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SUBJECT: Special Rept 2-SR-90-007:on 901212,diesel generator valid test failure.Caused by air in diesel generator fuel lines. Maint bulletins distributed to plant maint & work control groups.

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JAMES M. LEVINE
VICE PRESIDENT
NUCLEAR PRODUCTION

192-00709-JML/TRB/RKR
January 10, 1991

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Mail Station P1-37
Washington, DC 20555

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 2
Docket No. STN 50-529 (License No. NPF-51)
Special Report 2-SR-90-007
File: 91-020-404

Attached please find Special Report 2-SR-90-007 prepared and submitted pursuant to Technical Specifications 4.8.1.1.3 and 6.9.2. This report discusses the Unit 2 "A" diesel generator valid test failure.

If you have any questions, please contact T. R. Bradish, Compliance Manager at (602) 393-2521.

Very truly yours,

James M Levine

JML/TRB/RKR/dmn

Attachment

cc: W. F. Conway (all with attachment)
J. B. Martin
D. H. Coe
A. C. Gehr
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IE22 1/1

PALO VERDE NUCLEAR GENERATING STATION UNIT 2

Diesel Generator Valid Test Failure December 12, 1990

License No. NPF-51

Docket No. 50-529

Special Report 2-SR-90-007

Initial Conditions:

On December 12, 1990 at approximately 0124 MST, Palo Verde Unit 2 was in MODE 1 (POWER OPERATION) at 100 percent power.

Description of Event:

This Special Report is being submitted pursuant to Technical Specifications (TS) 4.8.1.1.3 and 6.9.2 and contains the information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977 for a diesel generator valid test failure.

At approximately 0500 MST on December 11, 1990, the Unit 2 "A" diesel generator was declared inoperable and taken out of service for preplanned maintenance. This included replacement of the fuel oil line from the engine mounted fuel oil head tank to the left bank supply header to correct minor fitting leakage. At approximately 2145 MST on December 11, 1990, maintenance work was completed and preparations were made to perform the surveillance test to verify diesel generator operability.

At approximately 0124 MST on December 12, 1990, the "A" diesel generator was started in accordance with an approved procedure to perform the monthly TS surveillance. It took approximately 10.9 seconds after initiating the diesel start for the generator voltage to reach the minimum acceptance voltage of 3740 volts. The observed generator frequency initially approached 60 Hz, but then dropped, returning to 60 Hz within 10 seconds after initiating the start. TS 4.8.1.1.2 requires that the diesel generator be demonstrated OPERABLE by verifying that the diesel generator can start and accelerate to generator voltage and frequency at 4160 $\pm$ 420 volts and 60 $\pm$ 1.2 Hz in less than or equal to 10 seconds. Therefore, this was a diesel generator valid test failure.

Concurrent with the diesel generator start, a loud bang was heard in the Control Room. The diesel continued to idle normally and was manually tripped approximately 5 minutes after starting. An investigation of the noise found that the relief device on the diesel generator exhaust silencer had lifted. The diesel generator was inspected for damage and rolled on starting air. The inspections included a visual inspection of valve train components, video probe examination of the turbocharger, and a visual inspection of the exhaust silencer internals. No abnormalities were noted during these inspections and there was no indication of

damage to the diesel generator. At approximately 1505 MST on December 12, 1990 the diesel generator was started and ran successfully during trouble shooting. At approximately 2008 MST on December 12, 1990, the diesel generator was successfully tested and returned to OPERABLE status.

Cause of Event:

A preliminary investigation determined that the cause of the valid test failure was air in the diesel generator fuel lines. There were no administrative requirements to fill and vent the fuel lines after maintenance. Initially there was sufficient fuel flow to start the diesel, then the air reached the injectors and the diesel rpm dropped. The diesel speed governor responded to the decreasing rpm by moving the fuel racks in the more fuel direction. After the fuel line had purged itself of air, excess fuel was injected into the cylinders because of the governor position. Unburned excess fuel was carried into the exhaust system and subsequently ignited. The diesel exhaust silencer relief device lifted per its intended function. Therefore, the additional time required to purge the fuel system of air adversely impaired the diesel generator's ability to achieve the required voltage in 10 seconds.

This was the first valid test failure in the last 100 valid tests. The diesel generator was unavailable for approximately 39 hours and 8 minutes (including the maintenance outage). The current surveillance test interval is 31 days. This conforms with the schedule of Regulatory Position C.2.d of Regulatory Guide 1.108, Revision 1, August 1977.

Corrective Actions:

1. Maintenance Bulletins have been distributed to the Units 1, 2, and 3 Maintenance and Work Control Groups to advise them to vent and refill the fuel oil system whenever work is performed which could affect the fuel oil system.

2. PVNGS Engineering has advised Units 1, 2, and 3 Operations to conduct maintenance starts following significant fuel oil system or governor control maintenance activities.

3. Diesel Generator maintenance and retest procedures will be reviewed and revised as required to implement corrective actions 1 and 2. Any required procedure changes will be completed by March 29, 1991.