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Mr. John B. Martin, Regional Administrator
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region V
1450 Maria Lane, Suite 210
Walnut Creek, CA 94596-5368

ANPP-33066-EEVB/GEC
July 19, 1985

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 1
Special Report - Diesel Generator Failure To Start
Docket No. STN 50-528, License No. NPF-41
File: 85-056-026; G.1.01.10

Dear Mr. Martin:

Attached please find a Special Report prepared and submitted pursuant to Specifications 4.8.1.1.3 and 6.9.2 of Appendix A (Technical Specifications) to the Palo Verde Nuclear Generating Station, Unit No. 1 Operating License. This report discusses the failure of Diesel Generator "B" to start in accordance with Specification 4.8.1.1.2.a.4.

If you have any questions or concerns, please contact me.

Very truly yours,

E. E. Van Brunt

E. E. Van Brunt, Jr.
Executive Vice President
Project Director

EEVB/GEC/mb
Attachments

cc: R. P. Zimmerman (All w/attachments)
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INPO Records Center

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PALO VERDE NUCLEAR GENERATING STATION UNIT 1

SPECIAL REPORT 1-SR-85-013

DIESEL GENERATOR FAILURES TO START

DOCKET NO. STN 50-528
LICENSE NO. NPF-41

On June 18, 1985 at 2030, Unit 1 Diesel Generator B was determined inoperable by failing to start within the 10 second Acceptance Criteria of Surveillance Test 41ST-1DG02. Actual start times were Voltage: 12.84 seconds, Frequency: 13.99 seconds and Speed: 14.15 seconds. Unit 1 was in Mode 1 at a power level of approximately 20% when this third (3rd) start failure (on a per nuclear unit basis) in seventy-four (74) valid tests occurred. Unit 1 complied with Technical Specification Action Statement 3.8.1.1.a and the shortened test interval schedule of Technical Specification Table 4.8-1 and R. G. 1.108.C.2.d.(3).

A strip chart recorder, used for Surveillance Testing, monitored Diesel Generator B parameters during the start failure. Chart analysis showed the engine cranked satisfactorily, but the fuel racks did not open to allow fuel to the engine until too late in the starting sequence to meet the 10 second time criteria.

A troubleshooting start attempt was performed at 2156 on June 18 and appeared normal, with the fuel racks opening satisfactorily. Since the start failure could not be repeated, the cause could not be further isolated. The System Engineer decided to have I&C Maintenance disassemble, clean, inspect and test all the pneumatic valves associated with fuel rack actuation. Work Order 092917 was generated to perform the work on the following valves: DGN-UV-244, UV-246, UV-248, UV-250. All the valves were inspected and tested by the afternoon of June 19, with no major discrepancies except for valve DGN-UV-250. A green abrasive substance resembling "vertigris" was discovered inside the valve and air supply tubing. It was cleaned, lubricated and tested satisfactory, and the tubing was flushed with alcohol. A sample of the green substance has been sent to Chemistry for analysis, with no report of the findings as yet. All components were reinstalled, the pneumatic control system was leak checked, with no significant leaks, and Diesel Generator B was restored to standby conditions.

At 1814 on June 19, 1985, Surveillance Test 41ST-1DG02 was reperformed on Unit 1 Diesel Generator B, with all Acceptance Criteria met. Diesel Generator B was declared operable at 1928, exiting Technical Specification Action Statement 3.8.1.1.a, having been inoperable for 22 hours 58 minutes.

Engineering's evaluation of the start failure is as follows: Pneumatic Control Valve DGN-UV-250 actuates to provide a time delay for the Turbo Lube Oil Pressure to build up on a Test Mode Diesel Generator start before resetting to activate the associated engine shutdown. Since Surveillance Test 41ST-1DG02 is performed in the Test Mode, slow actuation of DGN-UV-250, caused by the foreign substance in the valve, allowed control air to vent to atmosphere and kept the air pressure below the 20 psi required to actuate DGN-UV-246. The fuel racks cannot open in the Test Mode to supply fuel for an engine start without DGN-UV-246 actuation. Approximately 8 seconds after the start signal, DGN-UV-250 actuated. This allowed the control air pressure to build up to that required for DGN-UV-246 to actuate, resulting in the fuel racks opening and an engine start. The engine could not meet the 10 second Acceptance Criteria as the fuel rack opening time exceeded the normal

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value by approximately 6 seconds. Based on the recorder chart analysis, all parameters were normal once the engine received fuel and started.

Engineering's evaluation of the slow start of June 18, 1985 attributes the failure to slow actuation of DGN-UV-250. This valve functions to allow fuel rack actuation only during Test Mode Diesel Generator operation and is bypassed during Emergency Mode operation, with the fuel racks being opened directly through solenoid valve actuation. Had this been an Emergency Start and not a Test Mode Start, as required by Surveillance Test 41ST-1DG02, no start failure would have occurred because the failed component would have no effect on the starting sequence. Therefore, in accordance with RG 1.108.C.2.e(2), this start failure should not be considered a valid failure, allowing Unit 1 to return to a 14 day surveillance test interval per R.G.1.108.C.2.d.(2).

The following corrective action will be implemented:

1) Chemistry to analyze the foreign substance found in the pneumatic valve DGN-UV-250, with Engineering to discover the origin and eliminate it.

2) Engineering to evaluate the control air valve setpoints for actuation and reset pressures to ensure optimum system function and reliability.

3) Engineering to initiate a work document to inspect pneumatic valve DGN-UV-249 on Diesel Generator A for the foreign substance found in DGN-UV-250 on Diesel Generator B to determine if it is a generic problem.

4) Engineering to evaluate performing Emergency Mode Diesel Generator starts to satisfy the Acceptance Criteria of Surveillance Tests 41ST-1DG01 and 41ST-1DG02.