10 CFR 50.54(f)

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102-05955-DCM/DJS
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References:
1. NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems" dated January 11, 2008
2. Arizona Public Service Company (APS) Letter No. 102-05910, dated October 14, 2008, Palo Verde Nuclear Generating Station (PVNGS) Units 1, 2 and 3 Docket Nos. STN 50-528/529/530 Nine-Month Response to NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems" (ADAMS Accession No. ML08294032)
3. NRC Letter to APS: PVNGS Units 1, 2, and 3 – Proposed Alternative Course of Action, Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems" (TAC Nos. MD7857, MD7858, and MD7859), dated July 25, 2008 (ADAMS Accession No. ML081960078)

Dear Sirs:

Subject: PVNGS Unit 1
Docket No. STN 50-528
Nine-Month Supplemental (Post-Outage) Response to NRC Generic Letter 2008-01

The Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 2008-01 (Reference 1) to request that each licensee evaluate the licensing basis, design, testing, and corrective actions for the emergency core cooling, decay heat removal, and containment spray systems to ensure that gas accumulation is maintained less than the amount that challenges operability of these systems, and that appropriate action is taken when conditions adverse to quality are identified.

As requested in Reference 3, attached is the APS supplemental response to the nine month response letter (Reference 2). This supplemental response is being submitted within 90 days of startup from the Unit 1 outage in which the deferred system walkdowns were completed. The GL activities that remain to be accomplished in Unit 1 are described in the enclosure.

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In summary, APS has concluded that the subject systems in PVNGS Unit 1 are operable and that PVNGS Unit 1 is currently in compliance with the licensing basis documentation and applicable regulations, including 10 CFR 50, Appendix B, Criteria III, V, XI, XVI, and XVII, with respect to the concerns outlined in GL 2008-01 regarding managing gas accumulation in these systems.

There are five new commitments made by this letter and four commitments rescheduled as shown in the commitment table included in Section B.2 of the enclosure. Should you need further information regarding this submittal, please contact Russell A. Stroud, Licensing Section Leader, at (623) 393-5111.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 2/17/09

Sincerely,

DCM

DCM/TNW/DFS/

Enclosure: Nine-Month Supplemental (Post-Outage) Response to NRC GL 2008-01

cc: E. E. Collins Jr. NRC Region IV Regional Administrator
R. Hall NRC NRR Project Manager
R. I. Treadway NRC Senior Resident Inspector for PVNGS

ENCLOSURE

Nine-Month Supplemental (Post-Outage) Response to NRC Generic Letter 2008-01

As requested by the NRC in Reference 3 of the cover letter, the following provides the nine-month supplemental (post-outage) response to GL 2008-01 for actions that were deferred until the next refueling outage for Unit 1.

The following information is provided in this enclosure:

- A description of the results of evaluations that were performed pursuant to GL 2008-01 on the previously incomplete activities, such as system piping walkdowns, at PVNGS Unit 1 (see Section A of this enclosure),

- A description of any additional corrective actions determined to be necessary to assure system operability and compliance with the quality assurance criteria in Sections III, V, XI, XVI, and XVII of Appendix B to 10 CFR Part 50, the licensing basis, and the operating license with respect to the subject systems. For any additional corrective actions the information includes a schedule and a basis for that schedule (see Section B.1 of this enclosure).

- A summary of any changes or updates to previous corrective actions, including any schedule change and the basis for the change. (See Section B.2 of this enclosure).

The original conclusions documented in the 9-month response with respect to the licensing basis evaluation, testing evaluations, and corrective action evaluations have not changed.

A. EVALUATION RESULTS

1. Design Basis Documents

Completion and evaluation of the design validation walkdowns performed prior to and during the fall 2008 refueling outage in Unit 1 (1R14) identified a slope on the "A" train common suction header piping of approximately two inches over a length of approximately 20 ft. The common suction header is a 24-inch diameter pipe from which the individual suction lines to the High Pressure Safety Injection (HPSI), Low Pressure Safety Injection (LPSI) and Containment Spray (CS) pumps branch off. The suction lines from both the Refueling Water Tank (RWT) and the containment sump come together to form this suction header. To verify operability, the location has been confirmed by ultrasonic examination (UT) to be full of water. However, the measured pipe slope does affect the current calculation of allowable gas volume acceptance criteria (Reference 1 of this enclosure) for this and other "A" train suction piping segments. This calculation will be revised to provide criteria specific to the Unit 1 "A" train to account for the actual as-measured pipe slope. (COM-16)

2. Confirmatory Walkdowns

Just prior to and during 1R14, laser templating was performed of horizontal sections of Safety Injection (SI) system piping inside and outside of containment. The SI system at Palo Verde is inclusive of the emergency core cooling system (ECCS), containment spray system and the residual heat removal/shutdown cooling system. Preliminary results were received from the laser templating vendor in mid-January 2009 and final results in early February. An evaluation of the results was performed by Arizona Public Service Company (APS) engineers and pipe slopes and local high points that deviate from the nominal horizontal or prescribed slope greater than approximately one quarter inch (1/4") were identified. These points were then prioritized based on potential safety significance for subsequent verification that the piping was full using UT. Prioritization utilized the following criteria:

a. Priority 1. Any location on the suction side of the SI pumps for which the projected maximum gas accumulation volume based on the measured slope of the pipe at that location could exceed the allowable gas accumulation volume specified in Reference 1 of this enclosure for that segment of piping. In general, gas accumulation in suction piping is of more safety significance than accumulation in discharge piping. In suction piping, accumulated gas can be drawn directly into the pump inlet and cause pump performance degradation up to and including failure depending on the quantity or air volume fraction ingested.

b. Priority 2. Any location on the suction side of the SI pumps for which the projected maximum gas accumulation volume based on the measured slope of the pipe at that location could not exceed the allowable gas accumulation volume specified in Reference 1 of this enclosure for that segment of piping.

c. Priority 3. Any location on the discharge side of the SI pumps, upstream of the normally closed containment isolation valves, that deviates from horizontal or the prescribed slope by more than one half inch (1/2") for the primarily 4-inch diameter HPSI piping or more than one inch (1") for the larger (10-inch diameter and greater) LPSI or CS piping. The acceptance criteria for discharge piping are derived from waterhammer calculations (Reference 2 of this enclosure) that assume gas accumulations corresponding to one half inch (½") depth for HPSI piping and one inch (1") depth for LPSI or CS piping. Based on industry operating experience and recognition that any significant gas accumulation in the discharge piping would manifest itself during pump surveillance testing, the locations in discharge piping are considered less safety significant than either Priority 1 or 2 locations in the suction piping.

d. Priority 4. Any location on the discharge side of the SI pumps that deviates from horizontal less than or equal to the criteria identified as Priority 3.

Locations downstream of the normally closed containment isolation valves, as described in Section 2.2.c of the APS 9-month response to GL 2008-01 (Reference 3 of this enclosure), are not subject to conditions that would result in waterhammer

because of the slow-opening containment isolation valves and lack of downstream flow restrictions (Reference 4 of this Enclosure). UT examinations will not be performed on these locations.

Forty three points have been identified meeting criteria 1 through 4. Five locations on the suction piping were identified as Priority 1 and UT examinations have been completed. These five locations were confirmed to be full of water by UT (i.e., no detectable voids). In addition, four Priority 2 locations on suction piping were examined by UT and confirmed to be full of water. These four locations were located close to the pump inlets and, therefore, grouped with the Priority 1 locations for the purpose of safety significance and scheduling of the UT examinations. The UT on the remaining Priority 2, 3 and 4 locations are scheduled to be completed by April 30, 2009. The remaining locations have been assessed for potential safety significance. In all but nine locations the projected void size based on the measured pipe slope would be less than the acceptance criteria for that location. For the nine locations, all on pump discharge piping, the potential void size could exceed the screening criteria of one half inch for HPSI and one inch for LPSI and CS piping. However, there exists sufficient evidence to conclude that an actual void large enough to challenge system operability would not exist at these locations. This evidence includes lack of any system dynamic response indicative of waterhammer during pump surveillance tests or other pump starts, as well as, available margin/conservatisms in the acceptance criteria. (COM-18)

Gas accumulation in discharge piping upstream of the normally closed containment isolation valves may result in amplified pressure pulsations after a pump start. Evaluation of this potential at PVNGS was performed and documented in Reference 2 of this enclosure. The evaluation considers the pump run up time, the initial gas volume and its location within the piping system, and the opening time of the normally closed containment isolation valves. To simplify and make the evaluation conservatively bounding, the opening of the isolation valves is neglected (i.e., assumed to remain closed). The resulting force imbalance was calculated and ultimately the consequential pipe stress and pipe support loads were determined. During quarterly pump testing of the SI pumps, the conservative and bounding condition assumed in the waterhammer calculations is directly replicated. The tested pump is started and runs up to full pressure with the pump on minimum recirculation and the normally closed isolation valves remain closed. The quarterly pump tests explicitly demonstrate that a gas accumulation of sufficient volume to produce any dynamic response, and, therefore, challenge the safety function of the system, is not present.

The waterhammer evaluations performed in Reference 2 of this enclosure consider initial gas accumulation volumes in discharge piping equal to one-half inch depth across the entire length of each HPSI high point pipe segment and one inch depth for each length of LPSI or CS high point pipe segment. The pipe stress and pipe support evaluations resulted in acceptable margin and, in most cases, very large margins can be shown to exist between the associated pipe stress and pipe support loads and the corresponding allowables. As described in COM-6, the evaluations

associated with the PVNGS specific gas volume acceptance criteria for the segments of SI discharge piping upstream of the normally closed containment isolation valves are scheduled to be finalized by March 31, 2009.

3. Vent Valves

The evaluations and UT examinations performed to date have identified two locations where vent valve installations are being evaluated. Both locations have been confirmed by UT to be full of water. The first location is on the "A" train common suction header as described above. At this location the pipe slopes up approximately two inches over a length of approximately 20 ft. There is currently no means to vent this location directly if gas accumulation were to form. There are access and space limitations that may make installing a vent valve at this location not feasible. The second location is on the "B" train shutdown cooling suction line downstream of the out-board containment isolation valve. The pipe slopes up approximately one inch above the elevation of the existing vent valve and if gas accumulation were to form at this location it could not be removed directly by venting through the existing vent valve. In these two locations, either a vent valve will be installed/re-located or programmatic controls will be developed to ensure that these two locations remain filled with water. (COM-19) (COM-20)

4. Procedures

The following procedure changes were determined to be necessary as a result of the laser templating performed in Unit 1.

a. The surveillance test procedure will be revised to account for reduced allowable gas accumulation acceptance criteria developed specific to the Unit 1 "A" train suction piping to account for the as-measured slope of the common suction header. (COM-17)

b. The surveillance test procedures will be revised to add verification that the pipe is full for the two locations which may have an inherent vulnerability to air/gas accumulation due to the identified pipe slope on the "A" train common suction header and the "B" train shutdown cooling line. (COM-17)

B. DESCRIPTION OF NECESSARY ADDITIONAL CORRECTIVE ACTIONS

1. Additional Corrective Actions

The following additional corrective actions will be performed:

a. UT examinations will be performed at all remaining Priority 2, 3, and 4 locations by April 30, 2009. This timeframe allows for completion of the activity including scheduling of insulation removal. For these remaining locations, the potential gas accumulation volumes are small and the risk that these potential accumulations could challenge system operability is minimal. The current acceptance criteria, surveillance test procedures and operating procedures are adequate to ensure the SI piping systems are sufficiently full

to reliably perform their intended safety functions pending completion of the confirmatory UTs. (COM-18)

b. APS will complete its evaluation of installing or relocating vent valves at two locations by July 30, 2009. If the evaluation concludes that the installation of a vent valve is feasible and warranted, the vent valve installation will be completed no later than the completion of Unit 1's next refueling outage (1R15 scheduled for the spring of 2010). If vent valve installation is not feasible or is not warranted, an appropriate programmatic control to ensure these locations remain filled with water will be implemented by completion of the 1R15 refueling outage. This timeframe allows for determination of feasibility and necessity of vent valve installation, and evaluation of programmatic control options. These locations have been confirmed by UT to be full of water and not subject to any of the gas accumulation mechanisms identified during the original evaluations performed in response to the GL. These locations will be periodically surveilled as described in Section A.4.b. This provides assurance that the SI piping systems are sufficiently full to perform their intended safety functions pending completion of these actions. (COM-19) (COM-20)

c. The evaluation that determines the allowable gas accumulation volumes for the ECCS suction piping will be revised to account for the as-measured pipe slope in the Unit 1 "A" train ECCS common suction header by June 30, 2009. The corresponding surveillance test procedure will be revised to account for reduced allowable gas accumulation acceptance criteria by September 30, 2009.

   Surveillance test procedures will also be revised to add verifications that the pipe is full at the two locations on the "A" train common suction header and the "B" train shutdown cooling line which may have an inherent vulnerability to air/gas accumulation due to the identified pipe slope (see section A.4.b).

   The timeframe allows for revision of the evaluation and test procedures. The "A" train common suction header and the "B" train shutdown cooling line have been shown to be full of water by UT such that reliable performance of the intended safety function remains assured pending completion of these actions. (COM-16) (COM-17)

2. Corrective Action Updates

The following table provides updates to the list of commitments provided in Reference 5 of this enclosure.

No.	Commitments	Due
COM-1	APS commits to perform physical design verification walkdowns of the ECCS, shutdown cooling system (SCS) and containment spray system (CSS) to validate the as-built conditions for Unit 1 for GL 2008-01 prior to startup from the Unit 1 R14 refueling outage expected by 11/30/08	Complete
COM-2	APS commits to perform physical design verification walkdowns of the ECCS, SCS and CSS to validate the as-built conditions for Unit 3 for GL 2008-01 prior to startup from the Unit 3 R14 refueling outage expected by 05/31/09.	Prior to startup from Unit 3 R14 refueling outage.
COM-3	APS commits to perform physical design verification walkdowns of the ECCS, SCS and CSS to validate the as-built conditions for Unit 2 for GL 2008-01 prior to startup from the Unit 2 R15 refueling outage expected by 11/30/09.	Prior to startup from the Unit 2 R15 refueling outage.
COM-4	APS commits to submit to the NRC any required additional corrective actions resulting from performing the design validation walkdowns for Unit 1, 90 days after completion of the Unit 1 R14 refueling outage. (Est. 2/28/09)	Complete with this submittal.
COM-5	APS commits to submit to the NRC any required additional corrective actions resulting from performing the design validation walkdowns for Unit 3, 90 days after completion of the Unit 3 R14 refueling outage. (Est. 8/29/09)	90 days after completion of the Unit 3 R14 refueling outage.
COM-6	APS commits to submit to the NRC a final evaluation summarizing the findings and corrective actions resulting from the design validation walkdowns performed in all three PVNGS Units, 90 days after completion of the Unit 2 R15 refueling outage. (Est. 2/28/10)	90 days after completion of the Unit 2 R15 refueling outage.

The following table provides updates and additional commitments to the list of commitments provided in Reference 3 of this enclosure. The reference section numbers shown in these commitments are from the above letter unless specifically noted.

No.	Commitments - Corrective Actions to be completed including the scope and basis for the schedule	Due
COM-1	APS is continuing to support the industry and NEI Gas Accumulation Management Team activities regarding the resolution of generic TS changes via the TSTF traveler process. APS will evaluate the resolution of TS issues with respect to the changes contained in the TSTF traveler, and submit a LAR based on this evaluation within one year following NRC approval of the CLIIP Notice of Availability of the TSTF traveler. The basis changes associated with the TS changes will also be made. (Reference Sections: A 1.3.f)	One year following NRC approval of the CLIIP Notice of Availability

No.	Commitments - Corrective Actions to be completed including the scope and basis for the schedule	Due
COM-2	Design change SI-1057 and associated design basis document changes will be developed to support a proposed TS amendment to preclude the possibility of air entrainment from the RWT into SI system suction piping during the transfer to recirculation. This change includes raising the RAS set point and associated design calculations and requires NRC approval of a LAR. The LAR will include a revision to the UFSAR describing the required closure of the RWT outlet valves by control room operators within a prescribed condition. Associated Licensing Bases changes include a revision to reflect that proper initiation of recirculation is required to preclude excessive air entrainment from either the RWT or the containment sump and to the UFSAR to describe the additional design requirements necessary to preclude the possibility of drawing air from the RWT to the safeguard pump suction during recirculation. The LAR will be submitted by 11/30/2009. The time frame for completion of this corrective action is justified due to the time required to develop the design modification and corresponding LAR. The condition associated with this corrective action has been evaluated for Operability in accordance with RIS 2005-20. Detailed dynamic hydraulic evaluations have been performed which demonstrate that during the transfer to recirculation, sufficient air is not transported to either the CS or HPSI pumps to degrade their performance. This evaluation provides the technical justification for the acceptability of operation until the corrective actions are completed. (Reference Sections: A 1.3.a, A 1.3.b, A 1.3.c, A 2.3.a)	11/30/2009

No.	Commitments - Corrective Actions to be completed including the scope and basis for the schedule	Due
COM-3	The basis for TSR 3.5.202.4 and TRM Sections T3.6 and T3.5.201 will be revised to require the entire SI system suction piping to be verified full of water. This Corrective Action will be completed by January 15, 2009. This timeframe allows for the development of suction side acceptance criteria and the revision of surveillance test procedures. Operating procedures already contain requirements to vent the shutdown cooling suction piping and provide assurance these piping sections are full upon completion of this action. This Licensing Basis change will not require any additional suction piping needing to be verified full for ECCS or CS, since current surveillance test procedures already contain provisions for verifying the suction piping is full for these two systems. (Reference Sections: A 1.3.d)	TRM change was approved 01/15/2009
COM-4	UFSAR Table 3.9-10 will be revised to reflect the appropriate combination of the water hammer loads associated with gas accumulation in SI piping and seismic loads for design of piping and pipe supports. The corrective action will be completed March 31, 2009. This timeframe allows for completion of UFSAR change documentation. (Reference Sections: A 1.3.e)	3/31/2009
COM-5	Complete the PVNGS-specific evaluations to develop gas volume acceptance criteria for SI suction piping. This corrective action will be completed by October 30, 2008. Current acceptance criteria and surveillance test procedures are adequate to ensure the SI piping systems are sufficiently full to reliably perform the intended safety functions pending completion of these evaluations. (Reference Section: A 2.2.a)	Completed

No.	Commitments - Corrective Actions to be completed including the scope and basis for the schedule	Due
COM-6	Complete PVNGS-specific evaluations to develop gas volume acceptance criteria for each segment of SI discharge piping upstream of the normally closed containment isolation valves. This Corrective Action is scheduled to be completed by March 31, 2009. This timeframe allows for completion of detailed water hammer calculations of potential gas accumulations at all discharge piping high point locations, including resolution of the UFSAR Table 3.9-10 Loading Combinations, and subsequent revision to surveillance test procedures. Current surveillance test procedures that require opening of all pump discharge vent valves at the specified 31-day interval are adequate to ensure unacceptable gas accumulation does not occur pending completion of this corrective action. (Reference Section: A 2.2.b)	3/31/2009

No.	Commitments - Corrective Actions to be completed including the scope and basis for the schedule	Due
COM-7	Complete PVNGS specific evaluations to develop gas volume acceptance criteria for each segment of SI discharge piping downstream of the normally closed isolation valves. The downstream piping includes the CS piping downstream of the isolation valve that is normally closed during power operation and opens on receipt of a Containment Spray Actuation Signal (CSAS), the hot leg injection piping downstream of the isolation valve that is normally closed during power operation and opened following switchover to this injection location, and cold leg injection piping downstream of the isolation valves that are normally closed and open upon receipt of a SIAS or CSAS. This Corrective Action is scheduled to be completed by March 31, 2009. Acceptance criteria for the hot leg injection piping may have an associated change to applicable Emergency Operating procedures to specify a different valve alignment sequence than currently prescribed. The completion date for development of acceptance criteria for the hot leg injection piping only is revised to June 30, 2009.This timeframe allows for completion of evaluation of options regarding changes to valve alignment sequence and completion of waterhammer calculations for this specific piping. Development of all other acceptance criteria will be completed by the original March 31, 2009 scheduled completion date. Current practices to fill and vent the piping inside containment, the low consequences associated with gas accumulation in piping inside containment, and the lack of current indication of on-going gas accumulation mechanisms such as SIT leakage past the containment isolation valves make the schedule for this action acceptable. (Reference Section: A 2.2.c)	3/31/2009 Revised to 6/30/2009

No.	Commitments - Corrective Actions to be completed including the scope and basis for the schedule	Due
COM-8	Design modification SI-1057 will be implemented in each Unit's refueling outage that starts no sooner than one year following NRC approval of the associated LAR. The time frame for completion of this corrective action is justified due to the time required to develop the design modification. The condition associated with this corrective action has been evaluated for Operability in accordance with RIS 2005-20. Detailed dynamic hydraulic evaluations have been performed which demonstrate that during the transfer to recirculation, sufficient air is not transported to either the CS or HPSI pumps to degrade their performance. This evaluation provides the technical justification for the acceptability of operation until the corrective actions are completed. (Reference Section: A 2.3.a)	During scheduled refueling outages beginning with the first unit at least year after NRC approval of the associated LAR
COM-9	Develop a procedure or written instruction that will specify requirements for performance of confirmatory ultrasonic measurements that monitor or confirm the adequacy of system fill and vent. This corrective action is scheduled to be completed by March 31, 2009. Scheduled completion is revised to August 31, 2009. This schedule revision allows for evaluation of laser templating results and lessons learned from the upcoming 3R14 refueling outage (Spring 2009) This is currently a routine Engineering activity performed every refueling outage that is adequate pending incorporation into a procedure. (Reference Section: A 2.9)	3/31/2009 Revised to 8/31/2009

No.	Commitments - Corrective Actions to be completed including the scope and basis for the schedule	Due
COM-10	Develop a procedure or process that controls the performance of system and pump performance tests or other high velocity flushes to ensure these routine activities are performed as necessary to preclude gas accumulation potentially resulting from an incomplete initial system fill. This corrective action is scheduled to be completed by August 1, 2009. These pump and system performance tests are performed every refueling outage and current outage scheduling is adequate pending completion of this action. (Reference Section: A 2.9)	8/1/2009
COM-11	Applicable surveillance test procedures will be revised to include periodic ultrasonic inspection of the piping to identify and if necessary quantify the size of the voids in the piping. Acceptance criteria for each high point location will be specified. The procedures will require entry into the CAP when the acceptance criteria are exceeded. The need for sampling and analysis of gas will be determined through the CAP when abnormal conditions are detected. This corrective action will be phased in as acceptance criteria for each sub-system is developed. Full implementation of this corrective action is scheduled to be completed by April 30, 2009. The schedule for full implementation of this action is revised to June 30, 2009. This timeframe allows for completion of acceptance criteria evaluations and revisions and subsequent revision to surveillance test procedures. Current surveillance tests and the current acceptance criteria of a clear stream of water from accessible high point vent valves are adequate to ensure unacceptable gas accumulation does not occur pending completion of this corrective action. (Reference Sections: A 2.2.d, A 3.2.a, A 3.6.a)	4/30/2009 Revised to 6/30/2009

No.	Commitments - Corrective Actions to be completed including the scope and basis for the schedule	Due
COM-12	Surveillance test procedures will be revised to redefine accessibility of piping inside containment based on actual expected radiation exposure and scaffolding requirements. This corrective action is scheduled to be completed by March 31, 2009. All piping inside containment except for that located within the bio-shield wall is considered to be accessible for the purpose of the surveillance tests. The revised timeframe allows for the extensive surveillance test procedure revisions necessitated by this redefinition. Evaluations of the consequences of gas accumulation in discharge side piping inside containment have been completed by a PWROG program and by Westinghouse for certain CE-designed plants, which demonstrate that voids in this piping will typically not cause a water hammer effect because of the slow-opening containment isolation valves and lack of downstream flow restrictions. In addition, delays in injecting flow to the RCS due to voids in the discharge piping have been determined in the PWROG program to be inconsequential. The only gas accumulation mechanism identified following successful initial fill and vent following maintenance is leakage from either the SI Tanks or the RCS into the low pressure upstream SI piping. This mechanism can be monitored with installed plant instrumentation and verified by surveillance of upstream piping. Considering the reduced consequences associated with gas accumulation in piping inside containment, and the ability to detect and verify the conditions necessary to promote gas accumulation in these piping sections, current practices are considered adequate pending completion of this action. (Reference Sections: A 3.2.b, A 3.6.b)	3/31/2009 Revised to 6/30/2009

No.	Commitments - Corrective Actions to be completed including the scope and basis for the schedule	Due
COM-13	Procedure 40DP-9OP06 will be revised to provide guidance on the amount of SIT level change that should be considered abnormal and require entry into the CAP to assess the cause of the leak and the potential for void formation when the threshold is exceeded. This corrective action is scheduled to be completed by January 15, 2009. This time frame allows for determination of the appropriate threshold and specification of the appropriate response. The current procedure and practices at PVNGS have been adequate to ensure unacceptable gas accumulation does not occur pending completion of this corrective action. (Reference Sections: A 3.2.c, A 3.6.c)	Complete
COM-14	Revise surveillance test procedure 40ST-9SI13 to include verification that the SDC suction piping is sufficiently full of water. This corrective action is scheduled to be completed by January 15, 2009. This time frame allows for completion of acceptance criteria and subsequent procedure revision. Current procedures for restoring from SDC operations to standby SI alignment have been adequate to prevent unacceptable gas accumulation or formation. Operating procedures already contain requirements to vent the SDC suction piping and provide assurance these piping sections are full pending completion of this action. (Reference Sections: A 3.2.d, A 3.6.d)	Complete

No.	Commitments - Corrective Actions to be completed including the scope and basis for the schedule	Due
COM-15	A formalized trending process (or procedure) will be developed to document the results of the monthly surveillance tests and ensure Operability to the next surveillance test. This action is scheduled to be completed by April 15, 2009. The schedule to complete this action is revised to complete by July 31, 2009. The revised timeframe allows for completion of all related surveillance test procedures (see revised scheduled completion date for COM-12). This action proceduralizes trending activities recommended by the GL and industry practices, but does not have a direct impact on Operability. (Reference Sections: A 3.5, A 3.6.e)	4/15/2009 Revised to 7/31/2009
COM-16	Revise the PVNGS-specific evaluation of allowable gas volume acceptance criteria for SI suction piping to determine criteria specific to the Unit 1 "A" train to account for the actual measured pipe slope of the common suction header. This action is scheduled to be completed by June 30, 2009. The timeframe allows for completion of the evaluation revision. The common suction header has been shown to be full of water by UT such that reliable performance of the intended safety function remains assured pending completion of these actions. (Reference Sections: A.1, B.1.c of Nine-Month Supplemental Response)	6/30/2009

No.	Commitments - Corrective Actions to be completed including the scope and basis for the schedule	Due
COM-17	Revise the applicable surveillance test procedure to account for reduced allowable gas accumulation acceptance criteria specific to the Unit 1 "A" train suction piping. The surveillance test procedures will be revised to add verification that the pipe is full at the two locations which may have an inherent vulnerability to air/gas accumulation due to the identified pipe slope on the "A" train common suction header and the "B" train shutdown cooling line. This action is scheduled to be completed by September 30, 2009. The timeframe allows for completion of the evaluation revision and revision to the test procedures. The common suction header has been shown to be full of water by UT such that reliable performance of the intended safety function remains assured pending completion of these actions. (Reference Sections: A.4.a, B.1.c of Nine-Month Supplemental Response)	9/30/2009
COM-18	Complete UT examination of all remaining Priority 2, 3, and 4 locations identified by laser templating as deviating by more than one quarter inch (¼") from horizontal. This action will be completed by April 30, 2009. This timeframe allows for completion of the activity including scheduling of insulation removal within the Palo Verde work management system and associated risk evaluations. The location and potential gas accumulation volumes are such that there is minimal risk that an actual gas accumulation that would challenge system operability exists at these locations. The current acceptance criteria, surveillance test procedures and operating procedures are adequate to ensure the SI piping systems are sufficiently full to reliably perform the intended safety functions pending completion of the confirmatory UTs. (Reference Sections: A.2, B.1.a of Nine-Month Supplemental Response.	4/30/2009

No.	Commitments - Corrective Actions to be completed including the scope and basis for the schedule	Due
COM-19	Complete evaluation of installing or relocating vent valves at two locations identified by laser templating as being vulnerable to gas accumulation that cannot currently be easily vented or flushed. This action will be completed by June 30, 2009. This timeframe allows for determination of feasibility and necessity of vent valve installation, and evaluation of programmatic control options. These locations have been confirmed by UT to be full of water and appear not to be subject to any of the gas accumulation mechanisms identified during the original evaluations performed in response to the Generic Letter. (Reference Sections: A.3, B.1.b of Nine-Month Supplemental Response.	6/30/2009
COM-20	If evaluation concludes that the installation of a vent valve is feasible and warranted, the vent valve installation will be completed no later than the completion of the next refueling outage (1R15 scheduled for the Spring of 2010). If vent valve installation is not feasible or is not warranted, an appropriate programmatic control to ensure these locations remain filled with water will be implemented by completion of the next refueling outage. This commitment applies to both locations identified in COM-19. This timeframe allows for determination of feasibility and necessity of vent valve installation, and evaluation of programmatic control options. These locations have been confirmed by UT to be full of water and not subject to any of the gas accumulation mechanisms identified during the original evaluations performed in response to the Generic Letter. Reference Sections: A.3, B.1.b of Nine-Month Supplemental Response.	5/30/2010

Conclusion

APS has concluded that the subject systems at the Palo Verde Nuclear Generating Station Unit 1 remain in compliance with the Technical Specification definition of Operability, i.e. they are capable of performing their intended safety functions.

References

1. Westinghouse Calculation Note Number CN-SEE-III-08-36, Rev. 1 "Evaluation of Suction Side Criteria for Palo Verde Units 1, 2, and 3 to Address GL-2008-01.

2. Westinghouse/Fauske & Associates Calculation Note Number FAI/07-85, Rev. 0 "Methodology for Calculating Gas-Water Waterhammer Loads for Application to the Palo Verde Systems."

3. APS Letter No. 102-05910, dated October 14, 2008, PVNGS Nuclear Generating Station (PVNGS) Units 1, 2 and 3 Docket Nos. STN 50-528/529/530 Nine-Month Response to NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems" (ADAMS Accession No. ML08294032)

4. Westinghouse/Fauske & Associates Calculation Note Number FAI/08-189, Rev. 0 "Evaluation of the Potential for Gas-Water Waterhammer During Cold Leg Injection for Palo Verde."

5. APS letter No. 102-05857, dated May 09, 2008, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3, Docket Nos. STN 50-528, 50-529, and 50-530, Three-Month Response to NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems" (ADAMS Accession No. ML08120363).