Arizona Nuclear Power Project
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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

September 6, 1985
ANPP-33409-EEVB/GEC

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

Dear Mr. Martin:

Attached please find a Special Report prepared and submitted pursuant to PVNGS Unit 1 Technical Specifications 4.8.1.1.3 and 6.9.2. This report discusses the failure of Diesel Generator "A" 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, Jr.
Executive Vice President
Project Director

EEVB/GEC/dlm
Attachment

cc: R. P. Zimmerman (all w/a)
A. L. Hon
E. A. Licitra
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INPO Records Center

1/1 IE-28

PALO VERDE NUCLEAR GENERATING STATION UNIT 1

SPECIAL REPORT 1-SR-85-015

DIESEL GENERATOR FAILURE TO START WITHIN ALLOWABLE TIME

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

On August 7, 1985 at 0419, Unit 1 Diesel Generator A was determined to be inoperable by failing to start within the 10 second acceptance criteria of Surveillance Test 41ST-1DG01 (Technical Specifications Surveillance Requirement 4.8.1.1.2.a.4). Actual start times were as follows: Voltage, 9.03 seconds; Frequency, 11.16 seconds; and, Speed, 11.33 seconds.

Unit 1 was in Mode 4 when this third start failure (on a per nuclear unit basis) in ninety-one valid tests occurred. The Unit 1 Shift Supervisor complied with Technical Specifications ACTION 3.8.1.1.a, and invoked the shortened testing frequency 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 A selected parameters during the start failure. Subsequent chart analysis showed that the engine cranked satisfactorily, but did not start (accelerate above cranking speed) for approximately 5.5 seconds. This was too late in the Test Mode start sequence for the speed and frequency to attain 600 RPM and 58.8 Hz., respectively, within the required 10 seconds.

Since the engine cranking cycle appeared normal, troubleshooting efforts (Work Order #99553) concentrated on the fuel control system, which functions to open the fuel racks to supply fuel to the engine during a start. The troubleshooting effort consisted of the disassembly and inspection of those pneumatic control valves which were likely to have caused the "slow start". No conclusive cause was found after completion of the troubleshooting. However, an Airstart control valve was found to contain contamination, apparently from the starting air system, and the Turning Gear Interlock Valve in the start air system was found to be defective. These valves did not contribute to the diesel start failure.

The troubleshooting of the Diesel Generator A "slow start" was inconclusive, as the problem seems only to occur when the engine remains inactive for a period of two weeks or longer. Since the last surveillance test failure had placed the Unit 1 Diesel Generator A into a 7-day test interval, it was not possible to recreate a two-week period of inactivity for the Diesel Generator A while Unit 1 remains in MODES 1-4. Therefore, it was decided to perform a troubleshooting test start of Diesel Generator A and, if successful, perform the OPERABILITY surveillance test.

A troubleshooting test start of Unit 1 Diesel Generator A was performed satisfactorily on August 9, 1985, at 1937. At 1959, on the same date, the diesel generator OPERABILITY surveillance test was performed with all acceptance criteria being met. Unit 1 Diesel Generator A was declared OPERABLE at 2145, on August 9, 1985, thus exiting Technical Specification ACTION 3.8.1.1.a, after 63 hours, 45 minutes.

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Modification to the Unit 1 diesel generators' control governor system are being considered in order to enhance the response and reliability of the diesel generators. The air systems will be inspected for contamination.

The following corrective actions will be implemented:

1. Temporary modifications will be requested to install governor and fuel rack response measuring devices on both Unit 1 diesel generators.

2. Work Requests will be initiated to inspect the starting air and control air systems for contamination.

3. Evaluation of the need for installation of additional air filtering downstream of the starting air receivers.

4. Observation of diesel generator test starts whenever the engines are inactive for two weeks or longer.