1B RELIABILITY

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?	
93	NRC	MAR 21, 1978	SP 42-109	NO	
94	NRC	FEB 21, 1978	SP 42-109	NO	
95	NRC	JAN 21, 1978	SP 42-109	NO	
96	NRC	DEC 21, 1977	OPER TEST	NO	
97	NRC	DEC 21, 1977	SP 42-109	YES	LER 77-38
98	NRC	NOV 29, 1977	OPER TEST	NO	
99	NRC	NOV 20, 1977	SP 42-109	NO	
100	NRC	OCT 20, 1977	SP 42-109	NO	

TABLE 3A

DIESEL GENERATOR 1A RELIABILITY DATA

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
1		AUG 12, 1984	SP 42-152	NO
2		AUG 09, 1984	OPER TEST	NO
3	NRC	JUL 20, 1984	SP 42-109	NO
4		JUL 16, 1984	OPER TEST	NO
5		JUL 11, 1984	SP 42-152	NO
6		JUL 03, 1984	RX TRIP	NO
7		JUL 02, 1984	OPER TEST	NO
8		JUL 01, 1984	OPER TEST	NO
9		JUN 26, 1984	OPER TEST	NO
10		JUN 25, 1984	OPER TEST	NO
11	NRC	JUN 23, 1984	SP 42-109	NO
12		JUN 12, 1984	SP 42-152	NO
13	NRC	MAY 21, 1984	SP 42-109	NO
14		MAY 14, 1984	SP 42-152	NO
15		MAY 14, 1984	OPER TEST	NO
16		MAY 08, 1984	RX TRIP	NO
17		MAY 07, 1984	RX TRIP	NO
18		APR 27, 1984	SP 33-110	NO
19		APR 23, 1984	OPER TEST	NO
20	NRC	APR 21, 1984	SP 42-109	NO
21		APR 20, 1984	BUMPED SWITCH	NO
22		APR 16, 1984	SP 42-152	NO
23		APR 14, 1984	OPER TEST	NO
24	NRC	APR 13, 1984	OPER TEST	NO
25		APR 06, 1984	OPER TEST	NO
26		MAR 28, 1984	OPER TEST	NO
27	NRC	MAR 26, 1984	SP 42-109	NO
28		MAR 16, 1984	RX TRIP	NO
29		MAR 11, 1984	SP 42-152	NO
30		MAR 07, 1984	SP 08-186	NO
31		MAR 07, 1984	OPER TEST	NO
32		MAR 01, 1984	OPER TEST	NO
33		MAR 01, 1984	SP 08-186	NO
34		FEB 24, 1984	OPER TEST	NO
35	NRC	FEB 21, 1984	SP 42-109	NO
36		FEB 12, 1984	SP 42-152	NO
37		JAN 27, 1984	OPER TEST	NO
38	NRC	JAN 20, 1984	SP 42-109	NO
39		JAN 12, 1984	SP 42-152	NO
40		JAN 04, 1984	OPER TEST	NO
41	NRC	DEC 21, 1983	SP 42-109	NO
42		DEC 13, 1983	OPER TEST	NO

TABLE 3A (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA				
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
43		DEC 12, 1983	SP 42-152	NO
44	NRC	NOV 21, 1983	SP 42-109	NO
45		NOV 16, 1983	OPER TEST	NO
46		NOV 12, 1983	SP 42-152	NO
47	NRC	OCT 21, 1983	SP 42-109	NO
48		OCT 12, 1983	SP 42-152	NO
49	NRC	SEP 21, 1983	SP 42-109	NO
50		SEP 12, 1983	SP 42-152	NO
51	NRC	AUG 22, 1983	SP 42-109	NO
52		AUG 18, 1983	OPER TEST	NO
53		AUG 17, 1983	OPER TEST	NO
54		AUG 16, 1983	SP 08-186	NO
55		AUG 16, 1983	OPER TEST	NO
56		AUG 16, 1983	OPER TEST	NO
57		AUG 16, 1983	OPER TEST	NO
58		AUG 12, 1983	SP 42-152	NO
59		AUG 12, 1983	OPER TEST	NO
60		AUG 11, 1983	OPER TEST	NO
61		JUL 28, 1983	RX TRIP	NO
62		JUL 27, 1983	RX TRIP	NO
63	NRC	JUL 21, 1983	SP 42-109	NO
64		JUL 15, 1983	OPER TEST	NO
65		JUL 13, 1983	OPER TEST	NO
66		JUL 12, 1983	SP 42-152	NO
67	NRC	JUN 21, 1983	SP 42-109	NO
68		JUN 14, 1983	OPER TEST	NO
69		JUN 12, 1983	SP 42-152	NO
70		MAY 26, 1983	OPER TEST	NO
71		MAY 25, 1983	RX TRIP	NO
72		MAY 15, 1983	RX TRIP	NO
73		MAY 12, 1983	SP 42-152	NO
74	NRC	MAY 10, 1983	SP 42-109	NO
75		MAY 07, 1983	OPER TEST	NO
76	NRC	MAY 03, 1983	PWR REQUEST	NO
77		MAY 02, 1983	OPER TEST	NO
78		APR 29, 1983	OPER TEST	NO
79		APR 23, 1983	SP 33-110	NO
80		APR 13, 1983	SP 42-152	NO
81	NRC	APR 01, 1983	OPER TEST	NO
82	NRC	MAR 31, 1983	SP 42-109	YES
83		MAR 17, 1983	TURB TRIP	NO
84	NRC	MAR 16, 1983	SP 42-109	NO
85		MAR 12, 1983	SP 42-152	NO
86	NRC	FEB 21, 1983	SP 42-109	NO
87		FEB 16, 1983	OPER TEST	NO

IR #83-38

TABLE 3A (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA				
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
88		FEB 16, 1983	OPER TEST	NO
89		FEB 15, 1983	OPER TEST	NO
90		FEB 14, 1983	OPER TEST	NO
91		FEB 12, 1983	SP 42-152	NO
92		FEB 09, 1983	SP 08-186	NO
93		FEB 09, 1983	OPER TEST	NO
94		FEB 07, 1983	OPER TEST	NO
95		FEB 07, 1983	OPER TEST	NO
96		FEB 07, 1983	OPER TEST	NO
97	NRC	JAN 28, 1983	OPER TEST	NO
98	NRC	JAN 21, 1983	SP 42-109	NO
99		JAN 12, 1983	SP 42-152	NO
100		JAN 04, 1983	OPER TEST	NO
101		DEC 27, 1982	RX TRIP	NO
102	NRC	DEC 21, 1982	SP 42-109	NO
103		DEC 15, 1982	OPER TEST	NO
104		DEC 12, 1982	SP 42-152	NO
105		NOV 30, 1982	OPER TEST	NO
106	NRC	NOV 22, 1982	SP 42-109	NO
107		NOV 17, 1982	OPER TEST	NO
108		NOV 15, 1982	OPER TEST	NO
109		NOV 12, 1982	SP 42-152	NO
110	NRC	OCT 21, 1982	SP 42-109	NO
111		OCT 12, 1982	SP 42-152	NO
112		SEP 30, 1982	OPER TEST	NO
113	NRC	SEP 21, 1982	SP 42-109	NO
114		SEP 11, 1982	SP 42-152	NO
115		AUG 23, 1982	OPER TEST	NO
116		AUG 23, 1982	OPER TEST	NO
117	NRC	AUG 20, 1982	SP 42-109	NO
118		AUG 19, 1982	SP 08-186	NO
119		AUG 19, 1982	OPER TEST	NO
120		AUG 16, 1982	OPER TEST	NO
121		AUG 16, 1982	SP 08-186	NO
122		AUG 16, 1982	OPER TEST	NO
123		AUG 16, 1982	OPER TEST	NO
124		AUG 12, 1982	SP 42-152	NO
125		AUG 12, 1982	OPER TEST	NO
126		AUG 11, 1982	OPER TEST	NO
127		AUG 11, 1982	OPER TEST	NO
128		AUG 09, 1982	OPER TEST	NO
129		AUG 05, 1982	OPER TEST	NO
130		AUG 03, 1982	OPER TEST	NO
131	NRC	JUL 21, 1982	SP 42-109	NO
132		JUL 14, 1982	OPER TEST	NO

TABLE 3A (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA				
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
133		JUL 12, 1982	SP 42-152	NO
134		JUL 12, 1982	OPER TEST	NO
135		JUN 28, 1982	SP 47-062	NO
136	NRC	JUN 21, 1982	SP 42-109	NO
137		JUN 12, 1982	SP 42-152	NO
138	NRC	MAY 28, 1982	SP 42-109	NO
139		MAY 26, 1982	OPER TEST	NO
140		MAY 23, 1982	RX TRIP	NO
141		MAY 12, 1982	SP 42-152	NO
142		MAY 10, 1982	OPER TEST	NO
143		MAY 02, 1982	OPER TEST	NO
144		APR 29, 1982	SP 33-110	NO
145	NRC	APR 25, 1982	SP 42-109	NO
146		MAR 31, 1982	OPER TEST	NO
147	NRC	MAR 19, 1982	SP 42-109	NO
148		MAR 16, 1982	SP 42-152	NO
149		MAR 16, 1982	SP 42-152	NO
150		MAR 16, 1982	SP 42-152	NO
151		MAR 14, 1982	SP 42-152	NO
152	NRC	FEB 19, 1982	SP 42-109	NO
153		FEB 17, 1982	SP 08-186	NO
154		FEB 17, 1982	OPER TEST	NO
155		FEB 16, 1982	OPER TEST	NO
156		FEB 16, 1982	SP 08-186	NO
157		FEB 13, 1982	OPER TEST	NO
158		FEB 12, 1982	SP 42-152	NO
159	NRC	JAN 21, 1982	SP 42-109	NO
160		JAN 18, 1982	OPER TEST	NO
161		JAN 12, 1982	SP 42-152	NO
162		JAN 01, 1982	TRAINING	NO
163		JAN 01, 1982	OPER TEST	NO
164	NRC	DEC 21, 1981	SP 42-109	NO
165		DEC 12, 1981	SP 42-152	NO
166		DEC 11, 1981	OPER TEST	NO
167		DEC 10, 1981	OPER TEST	NO
168		DEC 09, 1981	OPER TEST	NO
169	NRC	NOV 19, 1981	SP 42-109	NO
170		NOV 14, 1981	SP 42-152	NO
171		OCT 27, 1981	SP 47-062	NO
172		OCT 23, 1981	OPER TEST	NO
173	NRC	OCT 22, 1981	SP 42-109	NO
174		OCT 20, 1981	OPER TEST	NO
175		OCT 16, 1981	OPER TEST	NO
176		OCT 12, 1981	SP 42-152	NO
177		OCT 01, 1981	OPER TEST	NO

TABLE 3A (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA					
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?	
178	NRC	SEP 21, 1981	SP 42-109	NO	
179		SEP 18, 1981	OPER TEST	NO	
180		SEP 12, 1981	SP 42-152	NO	
181	NRC	AUG 21, 1981	SP 42-109	NO	
182		AUG 12, 1981	SP 42-152	NO	
183		AUG 12, 1981	OPER TEST	NO	
184	NRC	JUL 22, 1981	SP 42-109	NO	
185		JUL 21, 1981	OPER TEST	NO	
186		JUL 12, 1981	SP 42-152	NO	
187		JUN 25, 1981	OPER TEST	NO	
188	NRC	JUN 22, 1981	SP 42-109	NO	
189		JUN 12, 1981	SP 42-152	NO	
190		JUN 06, 1981	RX TRIP	NO	
191		JUN 04, 1981	TURB TRIP	NO	
192		MAY 31, 1981	OPER TEST	NO	
193	NRC	MAY 26, 1981	SP 42-109	NO	
194		MAY 23, 1981	OPER TEST	NO	
195		MAY 12, 1981	SP 42-152	NO	
196		MAY 10, 1981	SP 33-110	NO	
197		MAY 03, 1981	OPER TEST	NO	
198	NRC	APR 29, 1981	SP 42-109	NO	
199		APR 20, 1981	TURB TRIP	NO	
200	NRC	APR 16, 1981	SP 42-109	NO	
201		APR 15, 1981	OPER TEST	NO	
202		APR 12, 1981	SP 42-152	NO	
203		APR 04, 1981	OPER TEST	NO	
204		MAR 31, 1981	OPER TEST	NO	
205		MAR 30, 1981	OPER TEST	NO	
206	NRC	MAR 24, 1981	SP 42-109	NO	
207		MAR 21, 1981	RX TRIP	NO	
208		MAR 17, 1981	OPER TEST	NO	
209		MAR 12, 1981	SP 42-152	NO	
210		FEB 28, 1981	RX TRIP	NO	
211		FEB 27, 1981	OPER TEST	NO	
212	NRC	FEB 20, 1981	SP 42-109	NO	
213		FEB 17, 1981	OPER TEST	NO	
214		FEB 17, 1981	SP 08-186	NO	
215		FEB 17, 1981	OPER TEST	NO	
216		FEB 16, 1981	OPER TEST	NO	
217		FEB 12, 1981	SP 42-152	NO	
218	NRC	JAN 21, 1981	SP 42-109	NO	
219		JAN 15, 1981	OPER TEST	NO	
220		JAN 15, 1981	TRAINING	NO	
221		JAN 14, 1981	OPER TEST	NO	
222		JAN 14, 1981	OPER TEST	NO	

TABLE 3A (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA				
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
223		JAN 13, 1981	OPER TEST	NO
224		JAN 12, 1981	SP 42-152	NO
225		DEC 26, 1980	RX TRIP	NO
226	NRC	DEC 22, 1980	SP 42-109	NO
227		DEC 16, 1980	OPER TEST	NO
228		DEC 12, 1980	SP 42-152	NO
229		DEC 12, 1980	OPER TEST	NO
230	NRC	DEC 05, 1980	SP ON VALVES	NO
231	NRC	NOV 21, 1980	SP 42-109	NO
232		NOV 21, 1980	OPER TEST	NO
233		NOV 17, 1980	OPER TEST	NO
234		NOV 17, 1980	SP 42-152	NO
235		NOV 17, 1980	SP 42-152	NO
236		NOV 12, 1980	SP 42-152	NO
237		OCT 31, 1980	OPER TEST	NO
238	NRC	OCT 21, 1980	SP 42-109	NO
239		OCT 12, 1980	SP 42-152	NO
240		SEP 26, 1980	RX TRIP	NO
241		SEP 23, 1980	OPER TEST	NO
242	NRC	SEP 22, 1980	SP 42-109	NO
243		SEP 22, 1980	OPER TEST	NO
244		SEP 19, 1980	OPER TEST	NO
245		SEP 15, 1980	OPER TEST	NO
246		SEP 12, 1980	SP 42-152	NO
247		SEP 10, 1980	OPER TEST	NO
248	NRC	AUG 22, 1980	SP 42-109	NO
249		AUG 19, 1980	RX TRIP	NO
250		AUG 14, 1980	SP 08-186	NO
251		AUG 14, 1980	OPER TEST	NO
252		AUG 13, 1980	OPER TEST	NO
253		AUG 12, 1980	SP 42-152	NO
254	NRC	JUL 21, 1980	SP 42-109	NO
255		JUL 21, 1980	OPER TEST	NO
256		JUL 16, 1980	OPER TEST	NO
257		JUL 13, 1980	RX TRIP	NO
258		JUL 12, 1980	SP 42-152	NO
259		JUL 02, 1980	OPER TEST	NO
260		JUL 02, 1980	OPER TEST	NO
261		JUN 21, 1980	SP 42-152	NO
262		JUN 10, 1980	OPER TEST	NO
263		JUN 01, 1980	SP 33-110	NO
264	NRC	MAY 21, 1980	SP 42-109	NO
265		MAY 15, 1980	OPER TEST	NO
266		MAY 12, 1980	SP 42-152	NO
267		MAY 09, 1980	RX TRIP	NO

TABLE 3A (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
268		APR 22, 1980	OPER TEST	NO
269	NRC	APR 21, 1980	SP 42-109	NO
270		APR 21, 1980	SP 47-062	NO
271		APR 21, 1980	OPER TEST	NO
272		APR 12, 1980	SP 42-152	NO
273		MAR 27, 1980	OPER TEST	NO
274		MAR 27, 1980	OPER TEST	NO
275	NRC	MAR 21, 1980	SP 42-109	NO
276		MAR 20, 1980	OPER TEST	NO
277		MAR 13, 1980	OPER TEST	NO
278		MAR 12, 1980	SP 42-152	NO
279		MAR 10, 1980	OPER TEST	NO
280		MAR 07, 1980	OPER TEST	NO
281		MAR 06, 1980	OPER TEST	NO
282		MAR 05, 1980	OPER TEST	NO
283		FEB 27, 1980	OPER TEST	NO
284	NRC	FEB 21, 1980	SP 42-109	NO
285		FEB 18, 1980	SP 08-186	NO
286		FEB 18, 1980	OPER TEST	NO
287		FEB 15, 1980	OPER TEST	NO
288		FEB 15, 1980	OPER TEST	NO
289		FEB 13, 1980	SP 42-152	NO
290		FEB 13, 1980	OPER TEST	NO
291		FEB 13, 1980	OPER TEST	NO
292	NRC	FEB 06, 1980	24 HR TEST	NO
293		FEB 03, 1980	RX TRIP	NO
294		FEB 01, 1980	OPER TEST	NO
295		JAN 31, 1980	OPER TEST	NO
296		JAN 30, 1980	OPER TEST	NO
297	NRC	JAN 27, 1980	OPER TEST	NO
298		JAN 26, 1980	OPER TEST	NO
299		JAN 26, 1980	OPER TEST	NO
300		JAN 25, 1980	SP 42-109	NO
301		JAN 17, 1980	RX TRIP	NO
302		JAN 16, 1980	OPER TEST	NO
303		JAN 12, 1980	SP 42-152	NO
304		JAN 05, 1980	RX TRIP	NO
305	NRC	DEC 27, 1979	SP 42-109	NO
306		DEC 27, 1979	OPER TEST	NO
307		DEC 26, 1979	OPER TEST	NO
308		DEC 26, 1979	OPER TEST	NO
309		DEC 22, 1979	OPER TEST	NO
310		DEC 21, 1979	OPER TEST	NO
311		DEC 21, 1979	OPER TEST	NO
312		DEC 19, 1979	OPER TEST	NO

TABLE 3A (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA				
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
313		DEC 18, 1979	OPER TEST	NO
314		DEC 18, 1979	OPER TEST	NO
315		DEC 17, 1979	OPER TEST	NO
316		DEC 12, 1979	SP 42-152	NO
317		DEC 10, 1979	RX TRIP	NO
318		NOV 26, 1979	SP 47-062	NO
319	NRC	NOV 21, 1979	SP 42-109	NO
320		NOV 21, 1979	OPER TEST	NO
321		NOV 12, 1979	SP 42-152	NO
322		NOV 02, 1979	OPER TEST	NO
323		OCT 23, 1979	OPER TEST	NO
324	NRC	OCT 22, 1979	SP 42-109	NO
325		OCT 14, 1979	OPER TEST	NO
326		OCT 12, 1979	SP 42-152	NO
327		SEP 26, 1979	OPER TEST	NO
328		SEP 24, 1979	SP 47-062	NO
329		SEP 22, 1979	OPER TEST	NO
330	NRC	SEP 21, 1979	SP 42-109	NO
331		SEP 12, 1979	SP 42-152	NO
332		SEP 12, 1979	RX TRIP	NO
333		AUG 30, 1979	OPER TEST	NO
334	NRC	AUG 22, 1979	SP 42-109	NO
335		AUG 21, 1979	SP 08-186	NO
336		AUG 21, 1979	OPER TEST	NO
337		AUG 17, 1979	OPER TEST	NO
338		AUG 17, 1979	OPER TEST	NO
339		AUG 16, 1979	OPER TEST	NO
340		AUG 15, 1979	SP 42-152	NO
341		AUG 02, 1979	RX TRIP	NO
342	NRC	JUL 13, 1979	SP 42-109	NO
343		JUL 09, 1979	OPER TEST	NO
344		JUN 28, 1979	OPER TEST	NO
345		JUN 20, 1979	OPER TEST	NO
346		JUN 18, 1979	OPER TEST	NO
347		JUN 14, 1979	OPER TEST	NO
348		JUN 12, 1979	SP 33-110	NO
349		JUN 07, 1979	OPER TEST	NO
350		JUN 06, 1979	OPER TEST	NO
351		JUN 05, 1979	OPER TEST	NO
352		JUN 04, 1979	OPER TEST	NO
353		JUN 02, 1979	OPER TEST	NO
354		JUN 01, 1979	OPER TEST	NO
355		MAY 23, 1979	SP 47-062	NO
356	NRC	MAY 22, 1979	SP 42-109	NO
357		MAY 13, 1979	SP 42-152	NO

TABLE 3A (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA				
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
358		MAY 02, 1979	OPER TEST	NO
359		MAY 01, 1979	OPER TEST	NO
360		APR 30, 1979	OPER TEST	NO
361		APR 23, 1979	SP 47-062	NO
362	NRC	APR 20, 1979	SP 42-109	NO
363		APR 18, 1979	OPER TEST	NO
364		APR 18, 1979	OPER TEST	NO
365		APR 17, 1979	OPER TEST	NO
366		APR 16, 1979	OPER TEST	NO
367		APR 13, 1979	SP 42-152	NO
368		APR 12, 1979	OPER TEST	NO
369		APR 11, 1979	OPER TEST	NO
370		APR 10, 1979	OPER TEST	NO
371		APR 08, 1979	OPER TEST	NO
372		APR 08, 1979	OPER TEST	NO
373		MAR 30, 1979	OPER TEST	NO
374		MAR 29, 1979	OPER TEST	NO
375		MAR 28, 1979	OPER TEST	NO
376		MAR 27, 1979	OPER TEST	NO
377		MAR 27, 1979	OPER TEST	NO
378		MAR 26, 1979	OPER TEST	NO
379		MAR 22, 1979	OPER TEST	NO
380	NRC	MAR 21, 1979	SP 42-109	NO
381		MAR 19, 1979	OPER TEST	NO
382	NRC	MAR 17, 1979	OPER TEST	NO
383		MAR 14, 1979	SP 42-152	NO
384		MAR 14, 1979	OPER TEST	NO
385		MAR 12, 1979	RX TRIP	NO
386		MAR 11, 1979	RX TRIP	NO
387	NRC	MAR 05, 1979	OPER TEST	NO
388		MAR 03, 1979	OPER TEST	NO
389		MAR 03, 1979	OPER TEST	NO
390		MAR 03, 1979	OPER TEST	NO
391		MAR 02, 1979	OPER TEST	NO
392	NRC	FEB 28, 1979	OPER TEST	NO
393		FEB 28, 1979	SP 08-186	NO
394		FEB 28, 1979	OPER TEST	NO
395	NRC	FEB 28, 1979	OPER TEST	NO
396		FEB 27, 1979	SP 47-062	NO
397		FEB 23, 1979	OPER TEST	NO
398		FEB 23, 1979	OPER TEST	NO
399		FEB 22, 1979	OPER TEST	NO
400		FEB 21, 1979	SP 42-109	NO
401	NRC	FEB 21, 1979	N-DGM-10	NO
402		FEB 21, 1979	OPER TEST	NO

TABLE 3A (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?	
403		FEB 20, 1979	OPER TEST	NO	
404		FEB 20, 1979	OPER TEST	NO	
405	NRC	FEB 16, 1979	OPER TEST	YES	LER 79-04
406		FEB 15, 1979	OPER TEST	NO	
407		FEB 14, 1979	OPER TEST	NO	
408		FEB 13, 1979	SP 42-152	NO	
409		FEB 05, 1979	RX TRIP	NO	
410		JAN 29, 1979	SP 47-062	NO	
411	NRC	JAN 22, 1979	SP 42-109	NO	
412		JAN 17, 1979	OPER TEST	NO	
413		JAN 13, 1979	SP 42-152	NO	
414		JAN 10, 1979	OPER TEST	NO	
415		JAN 10, 1979	OPER TEST	NO	
416		JAN 09, 1979	OPER TEST	NO	
417		JAN 08, 1979	OPER TEST	NO	
418		DEC 27, 1978	OPER TEST	NO	
419	NRC	DEC 21, 1978	SP 42-109	NO	
420		DEC 19, 1978	OPER TEST	NO	
421		DEC 13, 1978	SP 42-152	NO	
422		DEC 12, 1978	OPER TEST	NO	
423		DEC 08, 1978	OPER TEST	NO	
424		DEC 07, 1978	OPER TEST	NO	
425		DEC 06, 1978	OPER TEST	NO	
426		NOV 28, 1978	OPER TEST	NO	
427		NOV 27, 1978	OPER TEST	NO	
428		NOV 22, 1978	OPER TEST	NO	
429	NRC	NOV 21, 1978	SP 42-109	NO	
430		NOV 13, 1978	SP 42-152	NO	
431		NOV 05, 1978	RX TRIP	NO	
432		OCT 20, 1978	OPER TEST	NO	
433		OCT 20, 1978	OPER TEST	NO	
434	NRC	OCT 19, 1978	SP 42-109	YES	LER 78-32
435		OCT 13, 1978	SP 42-152	NO	
436		SEP 25, 1978	SP 47-062	NO	
437	NRC	SEP 21, 1978	SP 42-109	NO	
438		SEP 14, 1978	RX TRIP	NO	
439		SEP 13, 1978	SP 42-152	NO	
440	NRC	AUG 21, 1978	SP 42-109	NO	
441		AUG 18, 1978	OPER TEST	NO	
442		AUG 16, 1978	OPER TEST	NO	
443		AUG 14, 1978	OPER TEST	NO	
444		AUG 14, 1978	SP 42-152	NO	
445	NRC	JUL 21, 1978	SP 42-109	NO	
446		JUL 13, 1978	OPER TEST	NO	
447		JUL 13, 1978	SP 42-152	NO	

TABLE 3A (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA				
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
448		JUN 27, 1978	TURB TRIP	NO
449		JUN 27, 1978	RX TRIP	NO
450		JUN 24, 1978	TURB TRIP	NO
451	NRC	JUN 21, 1978	SP 42-109	NO
452		JUN 13, 1978	SP 42-152	NO
453		JUN 05, 1978	OPER TEST	NO
454		MAY 30, 1978	SP 47-062	NO
455		MAY 29, 1978	TURB TRIP	NO
456		MAY 28, 1978	RX TRIP	NO
457	NRC	MAY 23, 1978	SP 42-109	NO
458		MAY 20, 1978	OPER TEST	NO
459		MAY 19, 1978	OPER TEST	NO
460		MAY 16, 1978	SP 33-110	NO
461		MAY 14, 1978	OPER TEST	NO
462		MAY 14, 1978	SP 42-152	NO
463	NRC	MAY 04, 1978	OPER TEST	NO
464	NRC	APR 22, 1978	SP 42-109	NO
465		APR 13, 1978	SP 42-152	NO
466		APR 06, 1978	OPER TEST	NO
467	NRC	MAR 21, 1978	SP 42-109	NO
468		MAR 21, 1978	OPER TEST	NO
469		MAR 13, 1978	SP 42-152	NO
470		MAR 07, 1978	OPER TEST	NO
471		MAR 02, 1978	OPER TEST	NO
472		MAR 01, 1978	OPER TEST	NO
473		FEB 28, 1978	OPER TEST	NO
474		FEB 27, 1978	OPER TEST	NO
475	NRC	FEB 21, 1978	SP 42-109	NO
476		FEB 21, 1978	OPER TEST	NO
477		FEB 20, 1978	SP 47-062	NO
478		FEB 13, 1978	SP 42-152	NO
479		FEB 09, 1978	OPER TEST	NO
480		FEB 08, 1978	OPER TEST	NO
481		JAN 23, 1978	OPER TEST	NO
482		JAN 23, 1978	OPER TEST	NO
483	NRC	JAN 21, 1978	SP 42-109	NO
484		JAN 16, 1978	OPER TEST	NO
485		JAN 16, 1978	OPER TEST	NO
486		JAN 13, 1978	SP 42-152	NO
487		JAN 13, 1978	OPER TEST	NO
488		JAN 12, 1978	OPER TEST	NO
489		DEC 23, 1977	OPER TEST	NO
490		DEC 22, 1977	OPER TEST	NO
491	NRC	DEC 21, 1977	SP 42-109	NO
492		DEC 20, 1977	RX TRIP	NO

TABLE 3A (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA					
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?	
493		DEC 19, 1977	OPER TEST	NO	
494		DEC 16, 1977	OPER TEST	NO	
495		DEC 16, 1977	OPER TEST	NO	
496		DEC 15, 1977	OPER TEST	NO	
497	NRC	DEC 14, 1977	SP 42-152	YES	LER 77-36
498		DEC 14, 1977	OPER TEST	NO	
499		DEC 14, 1977	OPER TEST	NO	
500		DEC 05, 1977	OPER TEST	NO	
501		DEC 02, 1977	OPER TEST	NO	
502		DEC 01, 1977	OPER TEST	NO	
503		NOV 29, 1977	OPER TEST	NO	
504		NOV 23, 1977	OPER TEST	NO	
505		NOV 22, 1977	OPER TEST	NO	
506		NOV 21, 1977	OPER TEST	NO	
507	NRC	NOV 20, 1977	SP 42-109	NO	
508		NOV 20, 1977	SP 42-152	NO	
509		NOV 17, 1977	OPER TEST	NO	
510		NOV 15, 1977	OPER TEST	NO	
511		OCT 28, 1977	OPER TEST	NO	
512		OCT 27, 1977	OPER TEST	NO	
513	NRC	OCT 25, 1977	OPER TEST	YES	LER 77-30
514		OCT 25, 1977	OPER TEST	NO	
515		OCT 21, 1977	OPER TEST	NO	
516	NRC	OCT 20, 1977	SP 42-109	NO	
517		OCT 20, 1977	OPER TEST	NO	
518		OCT 20, 1977	OPER TEST	NO	
519		OCT 18, 1977	OPER TEST	NO	
520		OCT 17, 1977	OPER TEST	NO	
521		OCT 13, 1977	SP 42-152	NO	
522		OCT 10, 1977	OPER TEST	NO	
523		OCT 07, 1977	OPER TEST	NO	
524		OCT 06, 1977	OPER TEST	NO	
525		SEP 29, 1977	OPER TEST	NO	
526	NRC	SEP 23, 1977	SP 42-109	NO	
527	NRC	SEP 22, 1977	OPER TEST	NO	
528		SEP 22, 1977	OPER TEST	NO	
529		SEP 20, 1977	SP 42-109	NO	
530		SEP 20, 1977	SP 42-152	NO	
531		AUG 26, 1977	OPER TEST	NO	
532		AUG 24, 1977	OPER TEST	NO	
533	NRC	AUG 20, 1977	SP 42-109	NO	
534		AUG 20, 1977	SP 42-152	NO	
535		AUG 15, 1977	OPER TEST	NO	
536		AUG 09, 1977	OPER TEST	NO	
537		AUG 08, 1977	OPER TEST	NO	

TABLE 3A (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA				
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
538		JUL 25, 1977	SP 47-062	NO
539		JUL 22, 1977	OPER TEST	NO
540	NRC	JUL 20, 1977	SP 42-109	NO
541		JUL 20, 1977	SP 42-152	NO
542	NRC	JUN 20, 1977	SP 42-109	NO

TABLE 3B

DIESEL GENERATOR 1B RELIABILITY DATA

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
1		AUG 12, 1984	SP 42-152	NO
2		AUG 09, 1984	OPER TEST	NO
3		JUL 25, 1984	OPER TEST	NO
4	NRC	JUL 20, 1984	SP 42-109	NO
5		JUL 16, 1984	OPER TEST	NO
6		JUL 16, 1984	OPER TEST	NO
7		JUL 16, 1984	OPER TEST	NO
8		JUL 11, 1984	SP 42-152	NO
9		JUL 03, 1984	OPER TEST	NO
10		JUL 03, 1984	RX TRIP	NO
11		JUN 26, 1984	OPER TEST	NO
12		JUN 25, 1984	OPER TEST	NO
13	NRC	JUN 23, 1984	SP 42-109	NO
14		JUN 12, 1984	SP 42-152	NO
15	NRC	MAY 21, 1984	SP 42-109	NO
16		MAY 14, 1984	SP 42-152	NO
17		MAY 08, 1984	RX TRIP	NO
18		MAY 07, 1984	RX TRIP	NO
19	NRC	APR 30, 1984	SP 42-109	NO
20		APR 27, 1984	SP 33-110	NO
21		APR 20, 1984	BUMPED SWITCH	NO
22	NRC	APR 18, 1984	SP 42-109	NO
23		APR 18, 1984	OPER TEST	NO
24		APR 16, 1984	SP 42-152	NO
25	NRC	APR 14, 1984	OPER TEST	NO
26	NRC	APR 13, 1984	OPER TEST	NO
27		APR 06, 1984	OPER TEST	NO
28	NRC	MAR 26, 1984	SP 42-109	NO
29		MAR 16, 1984	RX TRIP	NO
30		MAR 11, 1984	SP 42-152	NO
31		MAR 07, 1984	OPER TEST	NO
32		MAR 01, 1984	SP 08-186	NO
33		MAR 01, 1984	OPER TEST	NO
34		FEB 24, 1984	OPER TEST	NO
35		FEB 24, 1984	OPER TEST	NO
36	NRC	FEB 21, 1984	SP 42-109	NO
37		FEB 12, 1984	SP 42-152	NO
38		JAN 27, 1984	SWIT PROC	NO
39	NRC	JAN 20, 1984	SP 42-109	NO
40		JAN 12, 1984	SP 42-152	NO
41	NRC	DEC 21, 1983	SP 42-109	NO
42		DEC 12, 1983	SP 42-152	NO

TABLE 3B (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA				
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
43	NRC	NOV 21, 1983	SP 42-109	NO
44		NOV 16, 1983	OPER TEST	NO
45		NOV 12, 1983	SP 42-152	NO
46	NRC	OCT 21, 1983	SP 42-109	NO
47		OCT 12, 1983	SP 42-152	NO
48	NRC	SEP 21, 1983	SP 42-109	NO
49		SEP 16, 1983	OPER TEST	NO
50		SEP 12, 1983	SP 42-152	NO
51	NRC	AUG 22, 1983	SP 42-109	NO
52		AUG 18, 1983	OPER TEST	NO
53		AUG 17, 1983	OPER TEST	NO
54		AUG 16, 1983	OPER TEST	NO
55		AUG 16, 1983	SP 08-186	NO
56		AUG 16, 1983	OPER TEST	NO
57		AUG 16, 1983	OPER TEST	NO
58		AUG 12, 1983	SP 42-152	NO
59		AUG 12, 1983	OPER TEST	NO
60		AUG 11, 1983	OPER TEST	NO
61		JUL 28, 1983	RX TRIP	NO
62		JUL 27, 1983	RX TRIP	NO
63	NRC	JUL 21, 1983	SP 42-109	NO
64		JUL 12, 1983	SP 42-152	NO
65		JUL 12, 1983	OPER TEST	NO
66	NRC	JUN 21, 1983	SP 42-109	NO
67		JUN 14, 1983	OPER TEST	NO
68		JUN 12, 1983	SP 42-152	NO
69		MAY 26, 1983	OPER TEST	NO
70		MAY 25, 1983	RX TRIP	NO
71		MAY 15, 1983	RX TRIP	NO
72		MAY 12, 1983	SP 42-152	NO
73	NRC	MAY 10, 1983	SP 42-109	NO
74		MAY 07, 1983	OPER TEST	NO
75	NRC	MAY 03, 1983	PWR REQUEST	NO
76		APR 24, 1983	OPER TEST	NO
77		APR 23, 1983	SP 33-110	NO
78		APR 13, 1983	SP 42-152	NO
79	NRC	APR 04, 1983	SP 42-109	NO
80		MAR 17, 1983	TURB TRIP	NO
81	NRC	MAR 16, 1983	SP 42-109	NO
82		MAR 12, 1983	SP 42-152	NO
83	NRC	FEB 21, 1983	SP 42-109	NO
84		FEB 18, 1983	OPER TEST	NO
85		FEB 16, 1983	OPER TEST	NO
86		FEB 15, 1983	OPER TEST	NO
87		FEB 14, 1983	OPER TEST	NO

TABLE 3B (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA				
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
88		FEB 14, 1983	OPER TEST	NO
89		FEB 12, 1983	SP 42-152	NO
90		FEB 09, 1983	OPER TEST	NO
91		FEB 09, 1983	SP 08-186	NO
92		FEB 09, 1983	OPER TEST	NO
93		FEB 07, 1983	OPER TEST	NO
94		FEB 07, 1983	OPER TEST	NO
95		JAN 28, 1983	OPER TEST	NO
96		JAN 27, 1983	OPER TEST	NO
97		JAN 26, 1983	OPER TEST	NO
98		JAN 25, 1983	OPER TEST	NO
99		JAN 24, 1983	OPER TEST	NO
100	NRC	JAN 21, 1983	SP 42-109	NO
101		JAN 18, 1983	OPER TEST	NO
102		JAN 17, 1983	OPER TEST	NO
103		JAN 12, 1983	SP 42-152	NO
104		JAN 04, 1983	OPER TEST	NO
105		DEC 27, 1982	RX TRIP	NO
106	NRC	DEC 21, 1982	SP 42-109	NO
107		DEC 21, 1982	OPER TEST	NO
108		DEC 15, 1982	OPER TEST	NO
109		DEC 12, 1982	SP 42-152	NO
110		NOV 30, 1982	OPER TEST	NO
111	NRC	NOV 22, 1982	SP 42-109	NO
112		NOV 15, 1982	OPER TEST	NO
113		NOV 15, 1982	OPER TEST	NO
114		NOV 12, 1982	SP 42-152	NO
115	NRC	OCT 21, 1982	SP 42-109	NO
116		OCT 12, 1982	SP 42-152	NO
117		SEP 30, 1982	OPER TEST	NO
118	NRC	SEP 21, 1982	SP 42-109	NO
119		SEP 21, 1982	OPER TEST	NO
120		SEP 11, 1982	SP 42-152	NO
121		AUG 23, 1982	OPER TEST	NO
122	NRC	AUG 20, 1982	SP 42-109	NO
123		AUG 19, 1982	OPER TEST	NO
124		AUG 19, 1982	SP 08-186	NO
125		AUG 19, 1982	OPER TEST	NO
126		AUG 16, 1982	SP 08-186	NO
127		AUG 16, 1982	OPER TEST	NO
128		AUG 12, 1982	SP 42-152	NO
129		AUG 12, 1982	OPER TEST	NO
130		AUG 11, 1982	OPER TEST	NO
131		AUG 09, 1982	OPER TEST	NO
132		AUG 09, 1982	OPER TEST	NO

TABLE 3B (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA				
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
133		AUG 06, 1982	OPER TEST	NO
134		AUG 05, 1982	OPER TEST	NO
135		AUG 03, 1982	OPER TEST	NO
136	NRC	JUL 21, 1982	SP 42-109	NO
137		JUL 14, 1982	OPER TEST	NO
138		JUL 12, 1982	SP 42-152	NO
139		JUL 12, 1982	OPER TEST	NO
140		JUL 11, 1982	OPER TEST	NO
141		JUN 28, 1982	SP 47-062	NO
142	NRC	JUN 21, 1982	SP 42-109	NO
143		JUN 12, 1982	SP 42-152	NO
144	NRC	MAY 28, 1982	SP 42-109	NO
145		MAY 26, 1982	OPER TEST	NO
146		MAY 23, 1982	RX TRIP	NO
147		MAY 16, 1982	OPER TEST	NO
148		MAY 12, 1982	SP 42-152	NO
149		MAY 04, 1982	OPER TEST	NO
150		APR 29, 1982	SP 33-110	NO
151	NRC	APR 22, 1982	SP 42-109	NO
152		APR 15, 1982	OPER TEST	NO
153		MAR 31, 1982	OPER TEST	NO
154	NRC	MAR 19, 1982	SP 42-109	NO
155		MAR 14, 1982	SP 42-152	NO
156	NRC	FEB 19, 1982	SP 42-109	NO
157		FEB 17, 1982	OPER TEST	NO
158		FEB 17, 1982	SP 08-186	NO
159		FEB 17, 1982	OPER TEST	NO
160		FEB 16, 1982	OPER TEST	NO
161		FEB 13, 1982	OPER TEST	NO
162		FEB 12, 1982	SP 42-152	NO
163	NRC	JAN 21, 1982	SP 42-109	NO
164		JAN 12, 1982	SP 42-152	NO
165		JAN 01, 1982	TRAINING	NO
166	NRC	DEC 21, 1981	SP 42-109	NO
167		DEC 18, 1981	OPER TEST	NO
168		DEC 12, 1981	SP 42-152	NO
169		DEC 11, 1981	OPER TEST	NO
170		DEC 10, 1981	OPER TEST	NO
171		DEC 09, 1981	OPER TEST	NO
172	NRC	NOV 19, 1981	SP 42-109	NO
173		NOV 19, 1981	OPER TEST	NO
174		NOV 14, 1981	SP 42-152	NO
175		OCT 23, 1981	OPER TEST	NO
176	NRC	OCT 22, 1981	SP 42-109	NO
177		OCT 22, 1981	OPER TEST	NO

TABLE 3B (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA				
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
178		OCT 20, 1981	OPER TEST	NO
179		OCT 16, 1981	OPER TEST	NO
180		OCT 12, 1981	SP 42-152	NO
181		OCT 01, 1981	OPER TEST	NO
182	NRC	SEP 21, 1981	SP 42-109	NO
183		SEP 18, 1981	OPER TEST	NO
184		SEP 12, 1981	SP 42-152	NO
185	NRC	AUG 21, 1981	SP 42-109	NO
186		AUG 12, 1981	SP 42-152	NO
187		AUG 12, 1981	OPER TEST	NO
188		AUG 12, 1981	OPER TEST	NO
189	NRC	JUL 22, 1981	SP 42-109	NO
190		JUL 21, 1981	OPER TEST	NO
191		JUL 17, 1981	OPER TEST	NO
192		JUL 12, 1981	SP 42-152	NO
193		JUN 25, 1981	OPER TEST	NO
194	NRC	JUN 22, 1981	SP 42-109	NO
195		JUN 22, 1981	OPER TEST	NO
196		JUN 16, 1981	OPER TEST	NO
197		JUN 12, 1981	SP 42-152	NO
198		JUN 06, 1981	RX TRIP	NO
199		JUN 04, 1981	TURB TRIP	NO
200		MAY 29, 1981	OPER TEST	NO
201		MAY 28, 1981	OPER TEST	NO
202		MAY 27, 1981	OPER TEST	NO
203	NRC	MAY 26, 1981	SP 42-109	NO
204		MAY 26, 1981	OPER TEST	NO
205		MAY 24, 1981	OPER TEST	NO
206		MAY 12, 1981	SP 42-152	NO
207		MAY 10, 1981	SP 33-110	NO
208	NRC	MAY 02, 1981	SP 42-109	NO
209		APR 20, 1981	TURB TRIP	NO
210	NRC	APR 16, 1981	SP 42-109	NO
211		APR 16, 1981	OPER TEST	NO
212		APR 16, 1981	OPER TEST	NO
213		APR 15, 1981	OPER TEST	NO
214		APR 12, 1981	SP 42-15	NO
215		APR 04, 1981	OPER TEST	NO
216		MAR 31, 1981	OPER TEST	NO
217		MAR 30, 1981	OPER TEST	NO
218	NRC	MAR 24, 1981	SP 42-109	NO
219		MAR 21, 1981	RX TRIP	NO
220		MAR 12, 1981	SP 42-152	NO
221		FEB 28, 1981	RX TRIP	NO
222		FEB 27, 1981	OPER TEST	NO

TABLE 3B (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA					
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?	
223	NRC	FEB 20, 1981	SP 42-109	NO	
224		FEB 17, 1981	OPER TEST	NO	
225		FEB 17, 1981	SP 08-186	NO	
226		FEB 17, 1981	OPER TEST	NO	
227		FEB 16, 1981	OPER TEST	NO	
228		FEB 16, 1981	OPER TEST	NO	
229		FEB 12, 1981	SP 42-152	NO	
230	NRC	JAN 21, 1981	SP 42-109	NO	
231		JAN 21, 1981	OPER TEST	NO	
232		JAN 14, 1981	OPER TEST	NO	
233	NRC	JAN 13, 1981	OPER TEST	YES	LER 81-02
234		JAN 13, 1981	OPER TEST	NO	
235		JAN 12, 1981	SP 42-152	NO	
236		DEC 26, 1980	RX TRIP	NO	
237	NRC	DEC 22, 1980	SP 42-109	NO	
238		DEC 16, 1980	OPER TEST	NO	
239		DEC 16, 1980	OPER TEST	NO	
240		DEC 12, 1980	OPER TEST	NO	
241		DEC 12, 1980	SP 42-152	NO	
242		DEC 12, 1980	OPER TEST	NO	
243	NRC	DEC 05, 1980	SP ON VALVES	NO	
244	NRC	NOV 21, 1980	SP 42-109	NO	
245		NOV 21, 1980	OPER TEST	NO	
246		NOV 17, 1980	OPER TEST	NO	
247		NOV 17, 1980	SP 42-152	NO	
248		NOV 17, 1980	SP 42-152	NO	
249		NOV 12, 1980	SP 42-152	NO	
250		OCT 31, 1980	OPER TEST	NO	
251		OCT 28, 1980	SP 47-062	NO	
252	NRC	OCT 21, 1980	SP 42-109	NO	
253		OCT 21, 1980	OPER TEST	NO	
254		OCT 21, 1980	OPER TEST	NO	
255		OCT 15, 1980	OPER TEST	NO	
256		OCT 12, 1980	SP 42-152	NO	
257		SEP 26, 1980	RX TRIP	NO	
258	NRC	SEP 23, 1980	OPER TEST	NO	
259	NRC	SEP 22, 1980	SP 42-109	NO	
260		SEP 19, 1980	OPER TEST	NO	
261		SEP 15, 1980	OPER TEST	NO	
262		SEP 12, 1980	SP 42-152	NO	
263		SEP 10, 1980	OPER TEST	NO	
264	NRC	AUG 22, 1980	SP 42-109	NO	
265		AUG 19, 1980	RX TRIP	NO	
266		AUG 14, 1980	OPER TEST	NO	
267		AUG 14, 1980	SP 08-186	NO	

TABLE 3B (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA					
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?	
268		AUG 14, 1980	OPER TEST	NO	
269		AUG 12, 1980	SP 42-152	NO	
270	NRC	JUL 21, 1980	SP 42-109	NO	
271		JUL 16, 1980	OPER TEST	NO	
272		JUL 13, 1980	RX TRIP	NO	
273		JUL 12, 1980	SP 42-152	NO	
274	NRC	JUN 21, 1980	SP 42-152	YES	LER 80-27
275		JUN 01, 1980	SP 33-110	NO	
276		MAY 27, 1980	OPER TEST	NO	
277	NRC	MAY 26, 1980	SP 42-109	NO	
278		MAY 23, 1980	OPER TEST	NO	
279		MAY 15, 1980	OPER TEST	NO	
280		MAY 12, 1980	SP 42-152	NO	
281		MAY 09, 1980	RX TRIP	NO	
282		APR 24, 1980	SP 47-062	NO	
283		APR 24, 1980	OPER TEST	NO	
284		APR 22, 1980	OPER TEST	NO	
285		APR 22, 1980	OPER TEST	NO	
286	NRC	APR 21, 1980	SP 42-109	NO	
287		APR 21, 1980	OPER TEST	NO	
288		APR 12, 1980	SP 42-152	NO	
289		MAR 27, 1980	OPER TEST	NO	
290		MAR 27, 1980	OPER TEST	NO	
291	NRC	MAR 21, 1980	SP 42-109	NO	
292		MAR 20, 1980	OPER TEST	NO	
293		MAR 13, 1980	OPER TEST	NO	
294		MAR 12, 1980	SP 42-152	NO	
295		MAR 10, 1980	OPER TEST	NO	
296		MAR 10, 1980	OPER TEST	NO	
297		MAR 07, 1980	OPER TEST	NO	
298	NRC	MAR 05, 1980	OPER TEST	YES	LER 80-16
299		FEB 27, 1980	OPER TEST	NO	
300		FEB 27, 1980	OPER TEST	NO	
301		FEB 21, 1980	OPER TEST	NO	
302	NRC	FEB 21, 1980	SP 42-109	YES	LER 80-12
303		FEB 18, 1980	OPER TEST	NO	
304		FEB 18, 1980	SP 08-186	NO	
305		FEB 18, 1980	OPER TEST	NO	
306		FEB 15, 1980	OPER TEST	NO	
307		FEB 15, 1980	OPER TEST	NO	
308		FEB 13, 1980	OPER TEST	NO	
309		FEB 13, 1980	SP 42-152	NO	
310		FEB 07, 1980	OPER TEST	NO	
311		FEB 07, 1980	OPER TEST	NO	
312		FEB 06, 1980	OPER TEST	NO	

TABLE 3B (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
313		FEB 03, 1980	RX TRIP	NO
314		FEB 01, 1980	OPER TEST	NO
315		JAN 30, 1980	OPER TEST	NO
316		JAN 29, 1980	OPER TEST	NO
317		JAN 27, 1980	OPER TEST	NO
318		JAN 27, 1980	OPER TEST	NO
319		JAN 26, 1980	OPER TEST	NO
320	NRC	JAN 25, 1980	SP 42-109	NO
321	NRC	JAN 19, 1980	8 HR LOAD	NO
322	NRC	JAN 18, 1980	OPER TEST	NO
323		JAN 18, 1980	OPER TEST	NO
324	NRC	JAN 17, 1980	RX TRIP	NO
325		JAN 16, 1980	OPER TEST	NO
326	NRC	JAN 15, 1980	24 HR TEST	NO
327		JAN 12, 1980	SP 42-152	NO
328		JAN 05, 1980	RX TRIP	NO
329		DEC 27, 1979	OPER TEST	NO
330	NRC	DEC 26, 1979	SP 42-109	NO
331		DEC 26, 1979	OPER TEST	NO
332		DEC 22, 1979	OPER TEST	NO
333		DEC 21, 1979	OPER TEST	NO
334		DEC 19, 1979	OPER TEST	NO
335		DEC 18, 1979	OPER TEST	NO
336		DEC 17, 1979	OPER TEST	NO
337		DEC 12, 1979	SP 42-152	NO
338		DEC 10, 1979	RX TRIP	NO
339		NOV 29, 1979	SP 47-062	NO
340	NRC	NOV 21, 1979	SP 42-109	NO
341		NOV 21, 1979	OPER TEST	NO
342		NOV 12, 1979	SP 42-152	NO
343		NOV 02, 1979	OPER TEST	NO
344		OCT 23, 1979	OPER TEST	NO
345	NRC	OCT 23, 1979	SP 47-062	YES
346		OCT 23, 1979	OPER TEST	NO
347	NRC	OCT 22, 1979	SP 42-109	NO
348		OCT 22, 1979	OPER TEST	NO
349		OCT 12, 1979	SP 42-152	NO
350		SEP 26, 1979	OPER TEST	NO
351		SEP 24, 1979	SP 47-062	NO
352		SEP 22, 1979	OPER TEST	NO
353	NRC	SEP 21, 1979	SP 42-109	NO
354		SEP 21, 1979	OPER TEST	NO
355		SEP 12, 1979	SP 42-152	NO
356		SEP 12, 1979	RX TRIP	NO
357		AUG 30, 1979	OPER TEST	NO

LER 79-27

TABLE 3B (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
358	NRC	AUG 22, 1979	SP 42-109	NO
359		AUG 22, 1979	OPER TEST	NO
360		AUG 21, 1979	OPER TEST	NO
361		AUG 21, 1979	SP 08-186	NO
362		AUG 21, 1979	OPER TEST	NO
363		AUG 20, 1979	OPER TEST	NO
364		AUG 17, 1979	OPER TEST	NO
365		AUG 16, 1979	OPER TEST	NO
366		AUG 15, 1979	OPER TEST	NO
367		AUG 15, 1979	SP 42-152	NO
368		AUG 14, 1979	OPER TEST	NO
369		AUG 02, 1979	RX TRIP	NO
370		JUL 25, 1979	OPER TEST	NO
371	NRC	JUL 13, 1979	SP 42-109	NO
372		JUL 09, 1979	OPER TEST	NO
373		JUN 28, 1979	OPER TEST	NO
374		JUN 15, 1979	OPER TEST	NO
375		JUN 14, 1979	OPER TEST	NO
376		JUN 13, 1979	OPER TEST	NO
377		JUN 12, 1979	SP 33-110	NO
378		JUN 12, 1979	OPER TEST	NO
379		MAY 24, 1979	SP 47-062	NO
380	NRC	MAY 22, 1979	SP 42-109	NO
381		MAY 22, 1979	OPER TEST	NO
382		MAY 13, 1979	SP 42-152	NO
383		MAY 02, 1979	OPER TEST	NO
384		MAY 01, 1979	OPER TEST	NO
385		APR 30, 1979	OPER TEST	NO
386		APR 25, 1979	SP 47-062	NO
387	NRC	APR 20, 1979	SP 42-109	NO
388		APR 18, 1979	OPER TEST	NO
389		APR 17, 1979	OPER TEST	NO
390		APR 16, 1979	OPER TEST	NO
391		APR 13, 1979	SP 42-152	NO
392		APR 12, 1979	OPER TEST	NO
393		APR 11, 1979	OPER TEST	NO
394		APR 10, 1979	OPER TEST	NO
395		APR 07, 1979	OPER TEST	NO
396		APR 06, 1979	OPER TEST	NO
397		APR 05, 1979	OPER TEST	NO
398		APR 04, 1979	OPER TEST	NO
399		MAR 30, 1979	OPER TEST	NO
400		MAR 28, 1979	OPER TEST	NO
401		MAR 27, 1979	OPER TEST	NO
402		MAR 26, 1979	OPER TEST	NO

TABLE 3B (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
403		MAR 22, 1979	OPER TEST	NO
404	NRC	MAR 21, 1979	SP 42-109	NO
405		MAR 21, 1979	OPER TEST	NO
406		MAR 19, 1979	OPER TEST	NO
407		MAR 16, 1979	OPER TEST	NO
408		MAR 15, 1979	OPER TEST	NO
409		MAR 14, 1979	SP 42-152	NO
410		MAR 14, 1979	OPER TEST	NO
411		MAR 12, 1979	RX TRIP	NO
412		MAR 11, 1979	RX TRIP	NO
413		MAR 03, 1979	OPER TEST	NO
414		MAR 02, 1979	OPER TEST	NO
415		FEB 28, 1979	OPER TEST	NO
416		FEB 28, 1979	SP 08-186	NO
417		FEB 28, 1979	OPER TEST	NO
418		FEB 27, 1979	SP 47-062	NO
419	NRC	FEB 23, 1979	SP 42-109	NO
420		FEB 23, 1979	OPER TEST	NO
421		FEB 22, 1979	OPER TEST	NO
422	NRC	FEB 21, 1979	OPER TEST	NO
423		FEB 21, 1979	OPER TEST	NO
424		FEB 20, 1979	OPER TEST	NO
425		FEB 19, 1979	OPER TEST	NO
426		FEB 18, 1979	OPER TEST	NO
427		FEB 17, 1979	OPER TEST	NO
428		FEB 16, 1979	OPER TEST	NO
429		FEB 15, 1979	OPER TEST	NO
430		FEB 14, 1979	OPER TEST	NO
431		FEB 13, 1979	OPER TEST	NO
432		FEB 13, 1979	SP 42-152	NO
433		FEB 05, 1979	RX TRIP	NO
434		JAN 29, 1979	SP 47-062	NO
435	NRC	JAN 22, 1979	SP 42-109	NO
436		JAN 17, 1979	OPER TEST	NO
437		JAN 13, 1979	SP 42-152	NO
438		JAN 12, 1979	OPER TEST	NO
439	NRC	JAN 11, 1979	OPER TEST	NO
440		JAN 08, 1979	OPER TEST	NO
441		DEC 27, 1978	OPER TEST	NO
442		DEC 27, 1978	OPER TEST	NO
443	NRC	DEC 21, 1978	SP 42-109	NO
444		DEC 19, 1978	OPER TEST	NO
445		DEC 13, 1978	SP 42-152	NO
446		DEC 12, 1978	OPER TEST	NO
447		DEC 08, 1978	OPER TEST	NO

TABLE 3B (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA				
OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
448		DEC 07, 1978	OPER TEST	NO
449		DEC 06, 1978	OPER TEST	NO
450		NOV 27, 1978	OPER TEST	NO
451		NOV 22, 1978	OPER TEST	NO
452	NRC	NOV 21, 1978	SP 42-109	NO
453		NOV 13, 1978	SP 42-152	NO
454		NOV 05, 1978	RX TRIP	NO
455	NRC	OCT 19, 1978	SP 42-109	NO
456		OCT 13, 1978	OPER TEST	NO
457		OCT 13, 1978	SP 42-152	NO
458		SEP 25, 1978	SP 47-062	NO
459	NRC	SEP 21, 1978	SP 42-109	NO
460		SEP 15, 1978	OPER TEST	NO
461		SEP 14, 1978	RX TRIP	NO
462		SEP 13, 1978	SP 42-152	NO
463	NRC	AUG 21, 1978	SP 42-109	NO
464		AUG 18, 1978	OPER TEST	NO
465		AUG 18, 1978	OPER TEST	NO
466		AUG 16, 1978	OPER TEST	NO
467		AUG 16, 1978	OPER TEST	NO
468		AUG 14, 1978	OPER TEST	NO
469		AUG 14, 1978	SP 42-152	NO
470	NRC	JUL 21, 1978	SP 42-109	NO
471		JUL 13, 1978	OPER TEST	NO
472		JUL 13, 1978	SP 42-152	NO
473		JUN 27, 1978	TURB TRIP	NO
474		JUN 27, 1978	RX TRIP	NO
475		JUN 24, 1978	TURB TRIP	NO
476	NRC	JUN 21, 1978	SP 42-109	NO
477		JUN 21, 1978	OPER TEST	NO
478		JUN 13, 1978	SP 42-152	NO
479		JUN 05, 1978	OPER TEST	NO
480		MAY 31, 1978	SP 47-062	NO
481		MAY 29, 1978	TURB TRIP	NO
482		MAY 28, 1978	RX TRIP	NO
483	NRC	MAY 23, 1978	SP 42-109	NO
484		MAY 20, 1978	OPER TEST	NO
485		MAY 19, 1978	OPER TEST	NO
486		MAY 16, 1978	SP 33-110	NO
487		MAY 14, 1978	SP 42-152	NO
488	NRC	MAY 06, 1978	OPER TEST	NO
489		MAY 03, 1978	OPER TEST	NO
490		MAY 02, 1978	OPER TEST	NO
491		APR 30, 1978	OPER TEST	NO
492	NRC	APR 22, 1978	SP 42-109	NO

TABLE 3B (CONT.)

DIESEL GENERATOR 1B RELIABILITY DATA

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
493		APR 13, 1978	SP 42-152	NO
494		APR 06, 1978	OPER TEST	NO
495		MAR 23, 1978	OPER TEST	NO
496	NRC	MAR 21, 1978	SP 42-109	NO
497		MAR 13, 1978	SP 42-152	NO
498		MAR 07, 1978	OPER TEST	NO
499		MAR 06, 1978	OPER TEST	NO
500		MAR 02, 1978	OPER TEST	NO
501		FEB 28, 1978	OPER TEST	NO
502		FEB 27, 1978	OPER TEST	NO
503	NRC	FEB 21, 1978	SP 42-109	NO
504		FEB 20, 1978	SP 47-062	NO
505		FEB 13, 1978	SP 42-152	NO
506		FEB 09, 1978	OPER TEST	NO
507		FEB 08, 1978	OPER TEST	NO
508		FEB 08, 1978	OPER TEST	NO
509		JAN 23, 1978	OPER TEST	NO
510	NRC	JAN 21, 1978	SP 42-109	NO
511		JAN 16, 1978	OPER TEST	NO
512		JAN 13, 1978	SP 42-152	NO
513		JAN 13, 1978	OPER TEST	NO
514		JAN 12, 1978	OPER TEST	NO
515		DEC 23, 1977	OPER TEST	NO
516		DEC 22, 1977	OPER TEST	NO
517		DEC 22, 1977	OPER TEST	NO
518	NRC	DEC 21, 1977	OPER TEST	NO
519	NRC	DEC 21, 1977	SP 42-109	YES
520		DEC 21, 1977	OPER TEST	NO
521		DEC 20, 1977	RX TRIP	NO
522		DEC 20, 1977	OPER TEST	NO
523		DEC 19, 1977	OPER TEST	NO
524		DEC 16, 1977	OPER TEST	NO
525		DEC 15, 1977	OPER TEST	NO
526		DEC 14, 1977	SP 42-152	NO
527		DEC 14, 1977	OPER TEST	NO
528		DEC 02, 1977	OPER TEST	NO
529		DEC 01, 1977	OPER TEST	NO
530		NOV 30, 1977	OPER TEST	NO
531		NOV 30, 1977	OPER TEST	NO
532		NOV 30, 1977	OPER TEST	NO
533		NOV 30, 1977	OPER TEST	NO
534		NOV 30, 1977	OPER TEST	NO
535		NOV 29, 1977	OPER TEST	NO
536		NOV 29, 1977	OPER TEST	NO
537		NOV 29, 1977	OPER TEST	NO

LER 77-38

TABLE 3B (CONT.)

OBS	NRC	DATE OF START	REASON FOR START	FAILURE?
538	NRC	NOV 29, 1977	OPER TEST	NO
539		NOV 23, 1977	OPER TEST	NO
540		NOV 22, 1977	OPER TEST	NO
541		NOV 21, 1977	OPER TEST	NO
542	NRC	NOV 20, 1977	SP 42-109	NO
543		NOV 20, 1977	OPER TEST	NO
544		NOV 20, 1977	SP 47-152	NO
545		NOV 17, 1977	OPER TEST	NO
546		NOV 15, 1977	OPER TEST	NO
547		OCT 28, 1977	OPER TEST	NO
548		OCT 27, 1977	OPER TEST	NO
549		OCT 25, 1977	OPER TEST	NO
550		OCT 21, 1977	OPER TEST	NO
551	NRC	OCT 20 1977	SP 42-109	NO

TABLE 4

No. of Failures		Category	
1A	1B		
1	3	Starting System	Engine and Related Failures
0	0	Fuel System	
0	0	Lube Oil System	
0	0	Cooling System	
2	1	Governor	
0	0	Miscellaneous	
1	1	Relays/Breakers	Electrical Failures
0	0	Conn. & Term.	
0	0	Exciter/ Voltage Regulator	
0	0	Miscellaneous	
0	0	Design Logic	General Failures
0	0	Procedure	
0	0	Personnel	
1	1	Miscellaneous	

APPENDIX A

The following is our interpretation of Regulatory Guide 1.108, (Revision 1, August 1977), position c.2.e "Periodic Testing of Diesel Generator Units Used as Onsite Electrical Power Systems at Nuclear Power Plants". The assembly of data for the requested last 20 and 100 demands was based on the following criteria. We feel that the appropriate method for diagnosing this data is to consider total diesel generator reliability as the combination of the probability for successful start and probability for successful loading, given start.

1. All start attempts that resulted in a failure were included in the compilation. According to Regulatory Guide 1.108; "Failure" is taken here to mean the failure to start, accelerate, and assume the design-rated load within and for the time prescribed during an emergency or a valid test.
2. All successful starts, including those initiated by bona fide signals, followed by successful loading to at least 50% of continuous rating and continued operation for at least one hour were included in the compilation as valid tests.
3. Successful starts followed by unsuccessful loading attempts were indicated as failures.
4. Tests that were terminated intentionally before completion, as defined in Regulatory Guide 1.108, position c.2.e(3), because of an alarmed abnormal condition that would ultimately have resulted in diesel generator damage or failure were considered valid tests and failures.

5. Tests that were performed to verify correction of a problem that also meet the criteria of a one hour continuous run with the diesel loaded to at least 50% of continuous rating were included as valid tests.
6. Cranking and venting procedures that lead to the discovery of conditions that would have resulted in the failure of the diesel generator unit during a test or during response to a bona fide signal were considered valid tests and failures.

The following criteria was employed for the exclusion of data from the requested last 20 and 100 demands.

1. Unsuccessful start and load attempts that were attributed to operating error, spurious operation of a trip that is bypassed in the emergency operating mode, or malfunction of equipment that is not operative in the emergency operating mode or is not part of the defined diesel generator unit design were excluded as valid tests and failures.
2. Successful starts that were terminated intentionally without loading were not included in the compilation. These starts do not meet the criteria set forth in position c.2.e(3) of the Regulatory Guide.
3. Tests performed in the process of troubleshooting were not included as valid tests or failures.

APPENDIX B

LER 77-30

IR #77-058

October 25, 1977

An operability test was being performed on diesel generator 1A prior to performing maintenance on diesel generator 1B. Diesel generator 1A started and was at approximately 70 RPM when it stopped and a "Start Failure Alarm" was received. Investigation into the failure of the diesel generator to remain running did not disclosed a cause for this start failure. Diesel generator 1A started and operated satisfactorily upon a second start attempt and during all subsequent scheduled testing (i.e. monthly surveillance procedures for logic test and 4-hour loaded run).

LER 77-36

IR #77-068

December 12, 1977

The logic test for diesel generator 1A was being conducted when the "Voltage Restoring Blown Fuse" annunciator sounded and diesel generator 1A failed to start. The failure was caused by corroded contacts in the instantaneous under-voltage relay. The relay was replaced with a fully enclosed relay. This fully enclosed design has eliminated the contact fouling problem encountered with the original relay.

LER 78-32

IR #78-69

October 19, 1978

Surveillance testing on 1A diesel generator indicated that the diesel generator would not pick up more than 2100 KW. This condition may have caused the diesel generator to be unable to fully respond in an accident condition. A cam in the upper load limit switch was found to be out of adjustment. The cam was readjusted and the diesel generator returned to full operability.

LER 79-04

IR #79-006

February 16, 1979

An operability test was being performed on diesel generator 1A when it failed to start due to a failure of the air start motors. A broken air start motor rotor vane jammed the primary diesel generator air start motor. Corrosion resulting from moisture in the startup air is believed to have contributed to this failure. The preventative maintenance procedure was revised to include an inspection of the air start motors on a frequency to prevent future failures of this type. In addition, during the 1982 refueling outage a design change installed air dryers on the air start system which resolved the moisture problem.

IR #83-38

March 31, 1983

Diesel generator 1A tripped on overspeed from 3050 KW during SP 42-109 after overhaul. The cause of the problem was air in the governor. No licensee event report was required due to the diesel generators not being needed during plant shutdown. A procedural change was made to correct this problem.

APPENDIX B (Continued)

LER 77-38

IR #77-071

December 21, 1977

Surveillance testing on diesel generator 1B indicated that the diesel generator would not pick up more than 1500 KW. Prior to this occurrence during corrective maintenance for an RPM indication problem, the diesel generator synchronizer limit switches were adjusted and the local RPM meter was calibrated. The maintenance procedure did not require testing of the diesel generator at full load when the work was completed. The synchronizer limit switches were returned to their original settings and a change to the diesel generator maintenance manual was made to provide for operational testing following adjustments to control components.

LER 79-27

IR #79-65

October 23, 1979

Diesel generator 1B failed to start during the performance of the turbine trip/reactor trip logic test step of the reactor protection logic surveillance procedure. The diesel generator received a start signal from logic circuits and attempted to start. A start failure alarm was annunciated in the control room. No faults in the logic or diesel generator start circuitry were identified. A diesel generator inspection could not identify a mechanical cause for the start failure. The diesel generator started and operated satisfactorily upon a second start attempt and during all subsequent testing.

LER 80-12

IR #80-15

February 21, 1980

During the diesel generator manual test step of closing the 1B diesel generator supply breaker, indication was lost and the breaker would not close. A mechanically misaligned knife switch was the cause.

LER 80-16

IR #80-019

March 5, 1980

The diesel generator 1B primary air start motors would not rotate the engine. No obvious problems were found although moisture in the startup air may have been part of the problem. During the 1982 refueling outage a design change installed air dryers on the air start system to resolve a potential moisture problem.

LER 80-27

IR #80-051

June 21, 1980

The diesel generator 1B failed to start due to a dirty and wet air-start motor solenoid valve. Moisture in the starting air system was found to be the problem. During the 1982 refueling outage a design change installed air dryers on the air start system to resolve this problem.

LER 81-02

IR #81-003

January 13, 1981

An operability test was being performed on diesel generator 1B prior to performing maintenance on diesel generator 1A when diesel generator 1B failed to start. Moisture in the air supply prevented the air start motors from engaging properly thus preventing the diesel generator from starting. During the 1982 refueling outage a design change installed air dryers on the air start system to resolve this problem.

Attachment 3

DIESEL GENERATOR RELIABILITY

Your letter of July 2, 1984 requested licensees to describe their diesel generator reliability improvement program. The program description was to address the surveillance and testing performed to demonstrate the selected diesel generator reliability. The KNPP does not have a "formal" diesel generator reliability improvement program; however, we have a network of procedures and practices which provide the same result. Many of the procedures have been described previously in this letter. Including the procedures previously described there are 8 Surveillance Procedures, 9 Maintenance Procedures, and 39 Instrument and Control Procedures which are also performed directly to the diesel generators.

In keeping with our desire to continually improve the present diesel generator reliability status a review was made of NSAC 79 entitled "A Limited Performance Review of Fairbanks Morse and General Motors Diesel Generators at Nuclear Plants" dated April 1984. This review was made to determine if any steps can be taken to improve the diesel generator reliability at the KNPP. In the conclusion of the report seven (7) practices as helping to improve diesel generator reliability were identified. A discussion of each of these practices and how we comply with them are presented below.

PRACTICE: Comprehensive preventive maintenance performed under a well documented program.

WPSC Response: The KNPP has a diesel generator preventative maintenance program that was developed using the vendor technical manual, recommendations from vendor technical representatives and vendor maintenance bulletins, industry wide experiences and recommendations and past maintenance history on the KNPP diesel generators. The maintenance history of the diesel generators are documented using, the preventative

maintenance procedure records, surveillance
procedure records, technical representative
maintenance reports, and performance data.

PRACTICE: Thorough initial training of maintenance personnel and
periodic refresher courses by the diesel manufacturer
or other qualified organization.

WPSC RESPONSE: Past practice of the KNPP has been to have very knowledgeable
and experienced vendor technical representatives on site
assisting the plant maintenance personnel whenever
overhaul/inspection work is being performed on the diesel
generators. This practice has proven to be very beneficial
in that,

- a) the technical representative has the most
knowledge concerning the diesel engine
specifics,
- b) problems occurring at other sites with similar
diesel engines can be examined and possibly be
alleviated prior to its occurrence.
- c) the technical representatives have the
most recent vendor inspection/maintenance
recommendations.

PRACTICE: Good communication between maintenance crews and operators
at plants with similar diesel generators. One useful
tool which might aid in this interplant communication is
the Nuclear "Network" system operated by INPO. It
would also be valuable for maintenance and operating
personnel from various plants to personally discuss
their problems and solutions face-to-face.

WPSC Response: WPSC agrees that good communications between
operators and maintenance personnel and between
plants with similar diesel generators is valuable
to maintaining good diesel generator reliability.
WPSC is an active participant in the nuclear
"Network" system operated by INPO. An operational
experience assessment review is initiated for diesel
generator problems obtained through this network.
Additionally, using the past experiences and up-to-date
technical representatives we are receiving
valuable maintenance and operating experience
from other nuclear plants.

PRACTICE: Maintenance intervals based primarily on actual running
time. Major engine disassembly is probably best limited
to occasions where there is some evidence of component
degradation.

WPSC Response: During the annual refueling outage an inspection procedure (SP 10-111) is performed on both diesel generators. This procedure inspects the pistons, rings, liners, connecting rods, generator stator and rotor, etc. Unless this inspection shows evidence of major component degradation, major engine disassemble is not performed. The inspection and determination as to whether there is significant component degradation is made by WPSC in conjunction with the recommendation of the Engine Service representative. The KNPP diesel generators also have elapsed time meters to record the number of hours each diesel has run. Specific maintenance inspections are made in conjunction with the elapsed running time. The inspections coincide with the recommendations of the engine manual.

PRACTICE: Coolant water heating. It appears that all plants are heating the lube oil continuously, but not all plants heat the coolant water. The addition of coolant water heating is valuable to enhance the engine's reliability during quick start from standby.

WPSC Response: To increase the starting reliability the diesel engine has an immersion heater to maintain lube oil and jacket water at set minimum temperatures of 115°F and 125°F, respectively. Also, a small oil circulation pump provides prelubrication and soak back oil flow. Lube oil pressure and immersion heater water temperature switches control operation of the heater. The oil circulation pump will run when the engine is shutdown unless the pump circuit breaker is open.

PRACTICE: Calibration of engine protection instrumentation at each refueling outage.

WPSC RESPONSE: The calibration of engine protection instrumentation is performed on an annual basis.

PRACTICE: Continuous lubrication of engine main bearings and turbocharger bearings.

WPSC RESPONSE: The KNPP diesel generators are equipped with a continuous lubrication system. This system provides warm lube oil to main engine bearings at all times.

Lastly, licensees were requested to comment on the performance specifications provided in the attachment to enclosure 3. WPSC is always interested in improving the KNPP Technical Specifications. We generally agree with the idea

Mr. D. G. Eisenhut
October 22, 1984
Page 55

of trying to achieve and maintain diesel generator reliability at or above a specific level. However, WPSC is not in agreement with the NRC staff's approach of proposing "Diesel Generator Performance Technical Specifications." The intent of plant technical specifications is to specify the minimum equipment required operable and the surveillance requirements necessary to provide protection for the health and safety of the public. The inclusion of performance specifications and reliability goals will add further complication to plant technical specifications making them more difficult to read and harder to understand, without any safety benefit.