



102-07621-MLL/MDD
January 12, 2018

U. S. Nuclear Regulatory Commission
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Dear Sirs:

Subject: **Palo Verde Nuclear Generating Station, Units 1, 2, and 3**
Docket Nos. STN 50-528, 50-529, and 50-530
Relief Request 50 - Request for Alternative to American Society of
Mechanical Engineers Section XI Requirements for Pressure Retaining
Boundary During System Leakage Tests

Pursuant to Title 10 of the Code of Federal Regulations (10 CFR) Part 50.55a, *Codes and standards*, paragraph (z)(2), Arizona Public Service Company (APS) requests Nuclear Regulatory Commission (NRC) approval of a proposed alternative for the Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3. A proposed alternative to the requirement of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, paragraph IWB-5222 – Class 1 pressure-retaining components during the system leakage tests is associated with the third 10-year Inservice Inspection (ISI) Program interval based upon ASME Code Case provisions.

The enclosure identifies the affected components, applicable ASME B&PV Code Case requirements, reason for the request, proposed alternative and basis for use. As described in the enclosure, APS is requesting an alternative to the specified requirements in ASME B&PV Code, Section XI, paragraph IWB-5222, pursuant to 10 CFR 50.55a(z)(2), as the code required test provisions represent a hardship or unusual difficulty without a compensating increase in the level of quality and safety.

APS requests approval of this relief request by March 16, 2018, since that is the end of the Unit 2 ASME Section XI ISI Program third interval including the allowable one year extension per paragraph IWA-2430 of the Code. A pre-submittal phone call was held with the NRC staff on December 12, 2017, to discuss various aspects of this Relief Request. No new commitments are being made in this submittal.

If you have any questions about this request, please contact Matthew S. Cox, Licensing Section Leader, at (623) 393-5753.

Sincerely,

MLL/MDD/NTA

102-07621-MLL/MDD

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U. S. Nuclear Regulatory Commission

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cc: K. M. Kennedy
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NRC Region IV Regional Administrator
NRC NRR Project Manager for PVNGS
NRC Senior Resident Inspector for PVNGS

Enclosure

Relief Request 50

**Request for Alternative to American Society of Mechanical
Engineers Section XI Requirements for Pressure Retaining
Boundary During System Leakage Tests**

**Arizona Public Service Company
Palo Verde Nuclear Generating Station – Units 1, 2, and 3
Proposed Alternative in Accordance with 10 CFR 50.55a(z)(2)
Relief Request 50 - Request for Alternative to American Society of Mechanical
Engineers Section XI Requirements for Pressure Retaining Boundary During System
Leakage Tests**

1. American Society of Mechanical Engineers (ASME) Code Components Affected

ASME Code Class: Code Class 1
Reference: IWB-2500, Table IWB-2500-1, IWB-5220, IWB-5222
Code Case N-798 and Code Case N-800
Examination Category: B-P
Item Number: B15.10
Description: Code Class 1 pressure retaining components that are beyond the first normally closed valve to the second boundary component, including Reactor Coolant System (RCS), Safety Injection (SI) and Shutdown Cooling System (SDC), and Chemical and Volume Control System (CH) piping, vents, drains, and valves as noted in Table 2 and Table 3.
Component Number: Piping components listed in Tables 2A, 2B, 2C, 3A, 3B, and 3C
Drawing Numbers: Drawings listed in Tables 2A, 2B, 2C, 3A, 3B, and 3C

2. Applicable Code Edition and Addenda

The applicable ASME Boiler and Pressure Vessel Code of Record (hereafter referred to as the "Code") edition and addenda is ASME Section XI, *Rules for Inservice Inspection of Nuclear Power Plant Components*, 2001 Edition through 2003 Addenda (Reference 1) used for the Third 10-Year Inservice Inspection (ISI) Interval at Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3.

3. Applicable Code Requirement

ASME Section XI, Table IWB-2500-1, *Examination Categories*, Examination Category B-P, *All Pressure Retaining Components*, Item number B15.10 requires that a system leakage test be conducted prior to startup following each refueling outage in accordance with the requirements of IWB-5220.

Paragraph IWB-5222(a) requires that the pressure retaining boundary during the system leakage test shall correspond to the reactor coolant boundary, with all valves in the position required for normal reactor operation startup, with the visual examination to include the second closed valve at the boundary extremity. Paragraph IWB-5222(b) requires the pressure retaining boundary during the system leakage test conducted at or near the end of each inspection interval shall extend to all Class 1 pressure retaining components within the system boundary.

ASME Code Case N-798, *Alternative Pressure Testing Requirements for Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices*, (Reference 2) states that for portions of Class 1 vent, drain, and test piping between the first and second isolation

devices that normally remain closed during plant operation, only the boundaries of IWB-5222(a) shall apply.

ASME Code Case N-800, *Alternative Pressure Testing Requirements for Class 1 Piping Between the First and Second Injection Valves*, (Reference 3) states that for portions of the Class 1 boundary between the first and second isolation valves in the injection and return path of standby safety systems, the system leakage test may be conducted by pressurization of the Class 1 volume using the Class 2 safety system to pressurize the volume. It further states that such alternative tests shall be performed each inspection interval and the system leakage test shall be conducted using the pressure associated with the Class 2 system function that provides the highest pressure between the Class 1 isolation valves.

The PVNGS, Units 1, 2, and 3 third 10-year ISI Program intervals end on the following dates including the one year extension:

- Unit 1 = July 17, 2019
- Unit 2 = March 17, 2018
- Unit 3 = January 10, 2019

Note: Unit 2 third interval end date is proposed to be changed to October 31, 2018, in Relief Request 56, submitted to the NRC in APS letter 102-07604, dated November 10, 2017.

4. Reason for Request

Pursuant to 10 CFR 50.55a(z)(2), an alternative is being requested by Arizona Public Service Company (APS) for PVNGS Units 1, 2, and 3 on the basis that a hardship or unusual difficulty exists in establishing a system configuration that will subject selected Class 1 components to RCS pressure during the system pressure test to be performed in accordance with IWB-5222(b) by the end of each PVNGS Unit ISI interval without a compensating increase in the level of quality and safety. APS requests authorization to perform the examination of selected Class 1 piping and valves at plant conditions other than those required by IWB-5222(b) by using the alternative boundaries and pressures permitted by Code Cases N-798 and N-800 prior to the end of the third ISI interval for Units 1, 2, and 3.

The design of some of the PVNGS Units 1, 2, and 3 Class 1 process piping requires substantial effort to extend the boundary subject to RCS pressure where check valves or non-redundant components serve as the first system isolation from the RCS. Such configurations would require manually opening vent and drain type valves or the use of temporary piping installations, such as high-pressure hoses and/or other unusual temporary system configurations in order to achieve test pressures at boundaries required by IWB-5222(b). These test configurations represent additional personnel safety concerns, with reliance on single boundary valves for high pressure systems. In addition, some tests increase the potential for intersystem leakage and the potential for over pressurizing the reactor drain tank.

Affected piping and components are located in areas involving high occupational radiation exposure and leakage testing of these lines would require significant dose. Establishing and restoring such temporary configurations would result in an unwarranted increase of worker radiation exposure. The activities associated with this work include scaffold erection, insulation removal, valve manipulations, examinations, reinstallation of insulation, and scaffold removal. Dose estimates were prepared by identifying tasks, personnel resources, and time based on existing site processes and then utilizing survey maps to quantify the estimated dose. The additional dose was estimated to be approximately 4.236 person rem

for performing these exams in all three units without utilizing Code Case N-798 and Code Case N-800.

Based on the above discussion, the extension of the boundary subjected to RCS pressure during system leakage tests to include all Class 1 pressure retaining components within the system boundary in accordance with IWB-5222(b) represents a hardship or unusual difficulty that does not provide a compensating increase in the level of quality and safety provided by the examination.

The following tables contain specific information pertaining to the various pipe segments for which the alternative is being requested.

Table 2A for Unit 1, Table 2B for Unit 2, and Table 2C for Unit 3, *Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)*, identifies the Class 1 pressure retaining components associated with the requested relief that will remain in their normal operating configuration and will not be pressurized to RCS pressure during the system leakage test. The total count is different between units due to implementation of an engineering design change which removed valves RCEV001 and RCEV062 from Units 2 and 3 but not yet implemented in Unit 1.

Table 3A for Unit 1, Table 3B for Unit 2, and Table 3C for Unit 3, *Class 1 Piping Between the First and Second Isolation Valves (N-800)*, identifies the Class 1 pressure retaining components associated with the requested alternative that will remain in their normal operating configuration and will not be pressurized to RCS pressure during the system leakage test, however, they will be examined at operating pressures associated with the Class 2 system functional pressure.

Small Bore Class 1 RCS, CH, and SI Manual Vent, Drain, and Test Connection Lines (Code Case N-798)

This alternative is being requested from pressurizing piping between the first and second isolation device on small size vent, drain and test connection lines. The Class 1 vent, drain, and test connection lines in the RCS, CH, and SI systems identified in Table 2A for Unit 1, Table 2B for Unit 2, and Table 2C for Unit 3 range in size from ¾-inch nominal pipe size (NPS) to 2-inch NPS. These Class 1 vents, drains, and test connections are in series with a second Class 1 isolation valve or have a downstream blind flange or pipe cap that provides double isolation of the reactor coolant pressure boundary (RCPB). The valves are maintained in the closed position during normal plant operation and the downstream piping and components are not normally pressurized. To pressurize those downstream piping segments as required by IWB-5222(b), it would be necessary to open the vent, drain, or test connection valves manually while at normal operating pressure in the RCS. Pressurization by this method defeats the double Class 1 isolation and reduces the margin of personnel safety for those performing venting and draining operations on high-pressure components after the test. Furthermore, performing the test with the vent, drain, or test connection valves open requires several person-hours to position the valves for the test and restore the valves to their closed positions once the test is completed. These valves are located in close proximity to the RCS loop piping and would require personnel entry into high radiation areas within the containment and a consequential increase in radiation exposure. The required plant configuration for testing would defeat one of the two RCPB isolation devices. In some cases, this would increase the likelihood of intersystem leakage and potentially over-pressurize the reactor drain tank. Thus, compliance with IWB-5222(b) requirements results in an unnecessary hardship without a compensating increase in the level of quality and safety.

Additionally, these piping segments are included in the examination population for visual examination (VT-2) through the entire length as part of the Class 1 system leakage test at the conclusion of each refueling outage. The proposed alternative leakage test will not specifically pressurize past the first vent, drain, or test connection isolation valves for this examination. No external or visible leakage is allowed. Since this type of test will assure that the combined first and second isolation devices are effective in maintaining the RCPB at normal operating temperature and pressure, the increase in safety intended to be achieved from the IWB-5222(b) required leakage test is not commensurate with the hardship of performing such testing. These tests were successfully completed for the third ISI interval using the methodology described in Code Case N-798, on the dates shown in the table below.

Table 1A – Code Case N-798	
Unit	Date
1	11/04/2017
2	05/07/2017
3	11/02/2016

Large Bore Class 1 Safety Injection and Shutdown Cooling Piping Segments (Code Case N-800)

High Pressure Safety Injection (HPSI)

The two HPSI piping segments identified in Table 3A for Unit 1, Table 3B for Unit 2, and Table 3C for Unit 3, provide the flow path for Emergency Core Cooling System (ECCS) hot leg injection from HPSI pumps A and B. The primary Class 1 isolation devices for these paths are two 3-inch check valves in series for each pump injecting into its associated RCS hot leg. The small bore piping segments with isolation valves between the two Class 1 check valves provide the required double isolation barrier for the RCPB.

Leakage testing at RCS pressure requires a pressure source to be connected by way of temporary high pressure hose connections and is performed in conjunction with RCS pressure isolation valve seat leakage testing. For the proposed testing under this request, the examination of these components will be performed during the associated full flow surveillance at HPSI pump discharge pressure. These lines will also be visually examined during the Mode 3 RCS leakage test as Class 1 boundary lines. These tests were successfully completed for the third ISI interval using the methodology described in Code Case N-800, on the dates shown in the table below.

Table 1B (HPSI) – Code Case N-800		
Unit	Train A	Train B
1	04/14/2016	04/13/2016
2	04/20/2014	04/20/2014
3	04/19/2015	04/22/2015

Hot Leg Shutdown Cooling (SDC) Suction

There are two 16-inch SDC suction lines coming from the RCS hot legs to Low Pressure Safety Injection (LPSI) pumps A and B identified in Table 3A for Unit 1, Table 3B for Unit 2, and Table 3C for Unit 3. Two locked closed motor operated valves (MOVs) V651 and V652 at each Unit serve as the first Class 1 boundary valves and locked closed valves V653 and V654 serve as the second Class 1 boundary valves. These valves have an open permissive interlock that prevents them from being opened at an RCS pressure of greater than or equal

to 410 psia to avoid over-pressurization of the SDC system. The interlock prevents remote opening of the valves from the control room when RCS pressure is above the interlock set point. The examination of these components will be performed using the Class 2 system functional pressure associated with normal SDC pressure. These lines will also be visually examined during the Mode 3 RCS leakage test as Class 1 boundary lines. These tests were successfully completed for the third ISI interval using the methodology described in Code Case N-800, on the dates shown in the table below.

Table 1C (SDC) – Code Case N-800		
Unit	Train A	Train B
1	04/11/2016	04/29/2016
2	04/22/2014	04/06/2014
3	04/20/2015	04/04/2015

HPSI/LPSI Loop Header and Safety Injection Tank (SIT) Discharge Piping

These large bore piping segments, identified in Table 3A for Unit 1, Table 3B for Unit 2, and Table 3C for Unit 3, provide the common flow path for: 1) SIT discharge to the RCS cold legs; 2) SIT fill and drain header piping connected to the RCS cold legs; and 3) ECCS flow from the HPSI and LPSI pumps and shutdown cooling return to the RCS cold legs.

The primary Class 1 isolation devices for the SIT flow path are eight 14-inch check valves (two in series per SIT). Between the 14-inch check valves is an MOV that is open during normal operation. Power is removed from each MOV operator when pressurizer pressure is greater than or equal to 1500 psia. The primary Class 1 isolation devices for the SIT fill and drain header are four 14-inch check valves and four 1-inch MOVs.

The primary Class 1 isolation devices for the HPSI and LPSI pump discharge and shutdown cooling return are four 14-inch check valves and four 12-inch check valves oriented to flow into the RCS cold legs.

These piping segments provide the design required double isolation barrier for the RCPB. However, leakage testing at RCS pressure requires a pressure source to be connected by way of temporary high pressure hose connections, which could challenge the connected Class 2 piping and components should the Class 1 to Class 2 boundary valves leak by. This configuration would violate the design requirement for two RCPB isolation devices during testing. These lines are all statically pressurized to SIT pressure during normal operation and are monitored for leakage by SIT pressure and level indications. For the proposed testing of this relief request the examination of these components will be performed using the Class 2 system functional pressure associated with the SIT during Mode 3 RCS leakage test as Class 1 boundary lines. These tests were successfully completed for the third ISI interval using the methodology described in Code Case N-800, on the dates shown in the table below.

Table 1D (Loop Header and SIT) - Code Case N-800	
Unit	Date
1	11/04/2017
2	05/07/2017
3	11/02/2016

5. Proposed Alternative and Basis for Use

Alternative

In accordance with 10 CFR 50.55a(z)(2), this alternative is being requested on the basis that a hardship or unusual difficulty exists in establishing system configurations that will subject the selected Class 1 components to RCS pressure during the system pressure tests as required by IWB-5222(b) without a compensating increase in the level of quality and safety.

APS proposes to perform the examination of selected PVNGS Units 1, 2, and 3, Class 1 piping and valves by the end of the third 10-year ISI interval with plant conditions other than those required by IWB-5220 by using the alternative boundaries permitted by Code Cases N-798 and N-800.

The objective of the required extended pressure boundary conditions in accordance with IWB-5222(b) is to detect evidence of leakage, and thereby verify the integrity of the RCPB beyond the first isolation valve. As discussed in Section 4 of this enclosure, *Reason for Request*, in order to meet IWB-5222(b) requirements, the establishment of and the return from the required temporary configurations would involve considerable time to accomplish and would result in an unwarranted increase of worker radiation exposure, exposure of personnel to industrial safety risks due to use of a single isolation valve, and the potential to over pressurize downstream piping in the event of valve leakage. In addition, certain temporary configurations could require bypassing updated final safety report (UFSAR) specified safety system protective features and interlocks. As a result, APS has concluded that compliance with IWB-5222(b) requirements constitutes a hardship without a compensating increase in the level of quality and safety. The proposed alternative testing methods permitted in Code Cases N-798 and N-800 would provide a level of assurance that the RCPB is maintaining structural integrity at elevated pressure.

In the unlikely event of a through wall leak in the piping segments identified in Tables 2A, 2B, and 2C and 3A, 3B, and 3C, that are located in containment, during normal operation, the leak would result in unidentified RCS leakage. RCS leakage detection instrumentation has been designed to aid operating personnel in differentiating between possible sources of detected leakage within the containment. The RCS leakage detection instrumentation consists of the containment sump monitor and the containment atmosphere radioactivity monitor (gaseous and particulate). Technical Specifications (TS) 3.4.16, *RCS Leakage Detection Instrumentation*, (Reference 5) requires the containment sump monitor, in combination with a gaseous and particulate radioactivity monitor to be operable.

The containment floor drain sump flow monitor and the reactor cavity sump flow monitor are normally utilized to fulfill the containment sump monitor requirement used to collect unidentified leakage at each unit. Alarms are provided to alert the operator of leakages of 1.0 gallon per minute (gpm).

The reactor coolant contains radioactivity that, when released to the containment, can be detected by the gaseous or particulate containment atmosphere radioactivity monitors. Radioactivity detection systems are included for monitoring both particulate and gaseous activities because of their sensitivities and rapid responses to RCS leakage, but have recognized limitations. Reactor coolant radioactivity levels will be low during initial reactor startup and for a few weeks thereafter, until activated corrosion products have been formed and fission products appear from fuel element cladding contamination or cladding defects. If there are few fuel element cladding defects and low levels of activation products, it may not be possible for the gaseous or particulate containment atmosphere radioactivity monitor to detect a 1.0 gpm increase within one hour during normal operation. However, as described in UFSAR sections 5.2.5.3.3 and 5.2.5.3.4, the gaseous or particulate containment atmosphere radioactivity

monitor is used to indicate the need to perform a water inventory balance to determine the RCS leak rate.

Technical Specifications 3.4.14, *RCS Operational LEAKAGE*, (Reference 6) for each Unit, limits system operation in the presence of leakage from RCS components to leakage amounts that do not compromise safety. Surveillance Requirement (SR) 3.4.14.1 requires the performance of RCS water inventory balance to verify RCS leakage is within limits to ensure that the integrity of the RCPB is maintained. The RCS water inventory balance surveillance is performed in accordance with Surveillance Requirement 3.4.14.1 which utilizes the emergency response facilities data acquisition and display system (ERFDADS) calculation to determine the RCS water inventory balance. In the event that unidentified leakage increases greater than 0.10 gpm above the normal, steady state value for a given plant condition during the performance of the RCS water inventory balance, administrative procedures require that the controls and actions for monitoring RCS leakage under the boric acid corrosion control program (BACCP) be implemented.

Actions that implement the RCS water inventory balance also define the methodology used to establish acceptable baseline values, establish unidentified leakage action levels, and the criteria used to ensure adequate monitoring of RCS leakage occurs, and the minimum actions that could be taken at each action level to ensure the safe operation of the plant. The program also addresses abnormal trends in RCS primary system leakage indicators, which may provide indication of leaks much smaller than TS and RCS leakage levels. ERFDADS also includes an indicator that provides an iteratively calculated RCS leakage value that is displayed in the control room in various locations to ensure prompt action is taken in accordance with surveillance and plant procedure requirements. ERFDADS is utilized to support operators in ensuring Technical Specification requirements and action levels are not violated should small leakage occur.

All the welds greater than 1-inch NPS encompassed by the boundaries described in Tables 2A, 2B, and 2C are in the population of welds subject to surface and or volumetric examination under ASME Section XI (Examination Category B-J). During the first, second and current completed portion of the third interval at PVNGS Units 1, 2, and 3, there have been no failures of examinations performed on these selected welds.

PVNGS has previously evaluated Information Notice (IN) 2011-04, *Contaminants and Stagnant Conditions Affecting Stress Corrosion Cracking in Stainless Steel Piping in Pressurized water Reactors*. Awareness of the issue was communicated to relevant Engineering, Radiation Protection, and Operations personnel. Outside diameter initiated stress corrosion cracking (ODSCC) in austenitic stainless steel piping is not a safety concern because crack growth is slow and austenitic stainless steel has a high resistance to fracture and the cracks are easily identified while they are small and tight which allows sufficient time to react before crack size becomes structurally significant. There have been no cases of stress corrosion cracking reported in the subject piping segments at PVNGS. The existing inspection requirements under the BACCP and ASME Section XI are adequate for addressing the ODSCC concerns of stainless steel.

For those portions of Class 1 vent, drain, and test connection lines between the first and second isolation devices that normally remain closed during plant operation (Tables 2A, 2B and 2C), APS plans to credit the system pressure tests performed using the alternatives of Code Case N-798 with the boundaries of IWB-5222(a) that apply as follows:

- The Class 1 vent, drain, and test connection lines system leakage tests were not specifically pressurized past the first isolation valve for this inspection. No external or visible leakage is allowed.

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For those portions of the Class 1 boundary between the first and second isolation valves (Tables 3A, 3B, 3C), APS plans to credit the system pressure tests performed using the alternatives of Code Case N-800 with only the boundaries of IWB-5222(a) that apply as follows:

- HPSI hot leg injection examinations were performed during the associated HPSI full flow surveillances. The pressure was at HPSI pump discharge pressure, which was approximately 1800 psig flowing into the reactor vessel at atmospheric pressure. The hold time was in accordance with IWA-5213. Per IWA-5213, no hold time is required for Class 1 components after attaining test pressure. These lines were also visually examined during the Mode 3 RCS leakage test as Class 1 boundary lines.
- HPSI/LPSI cold leg header and SIT discharge piping examinations were performed using the normal operating pressure of the SITs, which was approximately 600 psig during the Mode 3 RCS leakage test as Class 1 boundary lines. The hold time was in accordance with IWA-5213. Per IWA-5213 no hold time is required for Class 1 components after attaining test pressure.
- The hot leg SDC suction line examinations were performed using the pressure associated with normal SDC systems, approximately 200-350 psig. The hold time was in accordance with IWA-5213. Per IWA-5213, no hold time is required for Class 1 components after attaining test pressure, however, this test has a 4-hour hold time associated with it. These lines were also visually examined during the Mode 3 RCS leakage test as Class 1 boundary lines.

Therefore, authorization of this alternative is requested to change the test boundaries of IWB-5222(b) at PVNGS Units 1, 2, and 3, required for the selected Class 1 components during the system leakage tests conducted at or near the end of the inspection interval.

Basis for Use

As described above, the activities associated with the requirements of IWB-5222(b) would incur increased radiation exposure, potential personnel hazards, and additional workforce resources. The associated activities would include scaffold erection, insulation removal, valve manipulations, examinations, re-installation of insulation, and scaffold removal, without a commensurate increase in the quality and safety of the systems. Therefore, the extension of the boundary subjected to RCS pressure during system leakage tests to include all Class 1 pressure retaining components within the system boundary in accordance with IWB-5222(b) represents a hardship or unusual difficulty that does not provide a compensating increase in the level of quality and safety.

6. Duration of Proposed Alternative

The duration of the proposed alternative is requested for the remainder of the PVNGS Units 1, 2, and 3, third 10-Year ISI intervals.

7. Precedents

The NRC has previously authorized similar relief requests for the use of ASME Code Cases N-798 and N-800. Authorization has been granted for relief requests from the following stations.

- (1) Diablo Canyon Power Plant, Unit Nos. 1 and 2 – Third Interval Request PRS-3, Associated with Class 1 Piping Between First and Second Vent, Drain, and Test Isolation Devices was authorized by NRC Safety Evaluation dated September 18, 2015, [Agency Documents Access and Management System (ADAMS) Accession Number (No.) ML15261A007]

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- (2) Byron Station, Unit 1 – Relief Request I3R-26 Associated with the Third 10-Year Inservice Inspection Program Interval Relief from the requirements of the ASME Code authorized by NRC Safety Evaluation dated June 30, 2015, (ADAMS Accession No. ML15173A436)
- (3) Surry Power Station, Units 1 and 2, Fourth Inspection Interval Inservice (ISI) Program, System Pressure Testing (SPT), SPT-003 and SPT-002, was authorized by NRC Safety Evaluation dated May 28, 2014, (ADAMS Accession No. ML14142A089)
- (4) Sequoyah Nuclear Plant, Units 1 and 2, Third Inspection Interval Relief Request 11-SPT-1, was authorized by NRC Safety Evaluation dated May 20, 2014, (ADAMS Accession No. ML14133A112)
- (5) St. Lucie Plant, Unit 2, Third Inspection Interval Relief Request RFA 9, was authorized by NRC Safety Evaluation dated November 25, 2013, (ADAMS Accession No. ML13308C426)
- (6) Comanche Peak Nuclear Power Plant, Relief Request 1/2B3-2 for the Units 1 and Unit 2 Third Ten Year Inservice Inspection Interval dated October 30, 2017, Letter Number CP-201700886

If rulemaking to adopt revision 18 of Regulatory Guide (RG) 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division I*, in 10 CFR 50.55a is completed prior to approval of this Relief Request, APS will withdraw Relief Request 50, since revision 18 incorporates Code Cases N-798 and N-800 into RG 1.147.

8. References

- (1) American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components, 2001 Edition, through 2003 Addenda, the American Society of Mechanical Engineers, New York
- (2) American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Case N-798, *Alternative Pressure Testing Requirements for Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices Section XI, Division 1*
- (3) American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Case N-800, *Alternative Pressure Testing Requirements for Class 1 Piping between the First and Second Injection Valves Section XI, Division 1*
- (4) PVNGS, Units 1, 2, and 3, Technical Requirements Manual, Revision 64, T3.4.104 Reactor Coolant System Vents
- (5) PVNGS, Units 1, 2, and 3, Technical Specifications, Amendment 204, 3.4.16, *RCS Leakage Detection Instrumentation*.
- (6) PVNGS, Units 1, 2, and 3, Technical Specifications Amendment 204, 3.4.14, *RCS Operational LEAKAGE*

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Table 2A – Unit 1, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
1	01-M-RCP-0001 (G6)	Reactor Head Vent	V007 or 1PRCEV007	3/4" Test Connection from Vent Line 180-BCAA-3/4"	Blind Flange	0 – 7	2	0	N	
2	01-M-RCP-0001 (E6)	Pressurizer Aux. Spray from Reactor Coolant Loop 1A Cold Leg	V001 or 1PRCEV001	1" Vent Line Connected to 062-BCAA-3"	Blind Flange	0 – 6	2	0	Y	
3	01-M-RCP-0001 (F7)	Pressurizer Aux. Spray from Reactor Coolant Loop 1B Cold Leg	V062 or 1PRCEV062	1" Vent Line Connected to 017-BCAA-3"	Blind Flange	0 – 6	2	0	Y	
4	01-M-RCP-0001 (F7)	Drain Line to Reactor Drain Tank	V056 or 1PRCEV056	Drain Line 098-BCAA-1"	V060 or 1PRCEV060	0 – 6	2	0	Y	
5	01-M-RCP-0001 (G7)	Drain Line to Reactor Drain Tank	V057 or 1PRCEV057	Drain Line 099-BCAA-1"	V059	0 – 6	2	0	Y	Insulation is up to and including V057 only.
6	01-M-RCP-0001 (B12)	Drain Line 1A to Reactor Drain Tank	V334 or 1PRCEV334	Drain Line 060-BCAA-2"	V234	1 – 6	2	1	Y	Insulation is up to and including V334 only.
7	01-M-RCP-0001 (A13)	Drain Line 1B to Reactor Drain Tank	V335 or 1PRCEV335	Drain Line 058-BCAA-2"	V235	1 – 6	2	0	Y	Insulation is up to and including V335 only.
8	01-M-RCP-0001 (F2)	Drain Line 2A to Reactor Drain Tank	V333 or 1PRCEV333	Drain Line 096-BCAA-2"	V233	1 – 6	2	1	Y	Insulation is up to and including V333 only.
9	01-M-RCP-0001 (D2)	Drain Line 2B to Reactor Drain Tank	V332 or 1PRCEV332	Drain Line 089-BCAA-2"	V232	1 – 6	2	0	Y	Insulation is up to and including V332 only.

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Table 2A – Unit 1, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
10	01-M-RCP-0001 (H10)	Pressurizer Aux. Spray Line Test Connection	V058 or 1PRCEV058	1" Test Connection from 018-BCAA-4"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V058 only.
11	01-M-RCP-0001 (G14)	Pressurizer Safety Valve PSV202 Line to Reactor Drain Tank	HV108 or 1JRCBHV108	Line 179-BCAA-1"	HV109 and 1" Drain line including V392	2 - 1	6	0	Y	Insulation is up to and including HV108 only.
12	01-M-RCP-0002 (B12)	Reactor Coolant Pump 1A Seal Housing Drain	V900 or 1PRCNV900	Drain Line N-200-BCAA-1"	Blind Flange	0 – 8.5	2	0	N	
13	01-M-RCP-0002 (F12)	Reactor Coolant Pump 1B Seal Housing Drain	V901 or 1PRCNV901	Drain Line N-201-BCAA-1"	Blind Flange	0 – 8.5	2	0	N	
14	01-M-RCP-0002 (F4)	Reactor Coolant Pump 2A Seal Housing Drain	V902 or 1PRCNV902	Drain Line N-202-BCAA-1"	Blind Flange	0 – 8.5	2	0	N	
15	01-M-RCP-0002 (B4)	Reactor Coolant Pump 2B Seal Housing Drain	V903 or 1PRCNV903	Drain Line N-203-BCAA-1"	Blind Flange	0 – 8.5	2	0	N	
16	01-M-RCP-0002 (B10)	Cyclone Filter RCE-F02A Drain	V868 or 1PRCNV868	Drain Line N-106-BCAA-1"	V700	0 – 6	2	0	N	
17	01-M-RCP-0002 (E10)	Cyclone Filter RCE-F02B Drain	V869 or 1PRCNV869	Drain Line N-112-BCAA-1"	V701	0 – 6	2	0	N	
18	01-M-RCP-0002 (E3)	Cyclone Filter RCE-F02C Drain	V870 or 1PRCNV870	Drain Line N-124-BCAA-1"	V702	0 – 6	2	0	N	

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Table 2A – Unit 1, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
19	01-M-RCP-0002 (B3)	Cyclone Filter RCE-F02D Drain	V871 or 1PRCNV871	Drain Line N-118-BCAA-1"	V703	0 – 6	2	0	N	
20	01-M-RCP-0002 (E13)	Reactor Coolant Pump Seal Injection	V753 or 1PRCNV753	Drain Line from CH-N-024-BCAA-1"	Blind Flange	0 – 6	4	0	N	3/4" by 1" expander between valve and blind flange.
21	01-M-RCP-0002 (E12)	Reactor Coolant Pump Seal Injection	CH-VR30 or 1PCHNV830	1" Test Connection from CH-N-024-BCAA-1"	Blind Flange	0 – 6	2	0	N	
22	01-M-RCP-0002 (E6)	Reactor Coolant Pump Seal Injection	V754 or 1PRCNV754	Drain Line from CH-N-022-BCAA-1"	Blind Flange	0 – 6	4	0	N	3/4" by 1" expander between valve and blind flange.
23	01-M-RCP-0002 (A6)	Reactor Coolant Pump Seal Injection	V755 or 1PRCNV755	Drain Line from CH-N-020-BCAA-1"	Blind Flange	0 – 6	4	0	N	3/4" by 1" expander between valve and blind flange.
24	01-M-CHP-0001 (H2)	Seal Water Supply to Reactor Coolant Pump 1A	V848 or 1PCHNV848	Drain Line N-007-BCAA-3/4"	Blind Flange	0 – 6	2	0	N	
25	01-M-CHP-0001 (H1)	Seal Water Supply to Reactor Coolant Pump 1A	RCV752 or 1PRCNV752	Drain Line from CH-N-026-BCAA-1"	Blind Flange	0 – 6	4	0	N	3/4" by 1" expander welded to valve.
26	01-M-CHP-0001 (G2)	Seal Water Supply to Reactor Coolant Pump 1B	V849 or 1PCHNV849	Drain Line N-032-BCAA-3/4"	Blind Flange	0 – 6	2	0	N	

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Table 2A – Unit 1, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
27	01-M-CHP-0001 (F2)	Seal Water Supply to Reactor Coolant Pump 2A	V859 or 1PCHNV859	Drain Line N-034-BCAA-3/4"	Blind Flange	0 – 6	2	0	N	
28	01-M-CHP-0001 (E2)	Seal Water Supply to Reactor Coolant Pump 2B	V860 or 1PCHNV860	Drain Line N-061-BCAA-3/4"	Blind Flange	0 – 6	2	0	N	
29	01-M-CHP-0001 (G10)	Pressurizer Aux. Spray Supply Line	VM41 or 1PCHAVM41	1" Drain and Test Connection from A-520-BCAA-2"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including VM41 only.
30	01-M-CHP-001 (G15)	Letdown Line from Reactor Coolant Loop 2B Cold Leg	V853 or 1PCHEV853	3/4" Drain and Test Connection from E-001-BCAA-2"	Blind Flange	1 – 6.5	5	0	Y	Insulation is up to and including V853 only and there is flange between the valve and blind flange.
31	01-M-CHP-0001 (F9)	Charging Line to Reactor Coolant Loop 2A Cold Leg	VM42 or 1PCHEVM42	1" Drain and Test Connection from E-005-BCAA-3"	Blind Flange	0 – 8	2	0	Y	Insulation is up to and including VM42 only.
32	01-M-CHP-0001 (F11)	Charging Line to Reactor Coolant Loop 2A Cold Leg	V096 or 1PCHEV096	1" Drain and Test Connection from E-005-BCAA-3"	Blind Flange	0 – 8	2	0	Y	Insulation is up to and including V096 only.

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Table 2A – Unit 1, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
33	01-M-SIP-0002 (F1)	HPSI Pump 1 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V906 or 1PSIAV906	1" Vent and Test Connection from A-248-BCAA-3"- See Table 3A	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V906 only.
34	01-M-SIP-0002 (F1)	HPSI Pump 1 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V055 or 1PSIAV055	1" Drain Line from A-248-BCAA-3"- See Table 3A	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V055 only.
35	01-M-SIP-0002 (F2)	HPSI Pump 1 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V902 or 1PSIAV902	1" Vent Line from A-248-BCAA-3"- See Table 3A	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V902 only.
36	01-M-SIP-0002 (C3)	HPSI Pump 1 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V056 or 1PSIAV056	1" Variable Leg Sensing Connection from A-248-BCAA-3"	Blind Flange (Will be in place when the Leakage Test is performed)	0 – 6.75	2	0	Y	Insulation is up to and including V056 only and during Modes 5 and 6 the blind flange is removed and a flange with flexible tubing is attached for variable Leg sensing for refueling water level monitoring.

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Table 2A – Unit 1, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
37	01-M-SIP-0002 (B10)	HPSI Pump 2 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg	V057 or 1PSIBV057	1" Variable Leg Sensing Connection from B-199-BCAA-3"	Blind Flange (Will be in place when the Leakage Test is performed)	0 – 6.75	2	0	Y	Insulation is up to and including V057 only and during Modes 5 and 6 the blind flange is removed and a flange with flexible tubing is attached for variable leg sensing for refueling water level monitoring.
38	01-M-SIP-0002 (C10)	Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg	V879 or 1PSIBV879	1" Drain and Test Connection from B-193-BCAA-16"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V879 only.
39	01-M-SIP-0002 (C10)	Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg	V1026 1SIBV1026	1" Vent Line from B-193-BCAA-16"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V1026 only.
40	01-M-SIP-0002 (D10)	Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg - UV654 Valve Tap Line	VA06 1SIBVA06	1" Vent and Test Connection from B-515-BCAA-3/4"	Pipe Cap	0 – 6	1	0	Y	Insulation is up to and including VA06 only.
41	01-M-SIP-0002 (D10)	Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg - UV654 Valve Tap Line	VA08 1SIBVA08	1" Drain and Test Connection from B-515-BCAA-3/4"	Pipe Cap	0 – 6	1	0	Y	Insulation is up to and including VA08 only.

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Table 2A – Unit 1, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
42	01-M-SIP-0002 (A6)	LPSI from SI Tank 1A to Reactor Coolant Loop 1A Cold Leg	V882 or 1PSIEV882	1" Vent Line from 207-BCAA-14"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V882 only.
43	01-M-SIP-0002 (B6)	From HPSI and LPSI Headers to Reactor Coolant Loop 1A Cold Leg	V064 or 1PSIEV064	1" Drain and Test Connection from 203-BCAA-12"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V064 only.
44	01-M-SIP-0002 (B6)	LPSI Discharge Cross Connect Between SI Tanks 1A and 1B	V974 or 1PSIEV974	1" Vent Line from 217-BCAA-1"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V974 only.
45	01-M-SIP-0002 (A4)	LPSI from SI Tank 1B to Reactor Coolant Loop 1B Cold Leg	V883 or 1PSIEV883	1" Vent Line from 223-BCAA-14"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V883 only.
46	01-M-SIP-0002 (B4)	From HPSI and LPSI Headers to Reactor Coolant Loop 1B Cold Leg	V063 or 1PSIEV063	1" Drain and Test Connection from 221-BCAA-12"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V063 only.
47	01-M-SIP-0002 (B4)	LPSI Discharge Cross Connect Between SI Tanks 1B and 1A	V975 or 1PSIEV975	1" Vent Line from 225-BCAA-1"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V975 only.

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Table 2A – Unit 1, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
48	01-M-SIP-0002 (A13)	From HPSI and LPSI Headers to Reactor Coolant Loop 2A Cold Leg	V880 or 1PSIEV880	1" Vent Line from 156-BCAA-12"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V880 only.
49	01-M-SIP-0002 (B14)	From HPSI and LPSI Headers to Reactor Coolant Loop 2A Cold Leg	V804 or 1PSIEV804	1" Drain and Test Connection from 156-BCAA-12"	Pipe Cap	0 – 6	1	0	Y	Insulation is up to and including V804 only.
50	01-M-SIP-0002 (A11)	LPSI from SI Tank 2B to Reactor Coolant Loop 2B Cold Leg	V881 or 1PSIEV881	1" Vent Line from 179-BCAA-14"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V881 only.
51	01-M-SIP-0002 (B11)	From HPSI and LPSI Headers to Reactor Coolant Loop 2B Cold Leg	V803 or 1PSIEV803	1" Drain and Test Connection from 175-BCAA-12"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V803 only.
52	01-M-SIP-0002 (E3)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg - UV653 Valve Tap Line	VA05 or 1PSIAVA05	1" Vent and Test Connection from A-514-BCAA-3/4"	Pipe Cap	0 – 6	1	0	Y	Insulation is up to and including VA05 only.
53	01-M-SIP-0002 (D3)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg - UV653 Valve Tap Line	VA07 or 1PSIAVA07	1" Drain and Test Connection from A-514-BCAA-3/4"	Pipe Cap	0 – 6.75	1	0	Y	Insulation is up to and including VA07 only.

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Table 2A – Unit 1, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
54	01-M-SIP-0002 (D3)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V801 or 1PSIAV801	1" Drain and Test Connection from A-240-BCAA-16"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V801 only.
55	01-M-SIP-0002 (D3)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V892 or 1PSIAV892	1" Vent Line from A-240-BCAA-16"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V892 only.
56	01-M-SIP-0002 (C3)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V1027 or 1PSIAV1027	1" Vent Line from A-240-BCAA-16"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V1027 only.
57	01-M-SIP-0002 (F9)	HPSI Pump 2 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg	V907 or 1PSIBV907	1" Vent and Test Connection from B-199-BCAA-3" – See Table 3A	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V907 only.
Total Number of 1 st Isolation Valves that will not be opened per this request for the 10 Year System Pressure Test = 57										

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Table 2A – Unit 1, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	

NOTES:

Piping Design (Reference: PVNGS Piping Material Classification Drawing 13-P-ZZG-0012 for vents and drains)

- Vent and drain lines typically have no line designations thus only the connecting pipe line designation may be listed on the P&IDs and they are all 2" NPS and less.
- Piping is seamless Schedule 160 for 2500 psia or greater service and piping material is austenitic stainless steel ASME SA-376 Gr. TP304 or SA-312 Gr. TP304 for sizes 3/4" to 2" NPS.
- Fittings are socket welded for 6000 psia service on all vents and drains and the material is stainless steel ASME SA-182 Gr. F304 for size 3/4" to 2" NPS.
- Flanges are bored for socket welds to match pipe for 2500 psia or greater service and flange material is stainless steel ASME SA-182 Gr. F316.
- Valves are forged or machined from forgings and the material is stainless steel ASME SA-182 Gr. F316 for sizes 3/4" to 2" NPS.

ASME Code Classification

All piping components are classified as Class 1 under Examination Category B-P, for pressure testing.

Lines greater than 1" NPS are also classified under Examination Category B-J per the code of record, and if they have been required to be selected for volumetric examination, they are listed under the column "# Selected for Exam" only.

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Table 2B – Unit 2, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)										
	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
1	02-M-RCP-0001 (G6)	Reactor Head Vent	V007 or 2PRCEV007	3/4" Test Connection from Vent Line 180-BCAA-3/4"	Blind Flange	0 – 7	2	0	N	
2	02-M-RCP-0001 (F7)	Drain Line to Reactor Drain Tank	V056 or 2PRCEV056	Drain Line 098-BCAA-1"	V060	0 – 6	2	0	Y	
3	02-M-RCP-0001 (G7)	Drain Line to Reactor Drain Tank	V057 or 2PRCEV057	Drain Line 099-BCAA-1"	V059	0 – 6	2	0	Y	Insulation is up to and including V057 only.
4	02-M-RCP-0001 (B12)	Drain Line 1A to Reactor Drain Tank	V334 or 2PRCEV334	Drain Line 060-BCAA-2"	V234	1 – 6	2	0	Y	Insulation is up to and including V334 only.
5	02-M-RCP-0001 (A13)	Drain Line 1B to Reactor Drain Tank	V335 or 2PRCEV335	Drain Line 058-BCAA-2"	V235	1 – 6	2	0	Y	Insulation is up to and including V335 only.
6	02-M-RCP-0001 (F2)	Drain Line 2A to Reactor Drain Tank	V333 or 2PRCEV333	Drain Line 096-BCAA-2"	V233	1 – 6	2	0	Y	Insulation is up to and including V333 only.
7	02-M-RCP-0001 (D2)	Drain Line 2B to Reactor Drain Tank	V332 or 2PRCEV332	Drain Line 089-BCAA-2"	V232	1 – 6	2	0	Y	Insulation is up to and including V332 only.
8	02-M-RCP-0001 (H10)	Pressurizer Aux. Spray Line Test Connection	V058 or 2PRCEV058	1" Test Connection from 018-BCAA-4"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V058 only.
9	02-M-RCP-0001 (G14)	Pressurizer Safety Valve PSV202 Line to Reactor Drain Tank	HV108 or 2JRCBHV108	Line 179-BCAA-1"	HV109 and 1" Drain line including V392	2 - 1	6	0	Y	Insulation is up to and including HV108 only.

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Table 2B – Unit 2, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)										
	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
10	02-M-RCP-0002 (B12)	Reactor Coolant Pump 1A Seal Housing Drain	V900 or 2PRCNV900	Drain Line N-200-BCAA-1"	Blind Flange	0 – 8.5	2	0	N	
11	02-M-RCP-0002 (F12)	Reactor Coolant Pump 1B Seal Housing Drain	V901 or 2PRCNV901	Drain Line N-201-BCAA-1"	Blind Flange	0 – 8.5	2	0	N	
12	02-M-RCP-0002 (F4)	Reactor Coolant Pump 2A Seal Housing Drain	V902 or 2PRCNV902	Drain Line N-202-BCAA-1"	Blind Flange	0 – 8.5	2	0	N	
13	02-M-RCP-0002 (B4)	Reactor Coolant Pump 2B Seal Housing Drain	V903 or 2PRCNV903	Drain Line N-203-BCAA-1"	Blind Flange	0 – 8.5	2	0	N	
14	02-M-RCP-0002 (B10)	Cyclone Filter RCE-F02A Drain	V868 or 2PRCNV868	Drain Line N-106-BCAA-1"	V700	0 – 6	2	0	N	
15	02-M-RCP-0002 (E10)	Cyclone Filter RCE-F02B Drain	V869 or 2PRCNV869	Drain Line N-112-BCAA-1"	V701	0 – 6	2	0	N	
16	02-M-RCP-0002 (E3)	Cyclone Filter RCE-F02C Drain	V870 or 2PRCNV870	Drain Line N-124-BCAA-1"	V702	0 – 6	2	0	N	
17	02-M-RCP-0002 (B3)	Cyclone Filter RCE-F02D Drain	V871 or 2PRCNV871	Drain Line N-118-BCAA-1"	V703	0 – 6	2	0	N	
18	02-M-RCP-0002 (E13)	Reactor Coolant Pump Seal Injection	V753 or 2PRCNV753	Drain Line from CH-N-024-BCAA-1"	Blind Flange	0 – 6	4	0	N	3/4" by 1" expander between valve and blind flange.

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Table 2B – Unit 2, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
19	02-M-RCP-0002 (E12)	Reactor Coolant Pump Seal Injection	CH-VR30 or 2PRCNVR30	1" Test Connection from CH-N-024-BCAA-1"	Blind Flange	0 – 6	2	0	N	
20	02-M-RCP-0002 (E6)	Reactor Coolant Pump Seal Injection	V754 or 2PRCNV754	Drain Line from CH-N-022-BCAA-1"	Blind Flange	0 – 6	4	0	N	3/4" by 1" expander between valve and blind flange.
21	02-M-RCP-0002 (A6)	Reactor Coolant Pump Seal Injection	V755 or 2PRCNV755	Drain Line from CH-N-020-BCAA-1"	Blind Flange	0 – 6	4	0	N	3/4" by 1" expander between valve and blind flange.
22	02-M-CHP-0001 (H2)	Seal Water Supply to Reactor Coolant Pump 1A	V848 or 2PCHNV848	Drain Line N-007-BCAA-3/4"	Blind Flange	0 – 6	2	0	N	
23	02-M-CHP-0001 (H1)	Seal Water Supply to Reactor Coolant Pump 1A	RCV752 or 2PRCNV752	Drain Line from CH-N-026-BCAA-1"	Blind Flange	0 – 6	4	0	N	3/4" by 1" expander welded to valve.
24	02-M-CHP-0001 (G2)	Seal Water Supply to Reactor Coolant Pump 1B	V849 or 2PCHNV849	Drain Line N-032-BCAA-3/4"	Blind Flange	0 – 6	2	0	N	
25	02-M-CHP-0001 (F2)	Seal Water Supply to Reactor Coolant Pump 2A	V859 or 2PCHNV859	Drain Line N-034-BCAA-3/4"	Blind Flange	0 – 6	2	0	N	

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Table 2B – Unit 2, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
26	02-M-CHP-0001 (E2)	Seal Water Supply to Reactor Coolant Pump 2B	V860 or 2PCHNV860	Drain Line N-061-BCAA-3/4"	Blind Flange	0 – 6	2	0	N	
27	02-M-CHP-0001 (G10)	Pressurizer Aux. Spray Supply Line	VM41 or 2PCHAVM41	1" Drain and Test Connection from A-520-BCAA-2"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including VM41 only.
28	02-M-CHP-0001 (G15)	Letdown Line from Reactor Coolant Loop 2B Cold Leg	V853 or 2PCHEV853	3/4" Drain and Test Connection from E-001-BCAA-2"	Blind Flange	1 – 6.5	5	0	Y	Insulation is up to and including V853 only.
29	02-M-CHP-0001 (F9)	Charging Line to Reactor Coolant Loop 2A Cold Leg	VM42 or 2PCHEVM42	1" Drain and Test Connection from E-005-BCAA-3"	Blind Flange	0 – 8	2	0	Y	Insulation is up to and including VM42 only.
30	02-M-CHP-0001 (F11)	Charging Line to Reactor Coolant Loop 2A Cold Leg	V096 or 2PCHEV096	1" Drain and Test Connection from E-005-BCAA-3"	Blind Flange	0 – 8	2	0	Y	Insulation is up to and including V096 only.
31	02-M-SIP-0002 (F2)	HPSI Pump 1 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V906 or 2PSIAV906	1" Vent and Test Connection from A-248-BCAA-3"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V906 only.

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Table 2B – Unit 2, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
32	02-M-SIP-0002 (F2)	HPSI Pump 1 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V055 or 2PSIAV055	1" Drain Line from A-248-BCAA-3"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V055 only.
33	02-M-SIP-0002 (F2)	HPSI Pump 1 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V902 or 2PSIAV902	1" Vent Line from A-248-BCAA-3"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V902 only.
34	02-M-SIP-0002 (C3)	HPSI Pump 1 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V056 or 2PSIAV056	1" Variable Leg Sensing Connection from A-248-BCAA-3"	Blind Flange (Will be in place when the Leakage Test is performed)	0 – 6.75	2	0	Y	Insulation is up to and including V056 only and during Modes 5 and 6 the blind flange is removed and a flange with flexible tubing is attached for variable leg sensing for refueling water level monitoring.

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Table 2B – Unit 2, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
35	02-M-SIP-0002 (B10)	HPSI Pump 2 Line to Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg	V057 or 2PSIBV057	1" Variable Leg Sensing Connection from B-199-BCAA-3"	Blind Flange (Will be in place when the Leakage Test is performed)	0 – 6.75	2	0	Y	Insulation is up to and including V057 only and during Modes 5 and 6 the blind flange is removed and a flange with flexible tubing is attached for variable leg sensing for refueling water level monitoring.
36	02-M-SIP-0002 (C10)	Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg	V879 or 2PSIBV879	1" Drain and Test Connection from B-193-BCAA-16"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V879 only.
37	02-M-SIP-0002 (C10)	Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg	V1026 or 2PSIBV1026	1" Vent Line from B-193-BCAA-16"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V1026 only.
38	02-M-SIP-0002 (D10)	Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg - UV654 Valve Tap Line	VA06 or 2PSIBVA06	1" Vent and Test Connection from B-515-BCAA-3/4"	Pipe Cap	0 – 6	1	0	Y	Insulation is up to and including VA06 only.

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Table 2B – Unit 2, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
39	02-M-SIP-0002 (D10)	Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg - UV654 Valve Tap Line	VA08 2SIBVA08	1" Drain and Test Connection from B-515-BCAA-3/4"	Pipe Cap	0 – 6	1	0	Y	Insulation is up to and including VA08 only.
40	02-M-SIP-0002 (A6)	LPSI from SI Tank 1A to Reactor Coolant Loop 1A Cold Leg	V882 or 2PSIEV882	1" Vent Line from 207-BCAA-14"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V882 only.
41	02-M-SIP-0002 (B6)	From HPSI and LPSI Headers to Reactor Coolant Loop 1A Cold Leg	V064 or 2PSIEV064	1" Drain and Test Connection from 203-BCAA-12"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V064 only.
42	02-M-SIP-0002 (B6)	LPSI Discharge Cross Connect Between SI Tanks 1A and 1B	V974 or 2PSIEV974	1" Vent Line from 217-BCAA-1"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V974 only.
43	02-M-SIP-0002 (A4)	LPSI from SI Tank 1B to Reactor Coolant Loop 1B Cold Leg	V883 or 2PSIEV883	1" Vent Line from 223-BCAA-14"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V883 only.

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Table 2B – Unit 2, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)										
	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
44	02-M-SIP-0002 (B4)	From HPSI and LPSI Headers to Reactor Coolant Loop 1B Cold Leg	V063 or 2PSIEV063	1" Drain and Test Connection from 221-BCAA-12"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V063 only.
45	02-M-SIP-0002 (B4)	LPSI Discharge Cross Connect Between SI Tanks 1B and 1A	V975 or 2PSIEV975	1" Vent Line from 225-BCAA-1"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V975 only.
46	02-M-SIP-0002 (A13)	From HPSI and LPSI Headers to Reactor Coolant Loop 2A Cold Leg	V880 or 2PSIEV880	1" Vent Line from 156-BCAA-12"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V880 only.
47	02-M-SIP-0002 (B14)	From HPSI and LPSI Headers to Reactor Coolant Loop 2A Cold Leg	V804 or 2PSIEV804	1" Drain and Test Connection from 156-BCAA-12"	Pipe Cap	0 – 6	1	0	Y	Insulation is up to and including V804 only.
48	02-M-SIP-0002 (A11)	LPSI from SI Tank 2B to Reactor Coolant Loop 2B Cold Leg	V881 or 2PSIEV881	1" Vent Line from 179-BCAA-14"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V881 only.

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Table 2B – Unit 2, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
49	02-M-SIP-0002 (B11)	From HPSI and LPSI Headers to Reactor Coolant Loop 2B Cold Leg	V803 or 2PSIEV803	1" Drain and Test Connection from 175-BCAA-12"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V803 only.
50	02-M-SIP-0002 (E3)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg - UV653 Valve Tap Line	VA05 or 2PSIAVA05	1" Vent and Test Connection from A-514-BCAA-3/4"	Pipe Cap	0 – 6	1	0	Y	Insulation is up to and including VA05 only.
51	02-M-SIP-0002 (D3)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg - UV653 Valve Tap Line	VA07 or 2PSIAVA07	1" Drain and Test Connection from A-514-BCAA-3/4"	Pipe Cap	0 – 6.75	1	0	Y	Insulation is up to and including VA07 only.
52	02-M-SIP-0002 (D3)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V801 or 2PSIAV801	1" Drain and Test Connection from A-240-BCAA-16"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V801 only.
53	02-M-SIP-0002 (D3)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V892 or 2PSIAV892	1" Vent Line from A-240-BCAA-16"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V892 only.

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Table 2B – Unit 2, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
54	02-M-SIP-0002 (C2)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V1027 or 2PSIAV1027	1" Vent Line from A-240-BCAA-16"	Blind Flange	0 – 6.75	2	0	N	
55	02-M-SIP-0002 (G9)	HPSI Pump 2 Line to Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg	V907 or 2PSIBV907	1" Vent and Test Connection from B-199-BCAA-3"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V907 only.

Total Number of 1st Isolation Valves that will not be opened per this request for the 10 Year System Pressure Test = 55

NOTES:

Piping Design (Reference: PVNGS Piping Material Classification Drawing 13-P-ZZG-0012 for vents and drains)

- Vent and drain lines typically have no line designations thus only the connecting pipe line designation may be listed on the P&IDs and they are all 2" NPS and less.
- Piping is seamless Schedule 160 for 2500 psia or greater service and piping material is austenitic stainless steel ASME SA-376 Gr. TP304 or SA-312 Gr. TP304 for sizes 3/4" to 2" NPS.
- Fittings are socket welded for 6000 psia service on all vents and drains and the material is stainless steel ASME SA-182 Gr. F304 for size 3/4" to 2" NPS.
- Flanges are bored for socket welds to match pipe for 2500 psia or greater service and flange material is stainless steel ASME SA-182 Gr. F316.
- Valves are forged or machined from forgings and the material is stainless steel ASME SA-182 Gr. F316 for sizes 3/4" to 2" NPS.

ASME Code Classification

All piping components are classified as Class 1 under Examination Category B-P, for pressure testing.

Lines greater than 1" NPS are also classified under Examination Category B-J per the code of record, and if they have been required to be selected for volumetric examination, they are listed under the column "# Selected for Exam" only.

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Table 2C – Unit 3, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
1	03-M-RCP-0001 (G6)	Reactor head Vent	V007 or 3PRCEV007	3/4" Test Connection from Vent Line 180-BCAA-3/4"	Blind Flange	0 – 7	2	0	N	
2	03-M-RCP-0001 (F7)	Drain Line to Reactor Drain Tank	V056 or 3PRCEV056	Drain Line 098-BCAA-1"	V060	0 – 6	2	0	Y	
3	03-M-RCP-0001 (G7)	Drain Line to Reactor Drain Tank	V057 or 3PRCEV057	Drain Line 099-BCAA-1"	V059	0 – 6	2	0	Y	Insulation is up to and including V057 only.
4	03-M-RCP-0001 (B12)	Drain Line 1A to Reactor Drain Tank	V334 or 3PRCEV334	Drain Line 060-BCAA-2"	V234	1 – 6	2	1	Y	Insulation is up to and including V334 only.
5	03-M-RCP-0001 (A13)	Drain Line 1B to Reactor Drain Tank	V335 or 3PRCEV335	Drain Line 058-BCAA-2"	V235	1 – 6	2	0	Y	Insulation is up to and including V335 only.
6	03-M-RCP-0001 (F2)	Drain Line 2A to Reactor Drain Tank	V333 or 3PRCEV333	Drain Line 096-BCAA-2"	V233	1 – 6	2	0	Y	Insulation is up to and including V333 only.
7	03-M-RCP-0001 (D2)	Drain Line 2B to Reactor Drain Tank	V332 or 3PRCEV332	Drain Line 089-BCAA-2"	V232	1 – 6	2	0	Y	Insulation is up to and including V332 only.
8	03-M-RCP-0001 (H10)	Pressurizer Aux. Spray Line Test Connection	V058 or 3PRCEV058	1" Test Connection from 018-BCAA-4"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V058 only.
9	03-M-RCP-0001 (G14)	Pressurizer Safety Valve PSV202 Line to Reactor Drain Tank	HV108 or 3JRCBHV108	Line 179-BCAA-1"	HV109 and 1" Drain line including V392	2 - 1	6	0	Y	Insulation is up to and including HV108 only.

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Table 2C – Unit 3, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
10	03-M-RCP-0002 (B12)	Reactor Coolant Pump 1A Seal Housing Drain	V900 or 3PRCNV900	Drain Line N-200-BCAA-1"	Blind Flange	0 – 8.5	2	0	N	
11	03-M-RCP-0002 (F12)	Reactor Coolant Pump 1B Seal Housing Drain	V901 or 3PRCNV901	Drain Line N-201-BCAA-1"	Blind Flange	0 – 8.5	2	0	N	
12	03-M-RCP-0002 (F4)	Reactor Coolant Pump 2A Seal Housing Drain	V902 or 3PRCNV902	Drain Line N-202-BCAA-1"	Blind Flange	0 – 8.5	2	0	N	
13	03-M-RCP-0002 (B4)	Reactor Coolant Pump 2B Seal Housing Drain	V903 or 3PRCNV903	Drain Line N-203-BCAA-1"	Blind Flange	0 – 8.5	2	0	N	
14	03-M-RCP-0002 (B10)	Cyclone Filter RCE-F02A Drain	V868 or 3PRCNV868	Drain Line N-106-BCAA-1"	V700	0 – 6	2	0	N	
15	03-M-RCP-0002 (E10)	Cyclone Filter RCE-F02B Drain	V869 or 3PRCNV869	Drain Line N-112-BCAA-1"	V701	0 – 6	2	0	N	
16	03-M-RCP-0002 (E3)	Cyclone Filter RCE-F02C Drain	V870 or 3PRCNV870	Drain Line N-124-BCAA-1"	V702	0 – 6	2	0	N	
17	03-M-RCP-0002 (B3)	Cyclone Filter RCE-F02D Drain	V871 or 3PRCNV871	Drain Line N-118-BCAA-1"	V703	0 – 6	2	0	N	
18	03-M-RCP-0002 (E13)	Reactor Coolant Pump Seal Injection	V753 or 3PRCNV753	Drain Line from CH-N-024-BCAA-1"	Blind Flange	0 – 6	4	0	N	3/4" by 1" Expander between Valve and Blind Flange.

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Table 2C – Unit 3, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
19	03-M-RCP-0002 (E12)	Reactor Coolant Pump Seal Injection	CH-VR30 or 3PRCNVR30	1" Test Connection from CH-N-024-BCAA-1"	Blind Flange	0 – 6	2	0	N	
20	03-M-RCP-0002 (E6)	Reactor Coolant Pump Seal Injection	V754 or 3PRCNV754	Drain Line from CH-N-022-BCAA-1"	Blind Flange	0 – 6	4	0	N	3/4" by 1" Expander between Valve and Blind Flange.
21	03-M-RCP-0002 (A6)	Reactor Coolant Pump Seal Injection	V755 or 3PRCNV755	Drain Line from CH-N-020-BCAA-1"	Blind Flange	0 – 6	4	0	N	3/4" by 1" Expander between Valve and Blind Flange.
22	03-M-CHP-0001 (H2)	Seal Water Supply to Reactor Coolant Pump 1A	V848 or 3PCHNV848	Drain Line N-007-BCAA-3/4"	Blind Flange	0 – 6	2	0	N	
23	03-M-CHP-0001 (H1)	Seal Water Supply to Reactor Coolant Pump 1A	RCV752 or 3PCHNV752	Drain Line from CH-N-026-BCAA-1"	Blind Flange	0 – 6	4	0	N	3/4" by 1" Expander Welded to Valve.
24	03-M-CHP-0001 (G2)	Seal Water Supply to Reactor Coolant Pump 1B	V849 or 3PCHNV849	Drain Line N-032-BCAA-3/4"	Blind Flange	0 – 6	2	0	N	
25	03-M-CHP-0001 (F2)	Seal Water Supply to Reactor Coolant Pump 2A	V859 or 3PCHNV859	Drain Line N-034-BCAA-3/4"	Blind Flange	0 – 6	2	0	N	

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Table 2C – Unit 3, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
26	03-M-CHP-0001 (E2)	Seal Water Supply to Reactor Coolant Pump 2B	V860 or 3PCHNV860	Drain Line N-061-BCAA-3/4"	Blind Flange	0 – 6	2	0	N	
27	03-M-CHP-0001 (G10)	Pressurizer Aux. Spray Supply Line	VM41 or 3PCHAM41	1" Drain and Test Connection from A-520-BCAA-2"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including VM41 only.
28	03-M-CHP-0001 (G15)	Letdown Line from Reactor Coolant Loop 2B Cold Leg	V853 or 3PCHEV853	3/4" Drain and Test Connection from E-001-BCAA-2"	Blind Flange	1 – 6.5	5	0	Y	Insulation is up to and including V853 only.
29	03-M-CHP-0001 (F9)	Charging Line to Reactor Coolant Loop 2A Cold Leg	VM42 or 3PCHEVM42	1" Drain and Test Connection from E-005-BCAA-3"	Blind Flange	0 – 8	2	0	Y	Insulation is up to and including VM42 only.
30	03-M-CHP-0001 (F11)	Charging Line to Reactor Coolant Loop 2A Cold Leg	V096 or 3PCHEV096	1" Drain and Test Connection from E-005-BCAA-3"	Blind Flange	0 – 8	2	0	Y	Insulation is up to and including V096 only.
31	03-M-SIP-0002 (F2)	HPSI Pump 1 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V906 or 3PSIAV906	1" Vent and Test Connection from A-248-BCAA-3"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V906 only.

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Table 2C – Unit 3, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
32	03-M-SIP-0002 (F2)	HPSI Pump 1 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V055 or 3PSIAV055	1" Drain Line from A-248-BCAA-3"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V055 only.
33	03-M-SIP-0002 (F2)	HPSI Pump 1 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V902 or 3PSIAV902	1" Vent Line from A-248-BCAA-3"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V902 only.
34	03-M-SIP-0002 (C3)	HPSI Pump 1 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V056 or 3PSIAV056	1" Variable Leg Sensing Connection from A-248-BCAA-3"	Blind Flange (Will be in place when the Leakage Test is performed)	0 – 6.75	2	0	Y	Insulation is up to and including V056 only and during Modes 5 and 6 the Blind Flange is Removed and a Flange with Flexible tubing is attached for Variable Leg Sensing for Refueling Water Level Monitoring.

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Table 2C – Unit 3, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
35	03-M-SIP-0002 (B10)	HPSI Pump 2 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg	V057 or 3PSIBV057	1" Variable Leg Sensing Connection from B-199-BCAA-3"	Blind Flange (Will be in place when the Leakage Test is performed)	0 – 6.75	2	0	Y	Insulation is up to and including V057 only and during Modes 5 and 6 the Blind Flange is Removed and a Flange with Flexible tubing is attached for Variable Leg Sensing for Refueling Water Level Monitoring.
36	03-M-SIP-0002 (C10)	Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg	V879 or 3PSIBV879	1" Drain and Test Connection from B-193-BCAA-16"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V879 only.
37	03-M-SIP-0002 (C10)	Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg	V1026 or 3SIBV1026	1" Vent Line from B-193-BCAA-16"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V1026 only.
38	03-M-SIP-0002 (D10)	Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg - UV654 Valve Tap Line	VA06 or 3SIBVA06	1" Vent and Test Connection from B-515-BCAA-3/4"	Pipe Cap	0 – 6	1	0	Y	Insulation is up to and including VA06 only.

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Table 2C – Unit 3, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
39	03-M-SIP-0002 (D10)	Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg - UV654 Valve Tap Line.	VA08 or 3SIBVA08	1" Drain and Test Connection from B-515-BCAA-3/4"	Pipe Cap	0 – 6	1	0	Y	Insulation is up to and including VA08 only.
40	03-M-SIP-0002 (A6)	LPSI from SI Tank 1A to Reactor Coolant Loop 1A Cold Leg	V882 or 3PSIEV882	1" Vent Line from 207-BCAA-14"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V882 only.
41	03-M-SIP-0002 (B6)	From HPSI and LPSI Headers to Reactor Coolant Loop 1A Cold Leg	V064 or 3PSIEV064	1" Drain and Test Connection from 203-BCAA-12"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V064 only.
42	03-M-SIP-0002 (B6)	LPSI Discharge Cross Connect Between SI Tanks 1A and 1B	V974 or 3PSIEV974	1" Vent Line from 217-BCAA-1"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V974 only.
43	03-M-SIP-0002 (A4)	LPSI from SI Tank 1B to Reactor Coolant Loop 1B Cold Leg	V883 or 3PSIEV883	1" Vent Line from 223-BCAA-14"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V883 only.

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Table 2C – Unit 3, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
44	03-M-SIP-0002 (B4)	From HPSI and LPSI Headers to Reactor Coolant Loop 1B Cold Leg	V063 or 3PSIEV063	1" Drain and Test Connection from 221-BCAA-12"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V063 only.
45	03-M-SIP-0002 (B4)	LPSI Discharge Cross Connect Between SI Tanks 1B and 1A	V975 or 3PSIEV975	1" Vent Line from 225-BCAA-1"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V975 only.
46	03-M-SIP-0002 (A13)	From HPSI and LPSI Headers to Reactor Coolant Loop 2A Cold Leg	V880 or 3PSIEV880	1" Vent Line from 156-BCAA-12"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V880 only.
47	03-M-SIP-0002 (B14)	From HPSI and LPSI Headers to Reactor Coolant Loop 2A Cold Leg	V804 or 3PSIEV804	1" Drain and Test Connection from 156-BCAA-12"	Pipe Cap	0 – 6	1	0	Y	Insulation is up to and including V804 only.
48	03-M-SIP-0002 (A11)	LPSI from SI Tank 2B to Reactor Coolant Loop 2B Cold Leg	V881 or 3PSIEV881	1" Vent Line from 179-BCAA-14"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V881 only.

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Table 2C – Unit 3, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
49	03-M-SIP-0002 (B11)	From HPSI and LPSI Headers to Reactor Coolant Loop 2B Cold Leg	V803 or 3PSIEV803	1" Drain and Test Connection from 175-BCAA-12"	Blind Flange	0 – 6	2	0	Y	Insulation is up to and including V803 only.
50	03-M-SIP-0002 (E3)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg - UV653 Valve Tap Line	VA05 or 3PSIAVA05	1" Vent and Test Connection from A-514-BCAA-3/4"	Pipe Cap	0 – 6	1	0	Y	Insulation is up to and including VA05 only.
51	03-M-SIP-0002 (E3)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg - UV653 Valve Tap Line	VA07 or 3PSIAVA07	1" Drain and Test Connection from A-514-BCAA-3/4"	Pipe Cap	0 – 6.75	1	0	Y	Insulation is up to and including VA07 only.
52	03-M-SIP-0002 (D3)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V801 or 3PSIAV801	1" Drain and Test Connection from A-240-BCAA-16"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V801 only.
53	03-M-SIP-0002 (D3)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	V892 or 3PSIAV892	1" Vent Line from A-240-BCAA-16"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V892 only.
54	03-M-SIP-0002 (C2)	Shutdown Cooling from Reactor Coolant Loop	V1027 or 3PSIAV1027	1" Vent Line from A-240-BCAA-16"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V1027 only.

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Table 2C – Unit 3, Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices (N-798)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
		1 Hot Leg								
55	03-M-SIP-0002 (F9)	HPSI Pump 2 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg	V907 or 3PSIBV907	1" Vent and Test Connection from B-199-BCAA-3"	Blind Flange	0 – 6.75	2	0	Y	Insulation is up to and including V907 only.

Total Number of 1st Isolation Valves that will not be opened per this request for the 10 Year System Pressure Test = 55

NOTES:

Piping Design (Reference: PVNGS Piping Material Classification Drawing 13-P-ZZG-0012 for vents and drains)

- Vent and drain lines typically have no line designations thus only the connecting pipe line designation may be listed on the P&IDs and they are all 2" NPS and less.
- Piping is seamless Schedule 160 for 2500 psia or greater service and piping material is austenitic stainless steel ASME SA-376 Gr. TP304 or SA-312 Gr. TP304 for sizes 3/4" to 2" NPS.
- Fittings are socket welded for 6000 psia service on all vents and drains and the material is stainless steel ASME SA-182 Gr. F304 for size 3/4" to 2" NPS.
- Flanges are bored for socket welds to match pipe for 2500 psia or greater service and flange material is stainless steel ASME SA-182 Gr. F316.
- Valves are forged or machined from forgings and the material is stainless steel ASME SA-182 Gr. F316 for sizes 3/4" to 2" NPS.

ASME Code Classification

All piping components are classified as Class 1 under Examination Category B-P, for pressure testing.

Lines greater than 1" NPS are also classified under Examination Category B-J per the code of record, and if they have been required to be selected for volumetric examination, they are listed under the column "# Selected for Exam" only.

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Table 3A – Unit 1, Class 1 Piping Between the First and Second Isolation Valves (N-800)										
	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
1	01-M-SIP-0002 (C2) and (F1)	HPSI Pump 1 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	Check Valve V522 or 1PSIAV522	A-248-BCAA-3" and 250-BCAA-1"	Check Valve V523 and 1" piping to UV322 and FO710 - See Table 2A for included Vent, Drain, and Test Connections V906, V055, and V902	106 – 0	*40	10	Y	*26 welds in the ISI Program
2	01-M-SIP-0002 (C3) and (E3)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg to LPSI Pump 1	MOV UV651 or 1JSIAUV065 1	A-240-BCAA-16", A-514-BCAA-3/4", A-510-BCAA-3/4"	MOV UV653 - See Table 2A for included Vent, Drain, and Test Connections V1027, V892, and VA05.	121 - 0	*52	7	Y	*24 welds in the ISI Program

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Table 3A – Unit 1, Class 1 Piping Between the First and Second Isolation Valves (N-800)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
3	01-M-SIP-0002 (B10) and (F9)	HPSI Pump 2 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg	Check Valve V532 or 1PSIBV532	B-199-BCAA-3" and 154-BCAA-1"	Check Valve V533 and 1" piping to UV332 and FO711 - See Table 2A for included Vent and Test Connection V907	106 – 0	*22	5	Y	*14 welds in the ISI Program
4	01-M-SIP-0002 (B10) and (E10)	Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg to LPSI Pump 2	MOV UV652 or 1JSIBUV065 2	B-193-BCAA-16", B-515-BCAA ¾", B-511-BCAA-3/4".	MOV UV654 - See Table 2A for included Vent, Drain, and Test Connections V879, V1026, and VA06.	41 - 0	*46	2	Y	*14 welds in the ISI Program

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Table 3A – Unit 1, Class 1 Piping Between the First and Second Isolation Valves (N-800)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
5	01-M-SIP-0002 (A6), (A7), (A8), (B6), (B7) and (B8)	From HPSI, LPSI and SIT Headers to Reactor Coolant Loop 1A Cold Leg and 1" Branch Connection	Check Valve V237 or 1PSIEV237	207-BCAA-14", 203-BCAA-12", and 217-BCAA-1"	Check Valve V542, Check Valve V 235, FO708, FC UV638 - See Table 2A for included Vent, Drain, and Test Connections V064, V882, and V974	62 – 0	*32	2	Y	*15 welds in the ISI Program
6	01-M-SIP-0002 (A3), (A4), (A5), (B4) and (B5)	From HPSI, LPSI and SIT Headers to Reactor Coolant Loop 1B Cold Leg and 1" Branch Connection	Check Valve V247 or 1PSIEV247	223-BCAA-14", 221-BCAA-12", and 225-BCAA-1"	Check Valve V543, Check Valve V245, FO709, FC UV648 - See Table 2A for included Vent, Drain, and Test Connections V063, V883, and V975	62 – 0	*35	4	Y	*14 welds in the ISI Program

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Table 3A – Unit 1, Class 1 Piping Between the First and Second Isolation Valves (N-800)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
7	01-M-SIP-0002 (A13), (A14), (A15), (B13) and (B14)	From HPSI, LPSI and SIT Headers to Reactor Coolant Loop 2A Cold Leg and 1" Branch Connection	Check Valve V217 or 1PSIEV217	160-BCAA-14", 156-BCAA-12", and 171-BCAA-1"	Check Valve V540, Check Valve V215, FO706, FC UV618 - See Table 2A for included Vent, Drain, and Test Connections V880 and V804	62 – 0	*34	4	Y	*18 welds in the ISI Program
8	01-M-SIP-0002 (A10), (A11), (A12), (B11) and (B12)	From HPSI, LPSI and SIT Headers to Reactor Coolant Loop 2B Cold Leg and 1" Branch Connection	Check Valve V227 or 1PSIEV227	179-BCAA-14", 175-BCAA-12", and 190-BCAA-1"	Check Valve V541, Check Valve V225, FO707, FC UV628 - See Table 2A for included Vent, Drain, and Test Connections V881 and V803	62 – 0	*31	3	Y	*16 welds in the ISI Program

Table 3A – Unit 1, Class 1 Piping Between the First and Second Isolation Valves (N-800)

Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
						# of Welds	# Selected for Exam	Insulated Y/N	
<p>NOTES:</p> <p><u>Piping Design</u> (Reference: PVNGS Piping Material Classification Drawing 13-P-ZZG-0012 for vents and drains)</p> <ul style="list-style-type: none">• Piping is seamless Schedule 160 for 2500 psia or greater service and piping material is austenitic stainless steel ASME SA-376 Gr. TP304 or SA-312 Gr. TP304 for sizes 3/4” to 24” NPS.• Fittings are socket welded for 6000 psia service and the material is Stainless Steel ASME SA-182 Gr. F304 3/4” to 2” NPS and for 24” and smaller stainless steel seamless butt-welding (same Schedule as pipe) in for RCS, SI, and CH, ASME SA-403 Gr. WP304.• Flanges are 2500 psia, stainless steel, raised face, welding neck (bored to match pipe) 24” and smaller ASME SA-182 Gr. F316.• Valves are stainless steel to match the piping material and are stainless forged or machined from forgings and the material is ASME SA-182 Gr. F316 for sizes 3/4” to 2” NPS and others 1/2” to 24” may be cast or forged. <p><u>ASME Code Classification</u></p> <p>All piping components are classified as Class 1 under Examination Category B-P, for pressure testing.</p> <p>Lines greater than 1” NPS are also classified under Examination Category B-J per the Code of record, and if they have been required to be selected for <u>volumetric examination</u>, they are listed under the column “# Selected for Exam” only.</p>									

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Table 3B – Unit 2, Class 1 Piping Between the First and Second Isolation Valves (N-800)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
1	02-M-SIP-0002 (C2) and (F2)	HPSI Pump 1 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	Check Valve V522 or 2PSIAV522	A-248-BCAA-3" and 250-BCAA-1"	Check Valve V523 and 1" piping to UV322 and FO710 - See Table 2B for included Vent, Drain, and Test Connections V906, V055, and V902	106 – 0	*40	4	Y	*26 welds in the ISI Program
2	02-M-SIP-0002 (C3) and (E3)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg to LPSI Pump 1	MOV UV651 or 2JSIAUV065 1	A-240-BCAA-16", A-514-BCAA-3/4", A-510-BCAA-3/4"	MOV UV653 - See Table 2B for included Vent, Drain, and Test Connections V1027, V892, V801 VA07, and VA05.	121 – 0	*49	2	Y	*19 welds in the ISI Program

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Table 3B – Unit 2, Class 1 Piping Between the First and Second Isolation Valves (N-800)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
3	02-M-SIP-0002 (B10) and (F9)	HPSI Pump 2 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg	Check Valve V532 or 2PSIBV532	B-199-BCAA-3" and 154-BCAA-1"	Check Valve V533 and 1" piping to UV332 and FO711 - See Table 2B for included Vent and Test Connection V907	106 – 0	*22	9	Y	*14 welds in the ISI Program
4	02-M-SIP-0002 (B10) and (E10)	Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg to LPSI Pump 2	MOV UV652 or 2JSIBUV065 2	B-193-BCAA-16", B-515-BCAA ¾", B-511-BCAA-3/4".	MOV UV654 - See Table 2B for included Vent, Drain, and Test Connections V1026, V879, VA08, and VA06.	41 - 0	*40	3	Y	*8 welds in the ISI Program

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Table 3B – Unit 2, Class 1 Piping Between the First and Second Isolation Valves (N-800)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
5	02-M-SIP-0002 (A6), (A7), (A8), (B6), (B7) and (B8)	From HPSI and LPSI Headers to Reactor Coolant Loop 1A Cold Leg and 1" Branch Connection	Check Valve V237 or 2PSIEV237	207-BCAA-14", 203-BCAA-12", and 217-BCAA-1"	Check Valve V542, Check Valve V235, FO708, FC UV638 - See Table 2B for included Vent, Drain, and Test Connections V064, V882, and V974	62 – 0	*30	2	Y	*15 welds in the ISI Program
6	02-M-SIP-0002 (A3), (A4), (A5), (B4) and (B5)	From HPSI and LPSI Headers to Reactor Coolant Loop 1B Cold Leg and 1" Branch Connection	Check Valve V247 or 2PSIEV247	223-BCAA-14", 221-BCAA-12", and 225-BCAA-1"	Check Valve V543, Check Valve V245, FO709, FC UV648 - See Table 2B for included Vent, Drain, and Test Connections V063, V883, and V975	62 – 0	*33	5	Y	*14 welds in the ISI Program

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Table 3B – Unit 2, Class 1 Piping Between the First and Second Isolation Valves (N-800)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
7	02-M-SIP-0002 (A13), (A14), (A15), (B13) and (B14)	From HPSI and LPSI Headers to Reactor Coolant Loop 2A Cold Leg and 1" Branch Connection	Check Valve V217 or 2PSIEV217	160-BCAA-14", 156-BCAA-12", and 171-BCAA-1"	Check Valve V540, Check Valve V215, FO706, FC UV618 - See Table 2B for included Vent, Drain, and Test Connections V880 and V804	62 – 0	*33	6	Y	*19 welds in the ISI Program
8	02-M-SIP-0002 (A10), (A11), (A12), (B11) and (B12)	From HPSI and LPSI Headers to Reactor Coolant Loop 2B Cold Leg and 1" Branch Connection	Check Valve V227 or 2PSIEV227	179-BCAA-14", 175-BCAA-12", and 190-BCAA-1"	Check Valve V541, Check Valve V225, FO707, FC UV628 - See Table 2B for included Vent, Drain, and Test Connections V881 and V803	62 – 0	*28	5	Y	*15 welds in the ISI Program

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Table 3B – Unit 2, Class 1 Piping Between the First and Second Isolation Valves (N-800)

Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
						# of Welds	# Selected for Exam	Insulated Y/N	
<p>NOTES:</p> <p><u>Piping Design</u> (Reference: PVNGS Piping Material Classification Drawing 13-P-ZZG-0012 for vents and drains)</p> <ul style="list-style-type: none">• Piping is seamless Schedule 160 for 2500 psia or greater service and piping material is austenitic stainless steel ASME SA-376 Gr. TP304 or SA-312 Gr. TP304 for sizes 3/4” to 24” NPS.• Fittings are socket welded for 6000 psia service and the material is Stainless Steel ASME SA-182 Gr. F304 3/4” to 2” NPS and for 24” and smaller stainless steel seamless butt-welding (same Schedule as pipe) in for RCS, SI, and CH, ASME SA-403 Gr. WP304.• Flanges are 2500 psia, stainless steel, raised face, welding neck (bored to match pipe) 24” and smaller ASME SA-182 Gr. F316.• Valves are stainless steel to match the piping material and are stainless forged or machined from forgings and the material is ASME SA-182 Gr. F316 for sizes 3/4” to 2” NPS and others 1/2” to 24” may be cast or forged. <p><u>ASME Code Classification</u></p> <p>All piping components are classified as Class 1 under Examination Category B-P, for pressure testing.</p> <p>Lines greater than 1” NPS are also classified under Examination Category B-J per the Code of record, and if they have been required to be selected for <u>volumetric examination</u>, they are listed under the column “# Selected for Exam” only.</p>									

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Table 3C – Unit 3, Class 1 Piping Between the First and Second Isolation Valves (N-800)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
1	03-M-SIP-0002 (C2) and (F2)	HPSI Pump 1 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg	Check Valve V522 or 3PSIAV522	A-248-BCAA-3" and 250-BCAA-1"	Check Valve V523 and 1" piping to UV322 and FO710 - See Table 2C for included Vent, Drain, and Test Connections V906, V055, and V902	106 – 0	*40	6	Y	*26 welds in the ISI Program
2	03-M-SIP-0002 (C3) and (E3)	Shutdown Cooling from Reactor Coolant Loop 1 Hot Leg to LPSI Pump 1	MOV UV651 or 3JSIAUV065 1	A-240-BCAA-16", A-514-BCAA-3/4", A-510-BCAA-3/4"	MOV UV653 - See Table 2C for included Vent, Drain, and Test Connections V1027, V892, V801 VA07, and VA05.	121 - 0	*49	7	Y	*19 welds in the ISI Program

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Table 3C – Unit 3, Class 1 Piping Between the First and Second Isolation Valves (N-800)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
3	03-M-SIP-0002 (B10) and (F9)	HPSI Pump 2 Long Term Recirc. Line to Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg	Check Valve V532 or 3PSIBV532	B-199-BCAA-3" and 154-BCAA-1"	Check Valve V533 and 1" piping to UV332 and FO711 - See Table 2C for included Vent and Test Connection V907	106 – 0	*22	7	Y	*14 welds in the ISI Program
4	03-M-SIP-0002 (B10) and (E10)	Shutdown Cooling from Reactor Coolant Loop 2 Hot Leg to LPSI Pump 2	MOV UV652 or 3JSIBUV065 2	B-193-BCAA-16", B-515-BCAA ¾", B-511-BCAA-3/4".	MOV UV654 - See Table 2B for included Vent, Drain, and Test Connections V1026, V879, VA08, and VA06.	41 - 0	*40	3	Y	*8 welds in the ISI Program

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Table 3C – Unit 3, Class 1 Piping Between the First and Second Isolation Valves (N-800)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
5	03-M-SIP-0002 (A6), (A7), (A8), (B6), (B7) and (B8)	From HPSI and LPSI Headers to Reactor Coolant Loop 1A Cold Leg and 1" Branch Connection	Check Valve V237 or 3PSIEV237	207-BCAA-14", 203-BCAA-12", and 217-BCAA-1"	Check Valve V542, Check Valve V235, FO708, FC UV638 - See Table 2C for included Vent, Drain, and Test Connections V064, V882, and V974	62 – 0	*30	3	Y	*15 welds in the ISI Program
6	03-M-SIP-0002 (A3), (A4), (A5), (B4) and (B5)	From HPSI and LPSI Headers to Reactor Coolant Loop 1B Cold Leg and 1" Branch Connection	Check Valve V247 or 3PSIEV247	223-BCAA-14", 221-BCAA-12", and 225-BCAA-1"	Check Valve V543, Check Valve V245, FO709, FC UV648 - See Table 2C for included Vent, Drain, and Test Connections V063, V883, and V975	62 – 0	*33	4	Y	*14 welds in the ISI Program

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Table 3C – Unit 3, Class 1 Piping Between the First and Second Isolation Valves (N-800)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
7	03-M-SIP-0002 (A13), (A14), (A15), (B13) and (B14)	From HPSI and LPSI Headers to Reactor Coolant Loop 2A Cold Leg and 1" Branch Connection	Check Valve V217 or 3PSIEV217	160-BCAA-14", 156-BCAA-12", and 171-BCAA-1"	Check Valve V540, Check Valve V215, FO706, FC UV618 - See Table 2C for included Vent, Drain, and Test Connections V880 and V804	62 – 0	*34	5	Y	*18 welds in the ISI Program
8	03-M-SIP-0002 (A10), (A11), (A12), (B11) and (B12)	From HPSI and LPSI Headers to Reactor Coolant Loop 2B Cold Leg and 1" Branch Connection	Check Valve V227 or 3PSIEV227	179-BCAA-14", 175-BCAA-12", and 190-BCAA-1"	Check Valve V541, Check Valve V225, FO707, FC UV628 - See Table 2C for included Vent, Drain, and Test Connections V881 and V803	62 – 0	*27	4	Y	*14 welds in the ISI Program

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Table 3C – Unit 3, Class 1 Piping Between the First and Second Isolation Valves (N-800)

	Piping and Instrument Diagram No.	Line Function	1 st Isolation Valve	Affected Line	2 nd Isolation Device	Approx. Length (ft. – in.)	Piping Information			Comments
							# of Welds	# Selected for Exam	Insulated Y/N	
<p>NOTES:</p> <p><u>Piping Design</u> (Reference: PVNGS Piping Material Classification Drawing 13-P-ZZG-0012 for vents and drains)</p> <ul style="list-style-type: none">• Piping is seamless Schedule 160 for 2500 psia or greater service and piping material is austenitic stainless steel ASME SA-376 Gr. TP304 or SA-312 Gr. TP304 for sizes 3/4” to 24” NPS.• Fittings are socket welded for 6000 psia service and the material is Stainless Steel ASME SA-182 Gr. F304 3/4” to 2” NPS and for 24” and smaller stainless steel seamless butt-welding (same Schedule as pipe) in for RCS, SI, and CH, ASME SA-403 Gr. WP304.• Flanges are 2500 psia, stainless steel, raised face, welding neck (bored to match pipe) 24” and smaller ASME SA-182 Gr. F316.• Valves are stainless steel to match the piping material and are stainless forged or machined from forgings and the material is ASME SA-182 Gr. F316 for sizes 3/4” to 2” NPS and others 1/2” to 24” may be cast or forged. <p><u>ASME Code Classification</u></p> <p>All piping components are classified as Class 1 under Examination Category B-P, for pressure testing.</p> <p>Lines greater than 1” NPS are also classified under Examination Category B-J per the Code of record, and if they have been required to be selected for <u>volumetric examination</u>, they are listed under the column “# Selected for Exam” only.</p>										