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Dominion®

July 30, 2015

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

Serial No.	15-288A
NLOS/WDC	R1
Docket Nos.	50-336/423
License Nos.	DPR-65
	NPF-49

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNITS 2 AND 3
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST TO ADOPT TSTF-523, REVISION 2, GENERIC LETTER 2008-01, MANAGING GAS ACCUMULATION (TAC NO. MF5715 & MF5716)

By letter dated January 15, 2015, and supplemented by letter dated April 15, 2015, Dominion Nuclear Connecticut, Inc. (DNC) submitted a license amendment request (LAR) for Millstone Power Station Unit 2 (MPS2) and Millstone Power Station Unit 3 (MPS3). The proposed amendment would modify technical specification requirements to address Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," as described in Technical Specifications Task Force (TSTF)-523, Revision 2, "Generic Letter 2008-01, Managing Gas Accumulation." TSTF-523, Revision 2 is approved for use by the Nuclear Regulatory Commission (NRC) and was announced in the Federal Register on January 15, 2014 (79 FR 2700). In an email dated June 1, 2015, the NRC transmitted a request for additional information (RAI) containing nine questions related to the LAR. In a letter dated July 17, 2015, DNC responded to RAI Questions 2, 3, 4, 5, and 6.

The attachment to this letter provides DNC's response to the remaining four questions of the NRC's RAI - Questions 1, 7, 8, and 9.

If you should have any questions regarding this submittal, please contact Wanda Craft at (804) 273-4687.

Sincerely,

[signature]

Mark D. Sartain
Vice President – Nuclear Engineering

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County aforesaid, today by Mr. Mark D. Sartain, who is Vice President – Nuclear Engineering, of Dominion Nuclear Connecticut. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of that company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 30th day of July, 2015.

My Commission Expires: 12/31/16.

[signature]
Notary Public

CRAIG D SLY
Notary Public
Commonwealth of Virginia
Reg. # 7518653
My Commission Expires December 31, 2016

A001
NRR

Attachment:

Response to Request for Additional Information Regarding License Amendment Request to Adopt TSTF-523 – Questions 1, 7, 8, and 9

Commitments contained in this letter: None

cc: U.S. Nuclear Regulatory Commission
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ATTACHMENT

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST TO ADOPT TSTF-523 - QUESTIONS 1, 7, 8, AND 9

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNITS 2 AND 3

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RAI 1

Please clarify use of the Froude number, as follows:

a. *The License Amendment Request (LAR) referenced Generic Letter (GL) 2008-01. The response to GL 2008-01 states that a Froude number > 0.70 will remove gas from piping. This is inconsistent with the NEI 09-10, "Guidelines for Effective Prevention and Management of System Gas Accumulation," and the NRC's safety evaluation that approved NEI 09-10. Please explain this apparent inconsistency.*
b. *In the GL response, some locations are stated to be ensured to be gas free by use of a sufficient flow rate. What are the Froude numbers used at these locations? If a system is not exempted because it is in operation, how long is flow maintained when gas removal is being accomplished?*

DNC Response

a. At the time of the GL 2008-01 responses, MPS2 and MPS3 performed its evaluation of a flow rate's ability to sweep, flush, or remove voids from piping based on a Froude number $\geq$ 0.7. This value was obtained from a 1998 vendor (Creare Inc.) test report that was used to support MPS3's gas monitoring program up to year 2008, which was prior to issuance of NEI 09-10, Revision 0. In October 2009, NEI 09-10, Rev. 0 was issued recommending that dynamic venting flow rates be based on a single Froude number of $\geq$ 1.0. By April 2013, the latest (NRC approved) NEI 09-10, Rev. 1a guidance recommended a dynamic venting Froude range of $0.8 < N_{FR} < 2.0$ depending on pipe geometry and available flush time. Because flush time was not well characterized, a Froude number $\geq$ 2.0 was preferred. For the locations where dynamic venting is credited at MPS2 and MPS3, each location has a Froude number > 0.8. Most

locations have a Froude number ≥ 1.0 and some meet the preferred Froude number of ≥ 2.0. Operating experience at MPS2 and MPS3 has demonstrated that dynamic venting at these locations has been successful at these Froude numbers (which are based on flow rates specified in procedures and their inherent run times).

b. For MPS2, a list of the locations that would be ensured to be gas free due to sufficient flow rate is provided in the table below. For each location, details of the corresponding flow rate, Froude number, and length of time flow is maintained during gas removal (flush time) are also provided.

Location	Flow Rate (gpm)	Pipe Size/Froude No.	Flush Time
High Pressure Safety Injection (HPSI) pump discharge header from the pumps to the tie to the individual Low Pressure Safety Injection (LPSI) pump injection lines	The flow rate during plant refueling outages when a HPSI pump is used to fill the reactor cavity can be either 300 gpm (75 gpm per cold leg) or 600 gpm (150 gpm per cold leg) depending on procedure. In addition, a comprehensive (high) flow pump in-service test (IST) is performed at 500 gpm for each HPSI pump during plant refueling outages.	<u>Common Lines</u> 3" sch. 80 / 5.24 @ 300 gpm 10.47 @ 600 gpm 4" sch. 80 / 2.62 @ 300 gpm 5.24 @ 600 gpm 6" sch. 80 / 0.94* @ 300 gpm 1.88 @ 600 gpm * A Froude number slightly < 1.0 is acceptable here because the piping run is either horizontal or vertically upward. Per the NEI guidance, a Froude Number > 0.54 is required to move a gas void toward the downstream end of a horizontal pipe. <u>Individual Loop Lines</u> 2" sch. 160 / 5.07 @ 75 gpm 10.14 @ 150 gpm 3" sch. 160 / 1.68 @ 75 gpm 3.36 @ 150 gpm	These activities are normal plant functions performed during refueling outages. A flush time is not specified in the procedures. The run time of a HPSI pump while performing any of these activities is typically > 10 minutes, which is considered sufficient to flush the system piping.

Location	Flow Rate (gpm)	Pipe Size/Froude No.	Flush Time
LPSI pump discharge header from the pumps to the reactor coolant system (RCS)	The flow rate during plant shutdowns when shutdown cooling (SDC) is in service is a minimum of 3500 gpm (875 gpm per cold leg). Flow is into the RCS.	Common Lines 10" sch. 20 / 2.60 @ 3500 gpm 12" sch. 20 / 1.67 @ 3500 gpm Individual Loop Lines 6" sch. 10S / 2.15 @ 875 gpm 6" sch. 160 / 3.57 @ 875 gpm 6" sch. 120 / 3.08 @ 875 gpm	A flush time is not specified in the procedure because water is flowing continuously while SDC is in service. Both trains of LPSI are flushed prior to the end of a refueling outage.
Boron precipitation (alternate hot leg injection method) into RCS hot legs via HPSI pump (P-41A) through the charging system into the pressurizer auxiliary spray line	41 gpm single charging pump flow rate during normal plant operation continually sweeps the 2" discharge piping. The flowrate during boron precipitation with a HPSI pump would be higher.	2" sch. 160 / 2.8 @ 41 gpm	The flush time is continuous via a charging pump during normal plant operation.
Containment spray (CS) pump suction line	In addition to the minimum flow recirculation line, this pump can be aligned to the full flow recirculation test line during normal plant operations which allows for dynamic venting at 1377-1412 gpm following on-line maintenance.	10" sch. 20 / 1.02 @ 1377 gpm	>8 minutes

Location	Flow Rate (gpm)	Pipe Size/Froude No.	Flush Time
HPSI, LPSI, & CS pump minimum flow recirculation lines to the refueling water storage tank (RWST)	≥ 20.4 gpm from HPSI pump performed quarterly, ≥ 28.8 gpm from CS pump performed quarterly, ≥ 110 gpm from LPSI pump performed quarterly	2" sch. 80 / 0.97* @ 20.4 gpm 2" sch. 40 and sch. 80/ 1.17 @ 28.8 gpm 4.48 @ 110 gpm 4" sch. 80/ 0.96** @ 110 gpm * A Froude number slightly < 1.0 is sufficient to sweep the individual 2" HPSI recirculation lines into the common 4" lines. **The piping run in the common 4" line is either horizontal or vertically upward. Per the NEI guidance, a Froude Number > 0.54 is required to move a gas void toward the downstream end of a horizontal pipe.	A flush time is not specified in the procedures. The run time per pump necessary to obtain IST data is typically > 10 minutes, which is considered sufficient to flush the system piping.
SI & CS test line to the RWST	This discharge piping is flushed at 1500 gpm during plant heatup.	6" sch. 10S / 3.68 @ 1500 gpm	15 minutes
SDC Suction Lines	This suction piping is flushed at 3500 gpm during refueling outages when SDC is in service.	14" sch. 20 / 1.34 @ 3500 gpm	A flush time is not specified in the procedure because water is flowing continuously while SDC is in service. Both trains of LPSI are flushed prior to the end of a refueling outage.

Location	Flow Rate (gpm)	Pipe Size/Froude No.	Flush Time
Chemical and volume control system (CVCS) purification line to SDC suction header	While SDC is in service, a portion of the SDC flow from the SDC heat exchangers (HXs) is processed to the RCS letdown HX, through the purification ion exchanger and returns to the 14" SDC suction line (128 gpm).	3" sch 40 / 1.98 @ 128 gpm	A flush time is not specified in the procedure. This system flow path can be placed in service for extended time periods during refueling outages which is considered sufficient to flush the system piping.

For MPS3, a list of the locations that would be ensured to be gas free due to sufficient flow rate is provided in the table below. For each location, details of the corresponding flow rate, Froude number and length of time flow is maintained during gas removal (flush time) are also provided.

Location	Flow Rate (gpm)	Pipe Size/Froude No.	Flush Time
Quench Spray System (QSS) suction piping and discharge piping through recirculation line	>4000 gpm	14" sch. 40 / 1.60 @ 4000 gpm 12" sch. 40 / 2.00 @ 4000 gpm	A flush time is not specified in the procedure. The high flow IST is performed quarterly for each QSS pump. The run time per pump necessary to obtain IST data is typically > 10 minutes, which is considered sufficient to flush the system piping.

Location	Flow Rate (gpm)	Pipe Size/Froude No.	Flush Time
SDC suction and discharge piping to and from RCS	The flow rate during plant shutdowns when SDC is in service is 2800 gpm per train (1400 gpm per cold leg). The flow path takes suction from the RCS hot legs through the residual heat removal (RHR) pumps and heat exchangers, then discharges back to the RCS cold legs. The minimum flow rate during the emergency core cooling system (ECCS) flow test is 4000 gpm per train (2000 gpm per cold leg). When the system is used for ECCS, the LPSI flow path is from the RWST through the pumps and parallel through the HXs and the HXs bypass lines, then to the RCS cold legs for injection into the core.	16" sch. 40 / 1.15 @ 4000 gpm 14" sch. 40 / 1.12 @ 2800 gpm 1.60 @ 4000 gpm 12" sch. 40 / 1.40 @ 2800 gpm 2.00 @ 4000 gpm 12" sch. 160 / 2.15 @ 2800 gpm 10" sch. 40 / 2.20 @ 2800 gpm 3.15 @ 4000 gpm 10" sch. 140 / 1.55 @ 1400 gpm 2.21 @ 2000 gpm 10" sch. 160 / 3.32 @ 2800 gpm 4.75 @ 4000 gpm 6" sch. 160 / 5.51 @ 1400 gpm 8.16 @ 2000 gpm	A flush time is not specified in the procedure because water is flowing continuously while SDC is in service. Both trains of RHR are flushed prior to the end of a refueling outage.

Location	Flow Rate (gpm)	Pipe Size/Froude No.	Flush Time
Intermediate Head Safety Injection System (SIH) discharge piping from SIH pump to RCS through either cold legs or hot legs	The minimum flow rate during the ECCS pump high flow test is 576 gpm (144 gpm per cold leg). The test is performed during refueling outages. Flow path is from the RWST through the Safety Injection pumps then to the RCS cold legs. When operated for the quarterly pump IST surveillance, the minimum flow rate is 40.5 gpm per train.	6" sch. 40 / 1.59 @ 576 gpm 4" sch. 160 / 6.57 @ 576 gpm 2" sch. 160 / 9.74 @ 144 gpm 1.5" sch. 160 / 4.89 @ 40.5 gpm (recirculation line) 3" sch. 160 / 0.91* @ 40.5 gpm (common recirculation line) * A Froude number slightly < 1.0 is acceptable here because the piping run is either horizontal or vertically upward before entering the top of the RWST. Per the NEI guidance, a Froude Number > 0.54 is required to move a gas void toward the downstream end of a horizontal pipe.	A flush time is not specified in the procedure. The high flow IST test is performed for each SIH pump during refueling outages. The run time per pump necessary to obtain IST data is typically > 10 minutes, which is considered sufficient to flush the system piping.
HPSI inside containment piping from penetration 51 to the RCS via CHS pumps	The minimum flow rate during the ECCS pump high flow test is 405 gpm (101.25 gpm per cold leg). Note: Following DNC's response to GL 2008-01, flow rate for the high flow CHS pump IST has been increased to approximately 500 gpm.	4" sch. 160 / 4.62 @ 405 gpm 3" sch. 160 / 9.08 @ 405 gpm 1.5" sch. 160 / 12.22 @ 101.25 gpm	A flush time is not specified in the procedure. The high flow IST test is performed for each CHS pump during refueling outages. The run time per pump necessary to obtain IST data is typically > 10 minutes, which is considered sufficient to flush the system piping.

RAI 7

Many references are made to the effect that there are no known sources of gas that could contribute to a gas void in numerous components. A chemical sampling system that connects to multiple locations within containment has been known to cause gas accumulation due to multiple valve leaks. This system is not mentioned in the licensee's application. Does Millstone Power Station Unit 2 (MPS2) or MPS3 have such a system? If so, what is the potential for gas accumulation and how is it addressed?

DNC Response

DNC did not specifically address the chemical sampling systems at MPS2 and MPS3 as a potential source of gas intrusion during the GL 2008-01 response because the systems did not have a history of back leakage susceptibility. The gas monitoring program was initially developed by focusing on preventing gas accumulation at known problem areas as well as those areas deemed vulnerable to gas accumulation. New areas and/or additional systems would be handled via the corrective action program if they become self identified.

At MPS2, the Post Accident Sampling System (PASS) provides a sample pathway from the HPSI, LPSI and CS pump common 4-inch minimum flow recirculation line. The recirculation lines from each pump are 2-inch schedule (sch.) 80 before emptying into the common 4-inch sch. 80 recirculation line. The individual 2-inch lines are dynamically swept at a Froude number ≥ 0.97 whenever the HPSI pumps are run on recirculation to the RWST and ≥ 1 whenever the LPSI or CS pumps are run on recirculation to the RWST. The common 4-inch minimum flow line is dynamically swept at a Froude number ≥ 0.96 whenever a LPSI pump is run on recirculation to the RWST. The common recirculation line discharges to a tank at atmospheric pressure. Therefore, the periodic dynamic sweep of these lines obviates the need for gas monitoring. Also, a non-PASS sampling system connects to the 14-inch LPSI pump SDC suction line. This pipe section is dynamically flushed during refueling outages when SDC is first placed in-service. Any potential gas voids would be removed at that time. This pipe section is currently exempt from the quarterly gas monitoring surveillance since it is isolated without head pressure during normal plant operation. However, the SDC suction piping will be added to the gas monitoring surveillance upon NRC approval of the LAR.

At MPS3, the PASS provides a sample pathway from the ECCS cross-over piping (i.e., post LOCA long term recirculation piping between the Containment Recirculation Spray System (RSS) pumps and the ECCS pumps). This piping location is currently included in the current gas monitoring surveillance that supports TS 4.5.2.b.1.

The Reactor Plant Sampling system provides a sample pathway from the Residual Heat Removal (RHR) system pump minimum flow line. This piping is in service during

quarterly RHR pump surveillance tests. A gas void originating here would be swept into the main 14-inch RHR pump suction header during the IST and from there voids would collect in a 12-inch vertical take-off from the RWST. This piping section is inspected for gas following each quarterly RHR pump IST and is also included in the current gas monitoring surveillance that supports TS 4.5.2.b.1.

RAI 8

The reported April 6, 2014, 'B' LPSI pump cavitation was attributed to a previously recognized discharge side void. Please address how this interacted with behavior associated with a common two inch discharge line where the pump that has a lower discharge pressure capability may no longer provide flow.

DNC Response

The event occurred during the warm-up stages prior to placing the SDC system in service, which only requires a single LPSI pump to be running at a very low flow rate. Therefore, the concern associated with interaction between two pumps would not exist. Furthermore, the condition is not a concern for an ECCS event where two LPSI pumps could be operating simultaneously since the LPSI system alignment is different (i.e., an open system flow path from the RWST to the RCS where one or both LPSI pumps would sweep a void in the discharge piping into the RCS). The LPSI system alignment during the actual event (placing the SDC system in service) operated a single LPSI pump in a closed loop system.

RAI 9

Please provide the void surveillance history of MPS2 starting at January 1, 2008. Include the following:

a. *The surveillance frequency.*
b. *For each discovered void, provide the mode, date, location, void quantity, void acceptance criterion, post void action (location restored to a water-solid condition) and reason for discovery of the void (examples include routine surveillance, accumulator behavior, reactor coolant leakage). If the void quantity exceeded the void acceptance criterion, then provide the disposition with respect to the impact on operability.*
c. *A statement that if a void is not identified in Item b, then routine surveillances determined that there was no void.*
d. *The total number of surveillances conducted.*
e. *Monitoring of equipment such as accumulators or reactor coolant system leakage and follow-up from outages with respect to void assessment.*

DNC Response

The gas monitoring surveillance program at MPS2 began in March 2010. The surveillance data from March 2010 through June 2015 is provided in the table below.

a. The gas monitoring surveillance frequency at MPS2 is performed every 92 days. In the event of an active gas intrusion mechanism or a failed surveillance, the surveillance frequency at that location would be increased. Once resolved, the frequency would be returned to every 92 days.

b. Details of discovered voids are provided in the table below.

   Since March, 2010, gas accumulation at MPS2 has been predominantly found in two locations. The first location is the LPSI pump common discharge header at the four 6" cold-leg loop injection lines (i.e., UT Points 20, 21, 22, and 23). This location is the high point of the LPSI system piping just before it combines with HPSI and just outside the containment penetrations. The four locations are upstream of their respective normally closed isolation valve in a short horizontal pipe run (typically one to two feet in length). These areas are prone to collecting minor gas voids over time. The second location is the CS pump discharge headers [UT Point 26 (B Train) and UT Point 27 (A Train)] just prior to their containment penetrations (see the response to Question 9.e).

c. Routine surveillance is performed at 27 total locations every 92 days. There are 19 locations in the A Train and common piping (four are located in pump suction piping and 15 are located in pump discharge piping). There are eight locations in the B Train (four are located in pump suction piping and four are located in pump discharge piping). Per the routine 92-day surveillance frequency, voids were identified during the surveillance dates noted with an asterisk. For the dates with no asterisk, routine surveillance determined there were no voids at any of the surveillance locations.

Train A	Train B
3/16/10*	3/9/10*
6/8/10*	6/22/10*
8/31/10*	8/17/10*
12/20/10*	11/9/10
2/15/11*	2/3/11
5/10/11	7/19/11
8/2/11	10/13/11
11/2/11	1/3/12*
1/18/12*	3/27/12
4/17/12	6/25/12
7/10/12	9/18/12

9/25/12	12/4/12
12/18/12*	2/26/13*
3/12/13	5/21/13*
6/4/13	8/13/13*
8/27/13	11/5/13
11/19/13	1/27/14
2/11/14	5/17/14
5/16/14*	7/29/14
7/28/14*	10/6/14
10/23/14*	12/29/14
10/31/14*	3/24/15
1/16/15*	6/15/15
4/6/15*	
6/29/15*	

Details of the void locations are provided in the table below.

d. For each train, the total number of routine surveillances conducted since March 2010 (based on a 92-day frequency) is approximately 24. In addition, there have been approximately 108 surveillances performed at certain locations as either follow-up or trending of recurring problem areas. Surveillance results which identified gas voids are provided in the table below.

e. Gas accumulation discovered on May 21, 2013 at UT Point 26 (CS header - B Train) was a result of SIT back leakage across multiple valves. The common RWST return piping had become pressurized due to the SIT back leakage. This caused back leakage through a 1" line into the CS header just outside the containment penetration. Because the back leakage could not be corrected immediately, daily monitoring and venting of the CS header was necessary for the first week, then weekly for the next 46 weeks until the back leakage was corrected during the spring 2014 MPS2 refueling outage. Refer to UT Point 26 during operating cycle 22 in the table below.

   On May 16, 2014, during start-up from the spring 2014 refueling outage, gas accumulation was discovered at UT Point 27 (CS header – A Train). This void was due to improper fill and vent of the A Train CS. After the void was removed, continual degassing of aerated water at that location required daily monitoring and venting of the CS header for the first week, then weekly for the next 48 weeks. Once the trending data showed a stable void volume, the monitoring frequency was changed to every two weeks. The remaining air void is understood to be unventable air due to an unfavorably sloped pipe. This void will continue to be monitored until it is ultimately removed during the fall 2015 MPS2 refueling outage. Gas voids at this location are not typical when the CS discharge piping fill and vent process is properly performed following refueling outages. Refer to UT Point 27 during operating cycle 23 in the table below.

Cycle 23

Date and Train	Location	Void Vol. (ft^3)	Allowable Vol. (ft^3)	Notes	Surveillance Frequency	Reason for Discovery	Disposition with Respect to Impact on Operability
6/29/15 Train A	UT Point 20 – LPSI discharge	0.017	0.128	Mode 1. Source was degassing after securing shutdown cooling in Refueling Outage 22 - Location restored to water-filled condition.	92 days	Routine surveillance	Void volumes within operability limits
	UT Point 21– LPSI discharge	0.002	0.244				
	UT Point 23– LPSI discharge	0.020	0.147				
	UT Point 27– CS discharge	0.025	2.57	Mode 1. Source was degassing after securing shutdown cooling in Refueling Outage 22 –A portion of the piping is unventable due to pipe slope.			
5/19/14-6/15/15 Train A	UT Point 27– CS discharge	0.071 - 0.161	2.57	Mode 1. Source was degassing after securing shutdown cooling in Refueling Outage 22 –The recurrence of small gas voids is a continuation of the improper fill & vent that occurred on 5/16/14. A portion of the piping is unventable due to pipe slope.	Daily changed to Bi-weekly	Increased surveillance frequency after exit from Refueling Outage 22	Void volume within operability limits

Date and Train	Location	Void Vol. (ft^3)	Allowable Vol. (ft^3)	Notes	Surveillance Frequency	Reason for Discovery	Disposition with Respect to Impact on Operability
4/6/15 Train A	UT Point 20 – LPSI discharge	0.026	0.128	Mode 1. Source was degassing after securing shutdown cooling in Refueling Outage 22 - Location restored to water-filled condition.	92 days	Routine surveillance	Void volume was within operability limits
	UT Point 22 – LPSI discharge	0.037	0.129				
	UT Point 23 – LPSI discharge	0.030	0.147				
1/16/15 Train A	UT Point 21 – LPSI discharge	0.007	0.244	Mode 1. Source was degassing after securing shutdown cooling in Refueling Outage 22 - Location restored to water-filled condition.	92 days	Routine surveillance	Void volume was within operability limits
10/31/14 Train A	UT Point 20 – LPSI discharge	0.010	0.128	Mode 1. Source was degassing after securing shutdown cooling in Refueling Outage 22 - Location restored to water-filled condition.	92 days	Routine surveillance	Void volume was within operability limits
	UT Point 22 – LPSI discharge	0.006	0.129				
	UT Point 23 – LPSI discharge	0.025	0.147				
10/23/14 Train A	UT Point 20 – LPSI discharge	0.013	0.128	Mode 1. Source was degassing after securing shutdown cooling in Refueling Outage 22 - Location restored to water-filled condition.	92 days	Routine surveillance	Void volume was within operability limits
	UT Point 21 – LPSI discharge	0.069	0.244				
	UT Point 22 – LPSI discharge	0.048	0.129				
	UT Point 23 – LPSI discharge	0.025	0.147				
7/28/14 Train A	UT Point 20 – LPSI discharge	0.036	0.128	Mode 1. Source was degassing after securing shutdown cooling in Refueling Outage 22 -	92 days	Routine surveillance	Void volume was within operability limits
	UT Point 22 – LPSI discharge	0.122	0.129				

Date and Train	Location	Void Vol. (ft^3)	Allowable Vol. (ft^3)	Notes	Surveillance Frequency	Reason for Discovery	Disposition with Respect to Impact on Operability
	UT Point 23 – LPSI discharge	0.015	0.147	Location restored to water-filled condition.			
5/17/14 Train B	UT Point 25 – CS discharge	0.031	2.57	Mode 1. Source was improper fill and vent after Refueling Outage 22 - Location restored to water-filled condition.	Follow-up	Increased surveillance frequency after exit from Refueling Outage 22	Void volume was within operability limits
5/16/14 Train A	UT Point 20 – LPSI discharge	0.006	0.128	Mode 2. Source was degassing after securing shutdown cooling in Refueling Outage 22 - Location restored to water-filled condition.	92 days	Routine surveillance	Void volume was within operability limits
	UT Point 21 – LPSI discharge	0.025	0.244				
	UT Point 22 – LPSI discharge	0.027	0.129				
	UT Point 23 – LPSI discharge	0.042	0.147				
	UT Point 25 – CS discharge	0.343	2.57	Mode 2. Source was improper fill and vent after Refueling Outage 22 - Location restored to water-filled condition.			The A Train of CS was declared inoperable due to accumulated gas volume at Point 25 and Point 27 exceeding acceptance criteria of 2.57
	UT Point 27 – CS discharge	5.286	2.57				

Cycle 22

Date	Location	Void Vol. (ft^3)	Allowable Vol. (ft^3)	Notes	Surveillance Frequency	Reason for Discovery	Disposition with Respect to Impact on Operability
5/22/13-3/31/14 Train B	UT Point 26– CS discharge	0.088 - 0.161	2.57	Mode 1. Source was SIT back leakage across multiple valves into the B Train CS discharge header - Location restored to water-filled condition each instance.	Daily changed to Bi-weekly	Increased surveillance frequency	Void volume was within operability limits
5/21/13 Train B	UT Point 26 – CS discharge	6.557	2.57	Mode 1. Source was SIT back leakage across multiple isolation valves. Location restored to water-filled condition.	92 days	Routine surveillance	B Train of CS declared inoperable
2/26/13 Train B	UT Point 26 – CS discharge	0.341	2.57	Mode 1. Source was considered a one-time anomaly that was attributed to minor system degassing - Location restored to water-filled condition.	92 days	Routine surveillance	Void volume was within operability limits
12/18/12 Train A	UT Point 5 – HPSI suction	0.049	0.334	Mode 1. Source was improper fill and vent after HPSI pump on-line maintenance - Location restored to water-filled condition.	92 days	Routine surveillance	Void volume was within operability limits

Cycle 21

Date and Train	Location	Void Vol. (ft^3)	Allowable Vol. (ft^3)	Notes	Surveillance Frequency	Reason for Discovery	Disposition with Respect to Impact on Operability
1/18/12 Train A	UT Point 22 – LPSI discharge	0.037	0.129	Mode 1. Source was minor system degassing - Location restored to water-filled condition.	92 days	Routine surveillance	Void volume was within operability limits
1/3/12 Train B	UT Point 11 – HPSI discharge	0.059	0.207	Mode 1. Source was improper fill and vent after HPSI pump on-line maintenance - Location restored to water-filled condition.	92 days	Routine surveillance	Void volume was within operability limits

Cycle 20

Date and Train	Location	Void Vol. (ft^3)	Allowable Vol. (ft^3)	Notes	Surveillance Frequency	Reason for Discovery	Disposition with Respect to Impact on Operability
2/15/11 Train A	UT Point 20 – LPSI discharge	0.026	0.128	Mode 1. Source was degassing after securing shutdown cooling in Refueling Outage 19 - Location restored to water-filled condition.	92 days	Routine surveillance	Void volume was within operability limits

Date and Train	Location	Void Vol. (ft^3)	Allowable Vol. (ft^3)	Notes	Surveillance Frequency	Reason for Discovery	Disposition with Respect to Impact on Operability
12/20/10 Train A	UT Point 20 – LPSI discharge	0.013	0.128	Mode 1. Source was degassing after securing shutdown cooling in Refueling Outage 19 - Location restored to water-filled condition.	92 days	Routine surveillance	Void volume was within operability limits
	UT Point 21 – LPSI discharge	0.060	0.244				
	UT Point 23 – LPSI discharge	0.011	0.147				
8/31/10 Train A	UT Point 22 – LPSI discharge	0.005	0.129	Mode 1. Source was degassing after securing shutdown cooling in Refueling Outage 19 - Location restored to water-filled condition.	92 days	Routine surveillance	Void volume was within operability limits
	UT Point 23 – LPSI discharge	0.005	0.147				
8/17/10 Train B	UT Point 26 – CS discharge	0.088	2.57	Mode 1. Source was degassing after securing shutdown cooling in Refueling Outage 19 - Location restored to water-filled condition.	92 days	Routine surveillance	Void volume was within operability limits
6/22/10 Train B	UT Point 26 – CS discharge	0.123	2.57	Mode 1. Source was degassing after securing shutdown cooling in Refueling Outage 19 - Location restored to water-filled condition	92 days	Routine surveillance	Void volume was within operability limits
6/8/10 Train A	UT Point 20 – LPSI discharge	0.024	0.128	Mode 1. Source was degassing after securing shutdown cooling in Refueling Outage 19 - Location restored to water-filled condition.	92 days	Routine surveillance	Void volume was within operability limits
	UT Point 21 – LPSI discharge	0.012	0.244				

Date and Train	Location	Void Vol. (ft^3)	Allowable Vol. (ft^3)	Notes	Surveillance Frequency	Reason for Discovery	Disposition with Respect to Impact on Operability
3/16/10 Train A	UT Point 20 – LPSI discharge	0.022	0.128	Mode 1. Source was degassing after securing shutdown cooling in Refueling Outage 19 - Location restored to water-filled condition.	92 days	Routine surveillance	Void volume was within operability limits
	UT Point 21 – LPSI discharge	0.046	0.244				
	UT Point 22 – LPSI discharge	0.042	0.129				
	UT Point 23 – LPSI discharge	0.011	0.147				
3/9/10 Train B	UT Point 26 – CS discharge	0.341	2.57	Mode 1. Source was degassing after securing shutdown cooling in Refueling Outage 19 - Location restored to water-filled condition.	92 days	Routine surveillance	Void volume was within operability limits