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SUBJECT: Special Rept 1-SR-88-008-01:on 881114,looses part detection sys channel inoperable more than 30 days.

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JAMES M. LEVINE
VICE PRESIDENT
NUCLEAR PRODUCTION

192-00620-JML/TRB/DAJ
January 20, 1990

U. S. Nuclear Regulatory Commission
NRC Document Control Desk
Washington, D.C. 20555

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 1
Docket No. STN 50-528 (License No. NPF-41)
Special Report 1-SR-88-008-01
File: 90-020-404

Attached please find Supplement Number 1 to Special Report 1-SR-88-008 prepared and submitted pursuant to Technical Specifications 3.3.3.7, ACTION "a" and 6.9.2. This report discusses an inoperable Loose Parts Detection System Channel.

If you have any questions on this matter, please contact Mr. Thomas R. Bradish, Compliance Manager (Acting) at (602) 393-2521.

Very truly yours,

James M Levine

JML/TDS/DAJ/kj

Attachment

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PALO VERDE NUCLEAR GENERATING STATION UNIT 1

Loose Parts Detection Instrumentation

License No. NPF-41

Docket No. 50-528

Special Report No. 1-SR-88-008-01

This Special Report is being submitted pursuant to Technical Specification 3.3.3.7, ACTION "a" and Technical Specification 6.9.2 addressing a Loose Part Detection channel being inoperable for more than thirty (30) days. The 30 day period for returning the channel to an operable status was exceeded at approximately 2145 MST on November 13, 1988.

The Loose Part Detection System consists of eight (8) channels. Each channel consists of a piezoelectric crystal motion sensor and associated amplification, indication, and recording circuitry. The sensors are positioned in the following locations: two (2) mounted on the Reactor Vessel upper head, two (2) mounted on the Reactor Vessel lower incore nozzle, and one (1) on each of the two (2) Steam Generator's inlet and outlet nozzles. The piezoelectric sensors detect the loose parts using acoustic signals which are generated when loose parts impact a Reactor Coolant System component or structure. Signals in excess of the alarm setpoint will result in an alarm condition. The alarms are in the "latch-on" type, i.e., the alarm will remain on when the system returns to normal and will not clear until the alarm is manually reset. There is one alarm indicator in the Control Room for the eight channels such that a "latch on" alarm effectively renders the Control Room alarm indication inoperable for the remaining channels upon receipt of an alarm condition. In addition to the alarm in the control Room, a tape recorder will start. There are two tape recorders; four system channels input into one tape recorder.

On October 14, 1988 Palo Verde Unit 1 was in Mode 1 (POWER OPERATION) at approximately 100 percent power when Loose Part Detection System Channel 5 (Steam Generator 1A inlet) was declared inoperable due to repeated spurious alarms. An approved work document was initiated to troubleshoot the cause of the spurious alarms. As a result of troubleshooting, it was determined that no component malfunctions existed and that the alarm setpoint being near background noise levels resulted in the spurious alarms.

In order to enable the reflash capability for the visual alarm indication in the Control Room and the automatic recording feature for the other channels sharing the recorder utilized by Channel 5, the Channel 5 setpoint was raised to prevent false alarms. This rendered Channel 5 inoperable; however, it remained functional. During the period of Channel 5 inoperability, Operations Department personnel audibly monitored the Loose Part Detection System at least once per twenty-four hours. Additionally, PVNGS Vibration Group and Engineering personnel monitored the inoperable channel once per week during the period of inoperability.

Troubleshooting and an engineering evaluation of the Loose Part Detection System Channel 5 performance has been completed. Based upon this evaluation, it has been determined that the system has been operating properly. Channel response is reflective of the excitative energy from the Reactor Coolant System (RCS). APS has observed that, at different power levels and during different plant

transients, RCS excitative energies vary which affect the response of the LPVMS. Also, other sources (e.g., flow vortexing, core barrel bypass flow, etc.) can produce energy waves which excite the accelerometers. In many cases, it takes a significant length of time after a plant transient for the RCS to "stabilize" to the point where spurious LPVMS alarms do not occur.

During data evaluation and collection and during inspections conducted during the refueling outage, it was verified that no loose parts existed. APS engineering is continuing to review the operation of LPVMS for improvements. Since LPVMS appears to be operating properly at the present time, the alarm setpoint will be reset and Channel 5 will be returned to service prior to restart (i.e., Mode 2, STARTUP) from the current refueling outage.