

SECTION VIII: VALVE COLD SHUTDOWN JUSTIFICATION

VALVE COLD SHUTDOWN JUSTIFICATION 1**Valve Mark No(s):** 2CHS*HCV142**Category:** A **Class:** 2**System:** 7 - Chemical and Volume Control**Function:** This residual heat removal (RHR) system letdown flow control valve must close to provide containment isolation of penetration no. 28.**Test Requirement:** Per OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves," valves with fail-safe actuators shall be tested by observing the operation of the actuator upon loss of valve actuating power in accordance with the exercising frequency specified in Paragraph 4.2.1.1, "Exercising Test Frequency," which states that active Category A valves shall be tested nominally every 3 months.**Basis for CSJ:** This valve is normally closed during plant operation. Its safety position is closed for containment isolation of penetration no. 28. Full-stroke exercising in the closed direction is performed quarterly as required by OM-10, Paragraph 4.2.1.1. Fail-safe testing requires a local observation of the valve actuator following local isolation of its air supply. However, this valve is located inside containment which is not accessible during plant operation. Therefore, fail-safe testing in the closed direction in conjunction with the quarterly stroke test cannot be performed during plant operation. Per OM-10, Paragraphs 4.2.1.6 and 4.2.1.2(c), if the fail-safe exercising frequency is not practicable during plant operation, it may be limited to fail-safe testing during cold shutdowns.**Alternate Test:** Full-stroke exercised and timed closed quarterly per 2OST-47.3B (Containment Penetration and ASME XI Valve Test). Failed closed during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).**References:** OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.6.

VALVE COLD SHUTDOWN JUSTIFICATION 2

Valve Mark No(s): 2CCP*MOV112A
2CCP*MOV112B

Category: B **Class:** 3

System: 15 - Primary Component Cooling Water

Function: These primary component cooling water (CCP) supply to residual heat removal (RHR) heat exchanger isolation valves must open to supply cooling water to the RHR Heat Exchangers and Seal Coolers in order to achieve cold shutdown conditions following an accident.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally closed during power operation. They are full-stroke exercised and timed open during the quarterly CCP Pump Tests (2OST-15.1, 2 or 3), however, the quarterly testing frequency using these OST's is not practicable during cold shutdowns. During cold shutdowns, these valves are opened when placing the RHR System into service. Once the RHR System is in service, the safety position for these valves is to remain open in order to support cooling of the RHR Heat Exchangers and Seal Coolers. Per NUREG-1449, "Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States," at PWR's, the RHR system is essential to maintaining shutdown safety. In order to maintain the "defense in depth" strategy for shutdown safety, these valves cannot be exercised quarterly during cold shutdowns. In addition, if the RHR system is in service as the operable RCS loops per Technical Specification 3/4.4.1.3, these valves cannot be tested without entering the action statement which requires immediate restoration of the RCS loop. Failure of any valve to re-open during testing at that time would cause a loss of one of the required RCS loops. Once the RHR system is not required to be in service as the operable RCS loops, Technical Specifications would permit the exercising of these valves. However, these valves can only be exercised if their associated RHR Pump is not operating. Therefore, while the plant is in Mode 5 or 6, the RHR Pumps would have to be swapped in order to exercise the valves. However, as a result of excessive seal leakage on a RHR Pump during 2R6, the Maintenance Rule (a)(1) Disposition Review recommended that a review of operating practices/procedures be performed to determine a means to reduce the frequency of RHR Pump cycling. Therefore, in order to minimize the number of pump cycles, these valves will not be stroked if either of the RHR Pumps is operating. They will, however, be full-stroke exercised when placing the RHR system into service during station shutdown and when removing the RHR system from service during station startup. They will also be tested when the plant is defueled, if more than 92 days has passed since they were last tested.

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Alternate Test: Full-stroke exercised and timed open quarterly per 2OST-15.1, 2OST-15.2 or 2OST-15.3 (CCP Pump Tests), during power operation. Full-stroke exercised and timed open when placing the RHR system into service during station shutdown to cold shutdown per 2OST-10.3 and 2OST-10.4 (RHR System Valve Exercise Tests). Full-stroke exercised and timed open when removing the RHR system from service during station startup from cold shutdown, if greater than 92 days will pass until the respective quarterly test is scheduled, per 2OST-10.3 and 2OST-10.4 (RHR System Valve Exercise Tests). They will also be full-stroke exercised and timed open when the plant is defueled per 2OST-10.3 and 2OST-10.4 (RHR System Valve Exercise Tests), if more then 92 days has passed since they were last tested.

References: OM-10, Paragraph 4.2.1.1.
NUREG-1449.
Technical Specification 3/4.4.1.3.

VALVE COLD SHUTDOWN JUSTIFICATION 3

Valve Mark No(s): 2RCS*PCV455C
2RCS*PCV455D
2RCS*PCV456

Category: B **Class:** 1

System: 6 - Reactor Coolant

Function: These Pressurizer Power Operated Relief Valves (PORV's) provide overpressure protection for the reactor coolant system (RCS) by limiting system pressure for a large power mismatch.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally closed. Their safety position is open to provide overpressure protection for the reactor coolant system, however, they are also required to fail closed on a loss of control power. The PORV's are not needed for overpressure protection during power operation since the pressurizer code safety valves fulfill this function. In the event that a PORV was to fail or stick open while being cycled at power, the potential loss of RCS inventory through this relief path could lead to a forced plant shutdown. Since these valves have shown a high probability of sticking and failing open, as recognized in NUREG-1482, Section 4.4.1, "Pressurizer Power-Operated Relief Valve Inservice Testing," provisions for exercising quarterly during power operation is not practical. Therefore, exercising would be performed during cold shutdowns. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed open during cold shutdowns per ZOST-6.8 (PORV Operability Test). In addition, fail-safe testing in the closed direction, as required by NUREG-1482, Section 4.4.1, and OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves," is also performed during cold shutdowns each time a valve is returned to its NSA closed position following testing per ZOST-6.8 (PORV Operability Test) as follows: By placing the control switch to the closed position, this de-energizes the solenoid control power which in turn directs RCS pressure to the top of the PORV valve plug which closes the PORV to its fail-safe position.

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.6.
NUREG-1482, Section 4.4.1.

VALVE COLD SHUTDOWN JUSTIFICATION 4

Valve Mark No(s): 2CHS*84
2CHS*136
2CHS*141

Category: C **Class:** 2,3

System: 7 - Chemical and Volume Control

Function: These emergency and alternate emergency boration line check valves must open to provide a flowpath for 4% boric acid solution from the Boric Acid Tanks via the Boric Acid Transfer Pumps to the suction of the Charging Pumps.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed during plant operation. Their safety position is open for emergency and alternate emergency boration. They can be full-stroke exercised in the open direction by initiating the maximum required accident condition flow in accordance with Generic Letter No. 89-04, Position 1. However, testing in this manner at power, either by full or part-stroke exercising, would result in concentrated boric acid solution being injected in the reactor coolant system (RCS). This would cause an undesired negative reactivity addition resulting in a reduction in plant power. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised open during cold shutdowns per 2OST-7.13 (Emergency/Alternate Emergency Boration Flowpath Check Valve Exercise Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(c).
Generic Letter No. 89-04, Position 1.

VALVE COLD SHUTDOWN JUSTIFICATION 5

Valve Mark No(s): 2RHS*3
2RHS*4

Category: C **Class:** 2

System: 10 - Residual Heat Removal

Function: These Residual Heat Removal (RHR) Pump discharge check valves must open to support RHR system operation and must close to prevent reverse flow through the standby RHR Pump.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed during plant operation. Their safety position is open to support RHR system operation and closed to prevent reverse flow through the standby RHR Pump. They can be full-stroke exercised in the open direction by initiating the maximum required accident condition flow in accordance with Generic Letter No. 89-04, Position 1, when the RHR Pumps are in operation. However, during plant operation, the RHR system is isolated from the reactor coolant system (RCS) and the RHR Pumps are not required for operation. The RHR Pumps are only operated during cold shutdowns and refueling outages. Therefore, full or part-stroke exercising in the open direction with flow can only be performed during cold shutdowns and refueling outages. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." Full-stroke exercising in the closed direction requires closing of the discharge MOV of the idle standby RHR Pump and verifying non-rotation of the idle standby RHR pump by local observation while the other RHR Pump is operating. Because these check valves are located inside containment, they are not accessible to verify closure testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

VALVE COLD SHUTDOWN JUSTIFICATION 5

- Basis for CSJ:** Per NUREG-1449, "Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States," at PWR's, the RHR system is essential to maintaining shutdown safety. In order to maintain the "defense in depth" strategy for shutdown safety, these check valves cannot be exercised closed quarterly during cold shutdowns. In addition, if the RHR system is in service as the operable RCS loops per Technical Specification 3/4.4.1.3, these check valves cannot be tested closed (because the pump discharge MOV must also be closed) without entering the action statement which requires immediate restoration of the RCS loop. Failure of the pump discharge MOV to re-open would cause a loss of one of the required RCS loops. Once the RHR system is not required to be in service as the operable RCS loops, Technical Specifications would permit the exercising of these valves. However, these valves can only be exercised if their associated RHR pump is not operating. Therefore, while the plant is in Mode 5 or 6, the RHR Pumps would have to be swapped in order to exercise all of the valves. However, as a result of excessive seal leakage on a RHR Pump during 2R6, the Maintenance Rule (a)(1) Disposition Review recommended that a review of operating practices/procedures be performed to determine a means to reduce the frequency of RHR Pump cycling. Therefore, in order to minimize the number of pump cycles, these valves will not be stroked if either of the RHR Pumps is operating. They will, however, be full-stroke exercised closed when placing the RHR system into service during station shutdown, when removing the RHR system from service during station startup or when the plant is defueled, not more often than once per 92 days.
- Alternate Test:** Full-stroke exercised open during cold shutdowns per 2OST-10.1 and 2OST-10.2 (RHR Pump Performance Tests). Full-stroke exercised closed when placing the RHR system into service during station shutdown to cold shutdown, when removing the RHR system from service during station startup from cold shutdown or when the plant is defueled, not more often than once per 92 days, per 2OST-10.3 and 2OST-10.4 (RHR System Valve Exercise Tests).
- References:** OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(c).
Generic Letter No. 89-04, Position 1.
NUREG-1449
Technical Specification 3/4.4.1.3.

VALVE COLD SHUTDOWN JUSTIFICATION 6

Valve Mark No(s): 2RHS*FCV605A
2RHS*FCV605B

Category: B **Class:** 2

System: 10 - Residual Heat Removal

Function: These Residual Heat Removal (RHR) Heat Exchanger bypass flow control valves are normally throttled to control the amount of RHR flow bypassed around the RHR Heat Exchangers thus limiting reactor coolant system (RCS) cooldown. They must close as cooldown continues to ensure all RHR flow is through the RHR Heat Exchangers.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: During plant operation, the RHR system is isolated from the RCS and is not in service. When the RHR system is in service, these flow control valves are normally in a throttled position to control the amount of RHR flow bypassed around the RHR Heat Exchangers. Their safety position is closed and they are required to fail closed on a loss of power. Local observation is required to full-stroke exercise and to fail these valves in the closed position. Because these valves are located inside containment, they are not accessible for testing during plant operation. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." Per NUREG-1449, "Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States," at PWR's, the RHR system is essential to maintaining shutdown safety. In order to maintain the "defense in depth" strategy for shutdown safety, these valves cannot be exercised quarterly during cold shutdowns. In addition, if the RHR system is in service as the operable RCS loops per Technical Specification 3/4.4.1.3, these valves cannot be tested without entering the action statement which requires immediate restoration of the RCS loop. Failure of any valve to re-close during testing at that time could cause a loss of one of the required RCS loops. Once the RHR system is not required to be in service as the operable RCS loops, Technical Specifications would permit the exercising of these valves. However, these valves can only be exercised if their associated RHR Pump is not operating. Therefore, while the plant is in Mode 5 or 6, the RHR Pumps would have to be swapped in order to exercise the valves.

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Basis for CSJ: — However, as a result of excessive seal leakage on a RHR Pump during 2R6, the Maintenance Rule (a)(1) Disposition Review recommended that a review of operating practices/procedures be performed to determine a means to reduce the frequency of RHR Pump cycling. Therefore, in order to minimize the number of pump cycles, these valves will not be stroked if either of the RHR Pumps is operating. They will, however, be full-stroke exercised when placing the RHR system into service during station shutdown, when removing the RHR system from service during station startup or when the plant is defueled, not more often than once per 92 days.

Alternate Test: Full-stroke exercised and timed closed when placing the RHR system into service during station shutdown to cold shutdown, when removing the RHR system from service during station startup from cold shutdown or when the plant is defueled, not more often than once per 92 days, per 2OST-10.3 and 2OST-10.4 (RHR System Valve Exercise Tests). In addition, these valves will also be failed closed per 2OST-10.3 and 2OST-10.4 as required by OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves."

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.6.
NUREG-1449.
Technical Specification 3/4.4.1.3.

VALVE COLD SHUTDOWN JUSTIFICATION 7

Valve Mark No(s): 2RHS*MOV701A
2RHS*MOV701B
2RHS*MOV702A
2RHS*MOV702B
2RHS*MOV720A
2RHS*MOV720B

Category: A **Class:** 1

System: 10 - Residual Heat Removal

Function: These reactor coolant system (RCS) to residual heat removal (RHR) system isolation valves must open to support RHR system operation in attaining cold shutdown conditions. They must close to protect the lower pressure RHR system from overpressurization if RCS pressure rises above 700 psig while the RHR system is in service.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category A valves shall be tested nominally every 3 months.

Basis for CSJ: During plant operation, these valves are closed and must be leak tight to isolate the lower pressure RHR system from the higher pressure RCS. Their safety positions are open to support RHR system operation during shutdown to cold shutdown conditions, and closed to protect the RHR system from overpressurization. Full-stroke exercising during plant operation cannot be performed because they are interlocked closed to prevent overpressurization of the RHR system piping from the higher pressure RCS. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." Per NUREG-1449, "Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States," at PWR's, the RHR system is essential to maintaining shutdown safety. In order to maintain the "defense in depth" strategy for shutdown safety, these valves cannot be exercised quarterly during cold shutdowns. In addition, if the RHR system is in service as the operable RCS loops per Technical Specification 3/4.4.1.3, these valves cannot be tested without entering the action statement which requires immediate restoration of the RCS loop.

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- Basis for CSJ:** Failure of any valve to re-open during testing at that time would cause a loss of one of the required RCS loops. Once the RHR system is not required to be in service as the operable RCS loops, Technical Specifications would permit the exercising of these valves. However, these valves can only be exercised if their associated RHR Pump is not operating. Therefore, while the plant is in Mode 5 or 6, the RHR Pumps would have to be swapped in order to exercise all of the valves. However, as a result of excessive seal leakage on a RHR Pump during 2R6, the Maintenance Rule (a)(1) Disposition Review recommended that a review of operating practices/procedures be performed to determine a means to reduce the frequency of RHR Pump cycling. Therefore, in order to minimize the number of pump cycles, these valves will not be stroked if either of the RHR Pumps is operating. They will, however, be full-stroke exercised when placing the RHR system into service during station shutdown, when removing the RHR system from service during station startup or when the plant is defueled, not more often than once per 92 days.
- Alternate Test:** Full-stroke exercised and timed open and closed when placing the RHR system into service during station shutdown to cold shutdown, when removing the RHR system from service during station startup from cold shutdown or when the plant is defueled, not more often than once per 92 days, per 2OST-10.3 and 2OST-10.4 (RHR System Valve Exercise Tests).
- References:** OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(c).
NUREG-1449.
Technical Specification 3/4.4.1.3

VALVE COLD SHUTDOWN JUSTIFICATION 8

Valve Mark No(s): 2RHS*HCV758A
2RHS*HCV758B

Category: B **Class:** 2

System: 10 - Residual Heat Removal

Function: These Residual Heat Removal (RHR) Heat Exchanger flow control valves are normally throttled to control the amount of RHR flow through the RHR Heat Exchangers thus limiting reactor coolant system (RCS) cooldown. They must open as cooldown continues to ensure all RHR flow is through the RHR Heat Exchangers.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: During plant operation, the RHR system is isolated from the RCS and is not in service. When the RHR system is in service, these flow control valves are normally in a throttled position to control the amount of RHR flow through the RHR Heat Exchangers. Their safety position is open and they are required to fail open on a loss of power. Local observation is required to full-stroke exercise and to fail these valves in the open position. Because these valves are located inside containment, they are not accessible for testing during plant operation. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." Per NUREG-1449, "Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States," at PWR's, the RHR system is essential to maintaining shutdown safety. In order to maintain the "defense in depth" strategy for shutdown safety, these valves cannot be exercised quarterly during cold shutdowns. In addition, if the RHR system is in service as the operable RCS loops per Technical Specification 3/4.4.1.3, these valves cannot be tested without entering the action statement which requires immediate restoration of the RCS loop. Failure of any valve to re-open during testing at that time could cause a loss of one of the required RCS loops. Once the RHR system is not required to be in service as the operable RCS loops, Technical Specifications would permit the exercising of these valves. However, these valves can only be exercised if their associated RHR Pump is not operating. Therefore, while the plant is in Mode 5 or 6, the RHR Pumps would have to be swapped in order to exercise the valves.

However, as a result of excessive seal leakage on a RHR Pump during 2R6, the Maintenance Rule (a)(1) Disposition Review recommended that a review of operating practices/procedures be performed to determine a means to reduce the frequency of RHR Pump cycling. Therefore, in order to minimize the number of pump cycles, these valves will not be stroked if either of the RHR Pumps is operating. They will, however, be full-stroke exercised when placing the RHR system into service during station shutdown, when removing the RHR system from service during station startup or when the plant is defueled, not more often than once per 92 days.

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Alternate Test: Full-stroke exercised and timed open when placing the RHR system into service during station shutdown to cold shutdown, when removing the RHR system from service during station startup from cold shutdown or when the plant is defueled, not more often than once per 92 days, per 2OST-10.3 and 2OST-10.4 (RHR System Valve Exercise Tests). In addition, these valves will also be failed open per 2OST-10.3 and 2OST-10.4 as required by OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves."

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.6.
NUREG-1449
Technical Specification 3/4.4.1.3.

VALVE COLD SHUTDOWN JUSTIFICATION 9

Valve Mark No(s): 2SIS*MOV865A.
2SIS*MOV865B
2SIS*MOV865C

Category: B **Class:** 2

System: 11 - Safety Injection

Function: These Safety Injection (SI) Accumulator discharge isolation valves must remain open to allow the SI Accumulators to discharge to the reactor coolant system (RCS) in the event of a loss of coolant accident (LOCA). They must close during a small break LOCA to prevent nitrogen from being injected into the RCS.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: During plant operation, these valves are de-energized (shorting bars are removed) in the open position which is their passive safety position. Their safety position is also closed during a small break LOCA to prevent nitrogen from being injected into the RCS. Full-stroke exercising in the open direction is not required per OM-10, Table 1, "Inservice Test Requirements," since the valves are passive in this direction. Full-stroke exercising in the closed direction cannot be performed during plant operation because these valves are required to be open with their shorting bars removed per Technical Specification 4.5.1.c. In addition, failure of any valve to re-open after closure would place the plant in a 1 hour action per Technical Specification 3.5.1 which would require the plant to shutdown. In NUREG-1482, Section 3.1.1, "Deferring Valve Testing to Each Cold Shutdown or Refueling Outage," Example (1) lists the SI Accumulator discharge valves in PWR's as one specific example of valves whose failure in a non-conservative position during the cycling test would cause a loss of system function. Therefore, these valves will not be stroked and timed during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed closed when the SI Accumulators are isolated from the RCS on the way to cold shutdowns per 2OM-51.4.C (Station Shutdown-Cooldown from Mode 3 to Mode 4), and recorded in 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(c), and Table 1.
NUREG-1482, Section 3.1.1.

VALVE COLD SHUTDOWN JUSTIFICATION 10

Valve Mark No(s): 2SIS*HCV868A
2SIS*HCV868B

Category: B **Class:** 2

System: 11 - Safety Injection

Function: These high head safety Injection (HHSI) discharge to cold leg injection hand control valves must open and close to provide a throttled emergency boration flowpath when normal charging is lost.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally closed. Their safety position is throttled to provide an emergency boration flowpath to the cold legs in the event that the normal charging path is lost. Full or part-stroke exercising in the open and closed directions cannot be performed during plant operation because flow is required to properly close these valves. Operation of the HHSI pumps to provide the flow necessary to stroke these valves closed cannot be performed during plant operation because this will inject relatively cold water into the RCS cold legs and cause thermal shock to system piping and components which will result in an increased probability of system and component failures. OM-10, Paragraph 4.2.1.2 (c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed open and closed, and failed closed in accordance with OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves," during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(e)
NUREG-1482, Section 3.1.1.

VALVE COLD SHUTDOWN JUSTIFICATION 11

(DELETED)

VALVE COLD SHUTDOWN JUSTIFICATION 12

Valve Mark No(s): 2QSS*SOV100A
2QSS*SOV100B

Category: A **Class:** 2

System: 13 - Containment Depressurization (Quench Spray)

Function: These quench spray chemical injection to containment sump outside containment isolation valves must close to provide containment isolation of penetration no. 118. They must open following a CIB and low-low Refueling Water Storage Tank (RWST) level to admit a 23% to 25% sodium hydroxide (NaOH) solution to the containment sump for removal of radioactive iodine from the containment atmosphere during Recirculation Spray Pump operation.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category A valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally closed. Their safety positions are closed for containment isolation of penetration no. 118, and open for injection of NaOH solution to the containment sump following a CIB and low-low level in the RWST. Full or part-stroke exercising in the open and closed directions cannot be performed during plant operation because failure of either valve in the open position would cause NaOH injection flow to be fully or partially diverted away from the suction of the Quench Spray Pumps to the containment sump following a CIB, thus rendering chemical injection inoperable. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed open and closed during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 13

Valve Mark No(s): 2QSS*303
2QSS*304

Category: C **Class:** 2

System: 13 - Containment Depressurization (Quench Spray)

Function: These check valves are located in the quench spray Chemical Injection Pump discharge header to the suction of the Quench Spray Pumps. They must open following a CIB to admit a 23% to 25% sodium hydroxide (NaOH) solution to the suction of the Quench Spray Pumps for removal of radioactive iodine from the containment atmosphere during Quench Spray Pump operation. They must close to prevent diversion of Refueling Water Storage Tank (RWST) water from the quench spray system into the chemical injection system during the recirculation phase of operation or during low Quench Spray Pump discharge flow conditions.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed during plant operation. Their safety positions are open following a CIB signal, and closed during the recirculation phase of operation. They can be full-stroke exercised quarterly in the open direction by initiating the maximum required accident condition flow in accordance with Generic Letter No. 89-04, Position 1. However, full-stroke exercising in the closed direction can only be verified by leak testing or by opening [2QSS*SOV100A or B] and observing operation of [2QSS*SOV101A or B] or [2QSS*SOV102A or B] as follows. Verifying check valve closure by leak testing requires opening an upstream vent and collecting a timed leak rate sample, however, this requires draining the entire discharge header first. If leak rate testing was performed quarterly or at cold shutdown, the amount of radioactive water (borated RWST water is used for testing) drained from the discharge header would create additional liquid waste for disposal which is not practical. An alternate method (as discussed above) would require opening [2QSS*SOV100A or B] which can only be opened during cold shutdowns as discussed in VCSJ No. 12. Backleakage through the check valves would open Target Rock SOV's [2QSS*SOV101A or B] or [2QSS*SOV102A or B] due to a differential pressure created by the RWST head to the containment sump when [2QSS*SOV100A or B] is opened.

Therefore, full-stroke exercising in the closed direction is not practical during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

VALVE COLD SHUTDOWN JUSTIFICATION 13

Alternate Test: — Full-stroke exercised open quarterly per 2OST-13.10A and 2OST-13.10B (Chemical Injection System Valve Position and Pump Operability Tests).
Full-stroke exercised closed during cold shutdowns using the alternate method described above per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(c).
Generic Letter No. 89-04, Position 1.

VALVE COLD SHUTDOWN JUSTIFICATION 14

Valve Mark No(s): 2RSS*29
2RSS*30
2RSS*31
2RSS*32

Category: C **Class:** 2

System: 13 - Containment Depressurization (Recirculation Spray)

Function: These Recirculation Spray Pump discharge header to containment spray ring inside containment isolation check valves are required to close to prevent reverse flow to the opposite train of recirc spray through the spray rings. They are required to open to provide a flowpath from the containment sump via the Recirculation Spray Pumps to the spray rings located in the top of the containment dome in order to depress and maintain the containment pressure subatmospheric following a loss of coolant accident (LOCA).

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed. Their safety positions are open during RSS Pump operation following a LOCA, and closed to prevent reverse flow to the opposite train of recirc spray through the spray rings should a Recirculation Spray Pump not be running. Because the recirculation spray system (RSS) is maintained dry and the RSS Pumps can only be tested during refueling outages, these check valves cannot be exercised with flow during plant operation or during cold shutdown. Therefore, full or part-stroke exercising in the open and closed directions can only be verified by cycling the mechanical weight loaded swing arms of each check valve. Because these check valves are located inside containment, they are not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm, and closed by observation of its mechanical weight loaded swing arm during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 15

Valve Mark No(s): 2CCP*27A
2CCP*27B
2CCP*354
2CCP*355

Category: B **Class:** 3

System: 15 - Primary Component Cooling Water

Function: These Primary Component Cooling Water (CCP) Pump discharge header cross-connect manual isolation valves must close to separate and isolate redundant CCP Pump and CCP Heat Exchanger flowpaths following a passive failure.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These manual valves are normally open during plant operation to allow cross-connection of any two of three CCP Pumps supplying any two of three CCP Heat Exchangers through a Train A or Train B flowpath. Their safety position is closed for train separation. With one of the CCP Heat Exchangers out of service for cleaning, full or part-stroke exercising in the closed direction cannot be performed during plant operation because this would interrupt flow of cooling water to Train A or Train B cooling loads resulting in a thermal transient and potential plant trip. In addition, the idle CCP Heat Exchanger is normally held in reserve following cleaning to improve plant reliability until one of the inservice heat exchangers becomes fouled. Exercising these valves in conjunction with the quarterly pump tests with the "C" CCP Heat Exchanger in service would require placing the clean heat exchanger into service prematurely in order to prevent isolation of the Train A or Train B cooling loads. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised closed during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 17

Valve Mark No(s): 2MSS*AOV101A
2MSS*AOV101B
2MSS*AOV101C

Category: B **Class:** 2

System: 21 - Main Steam

Function: These Main Steamline Isolation Valves (MSIV's) must close to prevent blowdown of the Steam Generators in the case of a high energy line break (HELB) accident, and to provide outside containment isolation of penetration no's. 73, 74 and 75.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally open during plant operation. Their safety position is closed for HELB isolation, and to provide outside containment isolation of penetration no's. 73, 74 and 75. They are also required to fail closed on a loss of control power. Full-stroke exercising in the closed direction cannot be performed during plant operation because this would cause a reactor trip with the possibility of a safety injection. Although NUREG-1482, Section 4.2.4, "Main Steam Isolation Valves," notes that several plants do not perform a partial stroke exercise of their MSIV's during power operations because this increases the risk of full valve closure when the unit is operating, BVPS-2 Technical Specification 4.7.1.5.a requires a partial stroke exercise of the MSIV's every 92 days when the valves are open. OM-10, Paragraph 4.2.1.2(b) states, "If full-stroke exercising during plant operation is not practicable, it may be limited to part-stroke exercising during plant operation and full-stroke exercising during cold shutdowns."

Alternate Test: Part-stroke exercised closed quarterly per 2OST-21.1, 2OST-21.2 and 2OST-21.3 (MSIV Partial Closure Tests). Full-stroke exercised and timed closed when going to or following cold shutdowns with TAVG \geq 515F per 2OST-21.7 (MSIV Full Closure Test). In addition, fail-safe testing in the closed direction, as discussed in NUREG-1482, Section 4.2.4 and in accordance with OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves," is also performed during cold shutdowns each time a valve is full-stroke exercised to the closed position during testing per 2OST-21.7 (MSIV Full Closure Test). By depressing both main steam line isolation actuation pushbuttons, this de-energizes the solenoid control power to the MSIV's which in turn isolates instrument air and also vents air off of the valve actuator thus positioning the MSIV's to their fail-safe position.

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(b) and 4.2.1.6.
NUREG-1482, Section 4.2.4.
BVPS-2 Technical Specification 4.7.1.5.a,b.

VALVE COLD SHUTDOWN JUSTIFICATION 18

(DELETED)

VALVE COLD SHUTDOWN JUSTIFICATION 19

(DELETED)

VALVE COLD SHUTDOWN JUSTIFICATION 20

(DELETED)

VALVE COLD SHUTDOWN JUSTIFICATION 21

Valve Mark No(s): 2FWS*HYV157A
2FWS*HYV157B
2FWS*HYV157C

Category: B **Class:** 2

System: 24 - Main Feedwater

Function: The Steam Generator main feedwater isolation valves must close in the event of a high energy line break (HELB) or safety injection system actuation to prevent overfeeding the Steam Generators, and to provide outside containment isolation of penetration no's. 76, 77 and 78.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally open during plant operation providing feedwater flow to the Steam Generators. Their safety position is closed for Train "A" feedwater isolation to the Steam Generators, and to provide outside containment isolation of penetration no's. 76, 77 and 78. Full or part-stroke exercising in the closed direction cannot be performed during plant operation because this would isolate or reduce feedwater flow to the Steam Generators resulting in a plant shutdown. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 22

Valve Mark No(s): 2FWS*FCV478
2FWS*FCV488
2FWS*FCV498

Category: B **Class:** 2

System: 24 - Main Feedwater

Function: These Steam Generator main feedwater regulating valves must close in the event of a high energy line break (HELB) or safety injection system actuation to prevent overfeeding the Steam Generators.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally open during operation providing feedwater flow to the Steam Generators. Their safety position is closed for Train "B" feedwater isolation to the Steam Generators and they are also required to fail closed on a loss of control power. Full or part-stroke exercising in the closed direction cannot be performed during plant operation because this would isolate or reduce feedwater flow to the Steam Generators resulting in a plant shutdown. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised, timed and failed closed in accordance with OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves," during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.6.

VALVE COLD SHUTDOWN JUSTIFICATION 24

Valve Mark No(s): 2FWE*99
2FWE*100
2FWE*101

Category: C **Class:** 2

System: 24 - Auxiliary Feedwater

Function: These auxiliary feedwater (AFW) system to Steam Generator inside containment isolation check valves must close to provide containment isolation of penetration no's. 79, 80 and 83. They must open to provide an auxiliary feedwater system flowpath to the Steam Generators during an accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed during plant operation. Their safety positions are closed for containment isolation of penetration no's. 79, 80 and 83, and open for AFW system injection to the Steam Generators. Full-stroke exercising in the open direction cannot be performed during plant operation because the test method requires the maximum required accident condition flow to the Steam Generators, in accordance with Generic Letter No. 89-04, Position 1. However, this and part-stroke exercising cannot be performed during plant operation because this would require injecting relatively cold auxiliary feedwater into the Steam Generators which will cause a thermal shock to the auxiliary feedwater and main feedwater piping interface and result in an increased probability of system and component failure. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised open during cold shutdowns per 2OST-24.6 (AFW System Check Valve Exercise and Flow Verification Test). Full-stroke exercising in the closed direction is discussed in VROJ No. 43.

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(c).
Generic Letter No. 89-04, Position 1.

VALVE COLD SHUTDOWN JUSTIFICATION 25

Valve Mark No(s): 2FWE*FCV122
2FWE*FCV123A
2FWE*FCV123B

Category: B/C **Class:** 3

System: 24 - Auxiliary Feedwater

Function: These Auxiliary Feedwater (AFW) Pump discharge flow control/check valves have a dual function. As a manual automatic flow control valve, they must open to provide approximately 30% recirculation flow for each AFW Pump to prevent pump damage in the event of isolation of an AFW discharge line to the Steam Generators. They must close in order to isolate this same recirculation flowpath when full AFW Pump flow is being directed to the Steam Generators during an accident. As a check valve, they must open to provide a flowpath from the AFW Pumps to the Steam Generators. They must close to prevent reverse flow and feedwater intra-system recirculation through an idle AFW Pump.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months. Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These valves are normally closed as check valves and normally open as manual automatic flow control valves during plant operation. As a manual automatic flow control valve, their safety positions are open for AFW Pump recirculation and closed for isolation of this recirculation flowpath. As a check valve, their safety positions are open for AFW system injection to the Steam Generators and closed to prevent reverse flow through an idle AFW Pump. Full-stroke exercising in the open and closed directions cannot be performed during plant operation because the test method requires the maximum required accident condition flow to the Steam Generators, in accordance with Generic Letter No. 89-04, Position 1, in order to verify both forward and reverse stroke exercising of the check valve function and closure exercising of the flow control valve function. However, this and part-stroke exercising cannot be performed during plant operation because this would require injecting relatively cold auxiliary feedwater into the Steam Generators which will cause a thermal shock to the auxiliary feedwater and main feedwater piping interface and result in an increased probability of system and component failure. OM-10, Paragraphs 4.2.1.2(c) and 4.3.2.2(c) state, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

VALVE COLD SHUTDOWN JUSTIFICATION 25**Alternate Test:**

The flow control valve function of these valves in the open direction will be full-stroke exercised open quarterly per 2OST-24.2, 2OST-24.3 and 2OST-24.4 (AFW Pump Tests on Recirculation Flow). The flow control valve function of these valves in the closed direction and the check valve function of these valves in the open and closed directions will be full-stroke exercised during cold shutdowns per 2OST-24.4A and 2OST-24.6 (AFW System Check Valve Exercise and Full Flow Verification Tests).

References:

OM-10, Paragraphs 4.2.1.1, 4.3.2.1, 4.2.1.2(c) and 4.3.2.2(c).
Generic Letter No. 89-04, Position 1.

VALVE COLD SHUTDOWN JUSTIFICATION 26

Valve Mark No(s): 2SWS*57
2SWS*58
2SWS*59

Category: C **Class:** 3

System: 30 - Service Water

Function: These Service Water (SWS) Pump discharge check valves must open to allow cooling water from the river to flow to station loads required during an accident. They must close to prevent reverse flow through an idle SWS Pump.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally open during plant operation. Their safety positions are open to provide SWS cooling to station loads required during an accident, and closed to prevent reverse flow through an idle SWS Pump. Two SWS Pumps are required to be operable during plant operation. In order to full-stroke exercise these check valves in the closed direction, use of the idle SWS pump is required. Quarterly full-stroke exercising in the closed direction may not be possible if one SWS Pump is out of service for maintenance. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised closed quarterly, or when the idle SWS Pump is returned to service, or at least during cold shutdowns per 2OST-30.6A or 6B (Train A or B SWS Pump Tests). Full-stroke exercising in the open direction is discussed in VROJ No. 44.

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 27

Valve Mark No(s): 2SWS*MOV102A
2SWS*MOV102B
2SWS*MOV102C1
2SWS*MOV102C2

Category: B **Class:** 3

System: 30 - Service Water

Function: These Service Water (SWS) Pump discharge valves must open to provide cooling water from the river to station loads required during an accident.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category B valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally open during plant operation. Their safety position is open to provide SWS cooling to station loads required during an accident. Two SWS Pumps are required to be operable during plant operation. In order to full-stroke exercise these valves in the open direction, one operating pump at a time must be secured while the idle SWS pump is started. Quarterly full-stroke exercising in the open direction may not be possible if one SWS Pump is out of service for maintenance. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed open quarterly, or when idle SWS Pump is returned to service, or at least during cold shutdowns per 2OST-30.6A or 6B (Train A or B SWS Pump Tests).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 28

Valve Mark No(s): 2SWS*MOV107A
2SWS*MOV107B
2SWS*MOV107C
2SWS*MOV107D

Category: B **Class:** 3

System: 30 - Service Water

Function: These service water (SWS) supply to Secondary Component Cooling Water (CCS) Heat Exchanger isolation valves must close on a CIA signal to isolate the non-safety related portions of the SWS system so that SWS cooling is available for safety related loads during an accident.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active valves shall be tested nominally every 3 months.

Basis for CSJ: These valves are normally open during plant operation. Their safety position is closed to isolate the non-safety related portion of the SWS system. Full-stroke exercising in the closed direction cannot be performed during plant operation because closing these valves would isolate the SWS supply to the inservice turbine plant cooling loads including the CCS and chiller unit heat exchangers. This would interrupt flow of cooling water to Train A or B cooling loads resulting in undesirable thermal transients, operational concerns of stability problems and a potential plant trip. Changes in oil temperature from the turbine generator lube oil system create vibration problems. Changes in the hydrogen gas cooler temperature could imply problems or mask real problems with the generator. Chiller unit heat exchanger flow disturbances often result in a trip of the chiller unit causing containment temperature risks of exceeding the Technical Specification limit. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 29

Valve Mark No(s): 2SWS*486
2SWS*487
2SWS*488

Category: C **Class:** 3

System: 30 - Service Water

Function: These Service Water (SWS) Pump vacuum break check valves must open to prevent a vacuum from occurring which could damage the SWS Pump seals and piping when the pumps are shut down or trip. They must close during SWS Pump operation to prevent loss of SWS cooling to station loads required during an accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed during plant operation. Their safety positions are open to protect the SWS Pump seals and piping during pump shutdown or trip, and closed to ensure adequate SWS cooling to station loads required during an accident. Two SWS Pumps are required to be operable during plant operation. In order to full-stroke exercise these check valves in the open direction, use of the idle SWS is required. Quarterly full-stroke exercising in the open direction may not be possible if one SWS Pump is out of service for maintenance. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised closed quarterly per 2OST-30.2, 2OST-30.3 and 2OST-30.6A or 6B (SWS Pump Tests). Full-stroke exercised open quarterly, or when the idle SWS Pump is returned to service, or at least during cold shutdowns per 2OST-30.6A or 6B (Train A or B SWS Pump Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 30

Valve Mark No(s): 2FPW*382
2FPW*388
2FPW*753

Category: A/C **Class:** 2

System: 33 - Fire Protection

Function: These fire protection headers inside containment isolation check valves must close to provide containment isolation of penetration no's. 101, 116 and 117.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency", check valves shall be exercised nominally every 3 months.

Basis for CSJ: These check valves are normally closed and would only be opened in the event of a fire in containment. Their safety position is closed for containment isolation of penetration no's. 101, 116 and 117. Full or part-stroke exercising in the closed direction can only be verified by cycling the mechanical weight loaded swing arms of each check valve open and then closed or by leak testing. Because these check valves are located inside containment, they are not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised closed by observation of its mechanical weight loaded swing arm during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test), and during refueling outages per 2BVT 1.47.3 (Check Valve Lift Test).

References: OM-10, Paragraphs 4.3.2.1, and 4.3.2.2(c).

VALVE COLD SHUTDOWN JUSTIFICATION 31

Valve Mark No(s): 2HVR*MOD23A
2HVR*MOD23B
2HVR*MOD25A
2HVR*MOD25B

Category: A **Class:** 2

System: 44C - Containment Area Ventilation

Function: These containment purge and exhaust inside and outside containment isolation dampers must close to provide containment isolation of penetration no's. 90 and 91. They must also close if radiation levels in containment rise to the high setpoint during refueling operations.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency", active Category A valves shall be tested nominally every 3 months.

Basis for CSJ: These motor operated dampers (MOD's) are normally locked shut during plant operation and opened during refueling operations. Their safety position is closed for containment isolation of penetration no's. 90 and 91. Full or part-stroke exercising in the closed direction cannot be performed during plant operation because the Containment Penetration Table requires the MOD's to be locked shut during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns."

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test) and during refueling outages per 2OM-44C.1 (Containment Purge and Ventilation/Radiation Monitor Test), and recorded in 2OST-1.10.

References: OM-10, Paragraphs 4.2.1.1, and 4.2.1.2(c).

SECTION VIII: VALVE REFUELING OUTAGE JUSTIFICATIONS

VALVE REFUELING OUTAGE JUSTIFICATION 1

Valve Mark No(s):	2RCS*SOV200A	2RCS*SOV200B
	2RCS*SOV201A	2RCS*SOV201B
	2RCS*HCV250A	2RCS*HCV250B

Category: B **Class:** 1, 2

System: 6 - Reactor Coolant

Function: These reactor vessel head vent valves must open to vent non-condensable gasses and provide reactor coolant system (RCS) letdown capability from the reactor vessel head to the Pressurizer Relief Tank (PRT). They must close to minimize RCS pressure boundary leakage.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally closed during plant operation. Their safety positions are closed to minimize RCS pressure boundary leakage, and open to vent the RCS in an emergency to assure that core cooling during natural circulation will not be inhibited by buildup of non-condensable gases. [2RCS*HCV250A and B] are also required to fail closed on a loss of control power. Periodic full or part-stroke exercising in the open and closed directions during normal plant operation could degrade the system by repeatedly challenging the downstream valves due to a phenomenon known as "burping". This phenomenon has been previously described in ASME Report, "Spurious Opening of Hydraulic-Assisted, Pilot-Operated Valves - An Investigation of the Phenomenon." The phenomenon involves a rapid pressure surge buildup at the valve inlet caused by opening the upstream valve in a series double isolation arrangement or by closing a valve in a parallel redundant flowpath isolation arrangement. The pressure surge is sufficient enough to lift the valve plug until a corresponding pressure increase in a control chamber above the pilot and disc can create enough downward differential pressure to close the valve. In addition, per EM 103665 (dated August 4, 1992), Westinghouse does not recommend stroking the HCV's while isolated from the RCS by the SOV's during normal plant conditions (SOV's are required to remain closed to minimize RCS pressure boundary leakage) unless the trapped pressure between the HCV's and SOV's is first relieved by very slowly opening the HCV's. However, this goes against INPO's good practice of not pre-exercising power operated valves prior to stroking and timing them. In addition, if the SOV's are leaking sufficiently, there is the potential for exceeding the design pressure limit of the PRT because there is no pressure indication in this piping. Although these valves have been cycled in the past (in December 1996) under special conditions (determined acceptable by DLCO Calculation No. 10080-DLC(P)-900-XD, Rev. 0) so as to enable troubleshooting while the plant was at approximately 400F and 1200 psig, Westinghouse does not recommend "operating" the system to vent the reactor vessel during startup from a refueling outage at pressures exceeding 415 psig (Reference: Letter DLW-89-667, dated June 14, 1989). In addition, per letters PSE-SSA-4743 (dated February 5, 1985) and PT-SSAD-6813 (dated March 30, 1987), Westinghouse does not recommend that the reactor vessel

VALVE REFUELING OUTAGE JUSTIFICATION 1

Basis for ROJ: head vent system valves be "tested" at full operating temperature and pressure (620F and 2250 psia), but rather at low temperature and pressure (200F and 300 psia). Based on the above, full or part-stroke exercising in the open and closed directions cannot be performed during normal plant operation. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, the system conditions recommended for "testing" these valves may not always be obtainable during each cold shutdown. Stroke testing, if attempted at cold shutdown, could extend the length of a plant shutdown due to extensive preparatory work in establishing the proper RCS conditions. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed open and closed during refueling outages per 2OST-6.9 (Reactor Vessel Head Vent System Test). In addition, fail-safe testing in the closed direction for [2RCS*HCV250A and B], as required by OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves," is also performed during refueling outages per 2OST-6.9 (Reactor Vessel Head Vent System Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c), 4.2.1.2(e) and 4.2.1.6.
EM 103665.
DLCO Calculation No. 10080-DLC(P)-900-XD, Rev. 0.
Westinghouse Letters DLW-89-667, PSE-SSA-4743 and PT-SSAD-6813.
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 2

Valve Mark No(s): 2CHS*22
2CHS*23
2CHS*24

Category: C **Class:** 2

System: 7 - Chemical and Volume Control

Function: These Charging Pump discharge check valves must open to provide a flowpath from the Charging Pumps to the reactor coolant (RCS) loops for high head safety injection (HHSI). They must close to prevent reverse flow through an idle Charging Pump.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally open when their associated Charging Pump is in service. Their safety positions are open for HHSI and closed to prevent reverse flow through an idle Charging Pump. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flow in accordance with Generic Letter No. 89-04, Position 1, cannot be performed because the Charging Pumps will not develop the required flow. Part-stroke exercising in the open direction cannot be performed via the HHSI hot or cold legs injection flowpaths because injection of relatively cold water into the RCS during normal plant operation will cause a thermal shock on the injection nozzles resulting in an increased probability of system failure. However, part-stroke exercising in the open direction is possible via normal charging during plant operation. OM-10, Paragraph, 4.3.2.2(b) states, "If full-stroke exercising during plant operation is not practicable it may be limited to part-stroke exercising during plant operation and full-stroke exercising during cold shutdowns." However, during cold shutdowns, full flow exercising in the open direction cannot be performed because this could result in low-temperature overpressurization of the RCS. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Exercising the non-running Charging Pump discharge check valve(s) in the closed direction is normally done during quarterly pump testing by virtue of pump delta-p being greater than the system minimum operating point (MOP) curve for the operating pump. The quarterly pump test, however, can only be performed at lower flow rates on a flat portion of the pump curve. Therefore, a large change in flow is required to cause the delta-p to drop below the MOP curve. This quarterly test provides assurance that the check valves are closed. It does not verify that the check valves are leak tight. Verification that Charging Pump delta-p does not degrade below the system MOP curve at a substantial flow condition, verifies the adjacent pumps' discharge check valves are adequately closed and leak tight so as not to affect the pump's performance against minimum system requirements to perform its safety function. Therefore, in order to ensure acceptable check valve closure and leak tightness of the non-running pumps' discharge check valves, a functional test at substantial flow conditions will be performed. However, as stated in the first paragraph above, full-flow testing can only be performed during a refueling outage. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test:

Part-stroke exercised open and exercised closed quarterly per 2OST-7.4, 2OST-7.5 and 2OST-7.6 (Charging Pump Tests). Full-stroke exercised open and closed during refueling outages per 2OST-11.14B (HHSI Full-Flow Test).

References:

OM-10, Paragraphs 4.3.2.1, 4.3.2.2(b) and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.
CR 01-0807 and CA 01-0807-01

VALVE REFUELING OUTAGE JUSTIFICATION 3**Valve Mark No(s):** 2CHS*31**Category:** A/C **Class:** 2**System:** 7 - Chemical and Volume Control**Function:** This charging header inside containment isolation check valve must close to provide containment isolation of penetration no. 15.**Test Requirement:** Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally open when the charging system is in service. Its safety position is closed for containment isolation of penetration no. 15. Full or part-stroke exercising in the closed direction can only be verified by cycling the mechanical weight loaded swing arm of the check valve open and then closed or by leak testing. Because this check valve is located inside containment, it is not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full or part-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a Reactor Coolant Pump (RCP). Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to full or part-stroke exercise this check valve, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing because stopping the RCP's could extend the cold shutdown period and would be burdensome to the licensee. In addition, there could be a head of water creating a d/p against the check valve disk due to elevation differences between downstream piping and the reactor coolant system (RCS). Therefore, in order to cycle this check valve open so that it can be verified to close, the d/p may have to be equalized or removed. Setting up the conditions necessary to equalize or remove any d/p could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open quarterly with flow per 2OST-7.4,5 or 6 (Charging Pump Tests). Full-stroke exercised closed by observation of its mechanical weight loaded swing arm during refueling outages per 2BVT-1.47.11 (Safety Injection and Charging System Containment Penetration Integrity Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 4

Valve Mark No(s): 2CHS*LCV115C
2CHS*LCV115E

Category: B **Class:** 2

System: 7 - Chemical and Volume Control

Function: These Volume Control Tank (VCT) outlet isolation valves must close on a safety injection signal to ensure the suction of the charging / high head safety injection (HHSI) system is switched from the VCT to the Refueling Water Storage Tank (RWST).

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally open when the charging system is in service. Their safety position is closed to ensure the suction of the Charging Pumps is switched from the VCT to the RWST following a safety injection signal. Full or part-stroke exercising in the closed direction cannot be performed during plant operation without isolating the VCT from the Charging Pumps or potentially damaging the Charging Pumps due to inadequate suction flow. This would also result in loss of or limited pressurizer level control, normal reactor coolant system makeup, and loss of or limited seal injection flow to the Reactor Coolant Pump (RCP) seals resulting in seal damage. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full or part-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke these valves, the charging system and RCP's would have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 5**Valve Mark No(s):** 2CHS*AOV204**Category:** A **Class:** 2**System:** 7 - Chemical and Volume Control**Function:** This Non-Regen Heat Exchanger inlet and letdown isolation outside containment isolation valve must close to secure letdown flow and limit inventory loss from the reactor coolant system (RCS) on receipt of a CIA. It must also close to provide containment isolation of penetration no. 28.**Test Requirement:** Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.**Basis for ROJ:** This valve is normally open when the charging system is in service to provide a flowpath for letdown flow from the RCS. Its safety position is closed for containment isolation of penetration no. 28, and also for letdown isolation. Full or part-stroke exercising in the closed direction cannot be performed during plant operation because this will result in a thermal shock to the Regenerative Heat Exchanger and associated component piping resulting in an increased probability of system and component failures. In addition, failure of this valve in the closed position could lead to a loss of pressurizer level control and require a plant shutdown. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full or part-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a Reactor Coolant Pump (RCP). A failure of this valve in the closed position could lead to the shutdown of a Charging Pump and unnecessary shutdown of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke this valve, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."**Alternate Test:** Full-stroke exercised and timed closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).**References:** OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 6**Valve Mark No(s):** 2CHS*MOV289**Category:** A **Class:** 2**System:** 7 - Chemical and Volume Control**Function:** This normal charging header makeup and outside containment isolation valve must close on a safety injection signal to ensure that flow from the high head safety injection (HHSI) system is switched from normal charging to the safety injection system. It must also close to provide containment isolation of penetration no. 15.**Test Requirement:** Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.**Basis for ROJ:** This valve is normally open when the charging system is in service to provide a flowpath for normal charging to the RCS. Its safety position is closed for containment isolation of penetration no. 15, and also for normal charging isolation. Full-stroke exercising in the closed direction cannot be performed during plant operation because this will result in a thermal shock to the Regenerative Heat Exchanger and associated component piping resulting in an increased probability of system and component failures. In addition, failure of this valve in the closed position could lead to a loss of pressurizer level control and require a plant shutdown. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a Reactor Coolant Pump (RCP). A failure of this valve in the closed position could lead to the shutdown of a Charging Pump and unnecessary shutdown of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke this valve, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."**Alternate Test:** Full-stroke exercised and timed closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).**References:** OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 7

Valve Mark No(s): 2CHS*MOV308A
2CHS*MOV308B
2CHS*MOV308C

Category: A **Class:** 2

System: 7 - Chemical and Volume Control

Function: These Reactor Coolant Pump (RCP) seal water supply outside containment isolation valves must close to provide containment isolation of penetration no's. 35, 36 and 37.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally open when the charging system is in service to provide seal injection flow to the RCP seals. Their safety position is closed for containment isolation of penetration no's. 35, 36 and 37. Full-stroke exercising in the closed direction cannot be performed during plant operation because this would secure seal injection water to the RCP seals, resulting in seal damage. In addition, failure of these valves in the closed position will result in a plant shutdown. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke these valves, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 8**Valve Mark No(s):** 2CHS*MOV310**Category:** B **Class:** 2**System:** 7 - Chemical and Volume Control**Function:** This Regenerative Heat Exchanger outlet isolation and normal charging system makeup valve must close on a safety injection signal to ensure that flow from the high head safety injection (HHSI) system is switched from normal charging to the safety injection system.**Test Requirement:** Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.**Basis for ROJ:** This valve is normally open when the charging system is in service to provide a flowpath for normal charging to the RCS. Its safety position is closed for isolation of normal charging. Full-stroke exercising in the closed direction cannot be performed during plant operation because this will result in a thermal shock to the Regenerative Heat Exchanger and associated component piping resulting in an increased probability of system and component failures. In addition, failure of this valve in the closed position could lead to a loss of pressurizer level control and require a plant shutdown. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a Reactor Coolant Pump (RCP). A failure of this valve in the closed position could lead to the shutdown of a Charging Pump and unnecessary shutdown of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke this valve, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."**Alternate Test:** Full-stroke exercised and timed closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).**References:** OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 9

Valve Mark No(s): 2CHS*MOV378
2CHS*MOV381

Category: A **Class:** 2

System: 7 - Chemical and Volume Control

Function: These Reactor Coolant Pump (RCP) seal water return inside and outside containment isolation valves must close to provide containment isolation of penetration no. 19.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally open when the charging system is in service to provide seal water return from the RCP's. Their safety position is closed for containment isolation of penetration no. 19. Full-stroke exercising in the closed direction cannot be performed during plant operation because this would secure seal water return from the RCP's, resulting in seal damage. In addition, failure of these valves in the closed position will result in a plant shutdown. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal water return from the RCP's, resulting in seal damage. In order to stroke these valves, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 10

Valve Mark No(s): 2CHS*LCV460A
2CHS*LCV460B

Category: B **Class:** 1

System: 7 - Chemical and Volume Control

Function: These Regenerative Heat Exchanger inlet letdown isolation valves must close to secure letdown flow and limit inventory loss from the reactor coolant system (RCS) on receipt of a low level signal derived from the pressurizer level control system.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally open when the charging system is in service to provide a flowpath for letdown flow from the RCS. Their safety position is closed for letdown isolation. Full or part-stroke exercising in the closed direction cannot be performed during plant operation because this will result in a thermal shock to the Regenerative Heat Exchanger and associated component piping resulting in an increased probability of system and component failures. In addition, failure of this valve in the closed position could lead to a loss of pressurizer level control and require a plant shutdown. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full or part-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a Reactor Coolant Pump (RCP). A failure of this valve in the closed position could lead to the shutdown of a Charging Pump and unnecessary shutdown of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke these valves, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 10

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test). In addition, fail-safe testing in the closed direction in accordance with OM-10, Paragraph 4.2.1.6, "Fail-Safe Valves," is also performed each time a valve is full-stroke exercised to the closed position during testing per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c), 4.2.1.2(e) and 4.2.1.6.
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 11**Valve Mark No(s):** 2CHS*473**Category:** A/C **Class:** 2**System:** 7 - Chemical and Volume Control

Function: This seal water return inside containment isolation thermal relief check valve must close to provide containment isolation of penetration no. 19. It must also open to allow excess pressure trapped in the containment penetration due to thermal expansion to be equalized with the pressure inside the seal return line, inside containment.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally closed when the charging system is in service returning seal injection flow from the Reactor Coolant Pumps (RCP's). Its safety position is closed for containment isolation of penetration no. 19, however, it will momentarily open if required to relieve pressure trapped in the containment penetration due to thermal expansion. Full or part-stroke in the open and closed directions can only be verified by cycling the mechanical weight loaded swing arm of the check valve. Because this check valve is located inside containment, it is not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full or part-stroke exercising in the open and closed directions may not be possible during cold shutdown if the charging system is in service to support operation of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to full or part-stroke exercise these check valves, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected check valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm, and closed by observation of its mechanical weight loaded swing arm during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 12

Valve Mark No(s): 2CHS*474
2CHS*475
2CHS*476

Category: A/C **Class:** 2

System: 7 - Chemical and Volume Control

Function: These Reactor Coolant Pump seal water supply inside containment isolation check valves must close to provide containment isolation of penetration no's. 35, 36 and 37.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally open when the charging system is in service to supply seal injection flow to the Reactor Coolant Pump (RCP) seals. Their safety positions are closed for containment isolation of penetration no's. 35, 36 and 37. Full or part-stroke exercising in the closed direction can only be verified by cycling the mechanical weight loaded swing arms of these check valves open and then closed or by leak testing. Because these check valves are located inside containment, they are not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full or part-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to full or part-stroke exercise these check valves, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing because stopping the RCP's could extend the cold shutdown period and would be burdensome to the licensee. In addition, there could be a head of water creating a d/p against the check valve disks due to elevation differences with downstream piping. Therefore, in order to cycle these check valves open so that they can be verified to close, the d/p may have to be equalized or removed. Setting up the conditions necessary to equalize or remove any d/p could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 12

Alternate Test: Full-stroke exercised closed by observation of its mechanical weight loaded swing arm during refueling outages per 2BVT-1.47.11 (Safety Injection and Charging System Containment Penetration Integrity Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 13

Valve Mark No(s):	2CHS*MOV8130A	2CHS*MOV8132A
	2CHS*MOV8130B	2CHS*MOV8132B
	2CHS*MOV8131A	2CHS*MOV8133A
	2CHS*MOV8131B	2CHS*MOV8133B

Category: B **Class:** 2

System: 7 - Chemical and Volume Control

Function: These Charging Pump suction and discharge isolation valves must close to provide isolation and separation of the high head safety injection (HHSI) flow trains during the long term recirculation phase of safety injection.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: The suction valves are normally de-energized and locked open for Appendix R and the discharge valves are normally de-energized and locked open per technical specifications. Their safety positions are closed for safety injection train separation during cold leg recirculation, however, only one valve in the suction line and one valve in the discharge line are required to close for train separation during this scenario. Full-stroke exercising in the closed direction cannot be performed during plant operation because the valves are required to be de-energized and locked open for Appendix R or per technical specifications. In addition, failure of these valves in the closed position under certain Charging Pump operating configurations could result in damage to a Charging Pump, loss of pressurizer level control, loss of normal reactor coolant system makeup or loss of seal injection flow to the Reactor Coolant Pump (RCP) seals resulting in seal damage. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the closed direction may not be possible during cold shutdown if the charging system is in service to support operation of a RCP. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke these valves without the potential risk in damage to a Charging Pump or RCP seals, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 13

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 14

Valve Mark No(s): 2SIS*6
2SIS*7

Category: A/C **Class:** 2

System: 11 - Safety Injection

Function: These Low Head Safety Injection (LHSI) Pump discharge check valves must open to provide a flowpath from the LHSI Pumps to the reactor coolant (RCS) loops for LHSI. They must close to prevent reverse flow through an idle LHSI Pump back to the Refueling Water Storage Tank (RWST).

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety positions are open for LHSI and closed to prevent reverse flow through an idle LHSI Pump. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, in addition to part-stroke exercising in the open direction, cannot be performed because the LHSI Pumps will not develop enough head to overcome RCS pressure. During cold shutdowns, full or part-stroke exercising in the open direction cannot be performed because flow testing would require injection to the RCS where there is not sufficient volume to receive the additional inventory. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed quarterly per 2OST-11.1 and 2OST-11.2 (LHSI Pump Tests). Full-stroke exercised open during refueling outages per 2OST-11.14A (LHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 15**Valve Mark No(s):** 2SIS*27**Category:** A/C **Class:** 2**System:** 11 - Safety Injection

Function: This High Head Safety Injection (HHSI) Pump suction check valve from the Refueling Water Storage Tank (RWST) must open to provide a flowpath from the RWST to the suction of the HHSI Pumps during an accident. It must close when the RWST is empty to prevent reverse flow of containment sump water from entering the RWST.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally closed during plant operation. Its safety position is open for HHSI and closed during transfer to recirc to prevent reverse flow to the RWST. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flow in accordance with Generic Letter No. 89-04, Position 1, cannot be performed because the Charging Pumps will not develop the required flow. Part-stroke exercising in the open direction cannot be performed during plant operation because the HHSI Pumps must be aligned to take suction from the RWST. The boron concentration of the RWST water could cause reactivity transients in the Reactor and force a plant shutdown. In addition, injection of relatively cold water into the RCS during normal plant operation will cause a thermal shock on the injection nozzles resulting in an increased probability of system failure. During cold shutdowns, full flow exercising in the open direction cannot be performed because this could result in low-temperature overpressurization of the RCS. OM-10, Paragraph 4.3.2.2(d) states, "If exercising is not practicable during plant operation and full-stroke exercising during cold shutdowns is also not practicable, it may be limited to part-stroke exercising during cold shutdowns and full-stroke exercising during refueling outages." Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. This involves the installation and removal of special test equipment in order to perform the leakage testing. Per NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 15

Alternate Test: Part-stroke exercised open during cold shutdowns per 2OST-1.10 (Cold Shutdown Valve Exercise Test). Full-stroke exercised open during refueling outages per 2OST-11.14B (HHSI Full Flow Test). Full-stroke exercised closed by leakage testing during refueling outages per 2BVT 1.47.11 (Safety Injection and Charging System Containment Penetration Integrity Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(d) and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.
NUREG-1482, Section 4.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 16**Valve Mark No(s):** 2SIS*42**Category:** A/C **Class:** 2**System:** 11 - Safety Injection**Function:** This inside containment isolation check valve on the makeup water supply header to the Safety Injection Accumulators must close to provide containment isolation of penetration no. 20.**Test Requirement:** Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.**Basis for ROJ:** This check valve is normally closed and is only opened when the Hydro Test Pump is supplying makeup water from the RWST to the Safety Injection Accumulators. Its safety position is closed for containment isolation of penetration no. 20. Full or part-stroke exercising in the closed direction can only be verified by cycling the mechanical weight loaded swing arm of the check valve open and then closed or by leak testing. Because this check valve is located inside containment, it is not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, because downstream MOV's which isolate this fill header from each Safety Injection Accumulator may not be leak tight, and because the Accumulators may still be pressurized to approximately 600 psig during cold shutdown, full or part-stroke exercising in the closed direction may not be possible during cold shutdown if backleakage through the MOV's is present. Therefore, in order to cycle this check valve open so that it can be verified to close, trapped d/p may have to be equalized or removed. Setting up the conditions necessary to equalize or remove any d/p could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1 "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."**Alternate Test:** Full-stroke exercised closed by observation of its mechanical weight loaded swing arm during refueling outages per 2BVT 1.47.3 (Check Valve Lift Test).**References:** OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 17

Valve Mark No(s): 2SIS*46
2SIS*47

Category: C **Class:** 2

System: 11 - Safety Injection

Function: These Recirculation Spray Pump discharge to Low Head Safety Injection (LHSI) Pump discharge check valves must open during the Recirculation Phase to provide a recirculation flowpath from the containment sump via the C and D Recirculation Spray Pumps to the suction of the High Head Safety Injection (HHSI) Pumps.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed. Their safety position is open during the Recirculation Phase. These check valves cannot be exercised with flow without injecting containment sump water via the Recirculation Spray (RSS) Pumps into the LHSI/HHSI Systems. Therefore, full or part-stroke exercising in the open direction can only be verified by cycling the mechanical weight loaded swing arms of each check valve. Exercising these weighted arm check valves in the open direction requires excessive forces due to the head of water present from the Refueling Water Storage Tank (RWST) against the check valve disks. However, Engineering does not recommend applying the excessive forces required to cycle the check valves open. Therefore, in order to cycle these check valves open, the d/p created by the head of water from the RWST must either be equalized or removed. This must be done to ensure repeatability of breakaway torque test results for IST trending purposes. Setting up the conditions necessary to equalize or remove any d/p is not practicable during power operation or during cold shutdowns because this requires installation of a hose between an upstream drain valve in the RSS System and a downstream drain valve in the LHSI System for each check valve. This would also create excessive unavailability time if done at power and could result in a delayed plant startup if done at cold shutdown. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. In addition, OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 18

Valve Mark No(s): 2SIS*83
2SIS*84
2SIS*94
2SIS*95

Category: A/C **Class:** 2

System: 11 - Safety Injection

Function: These high head safety injection (HHSI) inside containment isolation check valves must close to provide containment isolation of penetration no's. 7, 17, 34 and 113. They must open for HHSI hot leg and cold leg recirculation.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed. Their safety positions are closed for containment isolation of penetration no's. 7, 17, 34 and 113, and open for HHSI hot leg and cold leg recirculation. During plant operation when the reactor coolant system (RCS) is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flow in accordance with Generic Letter No. 89-04, Position 1, cannot be performed because the Charging Pumps will not develop the required flow. In addition, they also cannot be full or part-stroke exercised with flow in the open direction during plant operation due to the potential for thermal shock on the injection nozzles from a cold water injection. Therefore, full or part-stroke exercising in the open and closed directions can only be verified by cycling the mechanical weight loaded swing arms of the check valves. However, because these check valves are located inside containment, they are not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, because downstream check valves which isolate the HHSI system from the RCS may not be leak tight, and because the RCS may still be pressurized during cold shutdown, full or part-stroke exercising by cycling the Mechanical weight loaded swing arms in the open and closed directions may not be possible during cold shutdown if backleakage through the downstream check valves is present. In addition, there could also be a head of water creating a d/p against the check valve disks due to elevation differences between downstream piping and the reactor coolant system (RCS). Therefore, in order to cycle the mechanical weight loaded swing arms of these check valves, the d/p may have to be equalized or removed to ensure repeatability of breakaway torque test results for IST trending purposes. Setting up the conditions necessary to equalize or remove any d/p could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown.

VALVE REFUELING OUTAGE JUSTIFICATION 18

- Basis for ROJ:** In addition, full or part-stroke exercising in the open direction with flow cannot be performed during cold shutdown because flow testing could result in low-temperature overpressurization of the RCS. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."
- Alternate Test:** Full-stroke exercised open with flow during refueling outages per 2OST-11.14B (HHSI Full Flow Test). Full-stroke exercised closed by observation of its mechanical weight loaded swing arm upon cessation of flow during refueling outages per 2OST-11.14B (HHSI Full Flow Test).
- References:** OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.
Generic Letter No. 89-04, Position 1.
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VALVE REFUELING OUTAGE JUSTIFICATION 19

Valve Mark No(s): 2SIS*107
2SIS*108
2SIS*109

Category: A/C **Class:** 1

System: 11 - Safety Injection

Function: These low head safety injection (LHSI) header check valves must open to provide a flowpath from the LHSI Pumps to the reactor coolant system (RCS) cold legs during a safety injection.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation for isolation of the LHSI piping from the higher pressure RCS. Their safety position is open for LHSI. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, in addition to part-stroke exercising in the open direction, cannot be performed because the LHSI Pumps will not develop enough head to overcome RCS pressure. During cold shutdowns, full or part-stroke exercising in the open direction cannot be performed because flow testing would require injection to the RCS where there is not sufficient volume to receive the additional inventory. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open during refueling outages per 2OST-11.14A (LHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 20

Valve Mark No(s): 2SIS*122
2SIS*123
2SIS*124
2SIS*125
2SIS*126
2SIS*127

Category: C **Class:** 1

System: 11 - Safety Injection

Function: These high head safety injection (HHSI) header check valves must open to provide a flowpath from the HHSI Pumps to the reactor coolant system (RCS) hot legs during a safety injection.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety position is open for HHSI. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, cannot be performed because the HHSI Pumps will not develop the required flow. Part-stroke exercising in the open direction cannot be performed because injection of relatively cold water into the RCS during normal plant operation will cause a thermal shock on the injection nozzles resulting in an increased probability of system failure. During cold shutdowns, full or part-stroke exercising in the open direction cannot be performed because this could result in low-temperature overpressurization of the RCS. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open during refueling outages per 2OST-11.14B (HHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 21

Valve Mark No(s): 2SIS*128
2SIS*129

Category: A/C **Class:** 1

System: 11 - Safety Injection

Function: These low head safety injection (LHSI) header check valves must open to provide a flowpath from the LHSI Pumps to the reactor coolant system (RCS) hot legs during a safety injection.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation for isolation of the LHSI piping from the higher pressure RCS. Their safety position is open for LHSI. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, in addition to part-stroke exercising in the open direction, cannot be performed because the LHSI Pumps will not develop enough head to overcome RCS pressure. During cold shutdowns, full or part-stroke exercising in the open direction cannot be performed because flow testing would require injection to the RCS where there is not sufficient volume to receive the additional inventory. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open during refueling outages per 2OST-11.14A (LHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1

VALVE REFUELING OUTAGE JUSTIFICATION 22**Valve Mark No(s):** 2SIS*130**Category:** A/C **Class:** 2**System:** 11 - Safety Injection**Function:** This low head safety injection (LHSI) inside containment isolation check valve must close to provide containment isolation of penetration no. 61. It must open for LHSI hot leg recirculation.**Test Requirement:** Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally closed to provide reactor coolant system (RCS) pressure boundary isolation. Its safety position is closed for containment isolation of penetration no. 61, and open for LHSI hot leg recirculation. During plant operation when the RCS is at normal operating pressure, full or part-stroke exercising this check valve in the open direction with flow cannot be performed because the Low Head Safety Injection Pumps cannot develop enough head to overcome RCS pressure. Therefore, full or part-stroke exercising in the open and closed directions can only be verified by cycling the mechanical weight loaded swing arm of the check valve. However, because this check valve is located inside containment, it is not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, because downstream check valves which isolate the LHSI system from the RCS may not be leak tight, and because the RCS may still be pressurized during cold shutdown, full or part-stroke exercising by cycling the mechanical weight loaded swing arms in the open and closed directions may not be possible during cold shutdown if backleakage through the downstream check valves is present. In addition, there could also be a head of water creating a d/p against the check valve disk due to elevation differences between downstream piping and the reactor coolant system (RCS). Therefore, in order to cycle the mechanical weight loaded swing arm of the check valve, the d/p may have to be equalized or removed to ensure repeatability of breakaway torque test results for IST trending purposes. Setting up the conditions necessary to equalize or remove any d/p could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown.

In addition, full or part-stroke exercising in the open direction with flow cannot be performed during cold shutdown because flow testing would require injection to the RCS where there is not sufficient volume to receive the additional inventory. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 22

Alternate Test: — Full-stroke exercised open with flow during refueling outages per 2OST-11.14A (LHSI Full flow Test). Full-stroke exercised closed by observation of its mechanical weight loaded swing arm upon cessation of flow during refueling outages per 2OST-11.14A (LHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 23

Valve Mark No(s): 2SIS*132
2SIS*133

Category: A/C **Class:** 2

System: 11 - Safety Injection

Function: These low head safety injection (LHSI) inside containment isolation check valves must close to prevent reverse flow from the opposite train of LHSI during an accident, and also to provide containment isolation of penetration no's. 60 and 62. They must open for LHSI cold leg recirculation.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed to provide reactor coolant system (RCS) pressure boundary isolation. Their safety positions are closed to prevent reverse flow from the opposite train of LHSI during an accident and for containment isolation of penetration no's. 60 and 62. Their safety positions are also open for LHSI cold leg recirculation. During plant operation when the RCS is at normal operating pressure, full or part-stroke exercising in the open direction with flow cannot be performed because the Low Head Safety Injection Pumps cannot develop enough head to overcome RCS pressure. Therefore, full or part-stroke exercising in the open and closed directions can only be verified by cycling the mechanical weight loaded swing arms of the check valves. However, because these check valves are located inside containment, they are not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, because downstream check valves which isolate the LHSI system from the RCS may not be leak tight, and because the RCS may still be pressurized during cold shutdown, full or part-stroke exercising by cycling the mechanical weight loaded swing arms in the open and closed directions may not be possible during cold shutdown if backleakage through the downstream check valves is present.

VALVE REFUELING OUTAGE JUSTIFICATION 23

- Basis for ROJ:** In addition, there could also be a head of water creating a d/p against the check valve disk due to elevation differences between downstream piping and the reactor coolant system (RCS). Therefore, in order to cycle the mechanical weight loaded swing arm of the check valve, the d/p may have to be equalized or removed to ensure repeatability of breakaway torque test results for IST trending purposes. Setting up the conditions necessary to equalize or remove any d/p could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. In addition, full or part-stroke exercising in the open direction with flow cannot be performed during cold shutdown because flow testing would require injection to the RCS where there is not sufficient volume to receive the additional inventory. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."
- Alternate Test:** Full-stroke exercised open with flow during refueling outages per 2OST-11.14A (LHSI Full Flow Test). Full-stroke exercised closed by observation of its mechanical weight loaded swing arm upon cessation of flow during refueling outages per 2OST-11.14A (LHSI Full Flow Test).
- References:** OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.
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VALVE REFUELING OUTAGE JUSTIFICATION 24

Valve Mark No(s): 2SIS*134
2SIS*135
2SIS*136
2SIS*137
2SIS*138
2SIS*139

Category: C **Class:** 1

System: 11 - Safety Injection

Function: These high head safety injection (HHSI) header check valves must open to provide a flowpath from the HHSI Pumps to the reactor coolant system (RCS) cold legs during a safety injection.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety position is open for HHSI. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, cannot be performed because the HHSI Pumps will not develop the required flow. Part-stroke exercising in the open direction cannot be performed because injection of relatively cold water into the RCS during normal plant operation will cause a thermal shock on the injection nozzles resulting in an increased probability of system failure. During cold shutdowns, full or part-stroke exercising in the open direction cannot be performed because this could result in low-temperature overpressurization of the RCS. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open during refueling outages per 2OST-11.14B (HHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 25

Valve Mark No(s): 2SIS*545
2SIS*546

Category: C **Class:** 1

System: 11 - Safety Injection

Function: These low head / high head safety injection (LHSI / HHSI) header check valves must open to provide a flowpath from either the LHSI Pumps or HHSI Pumps to the reactor coolant system (RCS) "B" and "C" loop hot legs during a safety injection.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety position is open for LHSI and HHSI. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, in addition to part-stroke exercising in the open direction, cannot be performed because the LHSI Pumps will not develop enough head to overcome RCS pressure. In addition, full-stroke exercising in the open direction cannot be performed using the HHSI Pumps because they will not develop the required flow. Part-stroke exercising in the open direction cannot be performed using the HHSI Pumps because injection of relatively cold water into the RCS during normal plant operation will cause a thermal shock on the injection nozzles resulting in an increased probability of system failure. During cold shutdowns, part-stroke exercising in the open direction using the HHSI Pumps cannot be performed because this could result in low-temperature overpressurization of the RCS. Full or part-stroke exercising in the open direction cannot be performed during cold shutdowns using the LHSI Pumps because this would require injection to the RCS where there is not sufficient volume to receive the additional inventory. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open during refueling outages per 2OST-11.14A (LHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 26**Valve Mark No(s):** 2SIS*547**Category:** C **Class:** 1**System:** 11 - Safety Injection**Function:** This high head safety injection (HHSI) header check valve must open to provide a flowpath from the HHSI Pumps to the reactor coolant system (RCS) "A" loop hot leg during a safety injection.**Test Requirement:** Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.**Basis for ROJ:** This check valve is normally closed during plant operation. Its safety position is open for HHSI. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, cannot be performed because the HHSI Pumps will not develop the required flow. Part-stroke exercising in the open direction cannot be performed because injection of relatively cold water into the RCS during normal plant operation will cause a thermal shock on the injection nozzles resulting in an increased probability of system failure. During cold shutdowns, full or part-stroke exercising in the open direction cannot be performed because this could result in low-temperature overpressurization of the RCS. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."**Alternate Test:** Full-stroke exercised open during refueling outages per 2OST-11.14B (HHSI Full Flow Test).**References:** OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 27

Valve Mark No(s): 2SIS*548
2SIS*550
2SIS*552

Category: C **Class:** 1

System: 11 - Safety Injection

Function: These low head / high head safety injection (LHSI / HHSI) header check valves must open to provide a flowpath from either the LHSI Pumps or HHSI Pumps to the reactor coolant system (RCS) cold legs during a safety injection.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety position is open for LHSI and HHSI. During plant operation when the RCS is at normal operating pressure, full-stroke exercising in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, in addition to part-stroke exercising in the open direction, cannot be performed because the LHSI Pumps will not develop enough head to overcome RCS pressure. In addition, full-stroke exercising in the open direction cannot be performed using the HHSI Pumps because they will not develop the required flow. Part-stroke exercising in the open direction cannot be performed using the HHSI Pumps because injection of relatively cold water into the RCS during normal plant operation will cause a thermal shock on the injection nozzles resulting in an increased probability of system failure. During cold shutdowns, part-stroke exercising in the open direction using the HHSI Pumps cannot be performed because this could result in low-temperature overpressurization of the RCS. Full or part-stroke exercising in the open direction cannot be performed during cold shutdowns using the LHSI Pumps because this would require injection to the RCS where there is not sufficient volume to receive the additional inventory. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised open during refueling outages per 2OST-11.14A (LHSI Full Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.

VALVE REFUELING OUTAGE JUSTIFICATION 28**Valve Mark No(s):** 2SIS*MOV836**Category:** A **Class:** 2**System:** 11 - Safety Injection**Function:** This high head safety injection (HHSI) to cold leg injection header outside containment isolation valve must close to provide containment isolation of penetration no. 34. It must open to establish a flowpath to the reactor coolant system (RCS) cold legs when transferring to the cold leg recirculation mode.**Test Requirement:** Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.**Basis for ROJ:** This valve is normally closed. Its safety position is closed for containment isolation of penetration no. 34, and open for cold leg recirculation. Full-stroke exercising in the open and closed directions cannot be performed during plant operation because this will inject relatively cold water into the RCS cold legs and cause thermal shock to system piping and components which will result in an increased probability of system and component failures. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the open and closed directions may not be possible during cold shutdown if the charging system is in service to support operation of a Reactor Coolant Pump (RCP). Cycling this valve open and closed with a Charging Pump operating to support RCP operation would cause significant changes in pressures and flows to the RCP seals, resulting in seal damage. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke these valves, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."**Alternate Test:** Full-stroke exercised and timed open and closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).**References:** OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 29

Valve Mark No(s): 2SIS*MOV869A
2SIS*MOV869B

Category: A **Class:** 2

System: 11 - Safety Injection

Function: These high head safety injection (HHSI) to hot leg injection header outside containment isolation valves must close to provide containment isolation of penetration no's. 7 and 17. They must open to establish a flowpath to the reactor coolant system (RCS) hot legs when transferring to the hot leg recirculation mode and must re-close when transferring back to the cold leg recirculation mode.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally closed. Their safety positions are closed ~~for~~ containment isolation of penetration no's. 7 and 17, and open and closed for hot and cold leg recirculation. Full-stroke exercising in the open and closed directions cannot be performed during plant operation because this will inject relatively cold water into the RCS cold legs and cause thermal shock to system piping and components which will result in an increased probability of system and component failures. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the open and closed directions may not be possible during cold shutdown if the charging system is in service to support operation of a Reactor Coolant Pump (RCP). Cycling these valves open and closed with a Charging Pump operating to support RCP operation would cause significant changes in pressures and flows to the RCP seals, resulting in seal damage. Shutting down the charging system during RCP operation while in cold shutdown would secure seal injection water to the RCP seals, resulting in seal damage. In order to stroke these valves, the charging system and RCP's would both have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed open and closed during cold shutdowns when the charging system and the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 30**Valve Mark No(s):** 2SIS*MOV8889**Category:** A **Class:** 2**System:** 11 - Safety Injection

Function: This low head safety injection (LHSI) to hot leg injection header outside containment isolation valve must close to provide containment isolation of penetration no. 61. It must open to establish a flowpath to the reactor coolant system (RCS) hot legs when transferring to the hot leg recirculation mode and must re-close when transferring back to the cold leg recirculation mode.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.

Basis for ROJ: This valve is normally de-energized closed per technical specifications. Its safety position is closed for containment isolation of penetration no. 61, and open and closed for hot and cold leg recirculation. Full-stroke exercising in the open and closed directions cannot be performed during plant operation when the RCS is at normal operating pressure because failure of this valve in the open position could result in overpressurization of the low pressure portion of the LHSI system piping if downstream check valves to the RCS are not leak tight. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the open and closed directions may not be possible during cold shutdown if the RCS is still pressurized during cold shutdown and backleakage through downstream check valves from the RCS still exists. Setting up the plant conditions (RCS pressure) necessary to permit exercising this valve without threat of overpressurizing the low pressure portion of the LHSI system piping could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed open and closed during cold shutdowns when the RCS is vented or at reduced pressure, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 31**Valve Mark No(s):** 2CVS*93**Category:** A/C **Class:** 2**System:** 12 - Containment Vacuum**Function:** This Containment Airborne Activity Radiation Monitor Pump discharge header and post-accident sampling system (PASS) inside containment isolation check valve must close to provide containment isolation of penetration no. 43. It must re-open to permit sampling of the containment atmosphere after an accident.**Test Requirement:** Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.**Basis for ROJ:** This check valve is normally open during plant operation to support continuous sampling of the containment atmosphere. Its safety position is closed for containment isolation of penetration no. 43, and open for post-accident sampling of the containment atmosphere. Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. Leak testing to verify check valve closure cannot be performed during plant operation because these check valves are located inside containment and are not accessible during plant operation. In addition, installation and removal of test equipment in order to perform leakage testing, if attempted during cold shutdowns, could result in a delayed plant startup. Per NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 31

Alternate Test: Full-stroke exercised closed by leakage testing during refueling outages per 2BVT 1.47.5 (Type-C Leak Test). Per NUREG-1482, Section 4.4.2, "Post-Accident Sampling System Valves," valves in the PASS that perform a containment isolation function are required to be included in the IST Program as Category A or A/C and be tested to Code requirements (for the containment isolation function) except where relief has been granted. The remaining valves in the PASS would typically be tested as required by the technical specifications or other documents and need not be included in the IST Program. However, the NRC recommends that if the licensee elects to include these valves in the IST Program, a note be included that the testing is beyond the scope of 10CFR50.55a. Although not required per NUREG-1482, Section 4.4.2, the opening function of this check valve has been included in the BVPS-2 IST Program because it has a function to re-open to sample the containment atmosphere following an accident. Based on the above, however, full-stroke exercising in the open direction is not required to meet the requirements of 10CFR50.55a which includes Generic Letter No. 89-04, Position 1. Therefore, this check valve will be verified to stroke open each quarter by observing Containment Airborne Activity Radiation Monitor performance per 2OM-54.3, Station Log L5-133 in accordance with OM-10, Paragraph 4.2.1.5, "Valves in Regular Use."

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(e) and 4.2.1.5.
Generic Letter No. 89-04, Position 1.
NUREG-1482, Sections 4.1.4 and 4.4.2.

VALVE REFUELING OUTAGE JUSTIFICATION 32**Valve Mark No(s):** 2QSS*3
2QSS*4**Category:** A/C **Class:** 2**Class:** 1 13 - Containment Depressurization (Quench Spray)**Function:** These quench spray header inside containment isolation check valves must close to provide containment isolation of penetration no's. 63 and 64. They must open to provide a flowpath from the RWST via the Quench Spray Pumps to the containment spray rings in order to depressurize the containment following a loss of coolant accident (LOCA).**Test Requirement:** Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.**Basis for ROJ:** These check valves are normally closed. Their safety positions are closed for containment isolation of penetration no's. 63 and 64, and open for the purpose of depressurizing the containment following a LOCA. These check valves cannot be exercised with flow without injecting water through the spray rings and spraying down containment. Therefore, full or part-stroke exercising in the open and closed directions can only be verified by cycling the mechanical weight loaded swing arms of each check valve. Because these check valves are located inside containment, they are not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." Exercising these weighted arm check valves in the open direction at cold shutdown requires excessive forces due to the head of water which exists above the check valve disks. The head of water is created through equalization with the level of water in the Refueling Water Storage Tank (RWST) via an open flowpath to the quench spray piping in containment. However, Engineering does not recommend applying the excessive forces required to cycle the check valves open. Therefore, in order to cycle these check valves open, the d/p created by the head of water above the check valves must be bled off by draining the piping. This must be done in order to ensure that any d/p across the check valves is removed to ensure repeatability of breakaway torque test results for IST trending purposes. The amount of potentially contaminated water drained from the system would create additional liquid waste for disposal which is not practicable if done at cold shutdown.

Setting up the conditions necessary to drain the piping could also result in a delayed plant startup if done at cold shutdown. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 32

Alternate Test: Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm, and closed by observation of its mechanical weight loaded swing arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2.(e)
NUREG-1482, Sections 3.1.1.1

VALVE REFUELING OUTAGE JUSTIFICATION 33

Valve Mark No(s): 2QSS*MOV102A
2QSS*MOV102B

Category: B **Class:** 2

System: 13 - Containment Depressurization (Quench Spray)

Function: These Quench Spray Chemical Addition Tank discharge to Chemical Injection Pump Suction isolation valves must open to provide a flowpath of 23% to 25% sodium hydroxide (NaOH) solution to either the Quench Spray Pumps or containment sump for removal of radioactive iodine from the containment atmosphere during an accident.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally closed to isolate the Quench Spray Chemical Addition Tank from the suction of the Chemical Injection Pumps so that NaOH solution is not introduced into downstream piping which typically contains Refueling Water Storage Tank (RWST) water used for testing of quench spray system pumps and valves. Their safety position is open for injection of NaOH solution into the quench spray following a CIB actuation. Full-stroke exercising in the open direction cannot be performed during plant operation because this introduces 23% to 25% NaOH solution from the Chemical Addition Tank into the piping downstream of these valves. Attempts to purge the downstream piping using a backflush of RWST water to the safeguards sump after valve stroking has proven ineffective. Subsequent testing of the Chemical Injection Pumps on recirculation with the RWST results in sodium contamination of the RWST. During refueling outages the reactor coolant system (RCS), fuel pool and RWST are all in direct communication, therefore any sodium intrusion into the RWST will eventually spread to the RCS, a highly undesirable situation.

Removal of sodium from the RWST is a difficult process which involves recirculation of the RWST through the Fuel Pool Ion Exchangers. This process can degrade RWST cooling (RWST temperature is limited by Technical Specifications), and can take months to reduce the concentration to the desired level. In order to prevent any sodium introduction into the RWST, a more effective flush after valve stroking could be performed, but it involves a much longer period of system inoperability. Performance at cold shutdown would allow a more thorough backflush while in a mode where the system is not required by Technical Specifications, however, the number of flushes needed could still result in a delayed plant startup, and would also create additional liquid waste for disposal which is not practicable. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 33

Alternate Test: Full-stroke exercised and timed open during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 34**Valve Mark No(s):** 2QSS*267**Category:** A/C **Class:** 2**System:** 13 - Containment Depressurization (Quench Spray)**Function:** This Chemical Injection Pump to containment sump discharge check valve must close to provide containment isolation of penetration no. 118. It must open to provide a chemical injection flowpath of 23% to 25% sodium hydroxide solution from the Chemical Injection Pumps directly to the containment sump following a CIB.**Test Requirement:** Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.**Basis for ROJ:** This check valve is normally closed. Its safety position is closed for containment isolation of penetration no. 118, and open to provide a chemical injection flowpath to the containment sump following a CIB. This check valve cannot be exercised with flow without injecting sodium hydroxide solution into the containment sump. Therefore, full or part-stroke exercising in the open and closed direction can only be verified by cycling the mechanical weight loaded swing arm of the check valve. Because this check valve is located inside containment, it is not accessible for testing during plant operation. In order to exercise this weighted arm check valve in the open and closed directions during cold shutdown, scaffolding must be erected in order to gain access to the check valve which could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."**Alternate Test:** Full-stroke exercised open using a manual mechanical exerciser attached to its mechanical weight loaded swing arm, and closed by observation of its mechanical weight loaded swing arm during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).**References:** OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 35

Valve Mark No(s): 2CCP*4
2CCP*5
2CCP*6

Category: C **Class:** 3

System: 15 - Primary Component Cooling Water

Function: These Primary Component Cooling Water (CCP) Pump discharge check valves must open to supply CCP cooling water to the Residual Heat Removal (RHR) Heat Exchangers in order to achieve cold shutdown conditions following an accident. They must close to prevent reverse flow through the idle CCP Pump(s).

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally open during plant operation. Their safety positions are open to provide CCP cooling to the RHR Heat Exchangers to support cooldown of the plant to cold shutdown conditions, and closed to prevent reverse flow through the idle CCP Pump(s). Full-stroke exercising in the open direction cannot be performed during plant operation because normal plant operating loads do not support enough CCP flow to develop the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1. In order to increase flow above the maximum required accident condition flowrate, the manual throttle valves at the discharge of the RHR Heat Exchangers would require throttling in the open direction. Since these valves are located inside containment, they are not accessible during plant operation. OM-10, Paragraph 4.3.2.2(b) states, "If full-stroke exercising during plant operation is not practicable it may be limited to part-stroke exercising during plant operation and full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the open direction may not be possible during cold shutdown if a Reactor Coolant Pump (RCP) is operating. In order to support RCP operation, reactor coolant system (RCS) temperature must be greater than 100F. Increasing CCP cooling flow through the RHR Heat Exchangers would reduce RCS temperature and could require shutdown of a RCP.

Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. In addition, setting up the plant conditions necessary to align the CCP system through the RHR Heat Exchangers as described

VALVE REFUELING OUTAGE JUSTIFICATION 35

Alternate Test: Part-stroke exercised open and full-stroked exercised closed quarterly per 2OST-15.1, 2OST-15.2 and 2OST-15.3 (CCP Pump Tests). Full-stroke exercised open during cold shutdowns when the RCP's are secured, or at least during refueling outages per 2OST-15.1, 2OST-15.2 and 2OST-15.3 (CCP Pump Tests).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(b) and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.
NUREG-1482, Sections 3.1.1.1 and 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 36

Valve Mark No(s): 2CCP*AOV107A
2CCP*AOV107B
2CCP*AOV107C

Category: A **Class:** 3

System: 15 - Primary Component Cooling Water

Function: These Reactor Coolant Pump (RCP) Thermal Barrier Cooler primary component cooling water (CCP) outlet isolation valves must close to isolate the lower pressure CCP system from the higher pressure reactor coolant system (RCS) in the event of a primary loop to CCP leak in the RCP Thermal Barrier Cooler.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally open to allow return of CCP cooling water from the RCP Thermal Barrier Coolers during RCP operation. Their safety position is closed in the event of a primary loop to CCP leak in the RCP Thermal Barrier Cooler. Full or part-stroke exercising in the closed direction cannot be performed during plant operation because this would interrupt or reduce flow of cooling water to the RCP seals. This could result in damage to the RCP seals. In addition, failure of these valves in the closed position could also result in a plant shutdown to avoid or due to RCP seal damage. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the closed direction may not be possible during cold shutdown if a RCP is operating. In order to stroke these valves without the potential risk in damage to the RCP seals, the RCP's would have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. The affected valves should be tested during outages when the RCP's are secured and during refueling outages, but not more often than once every 92 days. OM-10 Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed closed during cold shutdowns when the RCP's are secured, or at least during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 37

Valve Mark No(s):	2CCP*MOV150-1	2CCP*MOV156-1
	2CCP*MOV150-2	2CCP*MOV156-2
	2CCP*MOV151-1	2CCP*MOV157-1
	2CCP*MOV151-2	2CCP*MOV157-2

Category: A **Class:** 2

System: 15 - Primary Component Cooling Water

Function: These primary component cooling water (CCP) supply to and return from containment inside and outside containment isolation valves must close to provide containment isolation of penetration no's. 1, 2, 4 and 5. They must open, post-accident following reset of a CIB, to support cooling of the Residual Heat Removal (RHR) Heat Exchangers during shutdown to cold shutdown conditions.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category A valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally open to provide CCP cooling water for various components inside containment. Their safety positions are closed for containment isolation of penetration no's. 1, 2, 4 and 5, and open to support cooling of the RHR Heat Exchangers during shutdown to cold shutdown conditions. Full-stroke exercising in the closed direction cannot be performed during plant operation because this would interrupt flow of cooling water to the Reactor Coolant Pump (RCP) seals. This could result in damage to the RCP seals. In addition, failure of these valves in the closed position could also result in a plant shutdown to avoid or due to RCP seal damage. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, full-stroke exercising in the closed direction may not be possible during cold shutdown if a RCP is operating. In order to stroke these valves without the potential risk in damage to the RCP seals, the RCP's would have to be shutdown. Per NUREG-1482, Section 3.1.1.4, "Stopping Reactor Coolant Pumps for Cold Shutdown Valve Testing," the RCP's need not be stopped for cold shutdown valve testing. Therefore, these valves should only be tested when the RCP's are secured.

VALVE REFUELING OUTAGE JUSTIFICATION 37

- Basis for ROJ:** OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages." However, per NUREG-1449, "Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States," at PWR's, the RHR system is essential to maintaining shutdown safety. If the RHR system is in service as the operable RCS loops per Technical Specification 3/4.4.1.3, these valves cannot be tested without entering the action statement which requires immediate restoration of the RCS loop. Failure of any valve to re-open during testing at that time would cause a loss of cooling flow for one of the required RCS loops. Therefore, in order to maintain this "defense in depth" strategy for shutdown safety with the RHR System not in service, and based on the fact that these valves should not be cycled when the RCP's are operating, these valves should only be exercised closed during refueling outages when the core is defueled.
- Alternate Test:** Full-stroke exercised and timed open and closed during refueling outages per 2OST-1.10 (Cold Shutdown Valve Exercise Test).
- References:** OM-10, Paragraphs 4.2.1.1, 4.2.1.2(c) and 4.2.1.2(e).
NUREG-1482, Section 3.1.1.4.
NUREG-1449, Technical Specification 3/4.4.1.3.

VALVE REFUELING OUTAGE JUSTIFICATION 38

Valve Mark No(s): 2CCP*289
2CCP*290
2CCP*291

Category: A/C **Class:** 3

System: 15 - Primary Component Cooling Water

Function: These primary component cooling water (CCP) supply to Reactor Coolant Pump (RCP) Thermal Barrier Cooler check valves must close to isolate the lower pressure CCP system from the higher pressure reactor coolant system (RCS) in the event of a primary loop to CCP leak in the RCP Thermal Barrier Cooler.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally open during RCP operations to supply CCP cooling water to the RCP Thermal Barrier Coolers. Their safety position is closed in the event of a primary loop to CCP leak in the RCP Thermal Barrier Coolers. Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. Leak testing to verify check valve closure cannot be performed during plant operation because these check valves are located inside containment and are not accessible during plant operation. In addition, installation and removal of test equipment in order to perform leakage testing, if attempted during cold shutdowns, could result in a delayed plant startup. NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by leakage testing during refueling outages per 2BVT 1.60.6 (ASME XI Check Valve Reverse Flow Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 4.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 39**Valve Mark No(s):** 2CCP*352**Category:** C **Class:** 3**System:** 15 - Primary Component Cooling Water**Function:** This primary component cooling water (CCP) check valve is located in the return line from the Containment Instrument Air Compressors and must close to isolate these non-safety related pieces of equipment from the safety class 3 CCP piping when upstream motor operated valves (MOV's) close on a CIA.**Test Requirement:** Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.**Basis for ROJ:** This check valve is normally open during operation of the Containment Instrument Air Compressors. Its safety position is closed to isolate the non-safety related compressors from the safety class 3 CCP piping. Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. Leak testing to verify check valve closure cannot be performed during plant operation because this would cause extended interruption of CCP cooling water to the Containment Instrument Air Compressors. In addition, installation and removal of test equipment in order to perform leakage testing, if attempted during cold shutdowns, could result in a delayed plant startup. Per NUREG-1482 Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."**Alternate Test:** Full-stroke exercised closed by leakage testing during refueling outages per 2BVT 1.60.6 (ASME XI Check Valve Reverse Flow Test).**References:** OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 4.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 40

Valve Mark No(s):	2MSS*352	2MSS*18
	2MSS*19	2MSS*199
	2MSS*20	2MSS*196

Category: C **Class:** 3**System:** 21 - Main Steam

Function: These Turbine Driven Auxiliary Feedwater Pump (TDAFWP) steam supply check valves must open to allow steam flow to operate the TDAFWP during an accident. They must close to prevent Steam Generator cross-connection during a high energy line break (HELB) accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety positions are open to support operation of the TDAFWP and closed during a HELB accident. Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. This involves the installation and removal of special test equipment in order to perform the leakage testing. Per NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by leakage testing during refueling outages per 2BVT 1.60.6 (ASME XI Check Valve Reverse Flow Test). Full and part-stroke exercising in the open direction is discussed in VCSJ No. 16.

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 4.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 41

Valve Mark No(s): 2SVS*80
2SVS*81
2SVS*82

Category: C **Class:** 2

System: 21 - Main Steam (Vents)

Function: These Steam Generator residual heat release check valves must open to allow steam flow from the Steam Generators to atmosphere via the residual heat release path to aid in removal of all sensible and core decay heat after a reactor shutdown. They must close to prevent Steam Generator cross-connection during a high energy line break (HELB) accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety positions are open to provide a residual heat release flowpath to atmosphere and closed during a HELB accident. Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. This involves the installation and removal of special test equipment in order to perform the leakage testing. Per NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by leakage testing during refueling outages per 2BVT 1.60.6 (ASME XI Check Valve Reverse Flow Test). Full-stroke exercising in the open direction is discussed in VROJ No. 51.

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 4.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 42

Valve Mark No(s): 2FWS*28
2FWS*29
2FWS*30

Category: C **Class:** 2

System: 24 - Main Feedwater

Function: These main feedwater system to Steam Generator inside containment header isolation check valves must close for feedwater isolation of the Steam Generators in the event if a high energy line break (HELB), and to prevent reverse flow to the non-safety related main feedwater system piping during operation of the Auxiliary Feedwater (AFW) Pumps during an accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally open during plant operation to provide main feedwater flow to the Steam Generators. Their safety position is closed for feedwater isolation in the event of a HELB and to ensure adequate AFW Pump flow to the Steam Generators during an accident. Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. Leak testing to verify check valve closure cannot be performed during plant operation because it involves filling the Steam Generators to $\geq 85\%$ level and shutting down all feedwater flow to the Steam Generators. In addition, leak testing if attempted during cold shutdowns could result in a delayed plant startup. Per NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by leakage testing during refueling outages per ZOST-24.8 (Feedwater Check Valve Exercise Verification Test).

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 4.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 43

Valve Mark No(s): 2FWE*99
2FWE*100
2FWE*101

Category: C **Class:** 2

System: 24 - Auxiliary Feedwater

Function: These auxiliary feedwater (AFW) system to Steam Generator inside containment isolation check valves must close to provide containment isolation of penetration no's. 79, 80, and 83. They must open to provide an auxiliary feedwater system flowpath to the Steam Generators during an accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety positions are closed for containment isolation of penetration no's. 79, 80 and 83, and open for AFW system injection to Steam Generators. Full or part-stroke exercising in the closed direction can only be performed by leak testing because no other practical means is available to verify check valve closure. Leak testing to verify check valve closure cannot be performed during plant operation because it involves filling the Steam Generators to $\geq 85\%$ level and shutting down all flow to the Steam Generators. In addition, leak testing if attempted during cold shutdowns could result in a delayed plant startup. Per NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by leakage testing during refueling outages per 2OST-24.8A (Auxiliary Feedwater Check Valve Reverse Flow Test). Full-stroke exercising in the open direction is discussed in VCSJ No. 24.

References: OM-10, Paragraphs 4.3.2.1 and 4.3.2.2(e).
NUREG-1482, Section 4.1.4.

VALVE REFUELING OUTAGE JUSTIFICATION 44

Valve Mark No(s): 2SWS*57
2SWS*58
2SWS*59

Category: C **Class:** 3

System: 30 - Service Water

Function: These Service Water (SWS) Pump discharge check valves must open to allow cooling water from the river to flow to station loads required during an accident. They must close to prevent reverse flow through an idle SWS Pump.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally open during plant operation. Their safety positions are open to provide SWS cooling to station loads required during an accident, and closed to prevent reverse flow through an idle SWS Pump. Full-stroke exercising in the open direction cannot always be performed during plant operation because normal plant operating loads do not always support enough SWS flow to develop the maximum required accident condition flow in accordance with Generic Letter No. 89-04, Position 1. OM-10, Paragraph 4.3.2.2(b) states, "If full-stroke exercising during plant operation is not practicable it may be limited to part-stroke exercising during plant operation and full-stroke exercising during cold shutdowns." Note that full-stroke exercising in the open direction may still be possible during warm summer months when additional flowpaths and heat exchangers are in service, however, this can normally only be accomplished by aligning the SWS system through additional flowpaths which are only used for accident conditions and through additional heat exchangers not normally in service. The additional heat exchangers are maintained isolated for biota control to prevent fouling. Placing flow through these additional flowpaths and heat exchangers unnecessarily during quarterly or cold shutdown testing could increase the potential for fouling, thereby degrading this part of the SWS system and reducing its reliability in meeting the required flowrates during an accident. In addition, setting up the plant conditions necessary to align the SWS system through additional flowpaths and/or heat exchangers as described above could also result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 44

Alternate Test: Part-stroke exercised open quarterly and full-stroke exercised open during warm summer months when additional flowpaths and heat exchangers are in service per 2OST-30.2, 2OST-30.3 and 2OST-30.6A or 6B (SWS Pump Tests). At least full-stroke exercised open during refueling outages per 2OST-30.2, 2OST-30.3 and 2OST-30.6A or 6B (SWS Pump Tests) or per 2OST-30.13A or B (SWS Full Flow Tests). Full-stroke exercising in the closed direction is discussed in VCSJ No. 26.

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(b) and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 45

Valve Mark No(s): 2SWS*106
2SWS*107

Category: C **Class:** 3

System: 30 - Service Water

Function: These Service Water (SWS) Pump header check valves must open to allow cooling water from the river to flow to station loads required during an accident. They must close to prevent reverse flow by the Standby Service Water Pumps when they are supplying the SWS headers.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally open during plant operation. Their safety positions are open to provide SWS cooling to station loads required during an accident, and closed to prevent reverse flow to the SWS system if a Standby Service Water Pump is operating. Full-stroke exercising in the open direction cannot always be performed during plant operation because normal plant operating loads do not always support enough SWS flow to develop the maximum required accident condition flow in accordance with Generic Letter No. 89-04, Position 1. OM-10, Paragraph 4.3.2.2(b) states; "If full-stroke exercising during plant operation is not practicable it may be limited to part-stroke exercising during plant operation and full-stroke exercising during cold shutdowns." Note that full-stroke exercising in the open direction may still be possible during warm summer months when additional flowpaths and heat exchangers are in service, however, this can normally only be accomplished by aligning the SWS system through additional flowpaths which are only used for accident conditions and through additional heat exchangers not normally in service. The additional heat exchangers are maintained isolated for biota control to prevent fouling. Placing flow through these additional flowpaths and heat exchangers unnecessarily during quarterly or cold shutdown testing could increase the potential for fouling, thereby degrading this part of the SWS system and reducing its reliability in meeting the required flowrates during an accident. In addition, setting up the plant conditions necessary to align the SWS system through additional flowpaths and/or heat exchangers as described above could also result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

VALVE REFUELING OUTAGE JUSTIFICATION 45

- Basis for ROJ:** Full or part-stroke exercising in the closed direction can only be performed by leakage testing because no other practical means is available. This involves shutting down the operating Service Water Pump supplying the associated SWS header and providing an upstream vent path with a Standby Service Water Pump providing reverse flow for verifying check valve closure. If the SWS header cannot be depressurized, then the opposite trains Service Water Pump must also be shutdown so that the SWS headers can be cross-connected at the Service Water Pumps in order to provide a large enough upstream vent path of sufficient capacity to support the leakage test. This is not possible during plant operation because two Service Water Pumps are required to be operable per Technical Specifications. This is not practical during cold shutdowns because it may require the SWS headers to be cross-connected which could affect the availability of safety related SWS to support the Emergency Diesel Generator operability and RHR System operability during cold shutdown. Per NUREG-1482, Section 4.1.4, "Extension of Test Interval to Refueling Outage for Check Valves Verified Closed by Leak Testing," it is acceptable to verify that check valves are capable of closing by performing leak rate testing at each refueling outage, if no other practical means is available. OM-10, Paragraph 4.3.2.2(e), states, "if exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."
- Alternate Test:** Part-stroke exercised open quarterly and full-stroke exercised open during warm summer months when additional flowpaths and heat exchangers are in service per 2OST-30.2, 2OST-30.3 and 2OST-30.6A or 6B (SWS Pump Tests). At least full-stroke exercised open during refueling outages per 2OST-30.2, 2OST-30.3 and 2OST-30.6A or 6B (SWS Pump Tests) or per 2OST-30.13A or B (SWS Full Flow Tests). Full-stroke exercised closed by leakage testing during refueling outages per 2OST-30.8A or B (Standby Service Water System Tests).
- References:** OM-10, Paragraphs 4.3.2.1, 4.3.2.2(b) and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 46

Valve Mark No(s): 2SWS*MOV103A
2SWS*MOV103B

Category: B **Class:** 3

System: 30 - Service Water

Function: These Recirculation Spray (RSS) Heat Exchanger service water (SWS) supply isolation valves must open to supply SWS cooling water to the RSS Heat Exchangers during a CIB. They must re-close in the long term post-accident following a CIB and with the residual heat removal (RHR) system placed into service, to provide SWS cooling for the Component Cooling Water (CCP) Heat Exchangers in order to cool the RHR Heat Exchangers and bring the plant to cold shutdown conditions.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally closed during plant operation to isolate SWS flow to the RSS Heat Exchangers which are maintained in a dry lay-up condition. Their safety positions are open to supply DBA flow to the RSS Heat Exchangers following a CIB, and closed to ensure adequate SWS cooling for RHR cooldown of the plant to cold shutdown conditions. Full-stroke exercising in the open and closed directions cannot be performed during plant operation because failure of the valves in the open position would require a plant shutdown because the SWS system cannot simultaneously support normal plant operations and full flow to RSS Heat Exchangers. Failure of the valves in the open position during cold shutdowns would result in a delayed plant startup. In addition, full-stroke exercising in the open and closed directions during normal operation or during cold shutdowns would unnecessarily degrade the operational readiness of the RSS Heat Exchangers by depositing Asiatic clams, other marine life, river mud and silt in the heat exchangers. Therefore, exercising these valves during normal plant operation and during cold shutdowns is not practicable. OM-10, Paragraph 4.2.1.2(c) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed open and closed during refueling outages per 2OST-30.13A and 2OST-30.13B (SWS Full Flow Tests).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(e).

VALVE REFUELING OUTAGE JUSTIFICATION 47

Valve Mark No(s): 2SWS*MOV106A
2SWS*MOV106B

Category: B **Class:** 3

System: 30 - Service Water

Function: These service water system (SWS) supply header isolation valves must close on receipt of a CIB signal to ensure sufficient SWS cooling flow to the Recirculation Spray Heat Exchangers. They must re-open in the long term post-accident following a CIB to provide SWS cooling for the Component Cooling Water (CCP) Heat Exchangers in order to cool the Residual Heat Removal (RHR) Heat Exchangers and bring the plant to cold shutdown conditions.

Test Requirement: Per OM-10, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally open during plant operation to support SWS operation. Their safety position is closed to ensure sufficient SWS supply to the Recirculation Spray Heat Exchangers, and open to support RHR operation for cooldown of the plant to cold shutdown conditions. Full-stroke exercising in the open and closed directions cannot be performed during plant operation or during cold shutdowns because closing these valves would isolate SWS supply to the inservice primary (CCP) and secondary (CCS) component cooling water and chiller unit heat exchangers. Failure of these valves to reopen after closure either during plant operation or during cold shutdowns would interrupt flow of cooling water to Train A or B cooling loads resulting in undesirable thermal transients, operational concerns of stability problems and a potential plant trip if at power. Changes in oil temperature from the turbine generator lube oil system create vibration problems. Changes in the hydrogen gas cooler temperature could imply problems or mask real problems with the generator. Chiller unit heat exchanger flow disturbances often result in a trip of the chiller unit causing containment temperature risks of exceeding the Technical Specification limit. Changes in CCP cooling to the Reactor Coolant Pump (RCP) thermal barrier heat exchangers, bearing lube oil coolers and motor stator air coolers could result in heatup of the RCP's and require a plant trip if at power, or undesirable shutdown of the RCP's during cold shutdown. Changes in CCP cooling to the RHR Heat Exchangers while in cold shutdown could also result in undesirable thermal transients with the Reactor Coolant System (RCS). OM-10, Paragraph 4.2.1.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed open and closed during refueling outages per 2OST-30.13A and 2OST-30.13B (SWS Full Flow Tests).

References: OM-10, Paragraphs 4.2.1.1. and 4.2.1.2(e).

VALVE REFUELING OUTAGE JUSTIFICATION 48

(DELETED)

VALVE REFUELING OUTAGE JUSTIFICATION 49**Valve Mark No(s):** 2IAC*22**Category:** A/C **Class:** 2**System:** 34 - Compressed Air (Containment Instrument Air)**Function:** This containment instrument air header inside containment isolation check valve must close to provide containment isolation of penetration no. 59.**Test Requirement:** Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally open and will remain open during operation of the containment instrument air system. Its safety position is closed for containment isolation of penetration no. 59. Full or part-stroke exercising in the closed direction can only be verified by cycling the mechanical weight loaded swing arm of the check valve open and then closed or by leak testing. Because this check valve is located inside containment, it is not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." It is not practicable to cycle this check valve during cold shutdown because the containment instrument air system must be shutdown, which must typically be supported by a special valve alignment from the station service air system to maintain an air supply to containment components. Setting up the conditions necessary to maintain an air supply to containment components could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by observation of its mechanical weight loaded swing arm during refueling outages per 2BVT 1.47.3 (Check Valve Lift Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 50

Valve Mark No(s): 2SIS*141 2SIS*142
 2SIS*145 2SIS*147
 2SIS*148 2SIS*151

Category: A/C **Class:** 1

System: 11 - Safety Injection

Function: These Safety Injection (SI) Accumulator series discharge check valves must open upon depressurization of the RCS during a loss of coolant accident (LOCA) to provide a flowpath from the SI Accumulators to the reactor coolant system (RCS) cold legs. [2SIS*141 and 145] must also open to provide a flowpath for the residual heat removal (RHR) system when it is placed into service for cooldown of the plant to cold shutdown conditions.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months. Per OM-10, Paragraph 4.3.2.4(a), "Valve Obturator Movement," the necessary valve obturator movement shall be demonstrated by exercising the valve and observing that the obturator opens to the position required to fulfill its function.

Basis for ROJ: These check valves are normally closed as pressure isolation valves (PIV's) during plant operation to isolate the lower pressure SI Accumulators from the high pressure RCS. Their safety position is open for passive low pressure injection of the SI Accumulators into the RCS cold legs during a LOCA. An additional safety position for [2SIS*141 and 145] is open to support RHR system operation during cooldown of the plant to cold shutdown conditions. Full or part-stroke exercising in the open direction cannot be performed during plant operation because the RCS is at a higher pressure than the SI Accumulators. During cold shutdowns, [2SIS*141 and 145] are capable of being part-stroke exercise in the open direction during RHR system operation. However, full-stroke exercising of all six check valves in the open direction by initiating the maximum required accident condition flowrate in accordance with Generic Letter No. 89-04, Position 1, in addition to part-stroke exercising the remaining four check valves in the open direction, cannot be performed during cold shutdowns because of a lack of installed instrumentation. A proposed alternate method which measures a flow coefficient value (C_v) during a blowdown at reduced accumulator pressure (see next paragraph), also cannot be performed during cold shutdowns because of a lack of installed instrumentation and an uncontrolled test volume change if the SI Accumulator discharge MOV isolation valves are opened at low RCS pressure. In addition, the reduced pressure which is required to perform this alternate test method may not always be obtainable during each cold shutdown. Therefore, stroke testing, if attempted at cold shutdowns, could extend the length of a plant shutdown due to the extensive preparatory work in establishing the proper RCS and SI Accumulator conditions necessary to perform the test, due to delays involved with installation and removal of test equipment inside containment, and for delays while the SI Accumulators are re-filled and pressurized. For [2SIS*141 and 145], OM-10, Paragraph 4.3.2.2(d) states, "If exercising is not practicable during plant operation and full-stroke during cold

VALVE REFUELING OUTAGE JUSTIFICATION 50**Basis for ROJ:**

shutdowns is also not practicable, it may be limited to part-stroke during cold shutdown, and full-stroke during refueling outages." For the remaining check valves, OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or during cold shutdowns, it may be limited to full-stroke during refueling outages."

These SI Accumulator series discharge check valves will be full-stroke exercise in the open direction during each refueling outage using a method similar to the test used at the Fort Calhoun Nuclear Station (References: NUREG-1482, Section 4.1.2, "Exercising Check Valves with Flow and Nonintrusive Techniques," Issue 1). The test method will measure a flow coefficient value (C_v) during a blowdown at reduced accumulator pressure. The SER for the Fort Calhoun test method will be followed and the recommendations incorporated.

Alternate Test:

[2SIS*141 and 145] will be part-stroke exercised open during cold shutdowns per 2OST-10.1 and 2OST-10.2 (RHR Pump Performance Tests). The remaining check valves will be full-stroke exercised open during refueling outages per 2BVT 1.11.3 (SI Accumulator Discharge Check Valves Full Stroke Test). As a special test after maintenance, 2OST-11.15 may be performed to part-stroke exercise applicable check valve(s) in the open direction.

References:

OM-10, Paragraphs 4.3.2.1, 4.3.2.4(a), 4.3.2.2(e) and 4.3.2.2(e).
Generic Letter No. 89-04, Position 1.
NUREG-1482, Section 4.1.2 (Issue 1).

VALVE REFUELING OUTAGE JUSTIFICATION 51

Valve Mark No(s): 2SVS*80
2SVS*81
2SVS*82

Category: C **Class:** 2

System: 21 - Main Steam (Vents)

Function: These Steam Generator residual heat release check valves must open to allow steam flow from the Steam Generators to atmosphere via the residual heat release path to aid in removal of all sensible and core decay heat after a reactor shutdown. They must close to prevent Steam Generator cross-connection during a high energy line break (HELB) accident.

Test Requirement: Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: These check valves are normally closed during plant operation. Their safety positions are open to provide a residual heat release flowpath to atmosphere and closed during a HELB accident. Full or part-stroke exercising in the open direction cannot be performed during plant operation because a reduction in power would be required in order to prevent exceeding full power limitations. During cold shutdowns, full or part-stroke exercising in the open direction cannot be performed because there is not motive force (steam flow) to open the check valves. It is not desirable to forward stroke exercise these check valves with maximum required accident condition flow while shutting down to cold shutdown or during startup from cold shutdown when steam flow is available in Mode 3, because a possible uncontrolled cooldown could occur outside of Technical Specification and administrative limits, which if exceeded, could create positive reactivity. Per OM-10, Paragraph 4.3.2.4(c), "As an alternative to the testing in Paragraph 4.3.2.4(a) or (b), disassembly every refueling outage to verify operability of check valves may be used." In addition, per Generic Letter No. 89-04, Position 2, "Where the licensee determines that it is burdensome to disassemble and inspect all applicable valves each refueling outage, a sample disassembly and inspection plan for groups of identical valves in similar applications may be employed."

Alternate Test: Maintenance is to disassemble and inspect one check valve in accordance with the sample frequency requirements of Generic Letter No. 89-04, Position 2, per 1/2 CMP-75-ENERTECH CHECK-1M during each refueling outage. A part-stroke exercise in the open direction will be performed after valve re-assembly per 2OM-50.4.A, "Plant Heatup from Mode 5 to Mode 4." Full-stroke exercising in the closed direction is discussed in VROJ No. 41.

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.4(c)
Generic Letter No. 89-04, Position 2
BVPS Condition Report 981791

VALVE REFUELING OUTAGE JUSTIFICATION 52**Valve Mark No(s):** 2RCS*68**Category:** A/C **Class:** 2**System:** 6 - Reactor Coolant**Function:** This inside containment isolation check valve on the nitrogen supply to the Pressurizer Relief Tank [2RCS-TK22] must close to provide containment isolation of penetration no. 49.**Test Requirement:** Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.**Basis for ROJ:** This check valve is normally closed and is only opened during nitrogen makeup to the Pressurizer Relief Tank. Its safety position is closed for containment isolation of penetration no. 49. Full or part-stroke exercising in the closed direction can only be verified by cycling the mechanical weight loaded swing arm of the check valve open and then closed or by leak testing. Because this check valve is located inside containment, it is not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." Because this check valve is normally isolated by upstream and downstream isolation valves, a d/p across the check valve may be created due to thermal expansion when the cooler nitrogen gas is subjected to a higher containment temperatures. Therefore, in order to cycle this check valve open so that it can be verified to close, trapped d/p may have to be equalized or removed. Setting up the conditions necessary to equalize or remove any trapped d/p could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."**Alternate Test:** Full-stroke exercised closed by observation of its mechanical weight loaded swing arm during refueling outages per 2BVT 1.47.3 (Check Valve Lift Test).**References:** OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 53**Valve Mark No(s):** 2RCS*72**Category:** A/C **Class:** 2**System:** 6 - Reactor Coolant**Function:** This inside containment isolation check valve on the primary grade water supply to the Pressurizer Relief Tank [2RCS-TK22] must close to provide containment isolation of penetration no. 45.**Test Requirement:** Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.**Basis for ROJ:** This check valve is normally closed and is only opened during primary grade water makeup to the Pressurizer Relief Tank. Its safety position is closed for containment isolation of penetration no. 45. Full or part-stroke exercising in the closed direction can only be verified by cycling the mechanical weight loaded swing arm of the check valve open and then closed or by leak testing. Because this check valve is located inside containment, it is not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." Because this check valve is normally isolated by upstream and downstream isolation valves, a d/p across the check valve may be created due to thermal expansion when the cooler fluid is subjected to a higher containment temperatures. Therefore, in order to cycle this check valve open so that it can be verified to close, trapped d/p may have to be equalized or removed. Setting up the conditions necessary to equalize or remove any trapped d/p could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."**Alternate Test:** Full-stroke exercised closed by observation to its mechanical weight loaded swing arm during refueling outages per 2BVT 1.47.3 (Check Valve Lift Test).**References:** OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 54**Valve Mark No(s):** 2FPW*761**Category:** A/C **Class:** 2**System:** 33 - Fire Protection**Function:** This fire protection header inside containment isolation check valve must close to provide containment isolation of penetration no. 99.**Test Requirement:** Per OM-10, Paragraph 4.3.2.1, "Exercising Test Frequency," check valves shall be exercised nominally every 3 months.

Basis for ROJ: This check valve is normally closed and would only be opened in the event of a fire in containment. Its safety position is closed for containment isolation of penetration no. 99. Full or part-stroke exercising in the closed direction can only be verified by cycling the mechanical weight loaded swing arm of the check valve open and then closed or by leak testing. Because this check valve is located inside containment, it is not accessible for testing during plant operation. OM-10, Paragraph 4.3.2.2(c) states, "If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns." In addition, the upstream MOV, although isolated, is cycled open quarterly which allows some water to flow past this check valve and into the downstream piping. Because a head of water may exist against the check valve disk due to elevation differences between the check valve and downstream fire protection piping in containment, the water may need to be drained in order to cycle the check valve. Setting up the conditions necessary to drain the downstream side of the check valves in order to bleed off any trapped pressure could result in a delayed plant startup. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. OM-10, Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised closed by observation to its mechanical weight loaded swing arm during refueling outages per 2BVT 1.47.3 (Check Valve Lift Test).

References: OM-10, Paragraphs 4.3.2.1, 4.3.2.2(c) and 4.3.2.2(e).
NUREG-1482, Section 3.1.1.1.

VALVE REFUELING OUTAGE JUSTIFICATION 55

Valve Mark No(s): 2RSS*MOV154C
2RSS*MOV154D

Category: B **Class:** 2

System: 13 - Recirculation Spray

Function: These recirculation spray pump recirculation valves must open to provide a minimum recirculation flowpath for [2RSS*P21C and D] when pump flowrate is low following a CIB or during the recirculation mode of safety injection. They must close to isolate the recirculation flowpath so that all recirculation spray flow is directed to the spray rings in containment following a CIB.

Test Requirement: Per OM, Paragraph 4.2.1.1, "Exercising Test Frequency," active Category B valves shall be tested nominally every 3 months.

Basis for ROJ: These valves are normally closed. Their safety positions are open to provide a minimum recirculation flowpath for C and D recirculation spray pumps if flowrate is low following a CIB or during the recirculation mode of safety injection, and closed to isolate the recirculation flowpath so that all recirculation spray flow is directed to the spray rings in containment following a CIB. These valves do not have a control switch from which to stroke each valve. Their operation is strictly automatic as determined by recirculation spray pump flowrate. In order to cycle these valves open and closed for timing, recirculation spray pump flow must be initiated or a jumper wire must be installed in the circuitry of each valve. Installing a jumper creates a hardship as described in NUREG-1482, Section 3.1.1, "Deferring Valve Testing to Each Cold Shutdown or Refueling Outage," and could delay a plant startup if performed during cold shutdown. Per NUREG-1482, Section 3.1.1.1, "IST Cold Shutdown Testing," plant startup need not be delayed to complete inservice testing during cold shutdown. In addition, establishing recirculation spray pump flow can only be accomplished during refueling outages as described in Pump Refueling Outage Justification (PROJ) No. 1. OM-10, Paragraph 4.2.1.2(e) states, "if exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages."

Alternate Test: Full-stroke exercised and timed open and closed during at refueling outages per 2BVT 1.13.5 (Recirculation Spray Pump Test) or 2OST-1.10 (Cold Shutdown Valve Exercise Test).

References: OM-10, Paragraphs 4.2.1.1 and 4.2.1.2(e).
NUREG-1482, Section 3.1.1 and 3.1.1.1.

SECTION VIII: VALVE RELIEF REQUESTS

VALVE RELIEF REQUEST 1

This Relief Request was converted into VROJ50 per the NRC SER for the Second 10-Year Interval for Pumps and Valves Inservice Testing (IST) Program - BVPS-2, dated November 18, 1997.

VALVE RELIEF REQUEST 2

Valve Mark No(s): 2EGA*SOV202-1
2EGA*SOV202-2
2EGA*SOV203-1
2EGA*SOV203-2

Category: B **Class:** 3

System: 36 - 4KV Station Service (Diesel Air Start)

Function: These Emergency Diesel Generator air start solenoid valves must open to permit air to start the Emergency Diesel Generators.

Test Requirement: Per OM-10, Paragraph 4.2.1.3, "Valve Obturator Movement," the necessary valve obturator movement shall be determined by exercising the valve while observing an appropriate indicator, such as indicating lights which signal the required change of obturator position. Per OM-10, Paragraphs 4.2.1.4(a) and (b), "Power-Operated Valve Stroke Timing," the stroke time of all power-operated valves shall be measured to at least the nearest second with a limiting value of full-stroke time specified.

Basis for Relief: In accordance with 10CFR50.55a(f)(5)(iii), relief is requested on the basis that compliance with the code requirements is impractical for BVPS-2. These valves are quick acting and do not have position indication. Therefore, in accordance with NUREG-1482, Section 4.2.8, "Solenoid-Operated Valves," operation of these valves will be monitored by timing the starting time to rated speed of each Emergency Diesel Generator (EDG). Individual valves will be tested by isolating one bank of air prior to starting the EDG on an alternating frequency. This will ensure each bank is capable of starting the EDG's in the required time and that the air start solenoids are not degrading. Per NUREG-1482, Section 3.4, "Skid-Mounted Components and Component Subassemblies," the staff has determined that the testing of the major component is an acceptable means for verifying the operational readiness of the skid-mounted and component subassemblies if the licensee documents this approach in the IST Program.

Alternate Test: Stroked and indirectly timed on an alternating frequency in conjunction with 2OST-36.1 and 2OST-36.2 (Emergency Diesel Generator Monthly Tests). Assign a limiting stroke time based on the EDG starting requirements (≤ 10 seconds).

References: OM-10, Paragraphs 4.2.1.3, 4.2.1.4(a) and 4.2.1.4(b).
NUREG-1482, Sections 3.4 and 4.2.8.