VERMONT YANKEE
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FVY 84-126

REPLY TO:
ENGINEERING OFFICE
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FRAMINGHAM, MASSACHUSETTS 01701
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October 29, 1984

U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Darrell G. Eisenhut, Director
Division of Licensing

References: a) License No. DPR-28 (Docket No. 50-271)
b) Letter, USNRC to VYNPC, dated 7/16/84
(Generic Letter 84-15)

Dear Sir:

Subject: Response to Generic Letter 84-15, Diesel Generator Reliability

We have completed our review of Reference b) and are forwarding our response to your concerns. Enclosures 1, 2 and 3 respond to the corresponding enclosure of Reference b).

We trust this information is satisfactory; however, if you have any questions, please contact us.

Very truly yours,

VERMONT YANKEE NUCLEAR POWER CORPORATION

Warren P. Murphy
Vice President and
Manager of Operations

WPM/dm

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ENCLOSURE 1

Reduction in Number of Cold Fast Surveillance Tests for Diesel Generators

Vermont Yankee's existing program for Diesel Generator Surveillance minimizes the number of cold fast starts.

Monthly testing as well as testing necessary to demonstrate operability as required by Technical Specifications (when other systems are declared inoperable) are preceded by a 2 to 3 minute pre-lubrication. In addition, as a measure to further reduce cold start wear, procedures require that electrical loading be limited to 500 kw until all low temperature alarms have been cleared. The only exception to these requirements is the "ECCS integrated test". This test is performed once per operating cycle and must duplicate the actual conditions under which the diesel generators are required to automatically start; as such, no pre-lubrication is performed. Based on a cold start frequency of once per operating cycle, we do not feel that an excessive number of cold starts are performed. We do, however, support the premise (stated in Reference b) that diesel generator reliability can be increased by reduced operability testing and are therefore pursuing efforts to eliminate the requirement for diesel generator operability testing when an emergency core cooling system or a related subsystem is declared inoperable.

ENCLOSURE 2

Diesel Generator Reliability Data

The current reliability of diesel generators at Vermont Yankee is as follows:

	LAST 100 DEMANDS	LAST 20 DEMANDS
Diesel Generator A	97%	100%
Diesel Generator B	99%	100%

A time history tabulation of demands and failures is listed in Appendix A.

In regard to Regulatory Guideline 1.108 C.3.A, plant records provide a history of Diesel Generator Surveillance testing. Valid starts and failures are determined using Section C.2.e of Regulatory Guide 1.108 as guidance. Historical information such as maintenance, repair and operating data, as well as failure causes, although not maintained in a single log, is readily available from Maintenance and Operations records. Statistical analysis is performed based on failures, with adverse trends identified for plant management examination.

Reliability factors based on the number of failures over the past 100 demands (as suggested by the regulatory guide) are not routinely calculated. Although this information is easily obtained, qualitative evaluation of performance history is preferred. Records of specific failures as well as those of general maintenance are periodically reviewed in an effort to identify:

1. weaknesses in subcomponents;

2. design problems which may become apparent due to age;

3. accelerated wear due to environment or other factors (vibration, heat, etc.); and

4. maintenance or operation failures.

The results of this evaluation are utilized to detect adverse trends and determine corrective action.

ENCLOSURE 3

Diesel Generator Reliability

The example Technical Specification presented in Enclosure 3 to Reference b) provides an effective means of surveillance testing which accelerates as reliability degrades. Controls of this nature appear particularly relevant to plants whose Technical Specifications are grounded in Probabilistic Risk Assessment. Plants such as Vermont Yankee whose Technical Specifications are not, however, may find it inappropriate to assimilate the divergent methodology.

At Vermont Yankee, emphasis is on increased Maintenance or design change when diesel performance begins to degrade. This serves to identify and correct component deficiencies before failure. In the event a failure does occur, the specific cause is identified and a corrective action proposed.

Examples of modifications resulting from degraded diesel performance are: Plant Design Change Request (PDCR) 74-5 which replaced synthetic hoses between injection pumps with more reliable steel tubing; PDCR 84-03, which replaced faulty stopping relays with an improved model; and a revision to Procedure OP 5223 which increases the routine maintenance of starting air check valves.

Increased maintenance upon degradation of performance (rather than increased surveillance) in concert with a thorough and well organized maintenance program has yielded consistently high diesel generator reliability factors.

Based on our present program for diesel generator maintenance, and our history of high diesel generator reliability, we believe that the objectives outlined in References b) and c) are met.

APPENDIX A

HISTORICAL SUMMARY OF EMERGENCY DIESEL GENERATOR DEMANDS

1984

EMERGENCY DIESEL GENERATOR A			EMERGENCY DIESEL GENERATOR B		
Date	Reason for Demand	Result	Date	Reason for Demand	Result
1-10-84	Routine Monthly	Acceptable	1-11-84	Routine Monthly	Acceptable
2-6-84	Routine Monthly	Acceptable	2-7-84	Routine Monthly	Acceptable
3-5-84	Routine Monthly	Acceptable	3-5-84	Routine Monthly	Acceptable
4-9-84	Routine Monthly	Acceptable	4-9-84	Routine Monthly	Acceptable
4-12-84	Special--retest of dry tank makeup valve	Acceptable	5-4-84	Special--prior to removal of UPS	Acceptable
5-4-84	Special--prior to removal of UPS	Acceptable	5-8-84	Routine Monthly	Acceptable
5-8-84	Routine Monthly	Acceptable	5-21-84	Special--A D/G removed from service for maintenance	Acceptable
5-21-84	Special--Retest after work	Acceptable	6-5-84	Routine Monthly	Acceptable
6-4-84	Routine Monthly	Acceptable	7-14-84	Special--after maint.	Acceptable
7-6-84	Special--after maint.	Acceptable	7-28-84	Special--after maint.	Acceptable
7-7-84	Special--after maint.	Acceptable	8-9-84	Routine Monthly	Acceptable
7-26-84	Special--EDCR 80-49	Acceptable	8-9-84	Special	Acceptable
7-27-84	Special--operability after overspeed test	Acceptable	9-4-84	Routine Monthly	Acceptable
7-31-84	Special--operational test of alternate shutdown method	Acceptable			
7-31-84	Special--alt. shutdown testing	Acceptable			
8-8-84	Routine Monthly	Acceptable			
9-4-84	Routine Monthly	Acceptable			

APPENDIX A

HISTORICAL SUMMARY OF EMERGENCY DIESEL GENERATOR DEMANDS

1983

EMERGENCY DIESEL GENERATOR A			EMERGENCY DIESEL GENERATOR B		
Date	Reason for Demand	Result	Date	Reason for Demand	Result
1-12-83	Routine Mnthly Surv	Acceptable	1-8-83	Special--breaker replacement	Acceptable
1-14-83	Special	(1) Failed	1-12-83	Routine Mnthly Surv	Acceptable
1-14-83	Special--functional test following maint.	Acceptable	1-14-83	Special--D/G A inop	Acceptable
2-7-83	Routine monthly	Acceptable	2-8-83	Routine Monthly	Acceptable
3-1-83	Special--A RHR Hx out of service	Acceptable	3-1-83	Special--A RHR Hx out of service	Acceptable
3-2-83	Special--A RHR sub-system out of service	Acceptable	3-2-83	Special--A RHR subsys-tem out of service	Acceptable
3-12-83	Routine Mnthly Surv	Acceptable	3-12-83	Routine Mnthly Surv	Acceptable
3-25-83	Special--return to service	Acceptable	3-16-83	Special--A D/G out of service	Acceptable
3-27-83	Special--test prior to alternate shutdown testing	Acceptable	4-10-83	Routine Monthly and Special--after preven-tative maint.	Acceptable
3-28-83	Special--prove oper-ability after alt. shutdown testing	Acceptable	4-30-83	Special--operability after air compressor air line maint.	Acceptable
3-29-83	Special--prove oper-ability	Acceptable	5-11-83	Routine Mnthly Surv	Acceptable
4-20-83	Routine Mnthly and Special--Operability after maint.	Acceptable	6-9-83	Routine Monthly	Acceptable
5-1-83	Special--maintenance on LNP relay	Acceptable	6-13-83	Special	Acceptable
5-2-83	Special--test after maint.	Acceptable	7-12-83	Routine Monthly	Acceptable

1) due to low jacket coolant temp.

APPENDIX A

HISTORICAL SUMMARY OF EMERGENCY DIESEL GENERATOR DEMANDS

1983
(continued)

EMERGENCY DIESEL GENERATOR A			EMERGENCY DIESEL GENERATOR B		
Date	Reason for Demand	Result	Date	Reason for Demand	Result
5-3-83	Routine Monthly	Acceptable	8-11-83	Routine Monthly	Acceptable
5-6-83	Special--Trouble Shoot	Acceptable	8-26-83	Special	Failed (3)
5-7-83	Special-test after maint. on cool. sys.	Acceptable	8-27-83	Special--operability following repair	Acceptable
5-10-83	Special--test after maint.	Acceptable	9-6-83	Routine Monthly	Acceptable
5-11-83	Special--test after maint.	Acceptable	10-12-83	Routine Monthly	Acceptable
5-26-83	Special--operability after maintenance	Acceptable	11-1-83	Special--CS-B out of service	Acceptable
5-27-83	Special--Return to service after jacket coolant service water supply repair	Acceptable	11-8-83	Routine Monthly	Acceptable
6-7-83	Special--operability test	Acceptable	11-30-83	Special--testing A D/G 00 S	Acceptable
6-9-83	Routine Monthly	Failed (2)	12-1-83	Special--test following injector nozzle replacement	Acceptable
6-13-83	Special	Acceptable	12-6-83	Routine Monthly	Acceptable
6-13-83	Special	Acceptable	12-20-83	Special--prior to removal of UPS from service	Acceptable
6-15-83	Special--maint.	Acceptable	12-21-83	Special--A UPS inop.	Acceptable
7-11-83	Routine Monthly	Acceptable			
8-8-83	Routine Monthly	Acceptable			
8-26-83	Special--Alt. testing	Acceptable			
9-6-83	Routine Monthly	Acceptable			

(2) due to low jacket coolant temp
(3) solenoid failure

APPENDIX A

HISTORICAL SUMMARY OF EMERGENCY DIESEL GENERATOR DEMANDS

1983
(continued)

EMERGENCY DIESEL GENERATOR A			EMERGENCY DIESEL GENERATOR B		
Date	Reason for Demand	Result	Date	Reason for Demand	Result
10-11-83	Routine Monthly	Acceptable			
10-12-83	Special--return to service	Acceptable			
11-1-83	Special--CS-B out of service	Acceptable			
11-8-83	Routine Monthly	Acceptable			
12-1-83	Special--operational test after maintenance	Acceptable			
12-5-83	Routine Monthly	Acceptable			
12-20-83	Special--prior to removal of UPS from Service	Acceptable			
12-21-83	Special--A UPS inop.	Acceptable			

APPENDIX A

HISTORICAL SUMMARY OF EMERGENCY DIESEL GENERATOR DEMANDS

1982

EMERGENCY DIESEL GENERATOR A			EMERGENCY DIESEL GENERATOR B		
Date	Reason for Demand	Result	Date	Reason for Demand	Result
1-13-82	Routine	Acceptable	1-12-82	Routine Monthly	Acceptable
2-6-82	Special--UPS inop.	Acceptable	2-6-82	Special--UPS inop.	Acceptable
2-8-82	Routine	Acceptable	2-9-82	Routine Monthly	Acceptable
2-11-82	Special--UPS inop.	Acceptable	2-11-82	Special--UPS inop.	Acceptable
2-23-82	Special--UPS inop.	Acceptable	2-23-82	Special--UPS inop.	Acceptable
2-24-82	Special--UPS inop.	Acceptable	2-24-82	Special--UPS inop.	Acceptable
2-25-82	Special--UPS inop.	Acceptable	2-25-82	Special--UPS inop.	Acceptable
2-26-82	Special--UPS inop.	Acceptable	2-26-82	Special--UPS inop.	Acceptable
2-27-82	Special--UPS inop.	Acceptable	2-27-82	Special--UPS inop.	Acceptable
2-28-82	Special--UPS inop.	Acceptable	2-28-82	Special--UPS inop.	Acceptable
3-1-82	Special--UPS inop.	Acceptable	3-9-82	Routine Monthly	Acceptable
3-4-82	Special--B RHRSW work	Acceptable	3-16-82	Special--UPS inop.	Acceptable
3-9-82	Routine	Acceptable	3-22-82	Special--UPS inop.	Acceptable
3-16-82	Special--UPS inop.	Acceptable	4-13-82	Routine Monthly	Acceptable
3-22-82	Special--UPS inop.	Acceptable	4-24-82	Special--UPS inop.	Acceptable
4-12-82	Routine	Acceptable	5-11-82	Routine Monthly	Acceptable
4-24-82	Special--UPS inop.	Acceptable	6-9-82	Routine Monthly	Acceptable
5-10-82	Routine	Acceptable	7-12-82	Routine Monthly	Acceptable
6-7-82	Routine	Acceptable	8-9-82	Routine Monthly	Acceptable
7-13-82	Routine	Acceptable	8-10-82	Special--UPS inop. and CS brkr swap	Acceptable
7-15-82	Special--B RHRSW work	Acceptable	8-16-32	Special--A D/G work	Acceptable
8-9-82	Routine	Acceptable	9-6-82	Routine Monthly	Acceptable

APPENDIX A

HISTORICAL SUMMARY OF EMERGENCY DIESEL GENERATOR DEMANDS

1982
(continued)

EMERGENCY DIESEL GENERATOR A			EMERGENCY DIESEL GENERATOR B		
Date	Reason for Demand	Result	Date	Reason for Demand	Result
8-10-82	Special--UPS inop and CS breaker swap	Acceptable	9-8-82	Special--B RHRSW work	Acceptable
8-11-82	Special--Return to service	Acceptable	9-9-82	Special--B RHRSW work	Acceptable
8-17-82	Special--Operability following repair	Acceptable	9-10-82	Special--B RHRSW work	Acceptable
9-6-82	Routine	Acceptable	10-5-82	Special--CS breaker removal	Acceptable
9-8-82	Special--B RHRSW work	Acceptable	10-12-82	Routine Monthly	Acceptable
9-9-82	Special--B RHRSW work	Acceptable	11-2-82	Special--after ACB maint.	Acceptable
9-10-82	Special--B RHRSW work	Acceptable	11-2-82	Special--UPS inop.	Acceptable
10-5-82	Special--CS breaker work	(4) Failed	11-11-82	Routine Monthly	Acceptable
10-5-82	Special--check slow starting time	Acceptable	12-7-82	Routine Monthly	Acceptable
10-12-82	Routine	Acceptable			
11-2-82	Special--UPS inop.	Acceptable			
11-2-82	Special--after ACB maint.	Acceptable			
11-11-82	Routine	Acceptable			
12-6-82	Routine	Acceptable			

(4) Check valve in fuel oil return line - Failed resulting in excessive start time.

APPENDIX A

HISTORICAL SUMMARY OF EMERGENCY DIESEL GENERATOR DEMANDS

1981

EMERGEN / DIESEL GENERATOR A			EMERGENCY DIESEL GENERATOR B		
Date	Reason for Demand	Result	Date	Reason for Demand	Result
1-12-81	Routine Monthly	Acceptable	1-19-81	Routine Monthly	Acceptable
2-16-81	Routine Monthly	Acceptable	2-16-81	Routine Monthly	Acceptable
3-16-81	Routine Monthly	Acceptable	3-16-81	Routine Monthly	Acceptable
4-20-81	Routine Monthly	Acceptable	4-20-81	Routine Monthly	Acceptable
5-18-81	Routine Monthly	Failed (5)	5-18-81	Special--A diesel inop.	Acceptable
5-19-81	Routine--after repair	Acceptable	5-19-81	Routine Monthly	Acceptable
6-8-81	Routine Monthly	Acceptable	6-9-81	Routine Monthly	Acceptable
7-13-81	Routine Monthly	Acceptable	6-9-81	Special Monthly	Acceptable
8-11-81	Routine Monthly	Acceptable	7-14-81	Routine Monthly	Acceptable
9-9-81	Routine Monthly	Acceptable	8-12-81	Routine Monthly	Acceptable
10-12-81	Routine Monthly	Acceptable	9-8-81	Routine Monthly	Acceptable
11-1-81	Special--after maint.	Acceptable	10-13-81	Routine Monthly	Acceptable
11-9-81	Special--A D/G OOC	Acceptable	11-11-81	Special--after maint.	Acceptable
11-13-81	Routine Monthly	Acceptable	11-12-81	Routine Monthly	Acceptable
11-25-81	Special--after SW work	Acceptable	11-21-81	Special--after SW work	Acceptable
12-4-81	Special--B RHR OOC	Acceptable	12-4-81	Special--B RHR OOC	Acceptable
12-7-81	Routine Monthly	Acceptable	12-11-81	Routine Monthly	Acceptable

(5) Failed gasket in cooling water outlet of cylinder #12.