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SUBJECT: Special Rept 1-SR-89-001:on 890306,Channel B reactor vessel  
 water level sys inoperable for period greater than 7 days.

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## Arizona Nuclear Power Project

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192-00466-JGH/TDS/RJR

April 7, 1989

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-89-001  
File: 89-020-404

Attached please find Special Report 1-SR-89-001 prepared and submitted pursuant to Technical Specifications 3.3.3.6 ACTION 31. This report discusses the inoperability of one channel of the Reactor Vessel Water Level System.

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

Very truly yours,

J. G. Haynes  
Vice President  
Nuclear Production

JGH/TDS/RJR/kj

Attachment

cc: D. B. Karner (all w/attachments)  
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Palo Verde Nuclear Generating Station Unit 1  
Channel "B" Reactor Vessel Water Level System Inoperable

License No. NPF-41

Docket No. 50-528

Special Report No. 1-SR-89-001

Pursuant to Post Accident Monitoring Instrumentation Technical Specification 3.3.3.6 Table 3.3-10, ACTION STATEMENT 31, this submittal provides the required Special Report for the inoperability of one channel of the Reactor Vessel Water Level System (RVWLS) for a period of greater than seven (7) days. RVWLS consists of two channels ("A" and "B"). Each channel utilizes eight (8) heated junction thermocouples (HJTC) to generate the signals for 8 indicated levels. There are four HJTC's in the Reactor Vessel head region and four HJTC's in the Reactor Vessel outlet plenum. In order for each channel to be operable, two or more of the upper four sensors and two or more of the lower four sensors must be functional.

Prior to the conditions described in this Special Report, HJTC's 5 and 6 had malfunctioned on January 30, 1988 and HJTC's 3 and 4 had malfunctioned on June 9, 1988. ANPP has experienced reliability problems with the RVWLS in all three units and is currently investigating the root cause of failure mechanism.

On March 6, 1989, Palo Verde Unit 1 was in Mode 3 (HOT STANDBY) when, at approximately 1830 MST, a Shift Technical Advisor observed that Channel "A" RVWLS indication for HJTC's 7 and 8 was not operating properly. Since HJTC's 5 and 6 had malfunctioned in January 1988 (HJTC's 5, 6, 7, and 8 are the four sensors in the reactor vessel outlet plenum), RVWLS Channel "A" was declared inoperable. An approved work document was initiated to determine the cause of the improper operation and to perform the necessary rework to return the channel to service. During the troubleshooting, it was discovered that HJTC pair 7 and 8 had malfunctioned and repairs could not be effected until the next refueling outage.

HJTC's are electrically connected in pairs. HJTC's 5 and 6 are in series and HJTC's 7 and 8 are in series. Subsequent investigation has revealed that HJTC's 5 and 8 malfunctioned. Until permanent repairs can be accomplished, a Temporary Modification is being installed prior to unit startup to connect HJTC's 6 and 7 in series. This will return RVWLS Channel "A" to service pursuant to Technical Specification 3.3.3.6 Table 3.3-10.

The bases for the Technical Specification states:

"The Subcooled Margin Monitor (SMM), the Heat [sic] Junction Thermocouple (HJTC), and the Core Exit Thermocouples (CET) comprise the Inadequate Core Cooling (ICC) instrumentation required by Item II.F.2 NUREG-0737, the post TMI-2 Action Plan. The function of the ICC instrumentation is to enhance the ability of the plant operator to diagnose the approach to existence of, and recovery from ICC. Additionally, they aid in tracking reactor coolant inventory. These instruments are included in the Technical Specifications at the request of NRC Generic Letter 83-37. These are not required by the accident analysis, nor to bring the plant to Cold Shutdown.



In the event more than four sensors in a Reactor Vessel Level channel are inoperable, repairs may only be possible during the next refueling outage. This is because the sensors are accessible only after the missile shield and reactor vessel head are removed. It is not feasible to repair a channel except during a refueling outage when the missile shield and reactor head are removed to refuel the core." "If only one channel is inoperable, it is intended that this channel be restored to OPERABLE status in a refueling outage as soon as reasonably possible."

The root cause of failure initiated as a result of previous failures will address the failure mechanism for the malfunctioning HJTC's in Unit 1. This root cause will require removal of the presently installed HJTC's and is expected to be completed by March 1990 by the vendor. The RVWLS Channel "A" is scheduled to be replaced during the next scheduled refueling outage.

