



A subsidiary of Pinnacle West Capital Corporation

10 CFR 50.73

Palo Verde Nuclear
Generating Station

Dwight C. Mims
Vice President
Regulatory Affairs and Plant Improvement

Tel. 623-393-5403
Fax 623-393-6077

Mail Station 7605
P. O. Box 52034
Phoenix, Arizona 85072-2034

102-05755-DCM/REB
October 10, 2007

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528, 50-529 and 50-530
License No. NPF 41, NPF 51 and NPF 74
Licensee Event Report 2007-004-00**

Attached, please find Licensee Event Report (LER) 50-528/2007-004-00 which reports operation in a condition prohibited by Technical Specifications due to an inadequate procedure for Surveillance Testing.

In accordance with 10 CFR 50.4, copies of this LER are being forwarded to the NRC Regional Office, NRC Region IV and the Senior Resident Inspector. If you have questions regarding this submittal, please contact Ray E. Buzard, Section Leader, Regulatory Affairs, at (623) 393-5317.

Arizona Public Service Company makes no commitments in this letter.

Sincerely,

DCM/REB/gat

Attachment

cc: E. E. Collins Jr. NRC Region IV Regional Administrator
M. T. Markley NRC NRR Project Manager - (send electronic and paper)
G. G. Warnick NRC Senior Resident Inspector for PVNGS

A member of the **STARS** (Strategic Teaming and Resource Sharing) Alliance
Callaway • Comanche Peak • Diablo Canyon • Palo Verde • South Texas Project • Wolf Creek

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollect@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME Palo Verde Nuclear Generating Station (PVNGS) Unit 1	2. DOCKET NUMBER 05000528	3. PAGE 1 OF 7
---	-------------------------------------	--------------------------

4. TITLE
Inadequate Surveillance Test Procedure Resulted In Failure To Meet Surveillance Requirement

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
08	11	2007	2007	- 004 -	00	10	10	2007	PVNGS Unit 2	05000529
									FACILITY NAME	DOCKET NUMBER
									PVNGS Unit 3	05000530

9. OPERATING MODE 1 / 1 / 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)			
10. POWER LEVEL 100 / 100 / 100	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)(B)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Ray E. Buzard, Section Leader, Regulatory Affairs - Compliance	TELEPHONE NUMBER (Include Area Code) (623) 393-5317
--	---

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On August 11, 2007, Palo Verde Units 1, 2 and 3 were in Operating Mode 1 (Power Operations), at approximately 100 percent rated thermal power, when a void was discovered in the Unit 1 Containment Spray (CS) "B" header, which was not in compliance with Technical Specification (TS) Surveillance Requirement (SR) 3.6.6.2.

The direct cause of the void in the CS header was that the Unit 1 "B" CS Header was not properly vented during the fill and vent process on July 1, 2007. The root cause of this condition was ineffective use of operating fundamentals during the pre-job briefing, resulting in failure to identify the potential for air entrapment during the fill and vent process on July 1, 2007.

Subsequent investigation determined that the Surveillance Test Procedure (STP) for all three units did not adequately satisfy the requirements of the TS SR to demonstrate that the CS headers were full of water. The direct cause for the identified failure to properly meet the TS SR to verify the CS header is full was a procedural deficiency in that STP 40ST-9SI13, "LPSI and CS System Alignment Verification" did not adequately demonstrate compliance with TS SR 3.6.6.2. Ultrasonic Testing (UT) was performed on all CS headers in all three units to verify that they were full of water, and a small void in Unit 3 "B" header was detected and filled and vented. UT was subsequently added to the affected STP to ensure compliance with TS SR 3.6.6.2.

LER 1-2004-009-01 reported a condition in Units 1, 2 and 3 where there were voids in the Emergency Core Cooling System containment sump piping due to a failure to translate the design intent to have the line filled with water into start-up, surveillance, and operating procedures.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Palo Verde Nuclear Generating Station Unit 1	05000528	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 7
		2007	-- 004	-- 00	

17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

Note: All times listed in this event report are approximate and Mountain Standard Time (MST) unless otherwise indicated.

1. REPORTING REQUIREMENT(S):

This LER (50-528/2007-004-00) is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) to report operation in a condition prohibited by Technical Specifications (TS). Specifically, TS Surveillance Requirement (SR) 3.6.6.2 requires Containment Spray (CS) piping be maintained full of water to the 113 ft level in the CS header. Contrary to this requirement, system monitoring determined that a portion of the Unit 1 CS "B" header piping contained a void.

Further investigation revealed that the station surveillance test procedure (STP) failed to adequately assure that this TS SR had been met for the CS headers for any of the Units.

2. DESCRIPTION OF STRUCTURE(S), SYSTEM(S) AND COMPONENT(S):

System Description:

The CS system (EISS Code: BE) consists of two independent trains that provide a spray of cool borated water into the containment to reduce containment temperature and pressure, provide hydrogen mixing, and to reduce the concentration of fission products in the containment atmosphere during a Design Basis Accident (DBA) which results in actuation of the CS system. Heat is removed from the spray water by the Shutdown Cooling (EISS Code: BP) Heat Exchangers (SDCHX). The CS system may be actuated either automatically or manually for the initial injection phase, where inventory from the Refueling Water Tank (RWT) (EISS Code: BP) provides the borated water source for injection. Upon low RWT water level, a Recirculation Actuation Signal (RAS) automatically realigns pump suction to the containment Emergency Core Cooling System (ECCS) recirculation sump, thereby initiating the recirculation mode of operation.

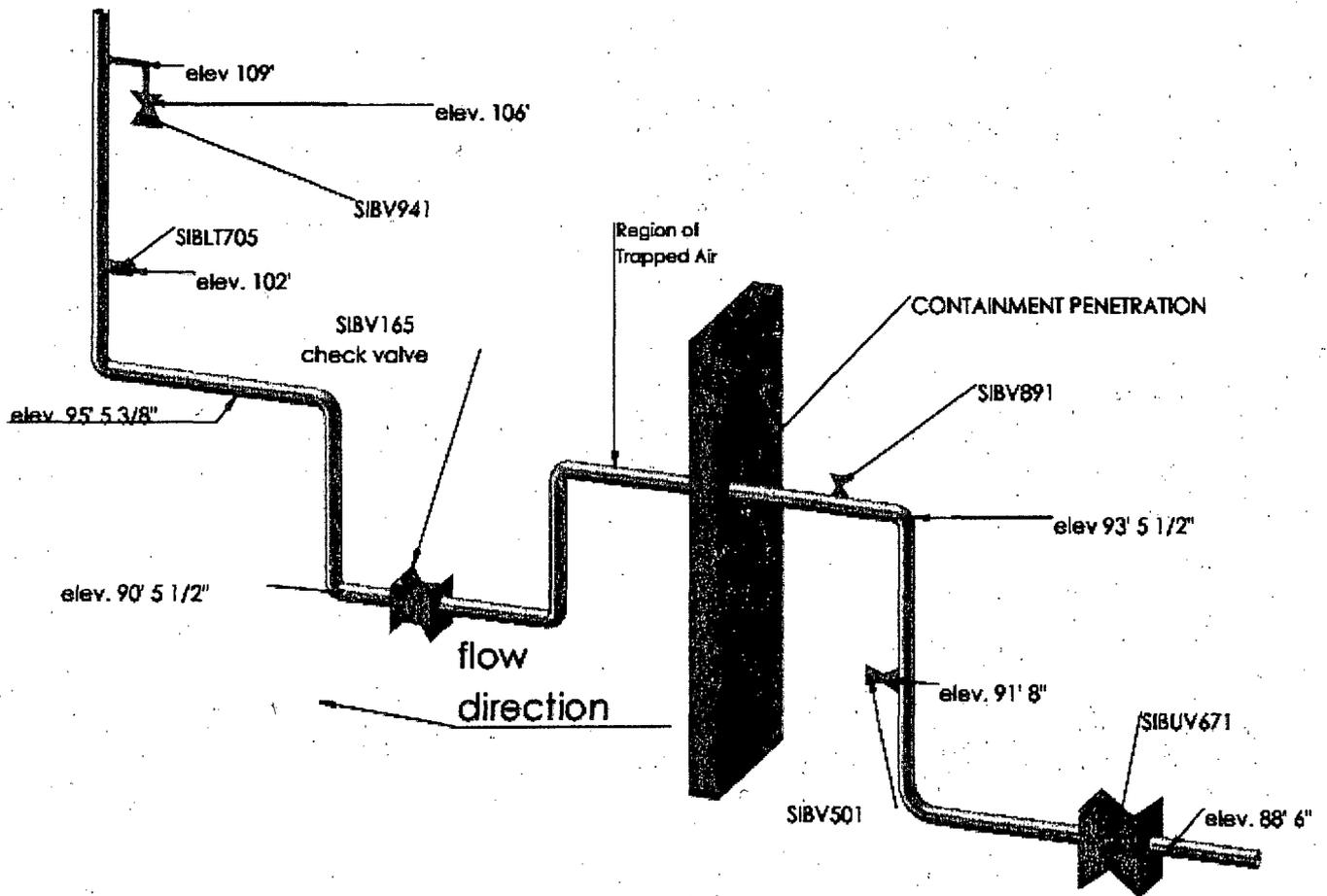
Palo Verde Nuclear Generating Station TS SR 3.6.6.2 requires CS piping be maintained full of water to the 113 ft level in the CS header. The requirement to fill the header to the 113 ft elevation ensures that the spray flow is admitted to the containment atmosphere within the time frame assumed in the safety analysis. This level also serves as an assumption in analysis for dynamic loading (water hammer) consideration in system design. The CS initial fill process following an outage (from a drained down condition) has been performed utilizing Procedures 40OP-9SI04, "Safety Injection System Venting," and 40OP-9SI02, "Recovery from Shutdown Cooling to Normal Operating Lineup." The following figure represents the piping arrangement of the "B" CS piping near the Containment penetration.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Palo Verde Nuclear Generating Station Unit 1	05000528	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 7
		2007	-- 004	-- 00	

17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

CS "B" CONTAINMENT PENETRATION AND PIPING CONFIGURATION



LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Palo Verde Nuclear Generating Station Unit 1	05000528	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 7
		2007	-- 004	-- 00	

17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

3. INITIAL PLANT CONDITIONS:

On August 11, 2007, Palo Verde Units 1, 2 and 3 were in Operating Mode 1 (Power Operations), at approximately 100 percent power. No equipment was inoperable that contributed to this event.

4. EVENT DESCRIPTION:

On August 11, 2007, the Safety Injection System Engineer was reviewing Unit 1 plant data and noticed that as Containment Building atmospheric pressure increased the level in the CS header decreased, indicative of air entrapment in the header volume. The System Engineer notified Unit 1 Operations personnel of the suspicious indications, and on August 11, 2007, at 23:15 hours Unit 1 Operations personnel declared the "B" CS System inoperable due to suspected voiding in the header, and entered TS Limiting Condition for Operation (LCO) 3.6.6. Engineering personnel performed system troubleshooting including Ultrasonic Testing (UT) analysis and determined that a section of the header did contain a void in the portion identified in the drawing above as "Region of Trapped Air". Therefore, the header was not "full of water" as required by the TS. Operations personnel filled and vented the header in accordance with procedure 40OP-9SI02. On August 12, 2007, at 16:09 hours the "B" CS System was restored to operable status and TS LCO 3.6.6 was exited.

During subsequent investigation of the cause of this event, station personnel determined that the STP developed to ensure compliance with the TS SR was inadequate in that it did not completely verify that the header was full of water. As a result, on September 8 at 14:05, all three units entered TS SR 3.0.3 which states that if it is discovered that a surveillance was not performed within its specified frequency, then compliance with the requirement to declare the LCO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified frequency, whichever is greater. This delay period is permitted to allow performance of the Surveillance. The affected STP was revised and reissued on September 21, 2007, to include direction to perform UT analysis of the CS header to verify that the header is full on a monthly basis.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Palo Verde Nuclear Generating Station Unit 1	05000528	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 OF 7
		2007	-- 004	-- 00	

17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

5. ASSESSMENT OF SAFETY CONSEQUENCES:

Unit 1 condition identified on August 11, 2007

The voided section of CS header in Unit 1 did not result in a planned or unplanned shutdown of any unit. However, this condition did result in the Unit 1 "B" Containment Spray system being declared inoperable for nearly 19 hours while UT analysis could confirm the location of the unfilled header and the header was appropriately filled and vented. During this nearly 19 hours of inoperability, Unit 1 remained in Mode 1 within the requirements of TS LCO 3.6.6. Subsequent investigation indicated that this voided condition was created during the initial fill process of this section of header on July 1, 2007, and, therefore, the condition existed for approximately 42 days.

The voided volume in Unit 1 was determined to be approximately 55 gallons and was located downstream of the outboard CS Containment Isolation Valve (CIV). The effect it would have on CS operation following an accident was evaluated and it was concluded that the condition would yield no significant effect from this decrease in Containment Spray header level/volume based on the volume of the void, the location of the void (downstream of the outboard CS header CIV, SIB-671) and the flow capacity of the CS pump (3890 gpm rated flow). The delivery of water to the spray nozzles would have been delayed as a result of the identified void by as much as 1.5 seconds assuming a maximum Containment Building atmospheric pressure of 60 psig. This would have had no effect on the ability of the CS system to perform its designed safety functions.

Additionally, this void did not present a water hammer concern since it was located in the discharge side of the CS pump and the discharge piping is open to the Containment Building atmosphere without obstruction. This would preclude any water hammer event. The void would have been simply flushed out into the Containment atmosphere.

The event did not result in any challenges to the fission product barriers or result in the release of radioactive materials. There were no adverse safety consequences or implications as a result of this event and the event did not adversely affect the safe operation of the plant or health and safety of the public.

The event did not result in a transient more severe than those analyzed in the updated Final Safety Evaluation Report Chapters 6 and 15. The event did not have any nuclear safety consequences or personnel safety impact.

The condition would not have prevented the fulfillment of any safety function of structures or systems as defined by 10 CFR 50.73(a)(2)(v).

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Palo Verde Nuclear Generating Station Unit 1	05000528	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	6 OF 7
		2007	-- 004	-- 00	

17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

Inadequate STP for all three units

Since the STP did not verify the CS piping between the outboard and inboard containment isolation valves was full there may have been past occurrences when the CS piping was not full for an extended period of time. The normal practice for filling the CS headers is to do a fill and vent using normal operating procedures following a refueling outage. Since this portion of the CS piping is not exposed to gas systems (e.g. nitrogen), if properly filled and vented the piping should remain full during plant operation. A review of internal operating experience did identify previous occurrences of some amount of voiding in the CS headers; however, in each instance the amount of void was determined to not be significant and would not have prevented the CS system from performing its safety function.

6. CAUSE OF THE EVENT:

There are two distinct but related conditions associated with this report, each with separate direct and root causes.

The direct cause of the void in the CS header was that the Unit 1 "B" CS Header was not properly vented during the fill and vent process on July 1, 2007. The root cause of this condition was ineffective use of operating fundamentals during performance of the pre-job briefing, resulting in failure to identify the potential for air entrapment during the fill and vent process on July 1, 2007. Contributing to this root cause was a procedural deficiency in procedure 40OP-9SI02, which in section 4.7.7.15, directed personnel to "Unlock and throttle open SIB-V891 as needed to vent the Containment Spray Header." In utilizing the words "as needed" the direction was unclear, in that operations personnel concluded that the entire step was optional, rather than the words "as needed" applying only to the extent valve SIB-V891 could be intermittently throttled. Operations personnel involved with the pre-job briefing believed that the CS header had not been drained during the outage, and as such would not require any fill and vent to be performed.

The direct cause for the identified failure to properly meet the TS SR to verify the CS header is full was a procedural deficiency in that STP 40ST-9SI13, "LPSI and CS System Alignment Verification" did not adequately demonstrate compliance with TS SR 3.6.6.2. The root cause of this condition is indeterminate in that greater than 20 years have passed since the STP was developed and no records were located to determine the basis of the original STP.

7. CORRECTIVE ACTIONS:

The Unit 1 "B" CS header was filled and vented and then verified through ultrasonic testing (UT) to be filled. Both "A" and "B" Train CS headers in each Unit were evaluated to assess their current condition for compliance with TS SR 3.6.6.2. In order to confirm that CS

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Palo Verde Nuclear Generating Station Unit 1	05000528	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	7 OF 7
		2007	-- 004	-- 00	

17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

headers were full, specific UT was performed on each of the Containment Penetration pipes of each CS Train on September 10, 2007. All CS headers were found to be completely filled except Unit 3 "B", which evidenced a slight void. Operations personnel completed an immediate operability determination and concluded that the "B" train remained operable. The Unit 3 "B" header was filled and then verified to be filled using UT.

On September 13, 2007, a Unit Night Order was entered for all 3 units to inform Operations personnel of the event, and to instruct that all procedural steps with qualifying statements such as "as necessary" or "as needed" shall be reviewed with the Control Room Supervisor (CRS) to ensure that the desired action is understood.

STP 40ST-9SI13 was revised and reissued on September 21, 2007, to require performance of UT analysis of each CS header, between the containment isolation valves, to verify that the header is full. The STP was completed on September 23, 2007, for the "A" train of CS for all three Units and for the "B" train in Units 1 and 2 on October 6 and October 8, 2007, respectively, thereby satisfying SR 3.0.3. Unit 3 entered Operating Mode 5 for its 13th Refueling Outage on September 29, 2007, and therefore the requirements of SR 3.0.3 were no longer applicable. As previously stated, UT had been performed on the "B" train of CS for Unit 3 on September 10, 2007, and performance of the revised STP including UT will be completed prior to restart of Unit 3 following the refueling outage.

Operations Department will establish and implement a program to improve the use of operator fundamentals which will include performance monitoring and trending.

A review of each Surveillance Requirement to verify a system, sub-system or component is filled with water (or other fluid) to a specific criterion will be performed to ensure the Surveillance Test adequately demonstrates the Surveillance Requirement criteria are met.

A review all procedures that affect safety related equipment for steps with conditional phrases such as "as needed", "as necessary", "if required", etc. will be performed to ensure the steps cannot be reasonably misinterpreted to permit an unintended action.

8. PREVIOUS SIMILAR EVENTS:

LER 1-2004-009-01 reported a condition in Units 1, 2 and 3 where there were voids in the Emergency Core Cooling System containment sump piping due to a failure to translate the design intent to have the line filled with water into start-up, surveillance, and operating procedures. The corrective actions for that event would not have prevented this event, as the intent to maintain the CS header full of water was clearly captured in the STPs and operating procedures.