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SUBJECT: Forwards Revs 1 & 2 to Operations Procedure 42AO-22250, "Venting Charging Pumps" & summary of venting demonstration test, per 851205 committment. Program showing completed mod to charging sys also encl.

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February 24, 1986
ANPP-35286-EEVB/BJA/98.05

Director of Nuclear Reactor Regulation
Attention: Mr. George W. Knighton, Project Director
PWR Project Directorate #7
Division of Pressurized Water Reactor Licensing - B
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Palo Verde Nuclear Generating Station
Unit 2
Docket No. STN 50-529 (License No. NPF-46)
Venting of the Charging Pumps
File: 86-056-026

Reference: (1) Letter from E. E. Van Brunt, Jr., ANPP, to G. W. Knighton, NRC, dated December 5, 1985 (ANPP-34174): Subject: Charging Pump Operability.

Dear Mr. Knighton:

As discussed in Reference (1), ANPP committed to submit a procedure for the process used to vent hydrogen from a gas bound charging pump. Additionally, ANPP committed to perform a demonstration of this venting procedure prior to initial criticality of PVNGS Unit 2.

ANPP has conducted a demonstration of the procedure used to vent hydrogen from a gas bound charging pump. A summary of the test that was conducted and the results of the test are included as Attachment 1 of this letter. This demonstration test was conducted using Revision 1 of the operations procedure for venting of the charging pumps (Station Manual Procedure No. 42AO-2ZZ50). This procedure is included as Attachment 2 of this letter.

The experience gained from the venting demonstration test was also used to update the operations procedure for venting of the charging pumps. The updated procedure will provide more information to the operators for the process of recovery from a gas bound charging system. It should be noted that this version of the operations procedure is reflective of the method that was actually used during the venting demonstration test. Thus, a copy of this updated procedure (Revision 2 of 42AO-2ZZ50) is included for NRC staff review and approval as Attachment 3 of this letter.

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ANPP has also committed to perform modifications to the charging system such that the hydrogen from a gas bound charging pump will not be vented into the charging pump cubicle. ANPP has completed the modification which provides a means of venting the hydrogen from the charging pump piping without introducing hydrogen into the charging pump cubicle. This modification involves a piping system which routes the vented hydrogen gas to a receiver tank which is located on the 88 ft. level of the Auxiliary Building. The receiver tank collects the vented hydrogen and then vents the hydrogen to the essential pipe tunnel. The area that the hydrogen is vented to is ventilated by essential ventilation systems following an accident and is monitored for radioactivity prior to release (refer to FSAR Figure 9.4-3, Sheet 1 of 4). A simplified diagram which shows the piping involved in this modification is presented as Attachment 4 of this letter. This modification is integral to the operations venting procedure for the charging pumps.

If you have any additional questions on this matter, please contact Mr. W. F. Quinn of my staff.

Very truly yours,

E. E. Van Brunt

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

EEVB/BJA/jle
Attachments

cc: E. A. Licitra (all w/a)
R. P. Zimmerman
C. Y. Liang
A. C. Gehr

Attachment 1

Summary of Venting Demonstration Test

The objective of the venting demonstration test was to demonstrate the capability to recover from a situation in which the charging pumps have become gas bound with the Volume Control Tank (VCT) hydrogen cover gas. Additionally, in order to prevent a potentially hazardous situation, the gas from the charging pump piping is not to be vented into the charging pump cubicles.

The preparation for the demonstration test involved isolating all sources of makeup to the VCT, pressurizing the VCT with nitrogen (used to simulate the normal hydrogen cover gas), and then draining the existing water from the VCT and the suction and discharge piping of all three charging pumps. After the system was drained, the VCT nitrogen pressure was increased to approximately 40 psig. This was done to ensure that the suction of the charging pumps and the VCT were at a higher pressure than the available Refueling Water Tank (RWT) head.

At this point, the recovery process was initiated by following the steps of the operations procedure for venting of the charging pumps (refer to Attachment 2 for a copy of the version that was used for conduct of this demonstration). The gravity feed isolation valve from the RWT (CH-536) was opened to provide the suction water supply to the charging pumps. The charging pump suction and discharge piping was then vented to the vent receiver tank and the water supply was restored to the charging pumps. The "A" charging pump was started and operated in a normal manner by delivering a discharge flowrate of approximately 44 gpm. This was the conclusion of the venting demonstration test. The test acceptance criteria was satisfied by demonstrating the capability of the charging pumps to deliver makeup flow to the reactor coolant system after recovering from a gas bound condition.

The experience that was gained from the performance of the venting demonstration test was used to update the operations procedure for venting of the charging pumps. There were three specific areas where the procedure was revised after the test. These changes are discussed below.

1) The procedure was revised to require the operators to vent the downstream charging header flow meter during the venting procedure. This is to ensure that accurate flow indication is available for the control room operators. During the demonstration test, the flow meter was vented due to the erroneous flow indication observed in the control room after restoring the "A" charging pump to operation. After the flow meter was vented, normal flow indication was restored.

Attachment 1 (Cont'd)

Summary of Venting Demonstration Test

2) The procedure was revised to establish proper communication and responsibilities for the operators performing the venting.

3) The procedure was also revised to establish a continuous draining of the vent receiver tank while it is receiving the hydrogen gas vented from the charging pumps. The previous revision of the procedure was written such that the vent receiver tank was only drained after it was determined to be full. It should be noted that continuous draining of the vent receiver tank was performed during the demonstration test. Therefore, the test was conducted in accordance with this change.

These three changes are included in revision 2 of the operations procedure (refer to Attachment 3). As an additional note, one of the NRC Resident Inspectors was present to witness this test.

Attachment 2

Operations Procedure for Venting of the Charging Pumps
(42AO-2ZZ50, Revision 1)