PECO ENERGY

*Limerick Generating Station*
*Units 1 and 2*

# *PUMP AND VALVE*
# *INSERVICE TESTING (IST) PROGRAM*

***Specification ML-008***
***Vol 2 of 2***

# LIMERICK GENERATING STATION UNITS 1 AND 2 INSERVICE TESTING BASIS DOCUMENT

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## INTRODUCTION

This Appendix comprises the IST Basis Document for LGS Units 1 & 2. The purpose of the IST Basis Document is to provide detailed information regarding the application of IST Program requirements at the system and component level. The generic or programmatic-type criteria used as the framework for the development and implementation of the Program are discussed in detail in Sections 1.0 through 8.0 of this Specification.

The LGS Units 1 & 2 IST Program for the second 10-year interval complies with the ASME OM Code - 1990, except as identified in the relief requests contained in Appendices B and C of this Specification. Details regarding the selection of the OM - 1990 Code are provided in Section 2.0 of this Specification.

## SCOPE

The scope of this Appendix is to document the basis for the inclusion in or exclusion from the IST Program of individual systems and components. For those components which are included in the program, this Appendix also documents the functions they are required to perform, their classification and categorization, and the specific testing requirements applicable to them.

The scope of the IST Program includes those pumps and valves which are required to perform a specific function in shutting down the Reactor to the cold shutdown condition, in maintaining the cold shutdown condition, or in mitigating the consequences of an accident, and those pressure relief devices which protect systems or portions of systems which perform any of these functions.

In order to determine which components are within the scope of the program, it is first necessary to determine what function(s) the system in which they are located must perform. The "safety function(s)" of the individual components can then be determined, based on what they are required to do in support of the system function(s). At this point, individual testing requirements, if any, are determined. This Appendix documents this process on a component-by-component basis.

IST Programs are required to be updated to the current edition and addenda of the Code specified in 10 CFR 50.55a once every 10 years. Due to variations in Code requirements, complexities in system designs, multiplicity of functions (both safety and non-safety related), changes in assignment of personnel, and other factors, the IST Basis Document is essential in maintaining continuity and uniformity within the IST Program.

This Appendix includes System Evaluations for the systems listed in the "Piping & Instrument Diagrams" table on M-00, Sheet 1. Component data sheets follow the System Evaluation section for each system which is determined to have one or more safety functions. Individual components can be located by referring to the Table of Contents for this Appendix.

Components are included in this Appendix, regardless of Code Class, if they perform a safety function or if required by PECO licensing commitments. Additionally, many components that do not perform a safety function are included to document the basis for excluding them from the IST Program.

## SYSTEM EVALUATIONS

### MAIN STEAM - MS (01)

The Main Steam System performs the process function of providing a means of delivering steam from the Nuclear Boiler to the Main Turbine. This function is non-safety related and the system is not required to be operable following a design basis accident. That portion of the system required to provide primary containment isolation or to support the alignment of the MSIV Leakage Alternate Drain Pathway do perform a safety related function and shall be included in this document and tested pursuant to the requirements of the IST Program. The Main Steam Isolation Valves and Main Steam Safety/Relief Valves (SRVs) are included in the Nuclear Boiler System (41).

### EXTRACTION STEAM - (02)

The Turbine Extraction Steam System performs the non-safety function of supplying steam from the HP Turbine, crossaround piping, and LP Turbine stages to the six stages of Feedwater Heaters. This is a non-safety related function. This system is not in the scope of the IST Program.

### VENTS, DRAINS, FEEDWATER HEATERS - (03 & 04)

As part of the Feedwater System, the Feedwater Heaters provide a means to preheat the Feedwater prior to reaching the Reactor Vessel. Proper operation of the Feedwater Heaters supports normal plant operation and is non-safety related. This system is not in the scope of the IST Program.

CONDENSATE AND CONDENSER - (05)

The Condensate and Condenser System is a non-safety related auxiliary system which supports normal plant operation. This system is not required to be operable following an accident. Failure of this system does not compromise any safety related system or component or prevent a safe shutdown of the plant. Therefore this system is not in the scope of the IST Program.

FEEDWATER - FW (06)

The Feedwater System performs the non-safety related process function of maintaining the water in the Reactor Vessel within predetermined levels during normal operation. The safety function of maintaining Reactor Vessel level is accomplished by the ECCS and RCIC Systems under various conditions. Failure of the Feedwater System does not compromise any safety related system or component or prevent a safe shutdown of the plant. Based on the system boundary practices utilized for LGS Systems, all safety-related Feedwater System components are included in this document with the Nuclear Boiler System (41).

AIR REMOVAL AND SEALING STEAM - (07)

The Main Condenser Air Removal System is a non-safety related function of the Offgas System. The purpose of air removal from the Main Condenser is to establish and maintain a vacuum, and to remove non-condensable gases. The Seal Steam System performs the non-safety related function of providing a continuous supply of clean (low level radioactive) steam to the Main Turbine and RFPT shaft seals and to stem packings on various valves. This sealing steam forms a steam barrier which keeps radioactive steam inside the process boundary while keeping outside air from penetrating the seals. Those components which support Main Condenser Air Removal and Sealing Steam System are classified as non-safety related. Therefore this system is not in the scope of the IST Program.

CONDENSATE AND REFUELING WATER STORAGE - (08)

The Condensate Storage and Transfer System, which also includes the Refueling Water Storage Tank, is considered an auxiliary system and is classified as non-safety related. Even though the Condensate Storage Tanks (CSTs) provide an alternate suction supply source for the HPCI, RCIC and the Core Spray pumps, they are classified as Seismic IIA, non-safety related. Failure of this system does not compromise any safety related system or component or prevent a safe shutdown of the plant. Therefore, components associated with this system are not in the scope of the IST Program.

CIRCULATING WATER - (09)

The Circulating Water System is a non-safety related auxiliary system which supports normal plant operation. This system is not required to be operable following an accident. Failure of this system does not compromise any safety related system or component or prevent a safe shutdown of the plant. Therefore this system is not in the scope of the IST Program.

SERVICE WATER - SW (10)

The Service Water System is a non-safety related auxiliary system which supports normal plant operation when offsite power is available. The system removes heat from heat exchangers in the turbine, reactor, and radwaste enclosures. The system is not required to be operable following an accident. Failure of this system does not compromise any safety related system or component or prevent a safe shutdown of the plant. Therefore this system is not in the scope of the IST Program.

EMERGENCY SERVICE WATER - ESW (11)

The ESW System is a safety-related auxiliary system which is common to LGS Units 1 & 2, and consists of two independent loops. The ESW System is designed to supply cooling water to selected essential equipment during a LOOP or a Loss of Coolant Accident (LOCA). Upon system initiation, essential heats loads normally cooled by the Service Water System are automatically transferred to the ESW System.

RESIDUAL HEAT REMOVAL SERVICE WATER - RHRSW (12)

The RHRSW System is a safety-related auxiliary system which is common to LGS Units 1 & 2, and consists of two independent loops. During two-unit operation two of the four pumps are required for safe shutdown and accident mitigation. Each loop services one RHR Heat Exchanger in each unit and provides sufficient cooling for safe shutdown and accident mitigation of both units. The system is designed to provide a reliable source of cooling water for all operating modes of the RHR System. The primary safety function of the RHRSW System is to supply cooling water flow to the RHR System Heat Exchangers for transfer of heat during post-accident conditions.

REACTOR ENCLOSURE COOLING WATER - RECW (13)

The RECW System is a closed-loop system that provides cooling water for miscellaneous reactor auxiliary plant non-safety related equipment. The RECW System is not safety related, except for the containment penetrations and isolation valves associated with the water supply lines to the Reactor Recirculation Pump Seal and Motor Oil Coolers. The applicable containment isolation valves shall be included in this document and tested pursuant to the requirements of the IST Program.

TURBINE ENCLOSURE COOLING WATER - TECW (14)

The TECW System is a closed-loop system that provides cooling water for miscellaneous auxiliary non-safety related equipment located in the turbine enclosure. Failure of this system does not compromise any safety related system or component or prevent a safe shutdown of the plant. Therefore, this system is not in the scope of the IST Program.

COMPRESSED AIR SYSTEM - CAS (15)

The Compressed Air System, as addressed in this paragraph shall include the Service Air System. The Service Air System is an auxiliary system which performs various non-safety functions. However, the system does perform the safety related function of providing nitrogen bottles that serve as a source of backup gas in case of loss of compressed air to the Q-listed inflatable seals. Additional safety related portions of the system include the piping associated with the Service Air containment penetration and the piping up to the equipment access door and personnel airlock. Those components necessary for support of these safety related functions shall be included in this document and tested pursuant to the requirements of the IST Program.

CONDENSATE FILTER/DEMINERALIZERS - (16)

As a part of the Condensate and Condenser System, the Condensate Filter/ Demineralizer System is classified as a non-safety related auxiliary system. This system is used to maintain a high degree of purity in the Feedwater and Nuclear Boiler Systems. The system is not required to be operable following an accident. Failure of this system does not compromise any safety related system or component or prevent a safe shutdown of the plant. Therefore this system is not in the scope of the IST Program.

CLARIFIED WATER - (17)

The Clarified Water System performs the non-safety related function of providing filtered, clarified river water for use in the Domestic Water System as lubricating water, and as the input stream for the Makeup Demineralizer System. Failure of the system does not compromise any safety related system or component, nor does it prevent a safe shutdown of the plant. Therefore this system is not in the scope of the IST Program.

DEMINERALIZED WATER MAKEUP SYSTEM - (18)

The Demineralized Water Makeup System performs the non-safety related function of providing a supply of treated water suitable as makeup for the plant and Reactor systems. Failure of the system does not compromise any safety related system or component, nor does it prevent a safe shutdown of the plant. Therefore this system is not in the scope of the IST Program.

EMERGENCY DIESEL GENERATOR FUEL AND DIESEL OIL STORAGE & TRANSFER AND STARTING AIR SYSTEM - (20/92)

These Emergency Diesel Generator support systems are safety related and are required to function for satisfactory engine operation. Failure of these systems to function properly would compromise diesel engine operation and subsequently the operation of various safety related systems and components which are dependent upon the diesel generators for electrical power during a design basis accident. Components associated with these systems shall be included in this document and tested pursuant to the requirements of the IST Program, as applicable.

AUXILIARY STEAM - (21)

The Auxiliary Steam System is non-safety related and is designed to supply plant heating steam and an auxiliary steam supply to accommodate the varying steam demands during all seasons and modes of operation. Failure of the system does not compromise any safety related system or component, nor does it prevent a safe shutdown of the plant. Therefore this system is not in the scope of the IST Program.

## FIRE PROTECTION SYSTEM - (22)

The Fire Protection System is a non-safety related system utilized for fire detection and fire suppression. The system includes fire detection and suppression equipment and design features which support safe shutdown of the plant. However, valves that are associated with safe shutdown solely due to fire shall not be included in the IST Program. Classification guidance utilized at LGS, pertaining to fire protection systems, include Branch Technical Position (BTP) Chemical Engineering Branch (CMEB) 9.5.-1, "Guidelines for Fire Protection for Nuclear Power Plants," Rev. 2, July 1981. Section 5.C.(6) of CMEB 9.5.-1 related to Alternative or Dedicated Shutdown Capability states "Shutdown systems installed to ensure postfire shutdown capability need not be designed to meet seismic Category I criteria, single failure criteria, or other design basis accident criteria, except where required for other reasons, e.g., because of interface with or impact on existing safety systems, or because of adverse valve actions due to valve damage." Therefore this system is not in the scope of the IST Program.

## PROCESS SAMPLING - (23)

The Process Sampling System is a non-safety related system which is provided to allow sampling for evaluation of various liquid process streams for water quality and radioactivity levels. Failure of the system does not compromise any safety related system or component, nor does it prevent a safe shutdown of the plant. Therefore, components associated with the Process Sampling System are not in the scope of the IST Program.

## CHLORINATION - (24)

The Chlorination System performs the non-safety related function of providing a means to inject sodium hypochlorite to prevent the formation of biological growth and to inject inhibitors to control corrosion of the tube sheets of the Main Condenser and heat exchangers cooled by the Service Water System. Failure of the system does not compromise any safety related system or component, nor does it prevent a safe shutdown of the plant. Therefore, components associated with the Chlorination System are not in the scope of the IST Program.

## PLANT LEAK DETECTION - (25)

The Plant Leak Detection System is a safety-related system which provides the capability for the detection and measurement of Reactor systems fluid leakage. This function is necessary so that appropriate action can be taken before a crack in a line grows to a large enough size that a break occurs which causes gross leakage or results in a LOCA. The instrumentation which senses the leakage is outside the scope of the IST Program. Primary containment isolation valves and excess flow check valves in the associated loops are included in this document with the applicable process systems and are tested pursuant to the requirements of the IST Program.

## PROCESS RADIATION MONITORING SYSTEM - PRMS (26)

The PRMS performs the process function of providing information to operations personnel regarding radioactivity levels in principal plant process and effluent streams to assist in maintaining radiation levels as low as possible. The main objective of the Radiation Monitoring System is to initiate appropriate protective action to limit the potential release of radioactive materials if predetermined radiation levels are exceeded. The primary containment isolation valves necessary to accomplish this function shall be included in this document and tested pursuant to the requirements of the IST Program.

## GENERATOR $H_2$ COOLING & $CO_2$ PURGE - (28)

This system performs the non-safety related function of providing hydrogen gas as coolant for the Main Generator rotor, stator core, and stator end windings. The system also provides the capability for purging the hydrogen as required for maintenance or other reasons. Failure of the system does not compromise any safety related system or component, nor does it prevent a safe shutdown of the plant. Therefore, components associated with the generator $H_2$ Cooling & $CO_2$ Purge System are not in the scope of the IST Program.

## POST ACCIDENT SAMPLING SYSTEM - PASS (30)

NUREG-0737, "Clarification of TMI Action Plan Requirements", Section II.B.3, details the requirements and capabilities of the PASS for sampling both the Reactor Coolant and the containment atmosphere. The IST program applies to any PASS valves within the scope of 10 CFR 50.55a. Those 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. The PASS at LGS Units 1 and 2 does not contain any of these valves. Valves which provide sampling capabilities of the Reactor Coolant and the containment atmosphere, and which also perform a containment isolation function are contained in other systems and will be addressed in this document with the systems in which they are located. The remaining valves in the PASS need not be included in the IST Program and are beyond the scope of 10 CFR 50.55a. This position is supported by NUREG-1482, Section 4.4.2.

MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL SYSTEM - MSIV-LCS (40)

All components of the MSIV-LCS have been physically removed or abandoned in place by the implementation of LGS Modification P-0017. The system has been deleted from the IST Program.

NUCLEAR BOILER SYSTEM - NBS (41)

The NBS is a power generation system which performs various non-safety related and safety related functions. The NBS is designed to transport the steam generated in the RPV to the outboard MSIVs to provide the steam needed to drive the Main Turbine during normal plant conditions, assist in overpressure protection and depressurization of the Reactor Coolant Pressure Boundary (RCPB), provide isolation to limit radioactive release, and limit steam line flow under accident conditions. The NBS also permits venting of non-condensable gases trapped in the RPV, and provides a method to drain condensate from steam lines and to permit equalizing pressure across the Main Steam Isolation Valves. The Automatic Depressurization System (ADS) is a portion of the ECCS and shall be addressed in this document as part of the Nuclear Boiler System. The ADS is automatically initiated as a backup to the HPCI and/or RCIC Systems, with time delay, following design basis events. The ADS actuates five NBS Main Steam Relief Valves (SRVs) which depressurize the Reactor Pressure Vessel (RPV) so that injection flow to the RPV from the RHR System Low Pressure Coolant Injection (LPCI) mode of operation and/or the Core Spray (CS) System can occur in adequate time to cool the core and prevent excessive fuel temperatures. The ADS also supports long term shutdown cooling when used in conjunction with the Suppression Pool cooling mode of RHR and the Core Spray System. Those components which support the safety related functions of the NBS shall be included in this document and tested pursuant to the requirements of the IST Program.

## NUCLEAR BOILER VESSEL INSTRUMENTATION - NBVI (42)

The NBVI System is designed to provide the Reactor operator with sufficient indication of Reactor Vessel coolant temperature, Reactor Vessel water level, Reactor Vessel pressure, and nuclear system leakage. The system is also designed to provide trip/ actuation signals to interfacing plant safety systems and to provide plant process information during all modes of operation including transient and accident conditions. Those components which interface with the Reactor Coolant System (RCS) and are necessary for maintaining the pressure boundary integrity of the RCS shall be included in this document and tested pursuant to the requirements of the IST Program.

## REACTOR RECIRCULATION - RR (43)

The Reactor Recirculation System performs the non-safety related function of providing forced coolant through the Reactor core so that steam can be generated without exceeding safe temperature limits of the nuclear fuel, and providing a means of controlling Reactor power by varying the coolant flow rate through the core. The Reactor Recirculation System contains primary containment isolation valves which perform the safety related function of maintaining primary containment integrity. The valves which function as primary containment isolation valves shall be included in this document and tested pursuant to the requirements of the IST Program.

## REACTOR WATER CLEANUP - RWCU (44)

The RWCU System is classified as a non-safety related primary power generation system. In conjunction with other systems, the RWCU maintains Reactor water quality during all operating modes. A small portion of the RWCU functions as part of the Reactor Coolant Pressure Boundary and primary containment barrier. The valves which function as Reactor Coolant Pressure Boundary or primary containment isolation valves shall be addressed in this document and tested pursuant to the requirements of the IST Program.

## CLEANUP FILTER/DEMINERALIZER - (45)

The Cleanup Filter/Demineralizer when operated in conjunction with the Reactor Water Cleanup System provides purification of the Reactor water during all modes of normal plant operation. This non-safety related function maintains water quality within technical specification limits by removing soluble and insoluble contaminants from the Reactor coolant. Failure of the system does not compromise any safety related system or component, nor does it prevent a safe shutdown of the plant. Therefore, components associated with the Cleanup Filter/Demineralizer System are not in the scope of the IST Program.

CONTROL ROD DRIVE HYDRAULICS - CRDH (46 & 47)

The Control Rod Drive Hydraulic System supplies clean high pressure water to the Control Rod Drive Mechanisms (CRDM) in order to position the control rods within the core and to cool the CRDMs when there is no drive motion. Additionally, the CRD Drive Water Pumps supply cooling water to the Reactor Recirculation Pumps. These functions of the Control Rod Drive Hydraulic System are classified as non-safety related. The components within the system which must function in support of a scram and the valves designated as primary containment isolation valves are the only components considered to perform a safety related function. Those components which must function in support of a scram or to provide primary containment isolation shall be included in this document and tested pursuant to the requirements of the IST Program.

STANDBY LIQUID CONTROL SYSTEM - SLCS (48)

The SLCS is a safety-related, reactivity control system which provides a backup method of shutting down the Reactor to cold subcritical conditions by independent means other than the normal method using the control rods. This is accomplished by pumping sodium pentaborate, a neutron absorber, into the Reactor Vessel. The components required to support injection into the Reactor Vessel shall be addressed in this document and tested pursuant to the requirements of the IST Program.

REACTOR CORE ISOLATION COOLING - RCIC (49 & 50)

The Reactor Core Isolation Cooling (RCIC) System performs the safety function of maintaining or supplementing Reactor Vessel coolant inventory so that the integrity of the fuel barrier is not compromised during certain accident scenarios. The RCIC System is used to support Reactor shutdown upon unavailability of the Reactor Feedwater System. It also provides high pressure backup to the HPCI System for supplying water to the Reactor Vessel in the event of a small break LOCA, thereby satisfying single failure criteria. Those components which support the safety related functions of the RCIC System shall be tested pursuant to the requirements of the IST Program.

RESIDUAL HEAT REMOVAL - RHR (51)

In the Low Pressure Coolant Injection (LPCI) mode, the RHR System functions as a part of the Emergency Core Cooling System (ECCS). The RHR/LPCI System which is comprised of four subsystems, each with one pump, provides adequate core flooding and containment cooling for worst case design basis LOCA. The RHR/LPCI pumps deliver water from the Suppression Pool to the Reactor Vessel, injecting through separate nozzles and core shroud penetrations, to flood and cool the core. The Suppression Pool Cooling and Containment Spray Cooling modes of RHR provide containment heat removal capability following an accident. The Suppression Pool Cooling mode may also be employed in conjunction with other components to provide backup to the Shutdown Cooling mode in the event that the Shutdown Cooling suction valves cannot be opened. The RHR Heat Exchangers are required for Suppression Pool cooling, and containment spray cooling. The Shutdown Cooling mode of RHR provides the primary method for placing and maintaining the Reactor in the cold shutdown condition. The components required to support the safety-related functions of the RHR System shall be addressed in this document and tested pursuant to the requirements of the IST Program.

CORE SPRAY SYSTEM - CS (52)

The CS System is a part of the Emergency Core Cooling System and provides the safety-related function of assuring that the Reactor Vessel core is adequately cooled following a loss-of-coolant accident and provides adequate core cooling capacity for all line break sizes up to and including the double-ended Reactor Recirculation line break, and for smaller breaks following depressurization by ADS. The CS System is the primary source of emergency core cooling after the vessel is depressurized and a source for flooding of the core in case of accidental draining. Additionally, the CS System performs the safety-related function of providing a means for alternate shutdown cooling to remove decay heat from the core assuming a single failure occurrence to RHR shutdown cooling. The alternate shutdown cooling path utilizes the RHR Pumps and Heat Exchangers, CS Pumps, and ADS valves.

SAFEGUARD PIPING FILL SYSTEM - SPFS (52)

The SPFS is a safety-related subsystem of Core Spray which provides a qualified backup source of makeup water to the ECCS and RCIC Pump discharge lines to prevent drainage of the lines from back leakage through the pump discharge check valves in the event that the Condensate Transfer System is unavailable. Maintaining these lines full of water ensures the ECCS and RCIC Systems will satisfy their design response times to deliver flow to the Reactor Vessel and minimizes the potential for water hammer due to the rapid acceleration of liquid in a partially voided line. The SPFS also provides water to the Feedwater lines to maintain a water seal against discharge of containment atmosphere into the Reactor enclosure in the event of any line break other than a Feed water line break inside containment. Those components which support the safety related functions of the SPFS shall be addressed in this document and tested pursuant to the requirements of the IST Program.

FUEL POOL COOLING AND CLEANUP - FPCC (53)

The FPCC System is designed to remove the decay heat generated by the spent fuel assemblies stored in the Fuel Pool and to maintain the pool water at a clarity and purity suitable for both underwater operations and for the protection of personnel in the refueling area. The FPCC System has no function in support of the safe shutdown of the plant. Makeup water is normally supplied by the Demineralized Water Makeup System. However, if this non-seismic source is lost, makeup can be supplied from the Spray Pond by the Seismic Category 1 ESW System. This feature satisfies the design requirements of Regulatory Guide 1.13 as specified in UFSAR Section 1.8. Components required to support the seismic makeup supply source from ESW shall be addressed in this document and tested pursuant to the requirements of the IST Program.

FUEL POOL FILTER/DEMINERALIZER - (54)

The Fuel Pool Filter/Demineralizer System is classified as non-safety related Seismic Category IIA. When used in conjunction with the Fuel Pool Cooling System, the filter/demineralizer maintains pool water at a level of purity and clarity suitable for both underwater operations and for the radiological protection of personnel in the refueling area. Failure of the system does not compromise any safety related system or component, nor does it prevent a safe shutdown of the plant. Therefore, components associated with the Fuel Pool Filter/Demineralizer System are not in the scope of the IST Program.

HIGH PRESSURE COOLANT INJECTION - HPCI (55 & 56)

The High Pressure Coolant Injection (HPCI) System is a part of the Emergency Core Cooling System (ECCS) and performs the safety function of providing sufficient coolant to the Reactor Vessel to prevent excessive fuel cladding temperatures in the event of a small-break LOCA, which typically does not result in rapid depressurization of the vessel.

The HPCI System also fulfills the objectives of the RCIC System in the event that the RCIC System fails. The HPCI System is designed to pump water into the vessel while it is fully pressurized, and will provide adequate core cooling until vessel pressure drops to the point at which LPCI or CS can be placed into operation. The HPCI System has automatic or remote manual starting capability to maintain or supplement Reactor Vessel coolant inventory so that the integrity of the fuel barrier is not compromised. The HPCI System shall be addressed in this document and tested pursuant to the requirements of the IST Program.

CONTAINMENT ATMOSPHERIC CONTROL - CAC (57)

The CAC System incorporates features for accomplishing a number of functions, including purging and venting of the primary containment, limitation of pressure differential between drywell and wetwell, monitoring of hydrogen and oxygen concentrations in the primary containment, and the control of hydrogen concentration in the primary containment after a LOCA. Those components which support the safety related functions of the CAC system shall be addressed in this document and tested pursuant to the requirements of the IST Program.

PRIMARY CONTAINMENT INSTRUMENT GAS - PCIG (59)

The PCIG System is designed to provide instrument gas to safety related and non-safety related pneumatic devices located inside the drywell and Suppression Chamber. The long-term nitrogen supply portion of the PCIG System serves the safety related function of providing a gas supply for long term operation of the ADS valves in the event the normal PCIG supply is not available. Those components which support the safety-related functions of the PCIG System shall be addressed in this document and tested pursuant to the requirements of the IST Program.

PRIMARY CONTAINMENT LEAK TESTING - PCLT (60)

The non-safety related PCLT System provides the ability to perform the 10 CFR 50, Appendix J, Type A Integrated Leak Rate Test (ILRT) of the primary containment structure, including containment penetrations, hatches, airlocks, and containment isolation valves to verify containment leakage is within specified limits. The PCLT System primary containment isolation valves are the only components within the system which perform a safety related function. These valves shall be addressed in this document and tested pursuant to the requirements of the IST Program.

RADWASTE SYSTEM - CRW/DRW - 61, 62, 63, 64, 66, and 67

The Radwaste System is a non-safety related auxiliary system. The system consists of various subsystems which include: Liquid Radwaste Collection (61), Liquid Radwaste Equipment Drain Processing (62), Liquid Radwaste Floor Drain Processing (63), Liquid Radwaste Chemical and Laundry Processing (64), Solid Radwaste Collection (66), and Solid Radwaste Collection and Processing (67). The non-safety related function of these subsystems is to collect, monitor, process, store and/or dispose of both liquid and solid radioactive waste. These functions are not required for safe shutdown of the Reactor or for accident mitigation. The primary containment isolation valves (PCIV) are the only components of the Radwaste System that perform any safety function. These PCIVs shall be addressed in this document and tested pursuant to the requirements of the IST Program.

PLANT WASTE WATER EFFLUENT - (68)

The Waste Water Effluent System is a non-safety related auxiliary system utilized for the processing of clean waste water. Failure of the system does not compromise any safety related system or component, nor does it prevent a safe shutdown of the plant. Therefore, components associated with the plant waste water effluent system are not in the scope of the IST Program.

GASEOUS RADWASTE RECOMBINATION - (69)

As part of the Offgas System, the non-safety related Gaseous Radwaste Recombination System processes non-condensable gases and carry-over steam removed from the Main Condenser by the Steam Jet Air Ejectors (SJAE). Failure of the system does not compromise any safety related system or component, nor does it prevent a safe shutdown of the plant. Therefore, components associated with the Gaseous Radwaste Recombination System are not in the scope of the IST Program.

GASEOUS RADWASTE AMBIENT CHARCOAL TREATMENT - (70)

As part of the Offgas System, the non-safety related Gaseous Radwaste Ambient Charcoal Treatment System reduces the Main Condenser non-condensable gas volume and radioactivity levels prior to release to the environment. Failure of the system does not compromise any safety related system or component, nor does it prevent a safe shutdown of the plant. Therefore, components associated with the Gaseous Radwaste Ambient Charcoal Treatment System are not in the scope of the IST Program.

TURBINE ENCLOSURE HVAC - (75)

The Turbine Enclosure Ventilation System performs the non-safety related function of maintaining design air temperatures and quality in the turbine enclosure. Failure of the system does not compromise any safety related system or component, nor does it prevent a safe shutdown of the plant. Therefore, components associated with the Turbine Enclosure HVAC System are not in the scope of the IST Program.

REACTOR ENCLOSURE & REFUELING AREA HVAC - (76)

The Reactor Enclosure & Refueling Area HVAC System performs the safety-related functions of supporting ECCS and RCIC Pump operation and of providing secondary containment isolation capability. Support for the ECCS and RCIC Pumps is provided by unit coolers. The pumps and valves which support the operation of the unit coolers are in the ESW System (11). Secondary containment isolation capability is provided by dampers which are outside the scope of the IST Program but are tested in accordance with Technical Specification 3/4.6.5. Thus, there are no components in the Reactor Enclosure & Refueling Area HVAC System that are in the scope of the IST Program.

DRYWELL HVAC - (77)

The Drywell HVAC System performs the safety related function of maintaining air circulation in the drywell to prevent stratification of hydrogen and oxygen that may be generated as a result of an accident. This is a ventilation function which is performed by the Drywell Unit Coolers. Cooling water supply to the unit coolers is not needed for this function. Therefore, components associated with the Drywell HVAC System are not in the scope of the IST Program.

CONTROL STRUCTURE HVAC - (78)

The Control Structure HVAC System includes various safety related ventilation systems, all of which must remain operable during post-accident conditions. The Control Structure HVAC subsystems include the Control Room HVAC, the Emergency Switchgear and Battery Room HVAC, the Auxiliary Equipment Room HVAC, and the Standby Gas

Treatment Room HVAC. The cooling coils associated with these safety related subsystems are provided cooling water from the Control Structure Chilled Water System (CSCWS). All components which support cooling water supply and return are addressed with the CSCWS (90). Thus, there are no components included in this document under the Control Structure HVAC System.

RADWASTE ENCLOSURE HVAC - (79)

The Radwaste Enclosure HVAC System performs the non-safety related function of maintaining area air temperatures and quality in the radwaste enclosure. Failure of the system does not compromise any safety related system or component, nor does it prevent a safe shutdown of the plant. Therefore, components associated with the Radwaste Enclosure HVAC System are not in the scope of the IST Program.

ADMINISTRATION COMPLEX, OFFICES & SHOPS HVAC - (80)

The Administrative Complex, Offices and Shops HVAC System performs the non-safety related function of maintaining air temperatures and quality in the associated areas. Failure of the system does not compromise any safety related system or component, nor does it prevent a safe shutdown of the plant. Therefore, components associated with the Administrative Complex, Offices and Shops HVAC System are not in the scope of the IST Program.

MISCELLANEOUS STRUCTURES HVAC - (81)

The Miscellaneous Structures HVAC System is comprised of various non-essential HVAC units. However, two essential ventilation systems are part of Miscellaneous Structures HVAC. The Diesel Generator Enclosure Ventilation System is designated as safety related and is designed to support engine operation by maintaining the cell temperature below the continuous-duty ambient rating of the safeguard equipment contained in the cell. The Spray Pond Pump Structure Ventilation System is designated as safety related and is designed to support ESW and RHRSW pump operation by maintaining the compartment temperature below the continuous-duty ambient rating of the safeguard electrical equipment located in the compartment and above freezing. These safety related systems do not contain any pumps or valves which are required to function in their support. Therefore, components associated with these ventilation systems are not in the scope of the IST Program.

HOT MACHINE SHOP HVAC - (82)

The non-safety related Hot Maintenance Shop Ventilation System maintains air temperature, quality, and pressure in the shop. The system has no safety related function. Failure of the system does not compromise any safety related system or component, nor does it prevent a safe shutdown of the plant. Therefore, components associated with the Hot Machine Shop HVAC System are not in the scope of the IST Program.

ADMINISTRATION COMPLEX GUARD STATION - (83)

The non-safety related Administration Complex Guard Station Ventilation System maintains air temperature, and quality in the guard station and CAS room. The system has no safety related function. Failure of the system does not compromise any safety related system or component, nor does it prevent a safe shutdown of the plant. Therefore, components associated with the Administration Complex Guard Station HVAC System are not in the scope of the IST Program.

DRYWELL CHILLED WATER - DCWS (87)

The DCWS performs the non-safety related function of providing chilled water to various nonessential components and the Drywell Unit Coolers during normal plant operating conditions to ensure proper operation of equipment inside the drywell, and to enable the Drywell HVAC System to maintain ambient air temperatures at acceptable levels. The Drywell Unit Coolers are credited as performing the safety function of maintaining the drywell atmosphere in a thoroughly mixed condition after a LOCA; however, this is a ventilation function of the Drywell HVAC System (77) and does not require cooling water flow. The DCWS is not safety related, except for the containment penetrations and the associated containment isolation valves. The applicable containment isolation valves shall be addressed in this document and tested pursuant to the requirements of the IST Program.

CONTROL STRUCTURE CHILLED WATER - CSCWS (90)

The CSCWS performs the safety related function of providing chilled water to various essential components which are required to mitigate the consequences of an accident. The CSCWS provides cooling water to the Control Room HVAC, the Emergency Switchgear and Battery Room HVAC, the Auxiliary Equipment Room HVAC, and the Standby Gas Treatment Room and Access Area HVAC. All of the cooling units supplied by CSCWS are required to remain operable during post-accident conditions to maintain ambient temperatures at acceptable levels. The components required to support the CSCWS shall be addressed in this document and tested pursuant to the requirements of the IST Program.

PLANT HEATING STEAM - (96)

As part of the non-safety related Auxiliary Steam System, the Plant Heating Steam System performs the non-safety related function of providing steam to the Plant HVAC System heating coils. Additionally, the Plant Heating Steam System provides freeze protection to various plant process system water storage tanks by providing steam to heating coils located inside the tanks. The Auxiliary Steam System and subsystems have no safety related function. The system is designed so that a failure of the system or one of its components does not compromise any safety related system or component or prevent a safe Reactor shutdown. Therefore, components associated with the Auxiliary Steam System are not in the scope of the IST Program.

# MAIN STEAM SYSTEM

**System (No):** Main Steam System (01)

**Component Description:** Main Stm. to RFPT & Recombiner Heater (Feed Turb/Recombiner)

**ID Nos.:** HV-01-108, HV-01-208

**P&ID/COORD** (respectively): M-01 (SHT 1) / D-8, M-01 (SHT 3) / H-7

**Code Class:** 2 **Category:** B **Active/Passive:** A

**Size:** 6.00 **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal O Safety C Failsafe AI

**Test Frequency (Direction):** ET-Q, ST-Q(C)
PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally open, motor operated valves are located in the main steam supply lines to the reactor feed pump turbine and the gaseous radwaste recombiner preheater. The valves perform an active safety function in the closed position to support the alignment of the MSIV Leakage Alternate Drain Pathway. This pathway channels the maximum seat leakage allowances for the MSIVs to the main condenser during postulated LOCA situations, thereby limiting the release of offsite doses to within the guidelines of 10CFR100. As boundary barrier valves, Class 2 to non-Code, failure of these valves to close could result in MSIV seat leakage being directed to a faulted piping system, thereby allowing the release of radioactive contamination in the turbine building enclosure which could migrate to the Main Control Room or outside environs.

These valves have no safety function in the open position. The alignment of main steam to the reactor feed pump turbine and the gaseous radwaste recombiner preheater is required to support normal plant operation only.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the closed position
Position indication verification once every two years

**References:**

1. LGS Technical Specifications, Section 3/4.6.1.4, MSIV Leakage Alternate Drain Pathway
2. LGS Technical Specifications Bases, B 3/4.6.1.4
3. UFSAR Sections 6.7.2 and 6.7.5
4. System Design Baseline Document, L-S-45, Main Steam, Turbine, and Extraction Steam Systems
5. 10CFR50.59 Safety Evaluation for LGS Modification P-00017
6. LGS Calc. LM-498, Radiological Impacts of MSIV Leakage Alternate Drain Pathway
7. LGS Special Event Procedure SE-10, LOCA

**System (No):** Main Steam System (01)

**Component Description:** Main Stm. to Hotwell Stm. Spargers

**ID Nos.:** HV-01-109, HV-01-209

**P&ID/COORD** (respectively): M-01 (SHT 1) / C-8, M-01 (SHT 3) / C-8

| | | | | | |
|---|---|---|---|---|---|
| **Code Class:** | 2 | **Category:** | B | **Active/Passive:** | A |
| **Size:** | 6.00 | **Valve Type:** | GT | **Act. Type:** | MO |
| **Positions:** | Normal_C_ | | Safety_C_ | | Failsafe_AI_ |

**Test Frequency (Direction):** ET-Q, ST-Q(C)
PI-T

**Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These motor operated valves are located in the main steam supply lines to the condenser hotwell steam spargers. They are normally closed during power operation, but may be opened to improve condensate deaeration during low turbine load or low circulating water temperature conditions.

The valves perform an active safety function in the closed position to support the alignment of the MSIV Leakage Alternate Drain Pathway. This pathway channels the maximum seat leakage allowances for the MSIVs to the main condenser during postulated LOCA situations, thereby limiting the release of offsite doses to within the guidelines of 10CFR100. As boundary barrier valves, Class 2 to non-Code, failure of these valves to close could result in MSIV seat leakage being directed to a faulted piping system, thereby allowing the release of radioactive contamination in the turbine building enclosure which could migrate to the Main Control Room or outside environs.

These valves have no safety function in the open position. The condenser hotwell steam spargers are used to enhance efficiency during certain normal operating conditions.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the closed position
Position indication verification once every two years

**References:**

1. LGS Technical Specifications, Section 3/4.6.1.4, MSIV Leakage Alternate Drain Pathway
2. LGS Technical Specifications Bases, B 3/4.6.1.4
3. UFSAR Section 6.7.2
4. System Design Baseline Document, L-S-21, Condensate and Condenser System
5. System Design Baseline Document, L-S-45, Main Steam, Turbine, and Extraction Steam Systems
6. 10CFR50.59 Safety Evaluation for LGS Modification P-00017
7. LGS Calc. LM-498, Radiological Impacts of MSIV Leakage Alternate Drain Pathway
8. LGS Special Event Procedure SE-10, LOCA

**System (No):** Main Steam System (01)

**Component Description:** Main Stm. to Stm. Seal Evaporators

**ID Nos.:** HV-01-111, HV-01-211

**P&ID/COORD** (respectively): M-01 (SHT 1) / H-8, M-01 (SHT 3) / D-7

**Code Class:** 2 **Category:** B **Active/Passive:** A

**Size:** 8.00 **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal_O_ Safety_C_ Failsafe_AI_

**Test Frequency (Direction):** ET-C, ST-C(C)
PI-T
**Appendix J, Type C:** N

**VRR/VCS/ROJ:** 01-VCS-2

**Remarks:** 01-VCS-2 provides justification for testing at cold shutdown due to potential turbine steam seal damage, release of radioactivity to the turbine enclosure, or loss of condenser vacuum resulting in a turbine trip.

**Safety Function(s):** These normally open, motor operated valves are located in the main steam supply lines to the steam seal evaporator. The valves perform an active safety function in the closed position to support the alignment of the MSIV Leakage Alternate Drain Pathway. This pathway channels the maximum seat leakage allowances for the MSIVs to the main condenser during postulated LOCA situations, thereby limiting the release of offsite doses to within the guidelines of 10CFR100. As boundary barrier valves, Class 2 to non-Code, failure of these valves to close could result in MSIV seat leakage being directed to a faulted piping system, thereby allowing the release of radioactive contamination in the turbine building enclosure which could migrate to the Main Control Room or outside environs.

These valves have no safety function in the open position. The alignment of main steam to the steam seal evaporator is required to support normal plant operation only.

**Test Requirement(s):**

Full stroke exercise test during Cold Shutdowns
Stroke time test to the closed position during Cold Shutdowns
Position indication verification once every two years

**References:**


1. LGS Technical Specifications, Section 3/4.6.1.4, MSIV Leakage Alternate Drain Pathway
2. LGS Technical Specifications Bases, B 3/4.6.1.4
3. UFSAR Sections 6.7.2 and 6.7.5
4. System Design Baseline Document, L-S-45, Main Steam, Turbine, and Extraction Steam Systems
5. 10CFR50.59 Safety Evaluation for LGS Modification P-00017
6. LGS Calc. LM-498, Radiological Impacts of MSIV Leakage Alternate Drain Pathway
7. LGS Special Event Procedure SE-10, LOCA

**System (No):** Main Steam System (01)

**Component Description:** Main Stm. to SJAE 1A & 1B

**ID Nos.:** HV-01-150, HV-01-250

**P&ID/COORD** (respectively): M-01 (SHT 1) / G-8, M-01 (SHT 3) / D-8

**Code Class:** 2 **Category:** B **Active/Passive:** A

**Size:** 4.00 **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal_O_ Safety_C_ Failsafe_AI_

**Test Frequency (Direction):** ET-C, ST-C(C) PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** 01-VCS-1

**Remarks:** 01-VCS-1 provides justification for testing at cold shutdown due to the potential of loss of condenser vacuum resulting in a turbine trip or creating an explosive condition in the main condenser from hydrogen collection.

**Safety Function(s):** These normally open, motor operated valves are located in the main steam supply lines to the steam jet air ejectors. The valves perform an active safety function in the closed position to support the alignment of the MSIV Leakage Alternate Drain Pathway. This pathway channels the maximum seat leakage allowances for the MSIVs to the main condenser during postulated LOCA situations, thereby limiting the release of offsite doses to within the guidelines of 10CFR100. As boundary barrier valves, Class 2 to non-Code, failure of these valves to close could result in MSIV seat leakage being directed to a faulted piping system, thereby allowing the release of radioactive contamination in the turbine building enclosure which could migrate to the Main Control Room or outside environs.

These valves have no safety function in the open position. The alignment of main steam to the steam jet air ejectors is required to support normal plant operation only.

**Test Requirement(s):**

Full stroke exercise test during Cold Shutdowns
Stroke time test to the closed position during Cold Shutdowns
Position indication verification once every two years

**References:**

1. LGS Technical Specifications, Section 3/4.6.1.4, MSIV Leakage Alternate Drain Pathway
2. LGS Technical Specifications Bases, B 3/4.6.1.4
3. UFSAR Sections 6.7.2 and 6.7.5
4. System Design Baseline Document, L-S-45, Main Steam, Turbine, and Extraction Steam Systems
5. 10CFR50.59 Safety Evaluation for LGS Modification P-00017
6. LGS Calc. LM-498, Radiological Impacts of MSIV Leakage Alternate Drain Pathway
7. LGS Special Event Procedure SE-10, LOCA

# EMERGENCY SERVICE WATER SYSTEM

**System (No):** Emergency Service Water (011)

**Component Description:** Emergency Service Water (ESW) Pumps

**ID Nos.:** 0AP548, 0BP548, 0CP548, 0DP548

**P&ID/COORD** (respectively): M-11 (SHT 1) / H-8, M-11 (SHT 1) / H-4, M-11 (SHT 1) / H-6, M-11 (SHT 1) / H-2

**Pump Type:** Centrifugal **Test Parameters:** D/P, Q, V

**Relief Request:** GPRR-2, 11-PRR-1

**Remarks:** Inlet pressure verified per T.S. 4.7.1.a. Relief request GPRR-2 provides for exemption from individual instrument accuracy and full-scale range requirements provided the applicable instrument(s) are accurate to at least ± 6% at the reference value. 11-PRR-1 requests relief to allow the use of pump curves for testing in lieu of fixed reference values.

**Safety Function:** The ESW system is a safety related auxiliary system which is common to LGS Units 1 & 2, and consists of two independent loops ("A" and "B"), with two 50% system capacity (100% loop capacity ) pumps per loop. With an individual design flow rate of approximately 6400 gpm, each ESW pump provides adequate flow to the cooling loads in its associated loop. One pump per subsystem (loop) is powered from a Unit 1 safeguard bus and the other pump is powered from a Unit 2 safeguard bus. This design feature ensures adequate onsite power sources to the system during a loss of offsite power (LOOP). The ESW system is designed to supply cooling water to selected essential equipment during a LOOP or a Loss of Coolant Accident (LOCA). The ESW system is designed to ASME III, Class 3, seismic Category I requirements and with sufficient capacity and redundancy so that no single active failure can impair the capability of the system to perform its safety related function. Subsequent to a LOOP, the ESW pumps start automatically following startup of its associated diesel generator, after speed, voltage, and bus breaker conditions are met, and after a load sequencing delay. Additionally, The ESW pumps are designed for remote operation from the Control Room. In the event of fire or Control Room evacuation, ESW loop "A" can be operated from the Unit 1 remote shutdown panel. ESW pumps "B" and "C" can be started and stopped from their respective MCCs in the event the Control Room and Unit 1 remote shutdown panels are inaccessible. Upon system initiation, essential heat loads normally cooled by the Service Water System are automatically transferred to the ESW system.

The accident flow rates identified below for essential equipment supplied by the ESW system are not dependent upon any single plant accident scenario or event. Cooling water flow requirements for each essential component supplied by loops "A" and "B" are based on the worst case event for each heat exchanger. The flow values identified are representative of ESW system balanced flow with 100% flow to all Pump Compartment Unit Coolers which perform a safety function.

Loop "A" Flow Requirements

| Safety Related Component | Total Flow Rate (GPM) |
|---|---|
| Emergency Diesel Generator HX's (4 ea.) | 1800 |
| RHR Pump Motor Oil Coolers (4 ea.) | 20.4 |
| RHR Pump Compt. Unit Coolers (4 ea.) | 40 |
| Core Spray Pump Compt. Unit Coolers (4 ea.) | 52 |
| Control Room Chiller (1 ea.) | 600 |
| Makeup to Fuel Pool (1 ea.) | 60 |
| Total Required Flow Rate | 2575 |

Loop "B" Flow Requirements

| Safety Related Component | Total Flow Rate (GPM) |
|---|---|
| Emergency Diesel Generator HX's (4 ea.) | 1800 |
| RHR Pump Motor Oil Coolers (4 ea.) | 20.4 |
| RHR Pump Compt. Unit Coolers (4 ea.) | 40 |
| Core Spray Pump Compt. Unit Coolers (4 ea.) | 52 |
| Control Room Chiller (1 ea.) | 600 |
| Makeup to Fuel Pool (1 ea.) | 60 |
| Total Required Flow Rate | 2575 |

Although not specifically included in the ESW system design basis, the cooling supplied by a single ESW loop is sufficient to safely shut down both units at all times. During the first 10 minutes of a DBA LOCA, three RHR pumps are nominally required on the LOCA unit for the LPCI mode of operation. Each ESW loop, however, provides cooling to only two RHR pumps. UFSAR Section 6.3.2.5 references NEDO-24708A which states that for postulated LOCAs, one low pressure ECCS (one LPCI or one CS loop) and ADS to depressurize is adequate to reflood the vessel and maintain core cooling sufficient to preclude fuel damage.

**Test Requirement(s):**

Quarterly Pump testing.

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Tables 9.2-3, 9.2.4
3. UFSAR Section 7.3.1.1.11, Instrumentation and Controls
4. UFSAR Section 6.3.2.5, System Reliability
5. System Design Baseline Document L-S-02, Emergency Service Water
6 LGS Technical Specifications 3/4.7.1.2
7. LGS Technical Specifications Bases, Section 3/4.7.1
8. LGS Modification P00212, HPCI and RCIC Room Qualification Upgrade

**System (No):** Emergency Service Water (011)

**Component Description:** Emergency Service Water (ESW) Supply Pumps' Discharge Check Valves

**ID Nos.:** 11-0001A, 11-0001B, 11-0001C, 11-0001D

**P&ID/COORD** (respectively): M-11 (SHT 1) / G-7, M-11 (SHT 1) / G-4, M-11 (SHT 1) / G-6, M-11 (SHT 1) / G-3

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 20.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal_C_ Safety_OC_ Failsafe_-_

**Test Frequency (Direction):** ET-Q(F&R) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These check valves have an active safety function in the open position to provide a path for cooling water flow to essential components which are dependent upon ESW for transferring design accident heat loads under LOOP and/or LOCA conditions. Since each ESW pump is capable of providing adequate flow to the cooling loads in its associated loop, each pump discharge check valve must also be capable of passing the accident flow rate required by its loop. The maximum required post accident flow rate for both ESW Loops "A" and "B" is 2575 gpm (refer to data sheet for ESW Pumps). Therefore, these check valves must be capable of passing a minimum of 2575 gpm in order to perform their safety function in the open position.

These check valves have an active safety function in the closed position to prevent gross diversion of ESW system flow. The ESW cooling loads are supplied by two independent loops. Each loop is supplied by two ESW pumps in parallel. One pump for each ESW loop may be idle during transient and accident conditions. Failure of a check valve to close would result in the diversion of flow from the operating pump through the idle pump.

**Test Requirement(s):**

Quarterly exercise to the full open and closed positions.

**References:**


1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Table 9.2-3
3. UFSAR Section 7.3.1.1.11, Instrumentation and Controls
4. System Design Baseline Document L-S-02, Emergency Service Water
5. LGS Technical Specification 3/4.7.1.2
6. LGS Technical Specifications Bases 3/4.7.1
7. LGS Modification P00212, HPCI and RCIC Room Qualification Upgrade

**System (No):** Emergency Service Water (011)

**Component Description:** Control Room Chillers A and B Cooling Water Check Valves

**ID Nos.:** 11-0032A, 11-0032B

**P&ID/COORD** (respectively): M-11 (SHT 2) / F-2, M-11 (SHT 2) / D-2

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 6.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal_C_ Safety_O_ Failsafe_-_

**Test Frequency (Direction):** ET-Q(F) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** Check valve 11-0032A has an active safety function in the open position to provide Loop "A" ESW cooling water flow to Control Room Chiller 0AK112; likewise, 11-0032B must open to provide Loop "B" ESW cooling water flow to Control Room Chiller 0BK112. Cooling supply during normal operation is provided by Service Water. However, startup of each ESW pump automatically initiates isolation of the ESW system from the SW system to ensure heat removal capability from a qualified, safety related cooling water supply source, thereby maintaining an acceptable Control Room operating environment during accident conditions. In order to satisfy the design heat transfer rate associated with each Control Room Chiller, these check valves must be capable of individually passing a minimum of 600 gpm in order to perform their safety function in the open position.

These check valves do not perform a safety function in the closed position. They do prevent diversion of Unit 2 Service Water to standby ESW system piping. However, the Service Water System is a non-qualified, non-safety related supply source and performs the non-safety related function of providing cooling water to plant loads during normal operation.

**Test Requirement(s):**

Quarterly exercise to the full open position.

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Table 9.2-3
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. LGS Technical Specification 3/4.7.1.2
6. LGS Technical Specifications Bases 3/4.7.1

**System (No):** Emergency Service Water (011)

**Component Description:** Control Room Chillers A and B, Unit 2 SW Supply Check Valves

**ID Nos.:** 11-0033A, 11-0033B

**P&ID/COORD** (respectively): M-11 (SHT 2) / F-2, M-11 (SHT 2) / D-2

**Code Class:** 3 **Category:** A/C **Active/Passive:** A

**Size:** 6.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-Q(R), LP-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** Check valve 11-0033A has an active safety function in the closed position to prevent diversion of Loop "A" ESW cooling water flow supplied to Control Room Chiller 0AK112, to the non-Code, non-seismic Unit 2 Service Water piping; likewise, 11-0033B must be capable of closure to prevent a loss of Loop "B" ESW cooling water flow to Control Room Chiller 0BK112. Failure of these valves to close in the event of a loss of Service Water could compromise the ability of the Control Room Chillers to perform their design safety function.

LGS UFSAR, Section 9.2.2.3, specifies that check valves used at the interface of the essential (ESW) from nonessential (SW) piping is verified to be operable and to have less than 10 gpm leakage as part of the LGS IST Program. Leakage of this magnitude will not compromise the safety function of the ESW system. Thus, even with this leakage at each interface, the ESW system could withstand a single active failure and still perform its safety function.

These check valves do not perform a safety function in the open position. The Service Water System is a non-qualified, non-safety related supply source and does not perform a safety function. The Service Water System serves to provide cooling water to plant loads during normal operation.

**Test Requirement(s):**

Quarterly exercise to the closed position and measurement of seat leakage.

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. System Design Baseline Document L-S-02, Emergency Service Water
3. System Design Baseline Document L-S-17, Service Water System
4. LGS Technical Specification 3/4.7.1.2
5. LGS Technical Specifications Bases 3/4.7.1
6. FSAR Question 410.52

**System (No):** Emergency Service Water (011)

**Component Description:** ESW Supply To Unit Coolers 2AV/BV 208 (RCIC Pump Compartment Unit Coolers)

**ID Nos.:** 11-0039

**P&ID/COORD :** M-11 (SHT 5) / D-2

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 3.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal C Safety N/A Failsafe -

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** Check valve 11-0039 is located in the Loop "A" ESW cooling water supply line to the Unit 2 RCIC Pump Compartment Unit Coolers, 2AV208 and 2BV208. This valve does not perform a safety function in the open position. LGS Modification P-00212 relocated certain components/instruments, determined to be temperature sensitive, to a non-harsh environment whereby room temperature will not impact operation of the RCIC pump/turbine. This modification results in ESW not being required for RCIC operability.

This check valve does not perform a safety function in the closed position. It does function to prevent diversion of Unit 2 Service Water to standby ESW Loop "A" system piping. However, the Service Water System is a non-qualified, non-safety related supply source and performs the non-safety related function of providing cooling water to plant loads during normal operation.

**Test Requirement(s):**

No test requirements.

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Table 9.2-3
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. LGS Technical Specification 3/4.7.1.2
6. LGS Technical Specifications Bases 3/4.7.1
7. LGS Modification P00212, HPCI and RCIC Room Qualification Upgrade

**System (No):** Emergency Service Water (011)

**Component Description:** Service Water Supply To HPCI Room Coolers, 1AV/1BV 209 (U/1) and SW Supply To Unit Coolers 2AV/2BV 208, RCIC Pump Compartment Unit Coolers (U/2)

**ID Nos.:** 11-0062, 11-0063

**P&ID/COORD** (respectively): M-11 (SHT 2) / E-7, M-11 (SHT 5) / D-3

**Code Class:** 3 **Category:** A/C **Active/Passive:** A

**Size:** 3.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal OC Safety C Failsafe -

**Test Frequency (Direction):** ET-Q(R), LP-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** Check valve 11-0062 has an active safety function in the closed position to prevent diversion of Loop "B" ESW cooling water flow supplied to the Unit 1 HPCI Pump Compartment Unit Coolers, 1AV209 and 1BV209, to the non-Code, non-seismic Unit 1 Service Water piping. Likewise, 11-0063 must be capable of closure to prevent a loss of Loop "A" ESW cooling water flow supplied to the Unit 2 RCIC Pump Compartment Unit Coolers, 2AV208 and 2BV208. Failure of these valves to close could compromise the ability of the Spray Pond to serve as the long term ultimate heat sink during emergency or accident conditions which result in a loss of Service Water availability. The LGS UFSAR, Section 9.2.6.1 credits the Spray Pond as the ultimate heat sink for both the ESW and RHRSW systems for at least 30 days without requiring makeup during any plant condition in which the ESW or RHRSW systems are running and utilizing the Spray Pond as a water source.

LGS UFSAR, Section 9.2.2.3, specifies that check valves used at the interface of the essential (ESW) from nonessential (SW) piping is verified to be operable and to have less than 10 gpm leakage as part of the LGS ISI Program. Leakage of this magnitude will not compromise the safety function of the ESW system. Thus, even with this leakage at each interface, the ESW system could withstand a single active failure and still perform its safety function.

These check valves do not perform a safety function in the open position. The Service Water System is a non-qualified, non-safety related supply source and performs the non-safety related function of providing cooling water to plant loads during normal operation.

**Test Requirement(s):**

Quarterly exercise to the closed position and measurement of seat leakage.

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. System Design Baseline Document L-S-02, Emergency Service Water
3. System Design Baseline Document L-S-17, Service Water System
4. LGS Technical Specification 3/4.7.1.2
5. LGS Technical Specifications Bases 3/4.7.1
6. FSAR Question 410.52

**System (No):** Emergency Service Water (011)

**Component Description:** Discharge To RHRSW Return Header Check Valves

**ID Nos.:** 11-0064A, 11-0064B, 11-0065A, 11-0065B

**P&ID/COORD** (respectively) : M-11 (SHT 1) / E-7, M-11 (SHT 1) / E-7, M-11 (SHT 1) / E-2, M-11 (SHT 1) / E-2

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 20.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal_C_ Safety_O_ Failsafe_-_

**Test Frequency (Direction):** ET-Q(F) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** Check valves 11-0064A and 11-0065A have an active safety function in the open position to provide Loop "A" ESW cooling water return header flow to the Spray Pond. Likewise, check valves 11-0064B and 11-0065B have an active safety function in the open position to provide Loop "B" ESW cooling water return header flow to the Spray Pond. The check valves associated with the inservice Loop must be capable of passing sufficient flow to ensure the proper design heat transfer rate occurs at the safety related component. Failure of these valves to fully open could restrict flow through the components, thereby preventing the components from performing their design safety function. The check valves located in the alternate Loop must be capable of opening during a loss of the inservice Loop, thereby providing redundancy in ESW return capability and providing the ability to safety shutdown either or both units during emergency or accident conditions. To satisfy the design heat transfer rate associated with the essential components relying on ESW, the Loop "A" and "B" check valves must be capable of individually passing a minimum of 2575 gpm in order to perform their safety function in the open position (refer to data sheet for ESW pumps).

These check valves do not perform a safety function in the closed position. They do provide separation between ESW return Loops "A & B". However, adequate isolation/separation capability is provided by motor-operated butterfly valve HV-11-015A.

**Test Requirement(s):**

Quarterly exercise to the full open position.

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.3, RHR Service Water System
3. UFSAR Table 9.2-3
4. System Design Baseline Document L-S-02, Emergency Service Water
5. System Design Baseline Document L-S-04, RHR Service Water System
6. System Design Baseline Document L-S-17, Service Water System
7. LGS Technical Specification 3/4.7.1.2
8. LGS Technical Specifications Bases 3/4.7.1

**System (No):** Emergency Service Water (011)

**Component Description:** ESW Supply To Unit 1 HPCI Pump Compartment Unit Coolers

**ID Nos.:** 11-0089

**P&ID/COORD :** M-11 (SHT 2) / E-7

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 4.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal_C_ Safety_N/A_ Failsafe_-_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** Check valve 11-0089 is located in the Loop "B" ESW cooling water supply line to the Unit 1 HPCI Pump Compartment Unit Coolers, 1AV209 and 1BV209. This valve does not perform a safety function in the open position. LGS Modification P-00212 relocated certain components/instruments, determined to be temperature sensitive, to a non-harsh environment whereby room temperature will not impact operation of the HPCI pump/turbine. This modification results in the ESW system not being required for HPCI operability.

This check valve does not perform a safety function in the closed position. It does function to prevent diversion of Unit 1 Service Water to standby ESW Loop "B" system piping. However, the Service Water System is a non-qualified, non-safety related supply source and performs the non-safety related function of providing cooling water to plant loads during normal operation.

**Test Requirement(s):**

No test requirements

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Table 9.2-3
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. LGS Technical Specification 3/4.7.1.2
6. LGS Technical Specifications Bases 3/4.7.1
7. LGS Modification P00212, HPCI and RCIC Room Qualification Upgrade

**System (No):** Emergency Service Water (011)

**Component Description:** ESW To TECW HTX'S

**ID Nos.:** 11-1003, 11-2003

**P&ID/COORD** (respectively): M-11 (SHT 1) / G-8, M-11 (SHT 1) / G-2

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 4.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal_C_ Safety_N/A_ Failsafe_-_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These check valves are located in the ESW supply lines to the Turbine Enclosure Cooling Water (TECW) Heat Exchangers upstream of the motor-operated boundary isolation valves. The check valves do not perform a safety function in the open or closed positions. The valves open to allow passage of ESW flow to the non safety related TECW heat exchangers in the event of a loss of offsite power during which the normal Service Water supply would be lost. This capability is provided to maintain continuity in the TECW system while the unit is placed in a safe shutdown condition.

**Test Requirement(s):**

No testing requirements

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. System Design Baseline Document L-S-17, Service Water System
3. System Design Baseline Document L-S-02, Emergency Service Water

**System (No):** Emergency Service Water (011)

**Component Description:** ESW Supply To Units 1 and 2 ECCS Pump Compartments

**ID Nos.:** 11-1007, 11-2007, 11-1009, 11-2009

**P&ID/COORD** (respectively) : M-11 (SHT 2) / B-6, M-11 (SHT 4) / E-7, M-11 (SHT 3) / D-4, M-11 (SHT 5) / C-4

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 8.00 (U/1), 6.00 (U/2) **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal_C_ Safety_O_ Failsafe_-_

**Test Frequency (Direction):** ET-Q(F) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** Check valves 11-1007 and 11-2007 have an active safety function in the open position to provide Loop "A" ESW cooling water flow to all associated essential loads. Cooling supply during normal operation is provided by Service Water. However, startup of each ESW pump automatically initiates isolation of the ESW system from the SW system to ensure heat removal capability from a qualified cooling water supply source. Failure of these valves to open could impact the operation of multiple components due to high room temperatures in addition to RHR pump operation due to inadequate ESW cooling water flow to the motor oil cooler and shaft seal cooler. To satisfy the design heat transfer rate associated with the essential loads, 11-1007 must be capable of passing a minimum of 680 gpm in order to perform its safety function in the open position, whereas 11-2007 must be capable of passing a minimum of 80 gpm. Likewise, check valve 11-1009 has an active safety function in the open position to provide Loop "B" ESW cooling water flow to all associated essential loads. To satisfy the design heat transfer rate associated with the essential loads, this check valve must be capable of passing a minimum of 680 gpm in order to perform its safety function in the open position, whereas 11-2009 must be capable of passing a minimum of 680 gpm.

These check valves do not perform a safety function in the closed position. They do prevent diversion of Service Water to standby ESW system piping. However, the Service Water System is a non-qualified, non-safety related supply source and performs the non-safety related function of providing cooling water to plant loads during normal operation.

**Test Requirement(s):**

Quarterly exercise to the full open position.

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Table 9.2-3
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. LGS Technical Specification 3/4.7.1.2
6. LGS Technical Specifications Bases 3/4.7.1
7. LGS Modification P00212, HPCI and RCIC Room Qualification Upgrade

**System (No):** Emergency Service Water (011)

**Component Description:** Normal SW Supply To Pump Room Coolers, Units 1 and 2

**ID Nos.:** 11-1011, 11-2011, 11-1012, 11-2012

**P&ID/COORD** (respectively): M-11 (SHT 2) / C-7, M-11 (SHT 4) / E-7, M-11 (SHT 3) / E-3, M-11 (SHT 5) / C-3

**Code Class:** 3 **Category:** A/C **Active/Passive:** A

**Size:** 8.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal_OC_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-Q(R), LP-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** Check valves 11-1011 and 11-1012 have an active safety function in the closed position to prevent diversion of ESW cooling water flow supplied to essential Room coolers during accident conditions. These check valves are located in the Unit 1 Service Water supply headers which support cooling load requirements during normal operation. However, startup of each ESW pump automatically initiates isolation of the ESW system from the SW system to ensure heat removal capability from a qualified cooling water supply source. Failure of these valves to close upon ESW initiation would allow diversion of ESW flow to the non-Code, non-seismic Unit 1 Service Water piping, thereby compromising the ability of the essential room coolers to perform their design safety function due to insufficient flow for heat transference during accident or emergency conditions which result in a loss of Service Water availability. Likewise, 11-2011 and 2012 must be capable of closure to prevent ESW cooling water flow to essential components from being diverted to the non-Code, non-seismic, Unit 2 Service Water piping resulting in the same consequences discussed for Unit 1. Additionally, failure of these valves to close could compromise the ability of the Spray Pond to serve as the long term ultimate heat sink during emergency or accident conditions which result in a loss of Service Water availability. The LGS UFSAR, Section 9.2.6.1, credits the Spray Pond as the ultimate heat sink for both the ESW and RHRSW systems for at least 30 days without requiring makeup during any plant condition in which the ESW or RHRSW systems are running and utilizing the Spray Pond as a water source.

LGS UFSAR, Section 9.2.2.3, specifies that check valves used at the interface of the essential (ESW) from nonessential (SW) piping is verified to be operable and to have less than 10 gpm leakage as part of the LGS ISI Program. Leakage of this magnitude will not compromise the safety function of the ESW system. Thus, even with this leakage at each interface, the ESW system could withstand a single active failure and still perform its safety function. These check valves do not perform a safety function in the open position. The Service Water System is considered a non-qualified supply source and performs the non-safety related function of providing cooling water to plant loads during normal operation.

**Test Requirement(s):**

Quarterly exercise to the closed position and measurement of seat leakage.

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. System Design Baseline Document L-S-02, Emergency Service Water
3. System Design Baseline Document L-S-17, Service Water System
4. LGS Technical Specification 3/4.7.1.2
5. LGS Technical Specifications Bases 3/4.7.1
6. LGS Modification P00212, HPCI and RCIC Room Qualification Upgrade
7. FSAR Question 410.52

**System (No):** Emergency Service Water (011)

**Component Description:** RHR Seal Cooler Outlet Valves

**ID Nos.:** 11-1017A, 11-1017B, 11-1017C, 11-1017D,
11-2017C, 11-2017D

**P&ID/COORD** (respectively): M-11 (SHT 2) / B-4, M-11 (SHT 3) / B-6,
M-11 (SHT 2) / B-2, M-11 (SHT 3) / B-8,
M-11 (SHT 4) / D-2, M-11 (SHT 5) / B-8

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 2.00 (U1)
1.50 (U2) **Valve Type:** GL **Act. Type:** MA

**Positions:** Normal_C_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These manual valves are located on the return side of the RHR pump seal cooler. These normally closed manual valves do not perform a safety function in the open position. Seal cooling water has been determined not to be required to support the operation of the RHR pumps. If these valves were opened, the safety function of the RHR pump motor bearing oil cooler could be compromised by allowing diversion of flow to pump shaft seal cooler. The seal manufacturer, John Crane Inc., has provided an analysis which demonstrates that cooling is not required for the existing pump seals.

These valves perform a passive safety function in the closed position to prevent a partial loss of RHR pump motor bearing oil cooler supply flow.

**Test Requirement(s):**

No testing requirements

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. Licensing Document Change Notice (LDCN) L-00648
3. UFSAR Change, UFSARCN L-00648
4. 10CFR50.59 Review For UFSARCN L-00648
5. System Design Baseline Document L-S-02, Emergency Service Water

**System (No):** Emergency Service Water (011)

**Component Description:** ESW To RECW HTX'S

**ID Nos.:** 11-1043, 11-2043

**P&ID/COORD** (respectively): M-11 (SHT 3) / D-3, M-11 (SHT 4) / B-5

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 10.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal C Safety N/A Failsafe -

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These check valves are located in the ESW supply lines to the Reactor Enclosure Cooling Water (RECW) Heat Exchangers upstream of the air-operated boundary isolation valves. The check valves do not perform a safety function in the open or closed positions. The valves open to allow passage of ESW flow to the non safety related RECW heat exchangers in the event of a loss of offsite power during which the normal Service Water supply would be lost. This capability is provided to maintain continuity in the RECW system while the unit is placed in a safe shutdown condition.

**Test Requirement(s):**

No testing requirements

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. System Design Baseline Document L-S-17, Service Water System
3. System Design Baseline Document L-S-02, Emergency Service Water

**System (No):** Emergency Service Water (011)

**Component Description:** ESW Return From RECW HTX'S

**ID Nos.:** 11-1044, 11-2044

**P&ID/COORD** (respectively): M-11 (SHT 3) / B-3, M-11 (SHT 4) / B-6

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 10.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal_C_ Safety_N/A_ Failsafe_-_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These check valves are located in the ESW return lines from the Reactor Enclosure Cooling Water (RECW) Heat Exchangers downstream of the air-operated boundary isolation valves. The valves do not perform a safety function in the open or closed positions. These valves do provide self actuated isolation capability in addition to the upstream power operated valve. However, by design the check valve is not credited as satisfying single active failure criteria. The upstream power operated boundary valve provides adequate isolation capability between the ESW and RECW. These power operated valves fail to the closed position upon loss of electric power, thereby satisfying single failure criteria during a loss of offsite power.

These check valves do not perform a safety function in the open position. They do provide an ESW return flow path from the non essential RECW heat exchangers. However, the RECW heat exchangers are not required for accident mitigation.

**Test Requirement(s):**

No test requirements

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. System Design Baseline Document L-S-17, Service Water System
3. System Design Baseline Document L-S-27, Spray Pond
4. System Design Baseline Document L-S-02, Emergency Service Water

**System (No):** Emergency Service Water (011)

**Component Description:** ESW To Diesel Gen HTX'S (Loop "A" Primary Supply)

**ID Nos.:** 11-1131A, 11-1131C

**P&ID/COORD** (respectively): M-11 (SHT 1) / D-6, D-6

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 6 **Valve Type:** BF **Act. Type:** MA

**Positions:** Normal LO Safety O Failsafe -

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These locked-open manually-operated butterfly valves are located in the normally aligned ESW Loop "A" supply to Diesel Generators D11 and D13 heat exchangers. These valves perform an active safety function in the open position to allow flow to the associated diesel generator heat exchangers subsequent to engine start.

These valves do not perform a safety function in the closed position. The alternate supply loop, ESW Loop "B", is not required to provide flow to achieve or maintain cold shutdown or to mitigate the consequences of an accident. The alternate supply loop isolation valves are maintained in the closed position. Therefore, diversion of flow from the alternate loop through these manual valves is not a concern.

These valves are not equipped with remote position indication.

**Test Requirement(s):**

No testing requirements.

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Table 9.2-4, ESW System Failure Modes and Effects Analysis
3. UFSAR Table 9.5.5, Diesel Generator Cooling Water System
4. System Design Baseline Document L-S-02, Emergency Service Water
5. LGS Technical Specification 3/4.7.1.2
6. LGS Technical Specification 3.8.1.1
7. ECR LG 99-01416

**System (No):** Emergency Service Water (011)

**Component Description:** ESW To Diesel Gen HTX'S (Loop "B" Primary Supply)

**ID Nos.:** 11-1133B, 11-1133D

**P&ID/COORD** (respectively): M-11 (SHT 1) / D-5, D-5

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 6 **Valve Type:** BF **Act. Type:** MA

**Positions:** Normal_LO_ Safety_O_ Failsafe_-_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These locked-open manually-operated butterfly valves are located in the normally aligned ESW Loop "B" supply to Diesel Generators D12 and D14 heat exchangers. These valves perform an active safety function in the open position to allow flow to the associated diesel generator heat exchangers subsequent to engine start.

These valves do not perform a safety function in the closed position. The alternate supply loop, ESW Loop "A", is not required to provide flow to achieve or maintain cold shutdown or to mitigate the consequences of an accident. The alternate supply loop isolation valves are maintained in the closed position. Therefore, diversion of flow from the alternate loop through these manual valves is not a concern.

These valves are not equipped with remote position indication.

**Test Requirement(s):**

No testing requirements.

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Table 9.2-4, ESW System Failure Modes and Effects Analysis
3. UFSAR Table 9.5.5, Diesel Generator Cooling Water System
4. System Design Baseline Document L-S-02, Emergency Service Water
5. LGS Technical Specification 3/4.7.1.2
6. LGS Technical Specification 3.8.1.1
7. ECR LG 99-01416

**System (No):** Emergency Service Water (011)

**Component Description:** ESW Loops "A" and "B" Return to Spray Pond via RHRSW Loops "A" and "B"

**ID Nos.:** HV-11-011A, HV-11-011B, HV-11-015B

**P&ID/COORD** (respectively): M-11 (SHT 1) / E-8, M-11 (SHT 1) / E-8, M-11 (SHT 1) / E-1

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 20.00 **Valve Type:** BF **Act. Type:** MO

**Positions:** Normal_O_ Safety_O_ Failsafe_AI_

**Test Frequency (Direction):** PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** Motor operated butterfly valves, HV-11-011A (Loop "A"), HV-11-011B and HV-11-015B (Loop "B"), are located in the ESW return to the Spray Pond via the RHRSW system return piping. These normally open valves perform a passive safety function in the open position to provide a return flow path for their respective loop.

These valves do not perform a safety function in the closed position. Sufficient isolation capabilities between ESW return headers is provided by HV-11-015A. Control circuitry for HV-11-011B is provided to allow actuation from the remote shutdown panel. However, closure of HV-11-011B would be required only during certain Appendix R fire safe shutdown scenarios which is outside the scope of ASME Section XI testing.

**Test Requirement(s):**

Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. UFSAR Section 9.2.3, RHR Service Water System
4. System Design Baseline Document L-S-02, Emergency Service Water
5. System Design Baseline Document L-S-17, Service Water System
6. System Design Baseline Document L-S-04, RHR Service Water System
7. System Design Baseline Document L-S-27, Spray Pond
8. LGS Technical Specification 3/4.7.1.2
9. LGS Technical Specification 3/4.7.1.3
10. LGS Technical Specification Table 3.3.7.4-1
11. NCR LG 93-00335
12. ECR LG 95-00271

**System (No):** Emergency Service Water (011)

**Component Description:** ESW Loop "A" Return To Spray Pond via RHRSW Loop "B"

**ID Nos.:** HV-11-015A

**P&ID/COORD** (respectively): M-11 (SHT 1) / E-2

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 20.00 **Valve Type:** BF **Act. Type:** MO

**Positions:** Normal_O_ Safety_C_ Failsafe_AI_

**Test Frequency (Direction):** ET-Q, ST-Q(C) PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** Motor operated butterfly valve HV-11-15A (Loop "A") is located in the ESW return header to the Spray Pond by the RHRSW system return piping. This normally open valve performs an active safety function in the closed position to provide isolation capabilities between ESW and RHRSW return headers. UFSAR Section 9.2.3.2 credits the redundant loop return header as providing the capability of the second return loop to safety shut down either or both units during emergency conditions upon loss of one RHRSW/ESW return loop. Failure of this valve to close could allow return flow to a nonoperating portion of the Spray Pond. This may result in exceeding the Tech Spec pond water temperature limit of 88 °F, thereby affecting the design heat transfer rate of the ESW system as the essential components require a cooling water inlet temperature of < 95 °F to perform their design safety function. Additionally, HV-11-15A receives a close signal from the remote shutdown panel and automatically closes when the transfer switch is actuated.

This valve performs a passive safety function in the open position. Should valve closure be required due to a loss of a return loop, repositioning to the open position would not be required to facilitate achieving a cold shutdown condition and maintaining that condition.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the closed position
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. UFSAR Section 9.2.3, RHR Service Water System
4. System Design Baseline Document L-S-02, Emergency Service Water
5. System Design Baseline Document L-S-17, Service Water System
6. System Design Baseline Document L-S-04, RHR Service Water System
7. System Design Baseline Document L-S-27, Spray Pond
8. LGS Technical Specification 3/4.7.1.2
9. LGS Technical Specification 3/4.7.1.3
10. LGS Technical Specification Table 3.3.7.4-1
11. NCR LG 93-00335
12. ECR LG 95-00271

**System (No):** Emergency Service Water (011)

**Component Description:** Unit 1 DIV 1 SFGD Equip A Return

**ID Nos.:** HV-11-041, HV-11-071

**P&ID/COORD** (respectively): M-11 (SHT 2) / A-6, M-11 (SHT 2) / A-5

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 8.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal_C_ Safety_O_ Failsafe_O_

**Test Frequency (Direction):** ET-Q, ST-Q(O) FS-Q(O), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-open valves are located in the Loop "A" ESW return from Unit 1 ECCS/RCIC room coolers and the main Control Room chillers. These normally closed valves perform an active safety function in the open position to provide an ESW return flow path to the Spray Pond, thereby allowing proper heat transference for various safety related components. Valve, HV-11-041, receives a signal to automatically open upon start of ESW pump "A"; and valve, HV-11-071, receives a signal to automatically open upon start of ESW pump "C". This design feature ensures a return flow path for ESW exists regardless of which pump starts in ESW Loop "A". Pump start is determined by which diesel generator receives a start signal (i.e. "A" pump starts with "A" diesel, "C" pump starts with "C" diesel, etc.). During normal plant operation cooling water is supplied by the Service Water System. However, this non-qualified, non-safety related source, both supply and return, is automatically isolated upon starting the ESW pumps. Failure of these valves to open, upon associated pump start, would compromise the ability of various essential components from performing their design safety function. These valves fail to the open position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the closed position. During normal plant operation the valves serve to isolate Service Water System return from ESW Loop "A" return. This alignment is inconsequential during normal operation to the components performing their safety function. The Service Water System is a non-qualified, non-safety related supply source and performs the non-safety related function of providing cooling water to plant loads during normal operation.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the open position
Quarterly fail-safe test to the open position
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. LGS Technical Specification 3/4.7.1.2

**System (No):** Emergency Service Water (011)

**Component Description:** Unit 1 HPCI Pump Room Coolers Return To ESW Loop "B"

**ID Nos.:** HV-11-042, HV-11-072

**P&ID/COORD** (respectively): M-11 (SHT 2) / F-8, M-11 (SHT 2) / F-7

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 3.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal_C_ Safety_N/A_ Failsafe_O_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-open valves are located in the Loop "B" ESW return lines from the Unit 1 HPCI pump compartment coolers. These valves do not perform a safety function in the open position. LGS Modification P-00212 relocated certain components/instruments, determined to be temperature sensitive, to a non-harsh environment whereby room temperature will not impact operation of the HPCI pump/turbine. Even though the function of the room cooler is no longer required to support HPCI pump/turbine operation, the valve interlocks still exist; valve HV-11-042 receives a signal to automatically open upon start of ESW pump "B", and valve HV-11-072 receives a signal to automatically open upon start of ESW pump "D". These valves fail to the open position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the closed position. During normal plant operation the valves serve to isolate Service Water return from ESW Loop "B" return. This alignment is inconsequential during normal operation to the HPCI pump/turbine performing its safety function. The Service Water System is a non-qualified, non-safety related supply source and performs the non-safety related function of providing cooling water to plant loads during normal operation.

**Test Requirement(s):**

No testing requirements

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. LGS Technical Specification 3/4.7.1.2
7. LGS Modification P00212, HPCI and RCIC Room Qualification Upgrade

**System (No):** Emergency Service Water (011)

**Component Description:** HPCI Pump Room Cooler Return To SW (Unit 1 Ret U/1 SW)

**ID Nos.:** HV-11-043, HV-11-073

**P&ID/COORD** (respectively): M-11 (SHT 2) / E-8, M-11 (SHT 2) / D-8

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 3.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal_O_ Safety_C_ Failsafe_C_

**Test Frequency (Direction):** ET-Q, ST-Q(C)
FS-Q(C), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-closed valves are located in the Unit 1 SW return lines from the Unit 1 HPCI pump compartment coolers. These normally open valves perform an active safety function in the closed position to provide automatic isolation between ESW Loop "B" return flow path and the non-safety, non-seismic Unit 1 SW system. Even though the function of the room cooler is no longer required to support HPCI pump/turbine operation, the valve interlocks still exist; valve HV-11-043 receives a signal to automatically close upon start of ESW pump "B", and valve HV-11-073 receives a signal to automatically close upon start of ESW pump "D". This design feature ensures SW return isolation regardless of which pump starts in ESW Loop "B". During normal plant operation cooling water is supplied by the Service Water System. However, this non-qualified, non-safety related source, both supply and return, is automatically isolated upon starting the ESW pumps. Failure of these valves to close upon associated pump start could allow diversion of ESW Loop "B" return flow to the non-seismic SW system. A loss of ESW return flow would compromise the ability of the Spray Pond to serve as the long term ultimate heat sink during emergency or accident conditions. The LGS UFSAR, Section 9.2.6.1, credits the Spray Pond as the ultimate heat sink for both the ESW and RHRSW systems for at least 30 days without requiring makeup during any plant condition in which the ESW or RHRSW systems are running and utilizing the Spray Pond as a water source. These valves fail to the closed position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the open position. During normal plant operation the valves serve to provide a return flow path for cooling water any time the Unit 1 HPCI pump compartment coolers are placed in operation without cooling water being supplied by Loop "B" ESW.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the closed position
Quarterly fail-safe test to the closed position
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. LGS Technical Specification 3/4.7.1.2
7. LGS Modification P00212, HPCI and RCIC Room Qualification Upgrade

**System (No):** Emergency Service Water (011)

**Component Description:** Unit 1 DIV 2 SFGD Equip ESW "B" Return (Unit 1 Return)

**ID Nos.:** HV-11-044, HV-11-074

**P&ID/COORD** (respectively): M-11 (SHT 3) / C-4, M-11 (SHT 3) / C-4

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 8.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal C Safety O Failsafe O

**Test Frequency (Direction):** ET-Q, ST-Q(O) FS-Q(O), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-open valves are located in the Loop "B" ESW return from Unit 1 safeguard equipment. These normally closed valves perform an active safety function in the open position to provide an ESW return flow path to the Spray Pond, thereby allowing proper heat transference for various safety related components. Valve HV-11-044 receives a signal to automatically open upon start of ESW pump "B"; valve HV-11-074 receives a signal to automatically open upon start of ESW pump "D". This design feature ensures an ESW return flow path exists regardless of which pump starts in ESW Loop "B". Pump start is determined by which diesel generator receives a start signal (i.e. "B" pump starts with "B" diesel, "D" pump starts with "D" diesel, etc.). During normal plant operation cooling water is supplied by the Service Water System. However, this non-qualified, non-safety related source, both supply and return, is automatically isolated upon starting the ESW pumps. Failure of these valves to open upon associated pump start would compromise the ability of various essential components to perform their design safety function. These valves fail to the open position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the closed position. During normal plant operation the valves serve to isolate Service Water return from ESW Loop "B" return. This alignment is inconsequential during normal operation to the components performing their safety function. The Service Water System is a non-qualified, non-safety related supply source and performs the non-safety related function of providing cooling water to plant loads during normal operation.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the open position
Quarterly fail-safe test to the open position
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. LGS Technical Specification 3/4.7.1.2

**System (No):** Emergency Service Water (011)

**Component Description:** "A" Loop ESW Return From U/2 SFGD Equip Room Coolers (Unit 2 Return)

**ID Nos.:** HV-11-046, HV-11-076

**P&ID/COORD** (respectively): M-11 (SHT 4) / B-7, M-11 (SHT 4) / B-6

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 6.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal_C_ Safety_O_ Failsafe_O_

**Test Frequency (Direction):** ET-Q, ST-Q(O) FS-Q(O), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-open valves are located in the Loop "A" ESW return from Unit 2 safeguard equipment pump room coolers. These normally closed valves perform an active safety function in the open position to provide an ESW return flow path to the Spray Pond, thereby allowing proper heat transference for various safety related motor/pump room coolers. Valve HV-11-046 receives a signal to automatically open upon start of ESW pump "A"; and valve HV-11-076 receives a signal to automatically open upon start of ESW pump "C". This design feature ensures an ESW return flow path exists regardless of which pump starts in ESW Loop "A". Pump start is determined by which diesel generator receives a start signal (i.e. "A" pump starts with "A" diesel, "C" pump starts with "C" diesel, etc.). During normal plant operation cooling water is supplied by the Service Water System. However, this non-qualified, non-safety related source, both supply and return, is automatically isolated upon starting the ESW pumps. Failure of these valves to open upon associated pump start would compromise the ability of various essential components to perform their design safety function. These valves fail to the open position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the closed position. During normal plant operation the valves serve to isolate Service Water return from ESW Loop "A" return. This alignment is inconsequential during normal operation to the components performing their safety function. The Service Water System is a non-qualified, non-safety related supply source and performs the non-safety related function of providing cooling water to plant loads during normal operation.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the open position
Quarterly fail-safe test to the open position
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. LGS Technical Specification 3/4.7.1.2

**System (No):** Emergency Service Water (011)

**Component Description:** "B" Loop ESW Return From U/2 SFGD Equip Room Coolers (Unit 2 Return)

**ID Nos.:** HV-11-047, HV-11-077

**P&ID/COORD** (respectively): M-11 (SHT 5) / B-4, M-11 (SHT 5) / B-4

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 6.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal_C_ Safety_O_ Failsafe_O_

**Test Frequency (Direction):** ET-Q, ST-Q(O) FS-Q(O), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-open valves are located in the Loop "B" ESW return from Unit 2 safeguard equipment pump room coolers. These normally closed valves perform an active safety function in the open position to provide a return flow path to the Spray Pond, thereby allowing proper heat transference for various safety related room coolers. Valve HV-11-047 receives a signal to automatically open upon start of ESW pump "B"; valve HV-11-077 receives a signal to automatically open upon start of ESW pump "D". This design feature ensures an ESW return flow path exists regardless of which pump starts in ESW Loop "B". Pump start is determined by which diesel generator receives a start signal (i.e. "B" pump starts with "B" diesel, "D" pump starts with "D" diesel, etc.). During normal plant operation, cooling water is supplied by the Service Water System. However, this non-qualified, non-safety related source, both supply and return, is automatically isolated upon starting the ESW pumps. Failure of these valves to open upon associated pump start would compromise the ability of various essential components to perform their design safety function. These valves fail to the open position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the closed position. During normal plant operation the valves serve to isolate Service Water return from ESW Loop "B" return. This alignment is inconsequential during normal operation to the components performing their safety function. The Service Water System is a non-qualified, non-safety related supply source and performs the non-safety related function of providing cooling water to plant loads during normal operation.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the open position
Quarterly fail-safe test to the open position
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. LGS Technical Specification 3/4.7.1.2

**System (No):** Emergency Service Water (011)

**Component Description:** U/2 RCIC Room Cooler SW Return (Unit 2 Ret U/2 SW)

**ID Nos.:** HV-11-048, HV-11-078

**P&ID/COORD** (respectively): M-11 (SHT 5) / C-3, M-11 (SHT 5) / C-3

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 2.00 **Valve Type:** GL **Act. Type:** AO

**Positions:** Normal_O_ Safety_C_ Failsafe_C_

**Test Frequency (Direction):** ET-Q, ST-Q(C) FS-Q(C), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-closed valves are located in the Unit 2 SW return lines from the Unit 2 RCIC pump compartment coolers. These normally open valves perform an active safety function in the closed position to provide automatic isolation between ESW Loop "A" return flow path and the non-safety, non-seismic Unit 2 SW system. Even though the function of the room cooler is no longer required to support RCIC pump/turbine operation, the valve interlocks still exist; valve HV-11-048 receives a signal to automatically close upon start of ESW pump "A", and valve HV-11-078 receives a signal to automatically close upon start of ESW pump "C". This design feature ensures SW return isolation regardless of which pump starts in ESW Loop "A". During normal plant operation cooling water is supplied by the Service Water System. However, this non-qualified, non-safety related source, both supply and return, is automatically isolated upon starting the ESW pumps. Failure of either valve to close upon associated pump start could allow diversion of ESW Loop "A" return flow to a faulted non-seismic SW system. A loss of ESW return flow would compromise the ability of the Spray Pond to serve as the long term ultimate heat sink during emergency or accident conditions. The LGS UFSAR, Section 9.2.6.1, credits the Spray Pond as the ultimate heat sink for both the ESW and RHRSW systems for at least 30 days without requiring makeup during any plant condition in which the ESW or RHRSW systems are running and utilizing the Spray Pond as a water source. These valves fail to the closed position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the open position. During normal plant operation the valves serve to provide a return flow path for cooling water any time the Unit 2 RCIC pump compartment coolers are placed in operation without cooling water being supplied by Loop "A" ESW.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the closed position
Quarterly fail-safe test to the closed position
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. LGS Technical Specification 3/4.7.1.2
7. LGS Modification P00212, HPCI and RCIC Room Qualification Upgrade

**System (No):** Emergency Service Water (011)

**Component Description:** U/2 RCIC Room Cooler ESW Return Loop "A" (Unit 2 Ret Loop "A")

**ID Nos.:** HV-11-049, HV-11-079

**P&ID/COORD** (respectively): M-11 (SHT 5) / D-2, M-11 (SHT 5) / D-2

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 2.00 **Valve Type:** GL **Act. Type:** AO

**Positions:** Normal _C_ Safety _N/A_ Failsafe _O_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-open valves are located in the Loop "A" ESW return lines from the Unit 2 RCIC pump compartment coolers. These normally closed valves do not perform a safety function in the open position. LGS Modification P-00212 evaluated certain components/instruments, and determined room temperature will not impact operation of the RCIC pump/turbine. This modification results in the RCIC system not requiring room cooling for operability. Even though the function of the room cooler is no longer required to support RCIC pump/turbine operation, the valve interlocks still exist; valve HV-11-049 receives a signal to automatically open upon start of ESW pump "A", and valve HV-11-079 receives a signal to automatically open upon start of ESW pump "C". These valves fail to the open position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the closed position. During normal plant operation the valves serve to isolate Service Water return from ESW Loop "A" return. This alignment is inconsequential during normal operation to the RCIC pump/turbine performing its safety function. The Service Water System is a non-qualified, non-safety related supply source and performs the non-safety related function of providing cooling water to plant loads during normal operation.

**Test Requirement(s):**

No testing requirements

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. LGS Technical Specification 3/4.7.1.2
7. LGS Modification P00212, HPCI and RCIC Room Qualification Upgrade

**System (No):** Emergency Service Water (011)

**Component Description:** Control Room Chiller "A" Return To U/2 SW (Return Unit 2 SW)

**ID Nos.:** HV-11-051A, HV-11-055A

**P&ID/COORD** (respectively): M-11 (SHT 2) / G-3, M-11 (SHT 2) / G-3

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 6.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal O Safety C Failsafe C

**Test Frequency (Direction):** ET-Q, ST-Q(C) FS-Q(C), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-closed valves are located in the Unit 2 SW return line from the Control Room Chiller, 0AK112. These normally open valves perform an active safety function in the closed position to provide automatic isolation between ESW Loop "A" return flow path and the non-safety, non-seismic Unit 2 SW system. Valve HV-11-051A receives a signal to automatically close upon start of ESW pump "A"; valve HV-11-055A receives a signal to automatically close upon start of ESW pump "C". This design feature ensures SW return isolation regardless of which pump starts in ESW Loop "A". During normal plant operation cooling water is supplied by the Service Water System. However, this non-qualified, non-safety related source, both supply and return, is automatically isolated upon starting the ESW pumps. Failure of either valve to close upon associated pump start could allow diversion of ESW Loop "A" return flow to a faulted non-seismic SW system. A loss of ESW return flow would compromise the ability of the Spray Pond to serve as the long term ultimate heat sink during emergency or accident conditions. The LGS UFSAR, Section 9.2.6.1 credits the Spray Pond as the ultimate heat sink for both the ESW and RHRSW systems for at least 30 days without requiring makeup during any plant condition in which the ESW or RHRSW systems are running and utilizing the Spray Pond as a water source. These valves fail to the closed position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the open position. During normal plant operation the valves serve to provide a return flow path for cooling water any time the Control Room Chiller "A" is placed in operation outside Design Basis Events.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the closed position
Quarterly fail-safe test to the closed position
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. LGS Technical Specification 3/4.7.1.2

**System (No):** Emergency Service Water (011)

**Component Description:** Control Room Chiller "B" Return To U/2 SW (Return Unit 2 SW)

**ID Nos.:** HV-11-051B, HV-11-055B

**P&ID/COORD** (respectively): M-11 (SHT 2) / E-3, M-11 (SHT 2) / E-3

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 6.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal_O_ Safety_C_ Failsafe_C_

**Test Frequency (Direction):** ET-Q, ST-Q(C) FS-Q(C), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-closed valves are located in the Unit 2 SW return line from the Control Room Chiller, 0BK112. These normally open valves perform an active safety function in the closed position to provide automatic isolation between ESW Loop "B" return flow path and the non-safety, non-seismic Unit 2 SW system. Valve HV-11-051B receives a signal to automatically close upon start of ESW pump "B"; valve HV-11-055B receives a signal to automatically close upon start of ESW pump "D". This design feature ensures SW return isolation regardless of which pump starts in ESW Loop "B". During normal plant operation cooling water is supplied by the Service Water System. However, this non-qualified, non-safety related source, both supply and return, is automatically isolated upon starting the ESW pumps. Failure of either valve to close upon associated pump start could allow diversion of ESW Loop "B" return flow to a faulted non-seismic SW system. A loss of ESW return flow would compromise the ability of the Spray Pond to serve as the long term ultimate heat sink during emergency or accident conditions. The LGS UFSAR, Section 9.2.6.1, credits the Spray Pond as the ultimate heat sink for both the ESW and RHRSW systems for at least 30 days without requiring makeup during any plant condition in which the ESW or RHRSW systems are running and utilizing the Spray Pond as a water source. These valves fail to the closed position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the open position. During normal plant operation the valves serve to provide a return flow path for cooling water any time the associated essential components are placed in operation outside Design Basis Events.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the closed position
Quarterly fail-safe test to the closed position
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. LGS Technical Specification 3/4.7.1.2

**System (No):** Emergency Service Water (011)

**Component Description:** Control Room Chiller "A" Return To ESW Loop "A" (Return Unit 1 Loop "A")

**ID Nos.:** HV-11-052A, HV-11-054A

**P&ID/COORD** (respectively): M-11 (SHT 2) / H-3, M-11 (SHT 2) / H-4

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 6.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal_C_ Safety_O_ Failsafe_O_

**Test Frequency (Direction):** ET-Q, ST-Q(O) FS-Q(O), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-open valves are located in the Loop "A" ESW return from Control Room Chiller, 0AK112. These normally closed valves perform an active safety function in the open position to provide a path for ESW Loop"A" return flow to the Spray Pond, thereby allowing proper heat transference for Control Room Chiller, 0AK112. Valve HV-11-052A receives a signal to automatically open upon start of ESW pump "C"; valve HV-11-054A receives a signal to automatically open upon start of ESW pump "A". This design feature ensures an ESW return flow path exists regardless of which pump starts in ESW Loop "A". During normal plant operation cooling water is supplied by the Service Water System. However, this non-qualified, non-safety related source, both supply and return, is automatically isolated upon starting the ESW pumps. Failure of these valves to open upon associated pump start,would compromise the ability of Control Room Chiller 0AK112 to perform its design safety function. These valves fail to the open position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the closed position. During normal plant operation the valves are closed to isolate ESW Loop "A" from Unit 2 Service Water. The Service Water System is a non-qualified, non-safety related supply source and performs the non-safety related function of providing cooling water to plant loads during normal operation.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the open position
Quarterly fail-safe test to the open position
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. LGS Technical Specification 3/4.7.1.2

**System (No):** Emergency Service Water (011)

**Component Description:** Control Room Chiller "B" Return To ESW Loop "B" (Return Unit 1 Loop "B")

**ID Nos.:** HV-11-052B, HV-11-054B

**P&ID/COORD** (respectively): M-11 (SHT 2) / E-3, M-11 (SHT 2) / E-4

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 6.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal_C_ Safety_O_ Failsafe_O_

**Test Frequency (Direction):** ET-Q, ST-Q(O) FS-Q(O), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-open valves are located in the Loop "B" ESW return from Control Room Chiller, 0BK112. These normally closed valves perform an active safety function in the open position to provide a path for ESW Loop "B" return flow to the Spray Pond, thereby allowing proper heat transference for Control Room Chiller, 0BK112. Valve HV-11-052B receives a signal to automatically open upon start of ESW pump "D"; valve HV-11-054B receives a signal to automatically open upon start of ESW pump "B". This design feature ensures an ESW return flow path exists regardless of which pump starts in ESW Loop "B". During normal plant operation cooling water is supplied by the Service Water System. However, this non-qualified, non-safety source, both supply and return, is automatically isolated upon starting the ESW pumps. Failure of these valves to open upon associated pump start would compromise the ability of Control Room Chiller 0BK112 to perform its design safety function. These valves fail to the open position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the closed position. During normal plant operation the valves are closed to isolate ESW Loop "B" from Unit 2 Service Water. The Service Water System is a non-qualified, non-safety related supply source and performs the non-safety related function of providing cooling water to plant loads during normal operation.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the open position
Quarterly fail-safe test to the open position
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. LGS Technical Specification 3/4.7.1.2

**System (No):** Emergency Service Water (011)

**Component Description:** CS Pump Room Cooler Supply Valve (Unit 1 Coolers "A" thru "H")

**ID Nos.:** HV-11-101A, HV-11-101B, HV-11-101C, HV-11-101D, HV-11-101E, HV-11-101F, HV-11-101G, HV-11-101H

**P&ID/COORD** (respectively): M-11 (SHT 2) / F-5, M-11 (SHT 3) / F-5, M-11 (SHT 2) / G-5, M-11 (SHT 3) / G-5, M-11 (SHT 2) / G-5, M-11 (SHT 3) / F-5, M-11 (SHT 2) / H-5, M-11 (SHT 3) / G-5

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 2.00 **Valve Type:** GL **Act. Type:** AO

**Positions:** Normal_C_ Safety_O_ Failsafe_O_

**Test Frequency (Direction):** ET-Q, ST-Q(O) FS-Q(O) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-open valves are located in the ESW supply to the Unit 1 Core Spray Pump Compartment Unit Coolers. These normally closed valves have an active safety function in the open position to allow ESW cooling water flow through the associated pump room cooler. These valves are interlocked to open automatically upon initiation of unit cooler fan operation. The fans automatically start on either high pump room temperature or subsequent to a CS pump start. Failure of one of these valves to open upon associated fan start would result in elevated room temperatures, should the redundant cooler also fail. Elevated room temperatures could compromise the extended operability of the Core Spray pumps. Redundant coolers are provided for pump room cooling. If the lead cooler in any pump compartment degrades to the point that room temperatures exceed desired levels, the redundant cooler will automatically start. In the event that both coolers degrade to the point that the compartments cannot be effectively cooled, high compartment temperatures will be annunciated in the Control Room. At which point, corrective action will be implemented to reduce compartment temperature. These valves fail to the open position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the closed position. During normal plant operation the valves are maintained closed isolating SW/ESW from the coolers. This is a standby condition not associated with the safety function of the cooler.

These valves are not provided with remote position indication.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the open position
Quarterly fail-safe test to the open position

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. System Design Baseline Document L-S-08C, Reactor Enclosure HVAC System
7. LGS Technical Specification 3/4.7.1.2

**System (No):** Emergency Service Water (011)

**Component Description:** CS Pump Room Cooler Supply Valve (Unit 2 Coolers "A" thru "H")

**ID Nos.:** HV-11-201A, HV-11-201B, HV-11-201C, HV-11-201D, HV-11-201E, HV-11-201F, HV-11-201G, HV-11-201H

**P&ID/COORD** (respectively): M-11 (SHT 4) / F-5, M-11 (SHT 5) / F-6,
M-11 (SHT 4) / G-5, M-11 (SHT 5) / G-6,
M-11 (SHT 4) / G-5, M-11 (SHT 5) / G-6,
M-11 (SHT 4) / H-5, M-11 (SHT 5) / H-6

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 2.00 **Valve Type:** GL **Act. Type:** AO

**Positions:** Normal_C_ Safety_O_ Failsafe_O_

**Test Frequency (Direction):** ET-Q, ST-Q(O) FS-Q(O) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-open valves are located in the ESW supply to the Unit 2 Core Spray Pump Compartment Unit Coolers. These normally closed valves have an active safety function in the open position to allow ESW cooling water flow through the associated pump room cooler. These valves are interlocked to open automatically upon initiation of unit cooler fan operation. The fans automatically start on either high pump room temperature or subsequent to a CS pump start. Failure of one of these valves to open upon associated fan start would result in elevated room temperatures, should the redundant cooler also fail. Elevated room temperatures could compromise the extended operability of the Core Spray pumps. Redundant coolers are provided for pump room cooling. If the lead cooler in any pump compartment degrades to the point that room temperatures exceed desired levels, the redundant cooler will automatically start. In the event that both coolers degrade to the point that the compartments cannot be effectively cooled, high compartment temperatures will be annunciated in the Control Room. At which point, corrective action will be implemented to reduce compartment temperature. These valves fail to the open position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the closed position. During normal plant operation the valves are maintained closed isolating SW/ESW from the coolers. This is a standby condition not associated with the safety function of the cooler.

These valves are not provided with remote position indication.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the open position
Quarterly fail-safe test to the open position

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. System Design Baseline Document L-S-08C, Reactor Enclosure HVAC System
7. LGS Technical Specification 3/4.7.1.2

**System (No):** Emergency Service Water (011)

**Component Description:** HPCI Pump Room Cooler Supply Valve (Unit 1 and 2 Coolers "A" and "B")

**ID Nos.:** HV-11-103A, HV-11-103B, HV-11-203A, HV-11-203B

**P&ID/COORD** (respectively): M-11 (SHT 2) / E-5, M-11 (SHT 2) / E-5, M-11 (SHT 5) / E-6, M-11 (SHT 5) / F-6

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 2.00 **Valve Type:** GL **Act. Type:** AO

**Positions:** Normal_C_ Safety_N/A_ Failsafe_O_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-open valves are located in the ESW supply to the Unit 1 and 2 HPCI Pump Compartment Unit Coolers. These normally closed valves do not perform a safety function in the open position. LGS Modification P-00212 relocated certain components/instruments, determined to be temperature sensitive, to a non-harsh environment whereby room temperature will not impact operation of the HPCI pump/turbine. This modification results in the HPCI not requiring room cooling for operability. Even though the function of the room cooler is no longer required to support HPCI pump/turbine operation, the valves are still interlocked to open automatically upon initiation of Unit Cooler Fan operation. These valves fail to the open position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the closed position. During normal plant operation the valves are maintained closed isolating Service Water from the coolers. Maintaining these valves in the closed position has no impact on ESW or HPCI pump/turbine operability.

**Test Requirement(s):**

No test requirements

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. System Design Baseline Document L-S-08C, Reactor Enclosure HVAC System
7. LGS Technical Specification 3/4.7.1.2
8. LGS Modification P00212, HPCI and RCIC Room Qualification Upgrade

**System (No):** Emergency Service Water (011)

**Component Description:** RHR Pump Room Cooler Supply Valve (Unit 1 Coolers "A" thru "H")

**ID Nos.:** HV-11-104A, HV-11-104B, HV-11-104C, HV-11-104D, HV-11-104E, HV-11-104F, HV-11-104G, HV-11-104H

**P&ID/COORD** (respectively): M-11 (SHT 2) / C-5, M-11 (SHT 3) / C-5, M-11 (SHT 2) / C-3, M-11 (SHT 3) / C-7, M-11 (SHT 2) / B-5, M-11 (SHT 3) / B-5, M-11 (SHT 2) / B-3, M-11 (SHT 3) / B-7

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 4.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal C Safety O Failsafe O

**Test Frequency (Direction):** ET-Q, ST-Q(O) FS-Q(O) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-open valves are located in the ESW supply to the Unit 1 RHR Pump Compartment Unit Coolers. These normally closed valves have an active safety function in the open position to allow ESW cooling water flow through the associated pump room cooler. These valves are interlocked to open automatically upon initiation of Unit Cooler Fan operation. The fans automatically start on either high pump room temperature or subsequent to a RHR pump start. Failure of one of these valves to open upon associated fan start would result in elevated room temperatures should the redundant cooler also fail. Elevated room temperatures could compromise the extended operability of the RHR pumps. Redundant coolers are provided for pump room cooling. If the lead cooler in any pump compartment degrades to the point that room temperatures exceed desired levels, the redundant cooler will automatically start. In the event that both coolers degrade to the point that the compartments cannot be effectively cooled, high compartment temperatures will be annunciated in the Control Room. At which point, corrective action will be implemented to reduce compartment temperature. These valves fail to the open position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the closed position. During normal plant operation the valves are maintained closed isolating SW/ESW from the coolers. This is a standby condition not associated with the safety function of the cooler.

These valves are not provided with remote position indication.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the open position
Quarterly fail-safe test to the open position

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. System Design Baseline Document L-S-08C, Reactor Enclosure HVAC System
7. LGS Technical Specification 3/4.7.1.2

**System (No):** Emergency Service Water (011)

**Component Description:** RHR Pump Room Cooler Supply Valve (Unit 2 Coolers "A" thru "H")

**ID Nos.:** HV-11-204A, HV-11-204B, HV-11-204C, HV-11-204D, HV-11-204E, HV-11-204F, HV-11-204G, HV-11-204H

**P&ID/COORD** (respectively): M-11 (SHT 4) / E-5, M-11 (SHT 5) / C-5, M-11 (SHT 4) / E-3, M-11 (SHT 5) / C-7, M-11 (SHT 4) / D-5, M-11 (SHT 5) / C-5, M-11 (SHT 4) / D-3, M-11 (SHT 5) / C-7,

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 4.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal_C_ Safety_O_ Failsafe_O_

**Test Frequency (Direction):** ET-Q, ST-Q(O) FS-Q(O) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-open valves are located in the ESW supply to the Unit 2 RHR Pump Compartment Unit Coolers. These normally closed valves have an active safety function in the open position to allow ESW cooling water flow through the associated pump room cooler. These valves are interlocked to open automatically upon initiation of Unit Cooler Fan operation. The fans automatically start on either high pump room temperature or subsequent to a RHR pump start. Failure of one of these valves to open upon associated fan start could result in elevated room temperatures should the redundant cooler also fail. Elevated room temperatures could compromise the extended operability of the RHR pumps. Redundant coolers are provided for pump room cooling. If the lead cooler in any pump compartment degrades to the point that room temperatures exceed desired levels, the redundant cooler will automatically start. In the event that both coolers degrade to the point that the compartments cannot be effectively cooled, high compartment temperatures will be annunciated in the Control Room. At which point, corrective action will be implemented to reduce compartment temperature. These valves fail to the open position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the closed position. During normal plant operation the valves are maintained closed isolating SW/ESW. This is a standby condition not associated with the safety function of the cooler.

These valves are not provided with remote position indication.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the open position
Quarterly fail-safe test to the open position

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. System Design Baseline Document L-S-08C, Reactor Enclosure HVAC System
7. LGS Technical Specification 3/4.7.1.2

**System (No):** Emergency Service Water (011)

**Component Description:** ESW To TECW HTX'S Outboard Isolation Valves

**ID Nos.:** HV-11-105, HV-11-205

**P&ID/COORD** (respectively): M-11 (SHT 1) / G-8, M-11 (SHT 1) / G-1

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 4.00 **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal_C_ Safety_N/A_ Failsafe_AI_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed, motor-operated valves are located in the ESW supply to the Turbine Enclosure Cooling Water (TECW) Heat Exchangers. These valves do not perform a safety function in the open or closed positions. Placing the valves in the open position allows the capability to supply the non-safety related TECW heat exchangers by ESW which are normally supplied cooling water flow from SW. However, the TECW heat exchangers are not required for accident mitigation.

These valves do not perform a safety function in the closed position. The valves serve as outboard isolation valves in a series valve application which provide isolation capability between the Class 3 ESW system piping and the non-Code, seismic IIA Service Water piping to the TECW heat exchangers. This non-safety related function is not required for accident mitigation due to the isolation capability provided by the normally closed upstream isolation valve HV-11-1(2)07. Utilizing one valve of a series or the inboard valve, to provide Class 3 to non-Code isolation is consistent with the boundary classification selection criteria of ANSI/ANS-52.1-1983. Instructions are provided in event procedure, E-10/20, to open these valves during a loss of offsite power to maintain continuity in the TECW system when Service Water is unavailable. However, administrative controls are procedurally provided to prevent their opening subsequent to a seismic event, thereby; preventing a loss ESW flow via a line break occurrence in the non-Code, seismic IIA Service Water System piping.

**Test Requirement(s):**

No testing requirements

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. System Design Baseline Document L-S-17, Service Water System
3. System Design Baseline Document L-S-02, Emergency Service Water
4. Site Engineering Event Procedure E-10/20, Loss Of Offsite Power
5. NCR LG 95-118, Rev. 1, Valves Not In IST Program
6. ANSI/ANS-52.1-1983, American National Standard, Nuclear Safety Criteria for the Design of Stationary Boiling Water Reactor Plants

**System (No):** Emergency Service Water (011)

**Component Description:** RCIC Pump Room Cooler Supply Valve (Unit 1 and 2 Coolers "A" and "B")

**ID Nos.:** HV-11-106A, HV-11-106B, HV-11-206A, HV-11-206B

**P&ID/COORD** (respectively): M-11 (SHT 2) / D-5, M-11 (SHT 2) / D-5, M-11 (SHT 5) / D-6, M-11 (SHT 5) / E-6

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 2.00 **Valve Type:** GL **Act. Type:** AO

**Positions:** Normal C Safety N/A Failsafe O

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-open valves are located in the ESW supply to the Unit 1 and 2 RCIC Pump Compartment Unit Coolers. These normally closed valves do not perform a safety function in the open position. LGS Modification P-00212 evaluated certain components/instruments, and determined room temperature will not impact operation of the RCIC pump/turbine. This modification results in the RCIC system being less susceptible to failure. Even though the function of the room cooler is no longer required to support RCIC pump/turbine operation, the valves are still interlocked to open automatically upon initiation of Unit Cooler Fan operation. These valves fail to the open position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the closed position. During normal plant operation the valves are maintained closed isolating Service Water from the coolers. Maintaining these valves in the closed position has no impact on ESW or RCIC pump/turbine operability.

**Test Requirement(s):**

No test requirements

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. System Design Baseline Document L-S-08C, Reactor Enclosure HVAC System
7. LGS Technical Specification 3/4.7.1.2
8. LGS Modification P00212, HPCI and RCIC Room Qualification Upgrade

**System (No):** Emergency Service Water (011)

**Component Description:** ESW To TECW HTX'S Inboard Isolation Valves

**ID Nos.:** HV-11-107, HV-11-207

**P&ID/COORD** (respectively): M-11 (SHT 1) / G-8, M-11 (SHT 1) / G-1

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 4.00 **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal_C_ Safety_C_ Failsafe_AI_

**Test Frequency (Direction):** PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed, motor-operated valves are located in the ESW supply to the Turbine Enclosure Cooling Water (TECW) Heat Exchangers. These valves do not perform a safety function in the open position. Placing the valves in the open position allows the capability to supply the non-safety related TECW heat exchangers by ESW which are normally supplied cooling water flow from SW. However, the TECW heat exchangers are not required for accident mitigation.

These valves perform a passive safety function in the closed position to prevent diversion of ESW flow from safety-related components. The valves serve as inboard isolation valves in a series valve application which provide isolation capability between the Class 3 ESW system piping and the non-Code, seismic IIA Service Water piping to the TECW heat exchangers. Instructions are provided in event procedure, E-10/20, to open these valves during a loss of offsite power to maintain continuity in the TECW system when Service Water is unavailable. However, administrative controls are procedurally provided to prevent their opening subsequent to a seismic event, thereby; preventing a loss ESW flow via a line break occurrence in the non-Code, seismic IIA Service Water System piping.

**Test Requirement(s):**

Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. System Design Baseline Document L-S-17, Service Water System
3. System Design Baseline Document L-S-02, Emergency Service Water
4. Site Engineering Event Procedure E-10/20, Loss Of Offsite Power
5. NCR LG 95-118, Rev. 1, Valves Not In IST Program

**System (No):** Emergency Service Water (011)

**Component Description:** ESW Loop "A" Return To Unit 1 Service Water (Unit 1 RET U/1 SW)

**ID Nos.:** HV-11-121, HV-11-123

**P&ID/COORD** (respectively): M-11 (SHT 2) / A-7, M-11 (SHT 2) / A-7

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 8.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal O Safety C Failsafe C

**Test Frequency (Direction):** ET-Q, ST-Q(C) FS-Q(C), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-closed valves are located in the Unit 1 SW return lines from ESW Loop "A". These normally open valves perform an active safety function in the closed position to provide automatic isolation between ESW Loop "A" return flow path and the non-safety, non-seismic Unit 1 SW system. Valve HV-11-121 receives a signal to automatically close upon start of ESW pump "A"; valve HV-11-123 receives a signal to automatically close upon start of ESW pump "C". This design feature ensures SW return isolation regardless of which pump starts in ESW Loop "A". During normal plant operation cooling water is supplied by the Service Water System. However, this non-qualified, non-safety related source, both supply and return, is automatically isolated upon starting the ESW pumps. Failure of either valve to close, upon associated pump start, could allow diversion of ESW Loop "A" return flow to a faulted non-seismic SW system. A loss of ESW return flow would compromise the ability of the Spray Pond to serve as the long term ultimate heat sink during emergency or accident conditions. The LGS UFSAR, Section 9.2.6.1, credits the Spray Pond as the ultimate heat sink for both the ESW and RHRSW systems for at least 30 days without requiring makeup during any plant condition in which the ESW or RHRSW systems are running and utilizing the Spray Pond as a water source. These valves fail to the closed position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the open position. During normal plant operation the valves serve to provide a return flow path for cooling water any time an associated pump compartment cooler is placed in operation outside Design Basis Events.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the closed position
Quarterly fail-safe test to the closed position
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. LGS Technical Specification 3/4.7.1.2

**System (No):** Emergency Service Water (011)

**Component Description:** ESW Loop "A" Return To Unit 2 Service Water (Unit 2 RET U/2 SW)

**ID Nos.:** HV-11-221, HV-11-223

**P&ID/COORD** (respectively): M-11 (SHT 4) / C-7, M-11 (SHT 4) / C-7

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 8.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal_O_ Safety_C_ Failsafe_C_

**Test Frequency (Direction):** ET-Q, ST-Q(C) FS-Q(C), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-closed valves are located in the Unit 2 SW return line from Loop "A" ESW. These normally open valves perform an active safety function in the closed position to provide automatic isolation between ESW Loop "A" return flow path and the non-safety, non-seismic Unit 2 SW system. Valve HV-11-221 receives a signal to automatically close upon start of ESW pump "A"; valve HV-11-223 receives a signal to automatically close upon start of ESW pump "C". This design feature ensures SW return isolation regardless of which pump starts in ESW Loop "A". During normal plant operation cooling water is supplied by the Service Water System. However, this non-qualified, non-safety related source, both supply and return, is automatically isolated upon starting the ESW pumps. Failure of either valve to close upon associated pump start could allow diversion of ESW Loop "A" return flow to a faulted non-seismic SW system. A loss of ESW return flow would compromise the ability of the Spray Pond to serve as the long term ultimate heat sink during emergency or accident conditions. The LGS UFSAR, Section 9.2.6.1, credits the Spray Pond as the ultimate heat sink for both the ESW and RHRSW systems for at least 30 days without requiring makeup during any plant condition in which the ESW or RHRSW systems are running and utilizing the Spray Pond as a water source. These valves fail to the closed position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the open position. During normal plant operation the valves serve to provide a return flow path for cooling water any time an associated pump compartment cooler is placed in operation outside Design Basis Events.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the closed position
Quarterly fail-safe test to the closed position
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. LGS Technical Specification 3/4.7.1.2

**System (No):** Emergency Service Water (011)

**Component Description:** ESW To RECW HTX'S Outboard Isolation Valves

**ID Nos.:** HV-11-124, HV-11-224

**P&ID/COORD** (respectively): M-11 (SHT 3) / D-3, M-11 (SHT 4) / B-5

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 10.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal_C_ Safety_N/A_ Failsafe_C_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed, air-operated valves are located in the ESW supply to the Reactor Enclosure Cooling Water (RECW) Heat Exchangers. The valves do not perform a safety function in the open or closed positions. They may be placed in the open position to provide the capability of supplying the non safety related RECW heat exchangers by ESW which are normally supplied cooling water flow from SW. However, the RECW heat exchangers are not required for accident mitigation.

These valves do not perform a safety function in the closed position. The valves serve as outboard isolation valves in a series valve application which provide isolation capability between the Class 3 ESW system piping and the non-Code, seismic IIA Service Water piping to the RECW heat exchangers. This non-safety related function is not required for accident mitigation due to the isolation capability provided by the normally closed upstream isolation valve HV-11-1(2)28. Utilizing one valve of a series or the inboard valve, to provide Class 3 to non-Code isolation is consistent with the boundary classification selection criteria of ANSI/ANS-52.1-1983. Instructions are provided in event procedure, E-10/20, to open these valves during a loss of offsite power to maintain continuity in the RECW system when Service Water is unavailable. However, administrative controls are procedurally provided to prevent their opening subsequent to a seismic event, thereby; preventing a loss ESW flow via a line break occurrence in the non-Code, seismic IIA Service Water System piping.

**Test Requirement(s):**

No testing requirements

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. System Design Baseline Document L-S-17, Service Water System
3. System Design Baseline Document L-S-02, Emergency Service Water
4. Site Engineering Event Procedure E-10/20, Loss Of Offsite Power
5. NCR LG 95-118, Rev. 1, Valves Not In IST Program
6. ANSI/ANS-52.1-1983, American National Standard, Nuclear Safety Criteria for the Design of Stationary Boiling Water Reactor Plants

**System (No):** Emergency Service Water (011)

**Component Description:** ESW Loop "B" Return To Unit 1 Service Water (Unit 1 RET U/1 SW)

**ID Nos.:** HV-11-125, HV-11-126

**P&ID/COORD** (respectively): M-11 (SHT 3) / C-3, M-11 (SHT 3) / C-3

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 8.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal_O_ Safety_C_ Failsafe_C_

**Test Frequency (Direction):** ET-Q, ST-Q(C) FS-Q(C), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-closed valves are located in the Unit 1 SW return line from ESW Loop "B". These normally open valves perform an active safety function in the closed position to provide automatic isolation between ESW Loop "B" return flow path and the non-safety, non-seismic Unit 1 SW system. Valve HV-11-125 receives a signal to automatically close upon start of ESW pump "B"; valve HV-11-126 receives a signal to automatically close upon start of ESW pump "D". This design feature ensures SW return isolation regardless of which pump starts in ESW Loop "B". During normal plant operation cooling water is supplied by the Service Water System. However, this non-qualified, non-safety related source, both supply and return, is automatically isolated upon starting the ESW pumps. Failure of either valve to close upon associated pump start could allow diversion of ESW Loop "B" return flow to a faulted non-seismic SW system. A loss of ESW return flow would compromise the ability of the Spray Pond to serve as the long term ultimate heat sink during emergency or accident conditions. The LGS UFSAR, Section 9.2.6.1, credits the Spray Pond as the ultimate heat sink for both the ESW and RHRSW systems for at least 30 days without requiring makeup during any plant condition in which the ESW or RHRSW systems are running and utilizing the Spray Pond as a water source. These valves fail to the closed position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the open position. During normal plant operation the valves serve to provide a return flow path for cooling water any time an associated pump compartment cooler is placed in operation outside Design Basis Events.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the closed position
Quarterly fail-safe test to the closed position
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document, L-S-02 Emergency Service Water
4. System Design Baseline Document, L-S-17 Service Water System
5. System Design Baseline Document, L-S-27 Spray Pond
6. LGS Technical Specification 3/4.7.1.2

**System (No):** Emergency Service Water (011)

**Component Description:** ESW Loop "B" Return To Unit 2 Service Water (Unit 2 RET U/2 SW)

**ID Nos.:** HV-11-225, HV-11-226

**P&ID/COORD** (respectively): M-11 (SHT 5) / C-3, M-11 (SHT 5) / C-3

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 8.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal_O_ Safety_C_ Failsafe_C_

**Test Frequency (Direction):** ET-Q, ST-Q(C) FS-Q(C), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These air-operated, fail-closed valves are located in the Unit 2 SW return line from ESW Loop "B". These normally open valves perform an active safety function in the closed position to provide automatic isolation between ESW Loop "B" return flow path and the non-safety, non-seismic Unit 2 SW system. Valve HV-11-225 receives a signal to automatically close upon start of ESW pump "B"; valve HV-11-226 receives a signal to automatically close upon start of ESW pump "D". This design feature ensures SW return isolation regardless of which pump starts in ESW Loop "B". During normal plant operation cooling water is supplied by the Service Water System. However, this non-qualified, non-safety related source, both supply and return, is automatically isolated upon starting the ESW pumps. Failure of either valve to close upon associated pump start could allow diversion of ESW Loop "B" return flow to a faulted non-seismic SW system. A loss of ESW return flow would compromise the ability of the Spray Pond to serve as the long term ultimate heat sink during emergency or accident conditions. The LGS UFSAR, Section 9.2.6.1, credits the Spray Pond as the ultimate heat sink for both the ESW and RHRSW systems for at least 30 days without requiring makeup during any plant condition in which the ESW or RHRSW systems are running and utilizing the Spray Pond as a water source. These valves fail to the closed position upon loss of air or loss of electrical power.

These valves do not perform a safety function in the open position. During normal plant operation the valves serve to provide a return flow path for cooling water any time an associated pump compartment cooler is placed in operation outside Design Basis Events.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the closed position
Quarterly fail-safe test to the closed position
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.2.6, Ultimate Heat Sink
3. System Design Baseline Document L-S-02, Emergency Service Water
4. System Design Baseline Document L-S-17, Service Water System
5. System Design Baseline Document L-S-27, Spray Pond
6. LGS Technical Specification 3/4.7.1.2

**System (No):** Emergency Service Water (011)

**Component Description:** ESW Return From RECW HTX'S

**ID Nos.:** HV-11-127, HV-11-227

**P&ID/COORD** (respectively): M-11 (SHT 3) / B-3, M-11 (SHT 4) / B-6

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 10.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal_C_ Safety_C_ Failsafe_C_

**Test Frequency (Direction):** PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed, air-operated valves are located in the ESW return lines from the Reactor Enclosure Cooling Water (RECW) Heat Exchangers. These valves do not perform a safety function in the open position. Placing the valves in the open position allows the capability of ESW return flow from the non safety related RECW heat exchangers. However, the RECW heat exchangers are not required for accident mitigation.

These valves perform a passive safety function in the closed position to prevent diversion of ESW flow from safety-related components. The valves serve a boundary barrier isolation function between the Class 3 ESW system piping and the non-Code, seismic IIA cooling water return piping from the RECW heat exchangers. Instructions are provided in event procedure, E-10/20, to open these valves during a loss of offsite power to maintain continuity in the RECW system when Service Water is unavailable. However, administrative controls are procedurally provided to prevent their opening subsequent to a seismic event, thereby preventing a loss ESW flow via a line break occurrence in the non-Code, seismic IIA attached piping.

**Test Requirement(s):**

Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. System Design Baseline Document L-S-17, Service Water System
3. System Design Baseline Document L-S-02, Emergency Service Water
4. Site Engineering Event Procedure E-10/20, Loss Of Offsite Power
5. NCR LG 95-118, Rev. 1, Valves Not In IST Program

**System (No):** Emergency Service Water (011)

**Component Description:** ESW To RECW HTX'S Inboard Isolation Valves

**ID Nos.:** HV-11-128, HV-11-228

**P&ID/COORD** (respectively): M-11 (SHT 3) / D-3, M-11 (SHT 4) / B-5

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 10.00 **Valve Type:** GT **Act. Type:** AO

**Positions:** Normal_C_ Safety_C_ Failsafe_C_

**Test Frequency (Direction):** PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed, air-operated valves are located in the ESW supply to the Reactor Enclosure Cooling Water (RECW) Heat Exchangers. These valves do not perform a safety function in the open position. Placing the valves in the open position allows the capability to supply the non safety related RECW heat exchangers by ESW which are normally supplied cooling water flow from SW. However, the RECW heat exchangers are not required for accident mitigation.

These valves perform a passive safety function in the closed position to prevent diversion of ESW flow from safety-related components. The valves serve as inboard isolation valves in a series valve application which provide isolation capability between the Class 3 ESW system piping and the non-Code, seismic IIA Service Water piping to the RECW heat exchangers. Instructions are provided in event procedure, E-10/20, to open these valves during a loss of offsite power to maintain continuity in the RECW system when Service Water is unavailable. However, administrative controls are procedurally provided to prevent their opening subsequent to a seismic event, thereby; preventing a loss of ESW flow via a line break occurrence in the non-Code, seismic IIA Service Water System piping.

**Test Requirement(s):**

Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. System Design Baseline Document L-S-17, Service Water System
3. System Design Baseline Document L-S-02, Emergency Service Water
4. Site Engineering Event Procedure E-10/20, Loss Of Offsite Power
5. NCR LG 95-118, Rev. 1, Valves Not In IST Program

**System (No):** Emergency Service Water (011)

**Component Description:** ESW To Diesel Gen HTX'S (Loop "A" Primary Supply)

**ID Nos.:** HV-11-131A, HV-11-131C

**P&ID/COORD** (respectively): N/A

**Code Class:** N/A **Category:** N/A **Active/Passive:** N/A

**Size:** N/A **Valve Type:** N/A **Act. Type:** N/A

**Positions:** Normal N/A Safety N/A Failsafe N/A

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N/A

**VRR/VCS/ROJ:** N/A

**Remarks:** This data sheet is included for historical reference. These valves were motor-operated stop-check valves located in the normally aligned ESW Loop "A" supply to Diesel Generators D11 and D13 heat exchangers. They were replaced during refueling outage 1R08 with manually-operated butterfly valves 11-1131A and 11-1131C.

**Safety Function(s):** N/A

**Test Requirement(s):** N/A

**References:**

1. ECR LG 99-01416

**System (No):** Emergency Service Water (011)

**Component Description:** ESW To Diesel Gen HTX'S (Loop "A" Primary Supply)

**ID Nos.:** HV-11-231A, HV-11-231C

**P&ID/COORD** (respectively): M-11 (SHT 1) / D-4, M-11 (SHT 1) / D-4

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 6.00 **Valve Type:** SK **Act. Type:** SA

**Positions:** Normal_C_ Safety_O_ Failsafe_-_

**Test Frequency (Direction):** ET-Q(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These motor-operated, stop-check valves are located in the normally aligned ESW Loop "A" supply to Diesel Generators D21 and D23 heat exchangers. The motor operators associated with these valves are maintained in the open position. However, the disk position is normally closed, since there is no flow in the system. These valves perform an active safety function in the open position to allow flow to the associated diesel generator heat exchangers subsequent to engine start. Since they function as check valves in fulfillment of their safety function, they are classified as Category C, active. The motor operators perform a passive safety function in the open position, since they are not required to change position in order to allow the valves to accomplish their safety function. Each of these valves must be capable of passing a minimum of 450 gpm.

These valves do not perform a safety function in the closed direction. The alternate supply loop, ESW Loop "B", is not required to achieve or maintain cold shutdown or to mitigate the consequences of an accident. Therefore, the alternate supply loop stop-check valves are maintained in the closed position. Thus, the ESW Loop "A" inlet valves are not required to prevent reverse flow. This position is consistent with LGS response to IE Bulletin 83-03 and the NRC's review of that response as documented in NRC inspection reports 50-352/84-49, 50-353/84-12, and in NUREG/CR-3963, as stated in 10CFR50.59 review for NCR LG 92-248.

**Test Requirement(s):**

Quarterly exercise to the full open position.
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Table 9.2-4, ESW System Failure Modes and Effects Analysis
3. UFSAR Table 9.5.5, Diesel Generator Cooling Water System
4. System Design Baseline Document L-S-02, Emergency Service Water
5. LGS Technical Specification 3/4.7.1.2
6. LGS Technical Specification 3.8.1.1
7. IE Bulletin 83-03, Check Valve Failures in Raw Water Cooling Systems of Diesel Generators
8. NCR LG 92-248, Changes to the Inservice Testing Program Limerick Generating Station

**System (No):** Emergency Service Water (011)

**Component Description:** ESW To Diesel Gen HTX'S (Loop "A" Alternate Supply)

**ID Nos.:** HV-11-131B, HV-11-131D, HV-11-231B, HV-11-231D

**P&ID/COORD** (respectively): M-11 (SHT 1) / D-5, M-11 (SHT 1) / D-5, M-11 (SHT 1) / D-3, M-11 (SHT 1) / D-2

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 6.00 **Valve Type:** SK **Act. Type:** MO

**Positions:** Normal_C_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:** If the alternate supply path is placed in service due to a loop outage, maintenance, etc., these valves shall be exercise tested in the forward direction prior to placing them in service.

**Safety Function(s):** These motor-operated, stop-check valves are located in the alternate ESW Loop "A" supply to Diesel Generators D12, D14, D22 and D24 heat exchangers. The valve disk is maintained in the closed position by operator force, thereby preventing the self actuating capabilities. These valves perform a passive safety function in the closed position to prevent backflow from the normally aligned ESW "B" Loop. Since these valves function as stop valves in fulfillment of their function, they are classified as Category B, passive.

These valves do not perform a safety function in the open direction. The alternate supply loop, ESW Loop "A", is not required to provide flow during accident conditions. Therefore, these valves are not required to change position. This position is consistent with LGS response to IE Bulletin 83-03 and the NRC's review of that response as documented in NRC inspection reports 50-352/84-49, 50-353/84-12, and in NUREG/CR-3963, as stated in NCR LG 92-248.

These valves may be placed into service in the event that it is necessary or desirable to remove the normal ESW supply from service. Under these circumstances, which are strictly controlled, these valves assume Category C, active functions. The applicable surveillance test procedures are written to accommodate the placement in or removal from service of these valves in order to comply with Code requirements. The applicable valve(s) are exercise tested prior to placement in service, and are then exercise tested quarterly as long as they remain in service. The normal supply valves would then be tested prior to their return to service if they had undergone maintenance or repair, or if they had not been tested within the last 92 days.

**Test Requirement(s):**

Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Table 9.2-4, ESW System Failure Modes and Effects Analysis
3. UFSAR Table 9.5.5, Diesel Generator Cooling Water System
4. System Design Baseline Document L-S-02, Emergency Service Water
5. LGS Technical Specification 3/4.7.1.2
6. LGS Technical Specification 3.8.1.1
7. IE Bulletin 83-03, Check Valve Failures in Raw Water Cooling Systems of Diesel Generators
8. NCR LG 92-248, Changes to the Inservice Testing Program Limerick Generating Station

**System (No):** Emergency Service Water (011)

**Component Description:** ESW Return From Diesel Gen HTX'S (Loop "A" Primary Return)

**ID Nos.:** HV-11-132A, HV-11-132C, HV-11-232A, HV-11-232C

**P&ID/COORD** (respectively): M-11 (SHT 1) / D-7, M-11 (SHT 1) / D-6, M-11 (SHT 1) / D-4, M-11 (SHT 1) / D-4

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 6.00 **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal_O_ Safety_O_ Failsafe_AI_

**Test Frequency (Direction):** PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These motor-operated valves are located in the normally aligned ESW Loop "A" return lines from diesel generators D11, D13, D21 and D23 heat exchangers. These normally open valves perform a passive safety function in the open position to allow return flow from the associated diesel generator heat exchangers subsequent to engine start.

These valves do not perform a safety function in the closed direction. The alternate return loop, ESW Loop "B", is not required to provide a return flow path during accident conditions. Therefore, the normally aligned return isolation valves are not required to change position for accident mitigation. These valves may change position for operational convenience and are provided with interlocks to ensure the return loop is the same loop which provides the supply.

**Test Requirement(s):**

Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Table 9.2-4, ESW System Failure Modes and Effects Analysis
3. UFSAR Table 9.5.5, Diesel Generator Cooling Water System
4. System Design Baseline Document L-S-02, Emergency Service Water
5. LGS Technical Specification 3/4.7.1.2
6. LGS Technical Specification 3.8.1.1
7. NCR LG 92-248, Changes to the Inservice Testing Program Limerick Generating Station

**System (No):** Emergency Service Water (011)

**Component Description:** ESW Return From Diesel Gen HTX'S (Loop "A" Alternate Return)

**ID Nos.:** HV-11-132B, HV-11-132D, HV-11-232B, HV-11-232D

**P&ID/COORD** (respectively): M-11 (SHT 1) / D-5, M-11 (SHT 1) / D-5, M-11 (SHT 1) / D-3, M-11 (SHT 1) / D-3

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 6.00 **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal C Safety C Failsafe AI

**Test Frequency (Direction):** PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These motor-operated valves are located in the alternate ESW Loop "A" return lines from diesel generators D12, D14, D22 and D24 heat exchangers. These normally closed valves perform a passive safety function in the closed position to ensure return flow via the inservice ESW Loop "B" from the associated diesel generator heat exchangers.

These valves do not perform a safety function in the open direction. The alternate return loop, ESW Loop "A", is not required to provide a return flow path during accident conditions. Therefore, the normally closed alternate return isolation valves are not required to change position for accident mitigation. These valves may change position for operational convenience and are provided with interlocks to ensure the return loop is the same loop which provides the supply.

**Test Requirement(s):**

Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Table 9.2-4, ESW System Failure Modes and Effects Analysis
3. UFSAR Table 9.5.5, Diesel Generator Cooling Water System
4. System Design Baseline Document L-S-02, Emergency Service Water
5. LGS Technical Specification 3/4.7.1.2
6. LGS Technical Specification 3.8.1.1
7. NCR LG 92-248, Changes to the Inservice Testing Program Limerick Generating Station

**System (No):** Emergency Service Water (011)

**Component Description:** ESW To Diesel Gen HTX'S (Loop "B" Alternate Supply)

**ID Nos.:** HV-11-133A, HV-11-133C, HV-11-233A, HV-11-233C

**P&ID/COORD** (respectively): M-11 (SHT 1) / D-6, M-11 (SHT 1) / D-6, M-11 (SHT 1) / D-4, M-11 (SHT 1) / D-4

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 6.00 **Valve Type:** SK **Act. Type:** MO

**Positions:** Normal_C_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:** If the alternate supply path is placed in service due to a loop outage, maintenance, etc., these valves shall be exercise tested in the forward direction prior to placing them in service.

**Safety Function(s):** These motor-operated, stop-check valves are located in the alternate ESW Loop "B" supply to diesel generators D11, D13, D21 and D23 heat exchangers. The valve disk is maintained in the closed position by operator force, thereby preventing the self actuating capabilities. These valves perform a passive safety function in the closed position to prevent backflow from the normally aligned ESW "A" Loop. Since these valves function as stop valves in fulfillment of their function, they are classified as Category B, passive.

These valves do not perform a safety function in the open direction. The alternate supply loop, ESW Loop "B", is not required to provide flow during accident conditions. Therefore, these valves are not required to change position. This position is consistent with LGS response to IE Bulletin 83-03 and the NRC's review of that response as documented in NRC inspection reports 50-352/84-49, 50-353/84-12, and in NUREG/CR-3963, as stated in NCR LG 92-248.

These valves may be placed into service in the event that it is necessary or desirable to remove the normal ESW supply from service. Under these circumstances, which are strictly controlled, these valves assume Category C, active functions. The applicable surveillance test procedures are written to accommodate the placement in or removal from service of these valves in order to comply with Code requirements. The applicable valve(s) are exercise tested prior to placement in service, and are then exercise tested quarterly as long as they remain in service. The normal supply valves would then be tested prior to their return to service if they had undergone maintenance or repair, or if they had not been tested within the last 92 days.

**Test Requirement(s):**

Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Table 9.2-4, ESW System Failure Modes and Effects Analysis
3. UFSAR Table 9.5.5, Diesel Generator Cooling Water System
4. System Design Baseline Document L-S-02, Emergency Service Water
5. LGS Technical Specification 3/4.7.1.2
6. LGS Technical Specification 3.8.1.1
7. IE Bulletin 83-03, Check Valve Failures in Raw Water Cooling Systems of Diesel Generators
8. NCR LG 92-248, Changes to the Inservice Testing Program Limerick Generating Station

**System (No):** Emergency Service Water (011)

**Component Description:** ESW To Diesel Gen HTX'S (Loop "A" Primary Supply)

**ID Nos.:** HV-11-133B, HV-11-133D

**P&ID/COORD** (respectively): N/A

**Code Class:** N/A **Category:** N/A **Active/Passive:** N/A

**Size:** N/A **Valve Type:** N/A **Act. Type:** N/A

**Positions:** Normal_N/A_ Safety_N/A_ Failsafe_N/A_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N/A

**VRR/VCS/ROJ:** N/A

**Remarks:** This data sheet is included for historical reference. These valves were motor-operated stop-check valves located in the normally aligned ESW Loop "B" supply to Diesel Generators D12 and D14 heat exchangers. They were replaced during refueling outage 1R08 with manually-operated butterfly valves 11-1133B and 11-1133D.

**Safety Function(s):** N/A

**Test Requirement(s):** N/A

**References:**

1. ECR LG 99-01416

**System (No):** Emergency Service Water (011)

**Component Description:** ESW To Diesel Gen HTX'S (Loop "B" Primary Supply)

**ID Nos.:** HV-11-233B, HV-11-233D

**P&ID/COORD** (respectively): M-11 (SHT 1) / D-3, M-11 (SHT 1) / D-2

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 6.00 **Valve Type:** SK **Act. Type:** SA

**Positions:** Normal_C_ Safety_O_ Failsafe_-_

**Test Frequency (Direction):** ET-Q(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These motor-operated, stop-check valves are located in the normally aligned ESW Loop "B" supply to Diesel Generators D22 and D24 heat exchangers. The motor operators associated with these valves are maintained in the open position. However, the disk position is normally closed, since there is no flow in the system. These valves perform an active safety function in the open position to allow flow to the associated diesel generator heat exchangers subsequent to engine start. Since they function as check valves in fulfillment of their safety function, they are classified as Category C, active. The motor operators perform a passive safety function in the open position, since they are not required to change position in order to allow the valves to accomplish their safety function. Each of these valves must be capable of passing a minimum of 450 gpm.

These valves do not perform a safety function in the closed direction. The alternate supply loop, ESW Loop "A", is not required to provide flow during accident conditions. Therefore, the alternate supply loop stop-check valves are maintained in the closed position. Thus, the ESW Loop "B" inlet valves are not required to prevent reverse flow. This position is consistent with LGS response to IE Bulletin 83-03 and the NRC's review of that response as documented in NRC inspection reports 50-352/84-49, 50-353/84-12, and in NUREG/CR-3963, as stated in 10CFR50.59 review for NCR LG 92-248.

**Test Requirement(s):**

Quarterly exercise to the full open position.
Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Table 9.2-4, ESW System Failure Modes and Effects Analysis
3. UFSAR Table 9.5.5, Diesel Generator Cooling Water System
4. System Design Baseline Document L-S-02, Emergency Service Water
5. LGS Technical Specification 3/4.7.1.2
6. LGS Technical Specification 3.8.1.1
7. IE Bulletin 83-03, Check Valve Failures in Raw Water Cooling Systems of Diesel Generators
8. NCR LG 92-248, Changes to the Inservice Testing Program Limerick Generating Station

**System (No):** Emergency Service Water (011)

**Component Description:** ESW Return From Diesel Gen HTX'S (Loop "B" Alternate Return)

**ID Nos.:** HV-11-134A, HV-11-134C, HV-11-234A, HV-11-234C

**P&ID/COORD** (respectively): M-11 (SHT 1) / D-7, M-11 (SHT 1) / D-6, M-11 (SHT 1) / D-4, M-11 (SHT 1) / D-4

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 6.00 **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal_C_ Safety_C_ Failsafe_AI_

**Test Frequency (Direction):** PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These motor-operated valves are located in the alternate ESW Loop "B" return lines from diesel generators D11, D13, D21 and D23 heat exchangers. These normally closed valves perform a passive safety function in the closed position to ensure return flow via the inservice ESW Loop "A" from the associated diesel generator heat exchangers.

These valves do not perform a safety function in the open direction. The alternate return loop, ESW Loop "B", is not required to provide a return flow path during accident conditions. Therefore, the normally closed alternate return isolation valves are not required to change position for accident mitigation. These valves may change position for operational convenience and are provided with interlocks to ensure the return loop is the same loop which provides the supply.

**Test Requirement(s):**

Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Table 9.2-4, ESW System Failure Modes and Effects Analysis
3. UFSAR Table 9.5.5, Diesel Generator Cooling Water System
4. System Design Baseline Document L-S-02, Emergency Service Water
5. LGS Technical Specification 3/4.7.1.2
6. LGS Technical Specification 3.8.1.1
7. NCR LG 92-248, Changes to the Inservice Testing Program Limerick Generating Station

**System (No):** Emergency Service Water (011)

**Component Description:** ESW Return From Diesel Gen HTX'S (Loop "B" Primary Return)

**ID Nos.:** HV-11-134B, HV-11-134D, HV-11-234B, HV-11-234D

**P&ID/COORD** (respectively): M-11 (SHT 1) / D-5, M-11 (SHT 1) / D-5, M-11 (SHT 1) / D-3, M-11 (SHT 1) / D-3

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 6.00 **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal O Safety O Failsafe AI

**Test Frequency (Direction):** PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These motor-operated valves are located in the normally aligned ESW Loop "B" return lines from diesel generators D12, D14, D22 and D24 heat exchangers. These normally open valves perform a passive safety function in the open position to allow return flow from the associated diesel generator heat exchangers subsequent to engine start.

These valves do not perform a safety function in the closed direction. The alternate return loop, ESW Loop "A", is not required to provide a return flow path during accident conditions. Therefore, the normally aligned return isolation valves are not required to change position for accident mitigation. These valves may change position for operational convenience and are provided with interlocks to ensure the return loop is the same loop which provides the supply.

**Test Requirement(s):**

Position indication verification once every two years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Table 9.2-4, ESW System Failure Modes and Effects Analysis
3. UFSAR Table 9.5.5, Diesel Generator Cooling Water System
4. System Design Baseline Document L-S-02, Emergency Service Water
5. LGS Technical Specification 3/4.7.1.2
6. LGS Technical Specification 3.8.1.1
7. NCR LG 92-248, Changes to the Inservice Testing Program Limerick Generating Station

**System (No):** Emergency Service Water (011)

**Component Description:** Control Room Chiller Relief Valves

**ID Nos.:** PSV-11-051A, PSV-11-051B

**P&ID/COORD** (respectively): M-11 (SHT 2) / G-3, M-11 (SHT 2) / E-3

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** RL **Act. Type:** SA

**Positions:** Normal_C_ Safety_OC_ Failsafe_-_

**Test Frequency (Direction):** RT-P3 **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These relief valves are located in the service water/emergency service water inlet to Control Room Chillers, 0AK112 and 0BK112. The Control Room HVAC System maintains the space temperature for personnel comfort and ensures the operability of Control Room equipment and instruments under normal and accident conditions. Normal overpressure protection is provided by system design in that the maximum credible system pressure is within the design rating of the piping and components. Also, the power operated valves located in the return lines are interlocked in the open position in order to preclude the possibility of thermal overpressurization during operation. This method of over pressure protection is applicable when the system is in standby or operation. However, ASME Section III, Article ND-7000 also requires that individual components which can be isolated from the normal overpressure protection be protected. These relief valves provide overpressure protection for the safety-related Control Room Chillers when they are isolated.

**Test Requirement(s):**

Relief valve testing once every 10 years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.4.1.1, Control Room HVAC System
3. ASME Section III, Article ND-7000
4. System Design Baseline Document L-S-02, Emergency Service Water
5. System Design Baseline Document L-S-08B, Control Room HVAC System

**System (No):** Emergency Service Water (011)

**Component Description:** Diesel Gen HTX'S Relief Valves

**ID Nos.:** PSV-11-107A, PSV-11-107B, PSV-11-107C, PSV-11-107D, PSV-11-207A, PSV-11-207B, PSV-11-207C, PSV-11-207D

**P&ID/COORD** (respectively): M-11 (SHT 1) / C-6, M-11 (SHT 1) / C-5, M-11 (SHT 1) / C-6, M-11 (SHT 1) / C-5, M-11 (SHT 1) / C-4, M-11 (SHT 1) / C-3, M-11 (SHT 1) / C-4, M-11 (SHT 1) / C-2

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 0.75 **Valve Type:** RL **Act. Type:** SA

**Positions:** Normal C Safety OC Failsafe -

**Test Frequency (Direction):** RT-P3 **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These relief valves are located between the ESW supply and return valves for the Emergency Diesel Generator Air Cooler Heat Exchangers, Lube Oil Coolers and Jacket Water Heat Exchangers. Normal overpressure protection is provided by system design in that the maximum credible system pressure is within the design rating of the piping and components. Also, the power operated valves located in the return lines are keylocked in the open position in order to preclude the possibility of thermal overpressurization during operation. This method of over pressure protection is applicable when the system is in standby or operation. However, ASME Section III, Article ND-7000 also requires that individual components which can be isolated from the normal overpressure protection be protected. These relief valves provide overpressure protection for the safety-related Diesel Generator Heat Exchangers when they are isolated.

**Test Requirement(s):**

Relief valve testing once every 10 years

**References:**

1. UFSAR Section 9.2.2, Emergency Service Water System
2. UFSAR Section 9.5.5, Diesel Generator Cooling Water System
3. UFSAR Section 9.5.7, Diesel Generator Lubrication System
4. UFSAR Section 9.5.8, Diesel Generator Combustion Air Intake and Exhaust System
5. System Design Baseline Document L-S-02, Emergency Service Water
6. System Design Baseline Document L-S-07, Diesel Generators and Auxiliary Systems

# RESIDUAL HEAT REMOVAL SERVICE WATER SYSTEM

**System (No):** Residual Heat Removal Service Water (012)

**Component Description:** Residual Heat Removal Service Water (RHRSW) Pumps

**ID Nos.:** 0AP506, 0BP506, 0CP506, 0DP506

**P&ID/COORD** (respectively): M-12 (SHT 1) / E-6, M-12 (SHT 1) / E-4, M-12 (SHT 1) / E-5, M-12 (SHT 1) / E-2

**Pump Type:** Centrifugal **Test Parameters:** D/P, Q, V

**Relief Request:** GPRR-2, Request for relief pertaining to instrumentation accuracy and full scale range requirements.

**Remarks:** Inlet pressure verified per T.S. 4.7.1.3a

**Safety Function:** The RHRSW system is a safety related auxiliary system which is common to LGS Units 1 & 2, and consists of two independent loops ("A" and "B"). During two-unit operation two of the four pumps are required for safe shutdown and accident mitigation. Each loop services one RHR heat exchanger in each unit, and provides sufficient cooling for safe shutdown and accident mitigation of both units. The system is designed to provide a reliable source of cooling water for all operating modes of the RHR system, including heat removal during post-accident conditions. RHRSW also has the capability to provide water for core flooding and primary containment spray, subsequent to an accident, via the RHR system piping. However, core flooding and containment spray are not safety related functions of the RHRSW system. This capability is not credited in the Design Basis Accident (DBA) analyses as being required to achieve safe shutdown. Furthermore, multiple failures would have to occur to emergency core cooling systems prior to the need for RHRSW to perform this function.

The primary safety function of the RHRSW system is to supply cooling water flow to the RHR system heat exchangers for transfer of heat during post accident conditions. The minimum required flow rate for each pump is 6150 gpm.

The RHRSW pump motors obtain their power from separate Class 1E buses; the A and B pumps from Unit 1 buses A and B, respectively, and the C and D pumps from the Unit 2 buses A and B, respectively. The RHRSW system is designed with sufficient capacity and redundancy so that single failure of any active component, assuming a loss of offsite power, cannot impair the capability of the system to perform its safety related functions.

**Test Requirement(s):**

Quarterly Pump testing.

**References:**

1. LGS Technical Specification 3/4.7.1.1
2. LGS Technical Specifications Bases 3/4.7.1
3. UFSAR Section 7.3.1.1.12, RHRSW Instrumentation and Controls
4. UFSAR Section 9.2.3, RHR Service Water System
5. UFSAR Section 9.2.6, Ultimate Heat Sink
6. UFSAR Table 9.2-6, RHRSW Failure Modes an Affects Analysis
7. System Design Baseline Document L-S-04, Residual Heat Removal Service Water
8. ECR 94-05855, Flow Analysis Rerate

**System (No):** Residual Heat Removal Service Water (012)

**Component Description:** Residual Heat Removal Service Water (RHRSW) Supply Pumps Discharge Check Valves

**ID Nos.:** 12-0001A, 12-0001B, 12-0001C, 12-0001D

**P&ID/COORD** (respectively): M-12 (SHT 1) / E-6, M-12 (SHT 1) / E-4, M-12 (SHT 1) / E-5, M-12 (SHT 1) / E-3

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 20.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal_C_ Safety_OC_ Failsafe_-_

**Test Frequency (Direction):** ET-Q(F&R) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These check valves have an active safety function in the open position to provide a path for cooling water flow to the RHR heat exchangers which are dependant upon RHRSW for transferring design accident heat loads under LOOP and/or LOCA conditions. Since each RHRSW pump is capable of providing adequate flow to accomplish the system's design safety function, each pump discharge check valve must also be capable of passing the accident flow rate required by its loop. The maximum required post accident flow rate for each RHRSW loop is 6150 gpm. Therefore, these check valves must be capable of passing a minimum of 6150 gpm in order to perform their safety function in the open position.

These check valves have an active safety function in the closed position to prevent gross diversion of RHRSW system flow. Each loop is supplied by two RHRSW pumps in parallel, each capable of 100% unit capacity. Since one pump for each RHRSW loop may be idle during transient and accident conditions, failure of a check valve to close would result in the diversion of flow from the operating pump through the idle pump.

**Test Requirement(s):**

Quarterly exercise in the forward and reverse directions.

**References:**

1. LGS Technical Specification 3/4.7.1.1
2. LGS Technical Specifications Bases 3/4.7.1
3. UFSAR Section 7.3.1.1.12, RHRSW Instrumentation and Controls
4. UFSAR Section 9.2.3, RHR Service Water System
5. UFSAR Section 9.2.6, Ultimate Heat Sink
6. UFSAR Table 9.2-6, RHRSW Failure Modes an Affects Analysis
7. System Design Baseline Document L-S-04, Residual Heat Removal Service Water

**System (No):** Residual Heat Removal Service Water (012)

**Component Description:** ESW RETURN FROM TECW HTX'S

**ID Nos.:** 12-1009, 12-2009

**P&ID/COORD** (respectively): M-12 (SHT 1) / E-7, M-12 (SHT 1) / E-8

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 4.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal O/C Safety N/A Failsafe -

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These check valves are located in the ESW return lines from the Turbine Enclosure Cooling Water (TECW) Heat Exchangers downstream of the motor-operated boundary isolation valves, HV-12-110 and HV-12-210.

The TECW Heat Exchangers are non-safety related and are not required for safe shutdown or accident mitigation. Therefore, these valves have no safety function in the open position.

Preventing diversion of ESW/RHRSW flow through this line is a safety function. However, these check valves are not required to perform this function, since it is accomplished passively by the upstream motor-operated valves (HV-12-110 and HV-12-210), which are administratively maintained in the closed position. Therefore, these valves have no safety function to prevent flow in the reverse direction.

**Test Requirement(s):**

No test requirements

**References:**

1. LGS Technical Specification 3/4.7.1.1
2. LGS Technical Specification 3/4.7.1.3
3. LGS Technical Specifications Bases 3/4.7.1
4. UFSAR Section 7.3.1.1.12, RHRSW Instrumentation and Controls
5. UFSAR Section 9.2.3, RHR Service Water System
6. UFSAR Section 9.2.6, Ultimate Heat Sink
7. UFSAR Table 9.2-6, RHRSW Failure Modes an Affects Analysis
8. System Design Baseline Document L-S-02, Emergency Service Water
9. System Design Baseline Document L-S-04, Residual Heat Removal Service Water
10. System Design Baseline Document L-S-17, Service Water System
11. System Design Baseline Document L-S-27, Spray Pond
12. Engineering Change Request, LG 95-00271

**System (No):** Residual Heat Removal Service Water (012)

**Component Description:** Spray Pond Make-up Stop Valve

**ID Nos.:** 12-1011

**P&ID/COORD:** M-12 (SHT 1) / C-8

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 6.00 **Valve Type:** GT **Act. Type:** MA

**Positions:** Normal OC Safety C Failsafe AI

**Test Frequency (Direction):** ET-Q(C) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** This normally closed, manual valve is located in the Schuylkill Cooling Tower make-up supply header to the Spray Pond which enters the pond below normal pond water level. The valve performs an active safety function in the closed position to prevent partial draining of the Spray Pond during the unlikely event of a design basis earthquake (DBE) or to prevent siphoning of the Spray Pond during a loss of supply header pressure while performing makeup activities. This manual valve is subject to infrequent use. However, on occasion it may remain in the open position for extended periods. The valve must demonstrate the capability of manual closure in order to perform its intended safety function.

This valve does not perform a safety function in the open position. Makeup to the Spray Pond is not required for accident mitigation. The Spray Pond is sized such that a 30 day inventory is available for accident mitigation, without requiring make-up.

**Test Requirement(s):**

Manually exercise to the closed position quarterly.

**References:**

1. LGS Technical Specification 3/4.7.1.1
2. LGS Technical Specification 3/4.7.1.3
3. LGS Technical Specifications Bases 3/4.7.1
4. UFSAR Section 7.3.1.1.12, RHRSW Instrumentation and Controls
5. UFSAR Section 9.2.3, RHR Service Water System
6. UFSAR Section 9.2.6, Ultimate Heat Sink
7. UFSAR Table 9.2-6, RHRSW Failure Modes an Affects Analysis
8. System Design Baseline Document L-S-04, Residual Heat Removal Service Water
9. System Design Baseline Document L-S-27, Spray Pond
10. Engineering Change Request, LG 94-05389

**System (No):** Residual Heat Removal Service Water (012)

**Component Description:** River Water Make-up to Spray Pond

**ID Nos.:** 12-0030, 12-0031

**P&ID/COORD** (respectively): M-12 (SHT 1) / C-7, M-12 (SHT 1) / C-7,

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 6.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal OC Safety N/A Failsafe -

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These check valves are located in the Schuylkill Cooling Tower make-up supply header to the Spray Pond which enters the pond below normal pond water level. The check valves prevent siphoning of the pond in the event of loss of pressure in the make-up line. This is not considered a safety function due to an upstream manual isolation valve, 12-1011, which is subject to quarterly testing and credited as the isolation boundary.

These check valves do not perform a safety function in the open position. Providing make-up to the Spray Pond is not required for accident mitigation. The Spray Pond is sized such that a 30 day inventory is available, for accident mitigation, without requiring make-up.

**Test Requirement(s):**

No Testing Requirements

**References:**

1. LGS Technical Specification 3/4.7.1.1
2. LGS Technical Specification 3/4.7.1.3
3. LGS Technical Specifications Bases 3/4.7.1
4. UFSAR Section 7.3.1.1.12, RHRSW Instrumentation and Controls
5. UFSAR Section 9.2.3, RHR Service Water System
6. UFSAR Section 9.2.6, Ultimate Heat Sink
7. UFSAR Table 9.2-6, RHRSW Failure Modes an Affects Analysis
8. System Design Baseline Document L-S-04, Residual Heat Removal Service Water
9. System Design Baseline Document L-S-27, Spray Pond
10. Engineering Change Request, LG 94-05389

**System (No):** Residual Heat Removal Service Water (012)

**Component Description:** RHRSW to Cooling Tower Cross-tie (Twr 1 - Twr 2)

**ID Nos.:** HV-12-017A, HV-12-017B

**P&ID/COORD** (respectively): M-12 (SHT 1) / A-5, M-12 (SHT 1) / A-4

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 20.00 **Valve Type:** BF **Act. Type:** MO

**Positions:** Normal C Safety N/A Failsafe AI

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed, motor-operated valves are located in the RHRSW discharge crosstie header to the Cooling Towers. They do not perform a safety function in the open or closed positions.

In the open position, these valves provide operational flexibility to allow one RHRSW loop to return to the Cooling Tower associated with the opposite loop. This alignment may be used in the event that a Cooling Tower is not available. However, the Cooling Towers are not required for safe shutdown or accident mitigation. Therefore, these valves do not have a safety function in the open position.

In the closed position, these valves provide separation between RHRSW return Loops A and B. Since both loops return to the Spray Pond, however, separation is a matter of operating convenience and is not specifically required for safe shutdown or accident mitigation. Isolation in the event of a loss of a Cooling Tower is provided by closure of the normal RHRSW return valves which are automatically isolated upon start of the ESW pumps; these valves are not required to provide isolation of a Cooling Tower. These valves normally remain in the closed position and are administratively controlled by procedure in the closed position. Although the closed position is preferred for certain operating conditions, there are no requirements for loop separation identified in the UFSAR or System Design Baseline Document. Therefore, these valves do not have a safety function in the closed position.

**Test Requirement(s):**

No testing requirements.

**References:**

1. LGS Technical Specification 3/4.7.1.1
2. LGS Technical Specification 3/4.7.1.3
3. LGS Technical Specifications Bases 3/4.7.1
4. UFSAR Section 7.3.1.1.12, RHRSW Instrumentation and Controls
5. UFSAR Section 9.2.3, RHR Service Water System
6. UFSAR Section 9.2.6, Ultimate Heat Sink
7. UFSAR Table 9.2-6, RHRSW Failure Modes an Affects Analysis
8. System Design Baseline Document L-S-04, Residual Heat Removal Service Water
9. Engineering Change Request, LG 95-00271

**System (No):** Residual Heat Removal Service Water (012)

**Component Description:** Spray Nozzles Bypass Isolation Valves

**ID Nos.:** HV-12-031A, HV-12-031B, HV-12-031C, HV-12-031D

**P&ID/COORD** (respectively): M-12 (SHT 1) / B-6, M-12 (SHT 1) / B-3, M-12 (SHT 1) / B-6, M-12 (SHT 1) / B-3

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 30.00 **Valve Type:** BF **Act. Type:** MO

**Positions:** Normal_OC_ Safety_OC_ Failsafe_AI_

**Test Frequency (Direction):** ET-Q, ST-Q(O&C), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These motor-operated valves are located in the spray nozzle bypass lines to the Spray Pond. They perform active safety functions in the open and closed positions.

These valves close automatically upon receipt of an ESW pump start signal to direct RHRSW return flow to the spray nozzle networks, which is the normal alignment during an accident condition. Their failure to close would result in nonfunctional spray networks, subsequently compromising the ability to reject heat to the atmosphere.

These valves are also required to close during normal plant operation to prevent Spray Pond temperature from exceeding its T.S. limit of 88°F, which would require declaring ESW and RHRSW inoperable. Maintaining Spray Pond temperature below the T.S. limit is required to mitigate the consequences of an accident if one were to occur.

These valves must be capable of opening when their control selector switch is placed in the bypass position. This bypass flow path may be necessary during winter months to melt a hole in the ice on the Spray Pond if it is frozen over. A frozen Spray Pond could result in pond inventory being lost to the overflow as water is returned to the frozen pond via the spray networks.

These valves obtain their power from the Class 1E emergency AC buses. The Loop A valves receive power from Division 1 and 3; the Loop B valves receive power from Division 2 and 4. The Loop A valves also have the capability of being actuated from the Remote Shutdown Panel.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the open and closed positions
Position indication verification once every two years

**References:**

1. LGS Technical Specification 3/4.7.1.1
2. LGS Technical Specification 3/4.7.1.3
3. LGS Technical Specifications Bases 3/4.7.1
4. UFSAR Section 7.3.1.1.12, RHRSW Instrumentation and Controls
5. UFSAR Section 7.4.1.4, Remote Shutdown System
6. UFSAR Section 9.2.3, RHR Service Water System
7. UFSAR Section 9.2.6, Ultimate Heat Sink
8. UFSAR Table 9.2-6, RHRSW Failure Modes an Affects Analysis
9. ECR LG 95-00271
10. System Design Baseline Document L-S-04, Residual Heat Removal Service Water
11. System Design Baseline Document L-S-09, Residual Heat Removal System

**System (No):** Residual Heat Removal Service Water (012)

**Component Description:** Spray Nozzles Inlet Isolation Valves

**ID Nos.:** HV-12-032A, HV-12-032B, HV-12-032C, HV-12-032D

**P&ID/COORD** (respectively): M-12 (SHT 1) / A-6, M-12 (SHT 1) / B-4, M-12 (SHT 1) / B-5, M-12 (SHT 1) / A-3

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 30.00 **Valve Type:** BF **Act. Type:** MO

**Positions:** Normal OC Safety OC Failsafe AI

**Test Frequency (Direction):** ET-Q, ST-Q(O&C), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed motor-operated valves are located in the spray nozzle inlet lines to the Spray Pond, and perform an active safety function in the open and closed positions. The valves perform an active safety function in the open position to direct RHRSW return flow to the spray networks, and must be capable of automatically opening upon receipt of an ESW pump start signal. Their automatic actuation upon ESW pump start is dependant upon the spray-bypass selector switch, HSS-012-016D, being in the SPRAY position.

These valves also perform an active safety function in the closed position. These valves must be capable of closure when the spray-bypass selector switch, HSS-012-016D, is placed in the BYPASS position. Valve closure would be required if the Spray Pond was frozen to allow RHRSW return flow to be directed through the bypass, thereby melting a hole in the ice. This design feature prevents RHRSW return flow from being discharged via the spray networks (above the ice), resulting in a loss of Spray Pond inventory to the overflow.

These valves obtain their power from the Class 1E ac emergency buses with loop A receiving power from Division 1 and 3, and loop B valves from Division 2 and 4. The loop A valves also have the capability of being actuated from the Remote Shutdown Panel

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the open and closed positions
Position indication verification once every two years

**References:**

1. LGS Technical Specification 3/4.7.1.1
2. LGS Technical Specification 3/4.7.1.3
3. LGS Technical Specifications Bases 3/4.7.1
4. UFSAR Section 7.3.1.1.12, RHRSW Instrumentation and Controls
5. UFSAR Section 7.4.1.4, Remote Shutdown System
6. UFSAR Section 9.2.3, RHR Service Water System
7. UFSAR Section 9.2.6, Ultimate Heat Sink
8. UFSAR Table 9.2-6, RHRSW Failure Modes an Affects Analysis
9. System Design Baseline Document L-S-04, Residual Heat Removal Service Water

**System (No):** Residual Heat Removal Service Water (012)

**Component Description:** RHRSW to Spray Nozzles Crosstie Isolation Valves

**ID Nos.:** HV-12-034A, HV-12-034B

**P&ID/COORD** (respectively): M-12 (SHT 1) / A-5, M-12 (SHT 1) / A-4

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 30.00 **Valve Type:** BF **Act. Type:** MO

**Positions:** Normal C Safety N/A Failsafe AI

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed, motor-operated valves are located in the RHRSW crosstie return to the Spray Pond providing physical separation between the return flow paths. They do not perform any safety function in the open or closed positions.

In the open position, these valves provide operational flexibility to allow one RHRSW loop to return to the Spray Pond via the return flow path associated with the opposite loop. This function is for operating convenience and is not required for safe shutdown or accident mitigation, although it may be optionally used for either purpose.

In the closed position, these valves provide separation between RHRSW return Loops A and B. Since both loops return to the Spray Pond, however, separation is a matter of operating convenience and is not specifically required for safe shutdown or accident mitigation. These valves normally remain in the closed position and are administratively controlled by procedure in the closed position. HV-12-034A is de-energized in the closed position at the motor control center. Although the closed position is preferred for certain operating conditions, there are no requirements for loop separation identified in the UFSAR or System Design Baseline Document. Therefore, these valves do not have a safety function in the closed position.

**Test Requirement(s):**

No testing requirements.

**References:**

1. LGS Technical Specification 3/4.7.1.1
2. LGS Technical Specification 3/4.7.1.3
3. LGS Technical Specifications Bases 3/4.7.1
4. UFSAR Section 7.3.1.1.12, RHRSW Instrumentation and Controls
5. UFSAR Section 9.2.3, RHR Service Water System
6. UFSAR Section 9.2.6, Ultimate Heat Sink
7. UFSAR Table 9.2-6, RHRSW Failure Modes an Affects Analysis
8. System Design Baseline Document L-S-04, Residual Heat Removal Service Water
9. System Design Baseline Document L-T-10, Fire Safe Shutdown
10. Engineering Change Request, LG 95-00271
11. ANSI/ANS 58.9-1981, Single Failure Criteria for LWR Safety-Related Fluid Systems

**System (No):** Residual Heat Removal Service Water (012)

**Component Description:** ESW RETURN FROM TECW HTX'S

**ID Nos.:** HV-12-110, HV-12-210

**P&ID/COORD** (respectively): M-12 (SHT 1) / E-8, M-12 (SHT 1) / E-1

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 4.00 **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal C Safety C Failsafe AI

**Test Frequency (Direction):** PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed, motor-operated valves are located in the ESW return lines from the Turbine Enclosure Cooling Water (TECW) Heat Exchangers. These valves do not perform a safety function in the open position. Placing the valves in the open position allows the capability of ESW return flow from the non safety related TECW heat exchangers. However, the TECW heat exchangers are not required for accident mitigation.

These valves perform a passive safety function in the closed position to prevent diversion of ESW flow from safety-related components. The valves serve a boundary barrier isolation function between the Class 3 RHRSW system and the non Code, seismic IIS cooling water return piping from the TECW heat exchangers. Instructions are provided in site event procedure, E-10/20, to open these valves during a loss of offsite power to maintain continuity in the TECW system when Service Water is unavailable. However, administrative controls are procedurally provided to prevent their opening subsequent to a seismic event, thereby preventing a loss of ESW flow via a line break occurrence in the non-Code, seismic IIA attached piping.

**Test Requirement(s):**

Position indication verification once every two years

**References:**


1. LGS Technical Specification 3/4.7.1.1
2. LGS Technical Specification 3/4.7.1.3
3. LGS Technical Specifications Bases 3/4.7.1
4. UFSAR Section 7.3.1.1.12, RHRSW Instrumentation and Controls
5. UFSAR Section 9.2.3, RHR Service Water System
6. UFSAR Section 9.2.6, Ultimate Heat Sink
7. UFSAR Table 9.2-6, RHRSW Failure Modes an Affects Analysis
8. System Design Baseline Document L-S-02, Emergency Service Water
9. System Design Baseline Document L-S-04, Residual Heat Removal Service Water
10. System Design Baseline Document L-S-17, Service Water System
11. System Design Baseline Document L-S-27, Spray Pond
12. NCR LG 95-118, Rev. 1, Valves Not In IST Program

**System (No):** Residual Heat Removal Service Water (012)

**Component Description:** RHRSW Return to Unit 1 and 2 Cooling Towers

**ID Nos.:** HV-12-111, HV-12-113, HV-12-211, HV-12-213

**P&ID/COORD** (respectively): M-12 (SHT 1) / A-6, M-12 (SHT 1) / A-6, M-12 (SHT 1) / A-3, M-12 (SHT 1) / A-3

| | | |
|---|---|---|
| **Code Class:** 3 | **Category:** B | **Active/Passive:** A |
| **Size:** 30.00 | **Valve Type:** BF | **Act. Type:** MO |
| **Positions:** Normal OC | Safety C | Failsafe AI |

**Test Frequency (Direction):** ET-Q, ST-Q(C), PI-T

**Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed, motor-operated valves are located in the RHRSW supply lines to the Cooling Towers. They provide operational flexibility to allow the non-safety related Cooling Towers to be used as a RHRSW source of cooling water, and as the heat sink during normal shutdown and cooldown operations. However, use of the Cooling Towers is not required for safe shutdown or accident mitigation. These valves do not perform a safety function in the open position.

In the closed position, these valves provide isolation capability between the non-safety related supply piping to the Cooling Towers and the Class 3 RHRSW return piping to the Spray Pond. These valves must be capable of automatic closure during any accident or transient condition which results in an ESW pump start. Their ability to close is required to maintain Spray Pond inventory, thereby supporting the safety function of the RHRSW and ESW systems. The valves obtain their power from Class 1E emergency ac buses and are installed in series to satisfy single failure design criteria.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the closed position
Position indication verification once every two years

**References:**

1. LGS Technical Specification 3/4.7.1.1
2. LGS Technical Specification 3/4.7.1.3
3. LGS Technical Specifications Bases 3/4.7.1
4. UFSAR Section 7.3.1.1.12, RHRSW Instrumentation and Controls
5. UFSAR Section 9.2.3, RHR Service Water System
6. UFSAR Section 9.2.6, Ultimate Heat Sink
7. UFSAR Table 9.2-6, RHRSW Failure Modes an Affects Analysis
8. System Design Baseline Document L-S-04, Residual Heat Removal Service Water
9. Engineering Change Request, LG 95-00271

**System (No):** Residual Heat Removal Service Water (012)

**Component Description:** Cooling Tower Return to RHRSW/ESW Wetwell

**ID Nos.:** HV-12-112, HV-12-114, HV-12-212, HV-12-214

**P&ID/COORD** (respectively): M-12 (SHT 1) / D-7, M-12 (SHT 1) / D-7, M-12 (SHT 1) / D-2, M-12 (SHT 1) / D-2

| | | |
|---|---|---|
| **Code Class:** 3 | **Category:** B | **Active/Passive:** A |
| **Size:** 36.00 | **Valve Type:** BF | **Act. Type:** MO |
| **Positions:** Normal OC | Safety C | Failsafe AI |
| **Test Frequency (Direction):** | ET-Q, ST-Q(C), PI-T | **Appendix J, Type C:** N |

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed, motor-operated valves are located in the Cooling Tower return lines to the RHRSW/ESW wetwell. They provide operational flexibility to allow the non-safety related Cooling Towers to be used as a RHRSW source of cooling water, and as the heat sink during normal shutdown and cooldown operations. However, use of the Cooling Towers is not required for safe shutdown or accident mitigation. These valves do not perform a safety function in the open position.

In the closed position, these valves provide isolation capability between the non-safety related Cooling Tower return piping and the Class 3 RHRSW portion of piping leading to the wetwell. These valves must be capable of automatic closure during any accident or transient condition which results in an ESW pump start. Their ability to close is required to maintain the Cooling Tower basin inventory which would gravity drain to the Spray Pond if these valves failed to close. The Cooling Tower inventory is an alternate non-safety related heat sink. However, due to an external event, particularly high winds or a tornado resulting in a loss of the spray networks, the Cooling Tower inventory is analyzed as potentially being relied upon to support the safety function of the ESW and RHRSW systems. The valves are installed in series to satisfy single failure design criteria and obtain their power from the Class 1E ac emergency buses.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the closed position
Position indication verification once every two years

**References:**

1. LGS Technical Specification 3/4.7.1.1
2. LGS Technical Specification 3/4.7.1.3
3. LGS Technical Specifications Bases 3/4.7.1
4. UFSAR Section 7.3.1.1.12, RHRSW Instrumentation and Controls
5. UFSAR Section 9.2.3, RHR Service Water System
6. UFSAR Section 9.2.6, Ultimate Heat Sink
7. UFSAR Table 9.2-6, RHRSW Failure Modes an Affects Analysis
8. System Design Baseline Document L-S-04, Residual Heat Removal Service Water
9. System Design Baseline Document L-S-22, Circulating Water and Cooling Towers
10. System Design Baseline Document L-S-27, Spray Pond
11. Engineering Change Request, LG 95-00271

**System (No):** Residual Heat Removal Service Water (012)

**Component Description:** RHRSW Discharge Header Relief Valves

**ID Nos.:** PSV-12-001A, PSV-12-001B

**P&ID/COORD** (respectively): M-12 (SHT 1) / F-6, F-3

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 0.75 **Valve Type:** RL **Act. Type:** SA

**Positions:** Normal C Safety OC Failsafe -

**Test Frequency (Direction):** RT-P3 **Appendix J, Type C:** N

**VRR/VCS/ROJ:**

**Remarks:**

**Safety Function(s):** These relief valves provide overpressure protection for the portion of the RHRSW System piping located between the RHRSW Pumps and the RHR Heat Exchanger Service Water inlet shutoff valves, HV-51-1(2)F014A/B. The design pressure of this piping is 160 psig. The RHRSW piping between the RHR HX inlet and outlet shutoff valves has a design pressure of 450 psig based on a postulated tube failure within the RHR Heat Exchanger. These relief valves are required by ASME Section III, paragraph ND-3612.4, which states that where piping systems operating at different pressures are connected by a valve or valves, the valve or valves shall be designed for the higher pressure requirements and the lower pressure system shall be designed to include relief valves.

**Test Requirement(s):**

Relief valve testing once every 10 years

**Reference(s):**

1. UFSAR Section 9.2.3, RHR Service Water System
2. ASME Section III, ND-3612.4
3. System Design Baseline Document L-S-04, Residual Heat Removal Service Water

# REACTOR ENCLOSURE COOLING WATER (RECW) SYSTEM

**System (No):** Reactor Enclosure Cooling Water (RECW) System (13)

**Component Description:** Reactor Recirculation Pump Cooling Water Inlet Isolation Valves - PCIV

**ID Nos.:** HV-13-106, HV-13-108, HV-13-206, HV-13-208

**P&ID/COORD** (respectively): M-13 (SHT 1) / F-5, M-13 (SHT 1) / F-5, M-13 (SHT 2) / F-5, M-13 (SHT 2) / F-5

**Code Class:** 2 **Category:** A **Active/Passive:** A

**Size:** 4.00 [1(2)06]
3.00 [1(2)08] **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal_O_ Safety_C_ Failsafe_AI_

**Test Frequency (Direction):** ET-C, ST-C(C), PI-T, LJ-B **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 13-VCS-1

**Remarks:** The cold shutdown test justification defers testing due to the consequences of isolating Reactor Recirc Pump cooling water flow during plant operation.

**Safety Function(s):** These normally open RECW cooling water supply valves to the Recirc Pumps valves provide a flow path for cooling water to the pump seal and motor oil coolers. The Reactor Recirc Pumps, however, are not required to mitigate the consequences of an accident or to bring the Reactor to a safe shutdown condition. Therefore, these valves do not have a safety function in the open position.

These valves are identified in UFSAR Table 6.2.17 as containment isolation valves for Penetration X-23. As such, they perform an active safety function in the closed position to maintain containment integrity. They must be capable of remote manual actuation, or automatic closure upon receipt of a Reactor Vessel Low Water Level - Level 1 or Drywell Pressure -High containment isolation signal. This isolation capability prevents the leakage of primary containment radioactivity to the environment in the event of an accident which results in increased pressure inside primary containment in conjunction with a loss of the attached non-Code piping.

The valve motor operators receive their control power from separate Class 1E emergency buses to assure operability during a loss of offsite power. These valves are provided with an automatic closure signal from the PCIS when conditions are detected which result in containment isolation. The maximum isolation time is 40 seconds for valves 1(2)06 and 30 seconds for valves 1(2)08.

**Test Requirement(s):**

Exercise test to the closed position during cold shutdown
Stroke time test to the closed position during cold shutdown
Position indication verification once every two years
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. T.S. Table 3.3.2-2, Isolation Actuation Instrumentation Setpoints
2. LGS Technical Specification 3/4.6.3
3. UFSAR Section 6.2.4, Containment Isolation System
4. UFSAR Table 6.2-17, Containment Penetration Data
5. UFSAR Section 9.2.8, Reactor Enclosure Cooling Water System
6. Design Baseline Document L-S-33, Reactor Enclosure Cooling Water System

**System (No):** Reactor Enclosure Cooling Water (RECW) System (13)

**Component Description:** Reactor Recirculation Pump Cooling Water Outlet Isolation Valves - PCIV

**ID Nos.:** HV-13-107, HV-13-111, HV-13-207, HV-13-211

**P&ID/COORD** (respectively): M-13 (SHT 1) / H-7, M-13 (SHT 1) / G-7, M-13 (SHT 2) / H-7, M-13 (SHT 2) / G-7

**Code Class:** 2 **Category:** A **Active/Passive:** A

**Size:** 4.00 [1(2)07]
3.00 [1(2)11] **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal_O_ Safety_C_ Failsafe_AI_

**Test Frequency (Direction):** ET-C, ST-C(C), PI-T, LJ-B **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 13-VCS-1

**Remarks:** The cold shutdown test justification defers testing due to the consequences of isolating Reactor Recirc Pump cooling water flow during plant operation.

**Safety Function(s):** These normally open RECW cooling water return valves from the Recirc Pumps valves provide a flow path for cooling water to the pump seal and motor oil coolers. The Reactor Recirc Pumps, however, are not required to mitigate the consequences of an accident or to bring the Reactor to a safe shutdown condition. Therefore, these valves do not have a safety function in the open position.

These valves are identified in UFSAR Table 6.2.17 as containment isolation valves for Penetration X-24. As such, they perform an active safety function in the closed position to maintain containment integrity. They must be capable of remote manual actuation, or automatic closure upon receipt of a Reactor Vessel Low Water Level - Level 1 or Drywell Pressure -High containment isolation signal. This isolation capability prevents the leakage of primary containment radioactivity to the environment in the event of an accident which results in increased pressure inside primary containment in conjunction with a loss of the attached non-Code piping.

The valve motor operators receive their control power from separate Class 1E emergency buses to assure operability during a loss of offsite power. These valves are provided with an automatic closure signal from the PCIS when conditions are detected which result in containment isolation. The maximum isolation time is 40 seconds for valves 1(2)07 and 30 seconds for valves 1(2)11.

**Test Requirement(s):**

Exercise test to the closed position during cold shutdown
Stroke time test to the closed position during cold shutdown
Position indication verification once every two years
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. T.S. Table 3.3.2-2, Isolation Actuation Instrumentation Setpoints
2. LGS Technical Specification 3/4.6.3
3. UFSAR Section 6.2.4, Containment Isolation System
4. UFSAR Table 6.2-17, Containment Penetration Data
5. UFSAR Section 9.2.8, Reactor Enclosure Cooling Water System
6. Design Baseline Document L-S-33, Reactor Enclosure Cooling Water System

**System (No):** Reactor Enclosure Cooling Water (RECW) System (13)

**Component Description:** Reactor Recirculation Pump Inlet and Discharge From ESW Cooling Water Crosstie Isolation Valves - PCIV

**ID Nos.:** HV-13-109, HV-13-110, HV-13-209, HV-13-210

**P&ID/COORD** (respectively): M-13 (SHT 1) / G-5, M-13 (SHT 1) / G-8, M-13 (SHT 2) / G-5, M-13 (SHT 2) / G-8

**Code Class:** 2 **Category:** A **Active/Passive:** P

**Size:** 3.00 **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal LC Safety C Failsafe AI

**Test Frequency (Direction):** LJ-B **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** The ESW cooling water crosstie supply and return valves to the Recirc Pumps perform a passive safety function in the closed position. These normally locked closed valves provide the operational flexibility to align ESW to RECW as an alternate source of cooling water. However, this capability has been terminated by removal of the power supply to the valve operators.

These valves are identified in UFSAR Table 6.2.17 as containment isolation valves for Penetrations X-23 and X-24, respectively. As such, the valves perform a passive safety function in the closed position to maintain containment integrity. This isolation capability prevents the leakage of primary containment radioactivity to the environment in the event of an accident which results in increased pressure inside primary containment.

The valve motor operators are not connected to any power supply. Therefore, position indication is not provided.

**Test Requirement(s):**

Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. T.S. Table 3.3.2-2, Isolation Actuation Instrumentation Setpoints
2. LGS Technical Specification 3/4.6.3
3. UFSAR Section 6.2.4, Containment Isolation System
4. UFSAR Table 6.2-17, Containment Penetration Data
5. UFSAR Section 9.2.8, Reactor Enclosure Cooling Water System
6. Design Baseline Document L-S-33, Reactor Enclosure Cooling Water System

# COMPRESSED AIR SYSTEM (CAS)

**System (No):** Compressed Air System (15)

**Component Description:** Service Air to Drywell - Inboard/Outboard PCIVs

**ID Nos.:** 15-1139, 15-1140, 15-2139, 15-2140

**P&ID/COORD** (respectively): M-15 (SHT 15) / F-4, M-15 (SHT 15) / F-4, M-15 (SHT 29) / H-5, M-15 (SHT 29) / H-5

**Code Class:** 2 **Category:** A **Active/Passive:** P

**Size:** 3.00 **Valve Type:** GT **Act. Type:** MA

**Positions:** Normal LC Safety C Failsafe AI

**Test Frequency (Direction):** LJ-B **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These locked closed manual valves are located in the containment penetration piping supplying service air to the primary containment. The valves perform a passive safety function in the closed position. The valves are identified in UFSAR Table 6.2.17 as containment isolation valves for Penetration X-21. As such, the valves must be capable of maintaining a leak tight barrier in order to prevent leakage of primary containment radioactivity to the environment, in the event of an accident which results in increased pressure inside primary containment in conjunction with a loss of the attached non-Code piping. The valves serve as boundary valves between the Class 2 seismic IA penetration piping and the non-Code seismic IIA service air piping.

These valves do not perform a safety function in the open position. They are opened during refueling outages to provide service air to outlets inside primary containment. This function provides an air source to support work activities, such as pneumatic tools and breathing air.

**Test Requirement(s):**

Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
4. UFSAR Section 9.3.1, Compressed Air and Gas Systems
5. Design Baseline Document L-S-10, Compressed Air System

**System (No):** Compressed Air System (15)

**Component Description:** Inflatable Seal Service Air Supply Check Valves

**ID Nos.:** 15-1412A, 15-1412B, 15-1412C, 15-1412D, 15-1412G, 15-1412K
15-2412A, 15-2412B, 15-2412C, 15-2412D, 15-2412G, 15-2412K

**P&ID/COORD** (respectively):

| | |
|---|---|
| M-15 (SHT 15) / A-5, | M-15 (SHT 16) / G-2, |
| M-15 (SHT 16) / E-2, | M-15 (SHT 16) / C-2, |
| M-15 (SHT 15) / C-5, | M-15 (SHT 16) / C-4, |
| M-15 (SHT 29) / A-6, | M-15 (SHT 30) / G-2, |
| M-15 (SHT 30) / E-2, | M-15 (SHT 30) / B-2, |
| M-15 (SHT 29) / C-6, | M-15 (SHT 30) / C-4 |

**Code Class:** NC **Category:** A/C **Active/Passive:** A

**Size:** 0.75 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal OC Safety C Failsafe -

**Test Frequency (Direction):** LP-T, **Appendix J, Type C:** N
ET-R(R) (A, B, G, K valves)
ET-Q(R) (C, D valves)

**VRR/VCS/ROJ:** 15-ROJ-1

**Remarks:** This refueling outage justification allows reverse exercise testing of 15-1(2)412A, B, G and K during refueling outages due to the potential of losing secondary containment integrity. This ROJ does not apply to 15-1(2)412C and D.

**Safety Function(s):** These check valves are located in the normal Service Air supply lines to various inflatable seals which form part of the secondary containment boundary for the Reactor enclosure. The inflatable seals serviced by these valves are as follows:

# 1 - Steam Dryer and Separator Stop Log, 1(2)AS290
# 2 - Steam Dryer and Separator Stop Log, 1(2)BS290
# 3 - Reactor Well, 1(2)CS290
# 4 - Reactor Well, 1(2)DS290
# 7 - Reactor Well/Spent Fuel Pool Stop Log, 1(2)GS290
# 10 - Reactor Well/Spent Fuel Pool Stop Log, 1(2)KS290

These valves perform an active safety function in the closed position to maintain secondary containment integrity by preventing the diversion of the backup seismic I bottled nitrogen supply upon the loss of the normal seismic IIA Service Air supply. The leakage rate from seals 1, 2, 7 and 10 cannot exceed 3.5 psig in a five minute period. The leakage rate from seals 3 and 4 cannot exceed 0.2 psig in a five minute period. This criteria ensures the capability to maintain the subject seals inflated to at least minimum operating pressure for at least one hour with bottle pressure ≥ 500 psig. Failure to maintain the seals inflated would result in the loss of vacuum on the secondary containment, allowing the release of radioactive materials in levels exceeding 10 CFR 100 limits.

These valves do not perform a safety function in the open position. They open to provide a flow path from the non-safety related seismic IIA Service Air System to the subject inflatable seals.

**Test Requirement(s):**

Exercise test to the closed position during refueling outages (15-1(2)412A, B, G and K)
Exercise test to the closed position quarterly (15-1(2)412C and D)
Seat leakage rate test once every two years

**Reference(s):**

1. LGS Technical Specification 3/4.6.5
2. LGS Technical Specification Bases B 3/4.6.5
3. UFSAR Section 6.2.3, Secondary Containment Functional Design
4. UFSAR Section 9.3.1, Compressed Air and Gas Systems
5. Design Baseline Document L-S-10, Compressed Air System
6. LGS NCR L90159, Disposition for Units 1 and 2 Inflatable Seals # 1,2,7 and 10
7. LGS NCR L90161, Disposition for Units 1 and 2 Inflatable Seals # 3 and 4
8. Engineering Change Request LG 95-00862

**System (No):** Compressed Air System (15)

**Component Description:** Inflatable Seal Service Air/Nitrogen Supply Manual 3-Way Vent Valves

**ID Nos.:** 15-1413A, 15-1413B, 15-1413C, 15-1413D, 15-1413G, 15-1413K
15-2413A, 15-2413B, 15-2413C, 15-2413D, 15-2413G, 15-2413K

**P&ID/COORD** (respectively): M-15 (SHT 15) / A-6, M-15 (SHT 16) / G-1,
M-15 (SHT 16) / E-1, M-15 (SHT 16) / C-1,
M-15 (SHT 15) / D-5, M-15 (SHT 16) / C-4,
M-15 (SHT 29) / A-6, M-15 (SHT 30) / G-1,
M-15 (SHT 30) / E-1, M-15 (SHT 30) / B-1,
M-15 (SHT 29) / D-6, M-15 (SHT 30) / C-4

**Code Class:** NC **Category:** A **Active/Passive:** P

**Size:** 0.75 **Valve Type:** TW **Act. Type:** MA

**Positions:** Normal O Safety O Failsafe AI

**Test Frequency (Direction):** LP-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These manual 3-way valves are located in the seismic I Service Air/nitrogen supply lines to various inflatable seals which form part of the secondary containment boundary for the Reactor enclosure. The inflatable seals serviced by these valves are listed on the data sheet for valves 15-1(2)412A, B, C, D, G and K.

The valves perform a passive safety function in the open (i.e., pressure supply to seal) position to provide a flow path for the backup seismic I bottled nitrogen supply upon loss of the normal seismic IIA Service Air supply. Since the 3-way design of these valves provides a potential leakage path for the inflatable seals' air volume through the vent port, they shall be seat leakage tested to verify their leak tight integrity. The leakage rate from seals 1,2,7, and 10 cannot exceed 3.5 psig in a five minute period. The leakage rate from seals 3 and 4 cannot exceed 0.2 psig in a five minute period. This criteria ensures the capability to maintain the subject seals inflated to at least minimum operating pressure for at least one hour with bottle pressure ≥ 500 psig. Failure to maintain the seals inflated would result in the loss of vacuum on the secondary containment, allowing the release of radioactive materials in levels exceeding 10 CFR 100 limits.

These valves do not perform a safety function in the vented position. This position provides a means to vent the inflatable seal air volume, allowing deflation in order to facilitate maintenance/replacement.

**Test Requirement(s):**

Seat leakage rate test once every two years

**Reference(s):**

1. LGS Technical Specification 3/4.6.5
2. LGS Technical Specification Bases B 3/4.6.5
3. UFSAR Section 6.2.3, Secondary Containment Functional Design
4. UFSAR Section 9.3.1, Compressed Air and Gas Systems
5. Design Baseline Document L-S-10, Compressed Air System
6. LGS NCR L90159, Disposition for Units 1 and 2 Inflatable Seals # 1, 2, 7 and 10
7. LGS NCR L90161, Disposition for Units 1 and 2 Inflatable Seals # 3 and 4

**System (No):** Compressed Air System (15)

**Component Description:** Inflatable Seal Backup Connection Check Valves

**ID Nos.:** 15-1886A, 15-1886B, 15-1886C, 15-1886D, 15-1886G, 15-1886K
15-2886A, 15-2886B, 15-2886C, 15-2886D, 15-2886G, 15-2886K

**P&ID/COORD** (respectively):

| | |
|---|---|
| M-15 (SHT 15) / B-6, | M-15 (SHT 16) / G-1, |
| M-15 (SHT 16) / E-1, | M-15 (SHT 16) / C-1, |
| M-15 (SHT 15) / D-6, | M-15 (SHT 16) / C-4, |
| M-15 (SHT 29) / B-7, | M-15 (SHT 30) / G-1, |
| M-15 (SHT 30) / E-1, | M-15 (SHT 30) / C-1, |
| M-15 (SHT 29) / D-6, | M-15 (SHT 30) / C-4 |

**Code Class:** NC  **Category:** A/C  **Active/Passive:** A

**Size:** 0.50  **Valve Type:** CK  **Act. Type:** SA

**Positions:** Normal C  Safety C  Failsafe -

**Test Frequency (Direction):** LP-T
ET-R(R) (A, B, G, K valves)
ET-Q(R) (C, D valves)

**Appendix J, Type C:** N

**VRR/VCS/ROJ:** 15-ROJ-1

**Remarks:** This refueling outage justification allows reverse exercise testing of 15-1(2)886A, B, G and K during refueling outages due to the potential of losing secondary containment integrity. This ROJ does not apply to 15-(2)886C and D.

**Safety Function(s):** These check valves are located in the backup bottled gas supply connection lines to various inflatable seals which form part of the secondary containment boundary for the Reactor enclosure. The inflatable seals are listed on the data sheet for valves 15-1(2)412A, B, C, D, G and K.

These valves perform an active safety function in the closed position to maintain secondary containment integrity by preventing the diversion of the backup seismic I bottled nitrogen supply upon the loss of the normal seismic IIA Service Air supply. The leakage rate from seals 1, 2, 7 and 10 cannot exceed 3.5 psig in a five minute period. The leakage rate from seals 3 and 4 cannot exceed 0.2 psig in a five minute period. This criteria ensures the capability to maintain the subject seals inflated to at least minimum operating pressure for at least one hour with bottle pressure ≥ 500 psig. Failure to maintain the seals inflated would result in the loss of vacuum on the secondary containment, allowing the release of radioactive materials in levels exceeding 10 CFR 100 limits.

It should be noted that the Unit 2 piping configuration associated with these valves is provided with an upstream normally closed plug valve. However, due to the historical leakage associated with these check valves, they shall remain in the IST program. Also, these check valves have recently undergone modification to enhance their leak tight reliability. Should subsequent testing continue to demonstrate leak tight reliability, the Unit 2 valves may be considered for removal from the IST program due to the normally closed upstream plug valve.

These valves do not perform a safety function in the open position. The valves open to provide a flow path in the unlikely event that a portable backup nitrogen bottle is required subsequent to a loss of the normal nitrogen bottle supply. The normal bottled nitrogen supply is credited as providing sufficient nitrogen makeup to the inflatable seals for maintaining secondary containment pressure boundary integrity.

**Test Requirement(s):**

Exercise test to the closed position during refueling outages (15-1(2)886A, B, G and K)
Exercise test to the closed position quarterly (15-1(2)886C and D)
Seat leakage rate test once every two years

**Reference(s):**

1. LGS Technical Specification 3/4.6.5
2. LGS Technical Specification Bases B 3/4.6.5
3. UFSAR Section 6.2.3, Secondary Containment Functional Design
4. UFSAR Section 9.3.1, Compressed Air and Gas Systems
5. Design Baseline Document L-S-10, Compressed Air System
6. LGS NCR L90159, Disposition for Units 1 and 2 Inflatable Seals # 1,2,7 and 10
7. LGS NCR L90161, Disposition for Units 1 and 2 Inflatable Seals # 3 and 4
8. Engineering Change Request LG 95-00862

**System (No):** Compressed Air System (15)

**Component Description:** Inflatable Seal Bottled Nitrogen Supply Pressure Regulating Valves

**ID Nos.:** PCV-15-146A, PCV-15-146B, PCV-15-146C, PCV-15-146D, PCV-15-146G, PCV-15-146K, PCV-15-246A, PCV-15-246B, PCV-15-246C, PCV-15-246D, PCV-15-246G, PCV-15-246K

**P&ID/COORD** (respectively): M-15 (SHT 15) / B-5, M-15 (SHT 16) / H-2, M-15 (SHT 16) / F-2, M-15 (SHT 16) / D-2, M-15 (SHT 15) / D-4, M-15 (SHT 16) / C-5, M-15 (SHT 29) / B-5, M-15 (SHT 30) / H-2, M-15 (SHT 30) / F-2, M-15 (SHT 30) / C-2, M-15 (SHT 29) / D-4, M-15 (SHT 30) / C-5

**Code Class:** NC **Category:** N/A **Active/Passive:** Q

**Size:** 0.50 **Valve Type:** DI **Act. Type:** SA

**Positions:** Normal_C_ Safety_N/A_ Failsafe_N/A_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These pressure regulating valves are located in the seismic I bottled nitrogen supply lines to various inflatable seals which form part of the secondary containment boundary for the reactor enclosure.

These pressure regulating valves do not perform a safety function in the open or closed positions. The valves regulate nitrogen pressure from the nitrogen bottles to the inflatable seals.

These valves function in a preset throttled position to provide regulated pressure to the seals. Seals 1, 2, 7 and 10 are designed to operate at pressures between 30 and 50 psig, and seals 3 and 4 are designed to operate at pressures between 47.5 and 57.5 psig. The nitrogen bottle supply is automatically connected to each inflatable seal supply header when low pressure is detected in the normal service air supply header. The nitrogen bottles are pressurized to 2250 psig and remain in operation until their pressure has decreased to 500 psig. In the event the pressure regulators fail to properly regulate nitrogen pressure, system design prevents overpressurization of the inflatable seals by the presence of a downstream relief valve. These valves are not considered to perform a safety function, and are exempt from Code required testing, by performing a pressure regulating function without a failsafe position. Due to the significance of these pressure regulators, and the necessity for them to function properly, they are included in the preventative maintenance program, and periodically checked for proper operation.

**Test Requirement(s):**

No testing requirements

**Reference(s):**

1. UFSAR Section 9.3.1, Compressed Air and Gas Systems
2. Design Baseline Document L-S-10, Compressed Air System
3. NUREG-1482, Guidelines for Inservice Testing at Nuclear Power Plants, Section 3.4.
4. LGS NCR L90159, Disposition for Units 1 and 2 Inflatable Seals # 1, 2, 7 and 10
5. LGS NCR L90161, Disposition for Units 1 and 2 Inflatable Seals # 3 and 4

**System (No):** Compressed Air System (15)

**Component Description:** Inflatable Seal Bottled Nitrogen Supply Pressure Relief Valves

**ID Nos.:** PSV-15-149A, PSV-15-149B, PSV-15-149C, PSV-15-149D, PSV-15-149G PSV-15-149K, PSV-15-249A, PSV-15-249B, PSV-15-249C, PSV-15-249D, PSV-15-249G, PSV-15-249K

**P&ID/COORD** (respectively):

| | |
|---|---|
| M-15 (SHT 15) / B-6, | M-15 (SHT 16) / G-1, |
| M-15 (SHT 16) / F-2, | M-15 (SHT 16) / C-2, |
| M-15 (SHT 15) / D-5, | M-15 (SHT 16) / C-4, |
| M-15 (SHT 29) / B-6, | M-15 (SHT 30) / G-2, |
| M-15 (SHT 30) / F-2, | M-15 (SHT 30) / C-2, |
| M-15 (SHT 29) / D-6, | M-15 (SHT 30) / C-4 |

**Code Class:** NC **Category:** A/C **Active/Passive:** A

**Size:** 0.50 **Valve Type:** RL **Act. Type:** SA

**Positions:** Normal_C_ Safety_O_ Failsafe_-_

**Test Frequency (Direction):** RT-P3, LP-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These pressure relief devices are located in the seismic I bottled nitrogen supply lines to various inflatable seals which form part of the secondary containment boundary for the Reactor enclosure. The inflatable seals protected by these relief valves, and which function as secondary containment boundary isolation, are as follows:

# 1 - Steam Dryer and Separator Stop Log, 1(2)AS290
# 2 - Steam Dryer and Separator Stop Log, 1(2)BS290
# 3 - Reactor Well, 1(2)CS290
# 4 - Reactor Well, 1(2)DS290
# 7 - Reactor Well/Spent Fuel Pool Stop Log, 1(2)GS290
# 10 - Reactor Well/Spent Fuel Pool Stop Log, 1(2)KS290

The relief valves perform an active safety function to provide overpressure protection to the above inflatable seals, in the event the associated pressure regulator fails to function properly.

Seals 1,2,7 and 10 are designed to operate at pressures between 30 and 50 psig, and seals 3 and 4 are designed to operate at pressures between 47.5 and 57.5 psig. The nitrogen bottles are pressurized to 2250 psig and remain in operation until their pressure has decreased to 500 psig. The nitrogen bottles supply the inflatable seals via pressure regulators. Failure of these relief valves to lift, subsequent to a failure of a pressure regulator, would result in gross overpressurization and rupture of the associated seal.

These relief valves also perform a passive safety function in the closed position. The relief valves discharge to atmosphere, and represent a potential leakage path for the inflatable seal's air volume through the discharge of the relief valve. Therefore, the valves shall receive a seat leakage test to verify their leak tight integrity. The leakage rate from seals 1, 2, 7 and 10 cannot exceed 3.5 psig in a five minute period. The leakage rate from seals 3 and 4 cannot exceed 0.2 psig in a five minute period. This criteria ensures the capability to maintain the subject seals inflated to at least minimum operating pressure for at least one hour with bottle pressure ≥ 500 psig. Failure to maintain the seals inflated would result in the loss of vacuum on the secondary containment, allowing the release of radioactive materials in levels exceeding 10 CFR 100 limits.

**Test Requirement(s):**

Seat leakage rate test once every two years
Relief valve test once every 10 years

**Reference(s):**

1. LGS Technical Specification 3/4.6.5
2. LGS Technical Specification Bases B 3/4.6.5
3. UFSAR Section 6.2.3, Secondary Containment Functional Design
4. UFSAR Section 9.3.1, Compressed Air and Gas Systems
5. Design Baseline Document L-S-10, Compressed Air System
6. LGS NCR L90159, Disposition for Units 1 and 2 Inflatable Seals # 1,2,7 and 10
7. LGS NCR L90161, Disposition for Units 1 and 2 Inflatable Seals # 3 and 4

# EMERGENCY DIESEL GENERATOR FUEL & DIESEL OIL STORAGE & TRANSFER SYSTEM AND STARTING AIR SYSTEM

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Diesel Fuel Oil Transfer Pumps

**ID Nos.:** 1AP514, 1BP514, 1CP514, 1DP514
2AP514, 2BP514, 2CP514, 2DP514

**P&ID/COORD** (respectively): M-20 (SHT 3) / D-4 (Typical for Unit 1, B, C, & D)
M-20 (SHT 9) / D-4 (Typical for Unit 2, B, C, & D)

**Pump Type:** Vertical Line Shaft **Test Parameters:** D/P, Q, V

**Relief Request:** GPRR-3

**Remarks:** Relief request GPRR-3 pertains to use of ultrasonic flow measuring equipment vs. instruments complying with Code accuracy and range requirements.

**Safety Function:** The Diesel Oil Transfer Pumps have an active safety function to transfer fuel oil to the Diesel Fuel Oil Day Tanks, thereby insuring at least 7 days of continuous operation of the diesel generators at rated loads. The capacity of the transfer pump is greater than the fuel oil consumption of the diesel engine. The pump can supply fuel oil for the diesel and simultaneously increase the inventory of the day tank. The fuel oil transfer pumps are started and stopped automatically by day tank level switches.

Each Diesel Oil Transfer Pump must provide sufficient fuel flow to one diesel engine to meet consumption requirements. The worst case calculation for diesel consumption is 33,749 gallons during a 7 day period. This consumption rate reflects the amount of fuel used by diesel D11, which is the highest consumer during the same 7 day scenario.

The Diesel Oil Transfer Pumps are powered by the Class 1E ac power system from the same electrical division as the Diesel Generator it supplies. They are submerged draft, vertical line shaft centrifugal pumps with a design output capacity of 20 gpm.

**Test Requirement(s):**

Quarterly Pump testing

**References:**

1. UFSAR Section 8.3.1.1.3, Standby Power Supply
2. UFSAR Section 9.5.4, Diesel Generator Fuel Oil System
3. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Engine Driven Fuel Pump

**ID Nos.:** 1AP537, 1BP537, 1CP537, 1DP537
2AP537, 2BP537, 2CP537, 2DP537

**P&ID/COORD** (respectively): M-20 (SHT 3) / G-7 (Typical for Unit 1, B, C, & D)
M-20 (SHT 9) / G-7 (Typical for Unit 2, B, C, & D)

**Pump Type:** N/A (integrally attached) **Test Parameters:** None

**Relief Request:** N/A

**Remarks:**

**Safety Function:** The Diesel Generator Engine-Driven Fuel Pumps have a safety function to provide fuel oil to the diesel engine injection header during normal Diesel Generator operation.

The Engine-Driven Fuel Pumps are mechanically powered directly from the respective diesel engine and must provide sufficient fuel flow to the diesel engine to meet consumption requirements. The design flow rate of the pumps is 9 GPM.

These pumps are integral to the diesel engine and are a component subassembly of the Diesel Generator. As such, these pumps are not tested as individual components. Satisfactory monthly surveillance testing of the respective Diesel Generator is an acceptable means of verifying the operational readiness of these pumps. This position is supported by NUREG-1482, Section 3.4.

**Test Requirement(s):**

No testing requirements.

**References:**

1. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems
2. UFSAR Section 8.3.1.1.3, Standby Power Supply
3. UFSAR Section 9.5.4, Diesel Generator Fuel Oil System
4. NUREG-1482, Guidelines for Inservice Testing at Nuclear Power Plants

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** DC Motor Driven Fuel Pump

**ID Nos.:** 1AP538, 1BP538, 1CP538, 1DP538
2AP538, 2BP538, 2CP538, 2DP538

**P&ID/COORD** (respectively): M-20 (SHT 3) / E-7 (Typical for Unit 1, B, C, & D)
M-20 (SHT 9) / E-7 (Typical for Unit 2, B, C, & D)

**Pump Type:** Positive Displacement **Test Parameters:** None

**Relief Request:** N/A

**Remarks:**

**Safety Function:** The Diesel Generator DC Motor Driven Fuel Pumps do not perform a safety function. They provide backup to the engine-driven pumps. However, this function is to enhance engine reliability, not to satisfy single failure criteria. A single active failure is considered to be the loss of the entire Emergency Diesel Generator. Therefore, the engine-driven fuel pump, being the primary fuel supply source to support engine operation, performs the safety function of supplying fuel to the engine.

The DC motor-driven pump starts simultaneously with the engine-driven pump on remote manual or automatic engine starts, and shuts off automatically about 10 seconds after the diesel attains a speed above 800 rpm. The DC motor-driven pump is then armed to restart automatically at the end of the engine starting sequence, approximately 4 seconds after stopping. The DC motor-driven pump will then remain a backup to the engine-driven pump and will automatically start on a low pressure condition (< 10 psig) at the fuel oil header. Operation of the DC motor-driven pump is not required during engine starts, or to support continued operation of the engine. The DC motor-driven pump is used to fill the header and engine fuel system subsequent to maintenance.

The DC motor-driven pump is a positive displacement pump with a discharge flow capacity of 10 gpm. The source of power for the DC fuel oil pump motor is Class 1E 125 V dc power system from the respective electrical division of its diesel generator.

**Test Requirement(s):**

No testing requirements.

**References:**

1. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems
2. UFSAR Section 8.3.1.1.3, Standby Power Supply
3. UFSAR Section 9.5.4, Diesel Generator Fuel Oil System
4. NUREG-1482, Guidelines for Inservice Testing at Nuclear Power Plants

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** DO Trans Pump, Discharge Check Valves

**ID Nos.:** 020-1046A, 020-1046B, 020-1046C, 020-1046D
020-2046A, 020-2046B, 020-2046C, 020-2046D

**P&ID/COORD** (respectively): M-20 (SHT 3) / D-4 (Typical for Unit 1, B, C, & D)
M-20 (SHT 9) / D-4 (Typical for Unit 2, B, C, & D)

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 2.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal OC Safety O Failsafe -

**Test Frequency (Direction):** ET-Q(F) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function:** The Diesel Oil Transfer Pump Discharge Check Valves have an active safety function in the open position to allow transfer of fuel oil to the Diesel Fuel Oil Day Tanks during normal diesel generator operation.

Each Diesel Oil Transfer train must be capable of providing sufficient fuel flow to one diesel engine to meet consumption requirements and replenish the level in the day tank. The worst case calculation for diesel consumption is 33,749 gallons during a 7 day period. This consumption rate reflects the amount of fuel used by diesel D11, which is the highest consumer during the same 7 day scenario. The worst case consumption rate corresponds to approximately 3.34 gpm. Therefore, these check valves must be capable of passing at least 3.34 gpm, in addition to sufficient flow rate to replenish day tank level, in order to perform their safety function in the open position. The total flow rate required for each individual check valve to pass is not defined in LGS licensing documents. Therefore, for test consistency, approximately two times the worst case engine consumption rate shall be established as the accident flow rate required to pass through these check valves. An accident flow rate of 6.5 gpm shall be considered adequate to satisfy the intended safety function for these check valves in the open direction.

These check valves have no safety function in the closed position. The diesel oil transfer discharge crosstie manual valves are maintained in a locked closed position, thereby preventing the possibility of backflow through an idle DO transfer pump.

**Test Requirement(s):**

Quarterly exercise to the full open position.

**References:**

1. UFSAR Section 8.3.1.1.3, Standby Power Supply
2. UFSAR Section 9.5.4, Diesel Generator Fuel Oil System
3. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** DC Motor Driven Fuel Pump Disch. Check Valve

**ID Nos.:** 020-1054A, 020-1054B, 020-1054C, 020-1054D
020-2054A, 020-2054B, 020-2054C, 020-2054D

**P&ID/COORD** (respectively): M-20 (SHT 3) / F-6 (Typical for Unit 1, B, C, & D)
M-20 (SHT 9) / F-6 (Typical for Unit 2, B, C, & D)

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 0.75 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal OC Safety C Failsafe -

**Test Frequency (Direction):** ET-Q(R) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function:** The DC Motor-Driven Fuel Pump discharge check valves have an active safety function in the closed position to prevent diversion of engine-driven pump fuel oil discharge flow back to the Day Tank. Failure of this valve to close could result in loss of flow either via the relief valve or through the pump. Although these fuel pumps are positive displacement pumps, they are screw type pumps and therefore, by design, will permit a small amount of backflow through the pump.

These check valves do not have a safety function in the open position. The passage of flow to the engine fuel oil injection header during a loss or malfunctioning of the engine-driven fuel oil pumps is an enhancement to engine reliability, not a safety function to satisfy single failure.

These check valves are mounted on the Diesel Generator skid and are considered to be a component subassembly of the Diesel Generator. As such, these valves will not be tested individually. Satisfactory monthly surveillance testing of the respective Diesel Generator is considered an acceptable means of verifying the operational readiness of these check valves. Failure of these valves to perform satisfactorily will prevent the respective diesel engine from functioning properly after startup. This position is supported by NUREG-1482, Section 3.4.

**Test Requirement(s):**

Quarterly exercise test in the reverse direction.

**References:**

1. UFSAR Section 8.3.1.1.3, Standby Power Supply
2. UFSAR Section 9.5.4, Diesel Generator Fuel Oil System
3. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems
4. NUREG-1482, Guidelines for Inservice Testing at Nuclear Power Plants

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Engine Driven Fuel Pump Disch. Check Valve

**ID Nos.:** 020-1055A, 020-1055B, 020-1055C, 020-1055D
020-2055A, 020-2055B, 020-2055C, 020-2055D

**P&ID/COORD** (respectively): M-20 (SHT 3) / G-7 (Typical for Unit 1, B, C, & D)
M-20 (SHT 9) / G-6 (Typical for Unit 2, B, C, & D)

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 0.75 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal OC Safety O Failsafe -

**Test Frequency (Direction):** ET-Q(F) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function:** The Engine Driven Fuel Pump Discharge Check Valves have an active safety function in the open position to provide a flow path to the engine fuel oil injection header during the start sequence and to support continued operation of the engine.

These check valves do not have a safety function in the closed position. Although they prevent diversion of DC motor-driven pump fuel oil discharge flow, this is not a safety function. The DC motor-driven pump is not credited as being required to support Emergency Diesel Generator operation.

These check valves are mounted on the diesel generator skid and are considered to be a component subassembly of the Diesel Generator. As such, these valves are not tested as individual components. Satisfactory monthly surveillance testing of the respective Diesel Generator is considered an acceptable means of verifying the operational readiness of these check valves. This position is supported by NUREG-1482, Section 3.4.

**Test Requirement(s):**

Quarterly exercise to the fully open position.

**References:**

1. UFSAR Section 8.3.1.1.3, Standby Power Supply
2. UFSAR Section 9.5.4, Diesel Generator Fuel Oil System
3. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems
4. NUREG-1482, Guidelines for Inservice Testing at Nuclear Power Plants

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Diesel Oil Transfer Disch. Crosstie Valve

**ID Nos.:** 020-1080A, 020-1080B, 020-1080C, 020-1080D
020-2080A, 020-2080B, 020-2080C, 020-2080D

**P&ID/COORD** (respectively): M-20 (SHT 3) / B-4 (Typical for Unit 1, B, C, & D)
M-20 (SHT 9) / B-4 (Typical for Unit 2, B, C, & D)

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 2.00 **Valve Type:** GL **Act. Type:** MA

**Positions:** Normal LC Safety C Failsafe -

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function:** These manual cross-tie valves provide the capability of any one of the diesel engines to be supplied from any one of the Diesel Oil Storage Tanks. However, they are maintained in the locked closed position and are not required to be opened for the Diesel Generators to perform their required safety functions. Should a diesel engine become unavailable due to a loss of its associated storage tank, safe shutdown of the plant would not be compromised. As stated in UFSAR Section 9.5.4.3, "Only a maximum of three out of the four diesel generators supplied for each unit are required during a LOOP and/or LOCA to meet the safeguard load requirements. Therefore, failure of any one component of the diesel fuel oil system does not preclude safe shutdown of the plant following a LOOP and/or LOCA".

These manual cross-tie valves have a passive safety function in the closed position to provide train separation, thereby ensuring that an active or passive failure in one fuel oil transfer trains does not prevent the other train from performing it's intended safety function.

**Test Requirement(s):**

No test requirements.

**References:**

1. LGS Technical Specification Bases 3/4.8.1
2. UFSAR Table 6.3-3, Single Failure Evaluation
3. UFSAR Section 8.3.1.1.3, Standby Power Supply
4. UFSAR Section 9.5.4, Diesel Generator Fuel Oil System
5. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Starting Air Receiver Outlet Tie Vlv.

**ID Nos.:** 020-1113A, 020-1113B, 020-1113C, 020-1113D,
020-2113A, 020-2113B, 020-2113C, 020-2113D

**P&ID/COORD** (respectively): M-20 (SHT 6) / D-4 (Typical for Unit 1, B, C, & D)
M-20 (SHT 12) / D-4 (Typical for Unit 1, B, C, & D)

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 2.00 **Valve Type:** GL **Act. Type:** MA

**Positions:** Normal C Safety C Failsafe -

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed manual isolation valves are located in the crosstie line between the Starting Air Receivers' outlet to the Starting Air headers. These valves perform a passive safety function in the closed position to maintain separation between the two independent Starting Air trains.

These valves do not perform a safety function in the open position. Each diesel is provided with two independent Starting Air systems, both of which have 100 % capacity. The engine has the ability to successfully start from either Air Start header. Therefore, a loss of one Air Start train would not compromise the ability of the associated Diesel Generator to start.

**Test Requirement(s):**

No testing requirements.

**References:**

1. UFSAR Section 8.3.1.1.3, Standby Power Supply
2. UFSAR Section 9.5.6, Diesel Generator Starting System
3. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Starting Air Receiver Inlet Tie Vlv.

**ID Nos.:** 020-1115A, 020-1115B, 020-1115C, 020-1115D,
020-2115A, 020-2115B, 020-2115C, 020-2115D

**P&ID/COORD** (respectively): M-20 (SHT 6) / C-4 (Typical for Unit 1, B, C, & D)
M-20 (SHT 12) / C-4 (Typical for Unit 1, B, C, & D)

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 1.00 **Valve Type:** GL **Act. Type:** MA

**Positions:** Normal C Safety C Failsafe -

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed manual isolation valves are located in the crosstie line between the Starting Air Receivers. These valves perform a passive safety function in the closed position to maintain separation between the two independent Starting Air trains.

These valves do not perform a safety function in the open position. They do provide the capability of supplying air to a Receiver with an alternate Starting Air Compressor. However, this scenario would never be required to support engine starting. Each Diesel is provided with two independent Starting Air Systems, both of which have 100 % capacity. Therefore, a loss of one Air Start train would not compromise the ability of the associated Diesel Generator to start.

**Test Requirement(s):**

No testing requirements.

**References:**

1. UFSAR Section 8.3.1.1.3, Standby Power Supply
2. UFSAR Section 9.5.6, Diesel Generator Starting System
3. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Starting Air Compressor Outlet Tie Vlv.

**ID Nos.:** 020-1117A, 020-1117B, 020-1117C, 020-1117D,
020-2117A, 020-2117B, 020-2117C, 020-2117D

**P&ID/COORD** (respectively): M-20 (SHT 6) / B-4 (Typical for Unit 1, B, C, & D)
M-20 (SHT 12) / B-4 (Typical for Unit 1, B, C, & D)

**Code Class:** 3 **Category:** B **Active/Passive:** P

**Size:** 1.00 **Valve Type:** GL **Act. Type:** MA

**Positions:** Normal C Safety C Failsafe -

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed manual isolation valves are located in the crosstie line between the Starting Air Compressors' discharge lines. These valves perform a passive safety function in the closed position to maintain separation between the two independent Starting Air trains.

These valves do not perform a safety function in the open position. They do provide the capability of charging a Receiver with an adjacent Starting Air Compressor. However, this scenario would never be required to support engine starting. Each Diesel is provided with two independent Starting Air Systems, both of which have 100 % capacity. Therefore, a loss of one Air Start train would not compromise the ability of the associated Diesel Generator to start.

**Test Requirement(s):**

No testing requirements.

**References:**

1. UFSAR Section 8.3.1.1.3, Standby Power Supply
2. UFSAR Section 9.5.6, Diesel Generator Starting System
3. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Starting Air Receiver Inlet Check Valve

**ID Nos.:** 020-1118A, 020-1118B, 020-1118C, 020-1118D,
020-1122A, 020-1122B, 020-1122C, 020-1122D,
020-2118A, 020-2118B, 020-2118C, 020-2118D,
020-2122A, 020-2122B, 020-2122C, 020-2122D

**P&ID/COORD** (respectively): M-20 (SHT 6) / B-5 (Typical for Unit 1 A,B,C,& D)
M-20 (SHT 6) / B-4 (Typical for Unit 1 A,B,C,& D)
M-20 (SHT 12) / B-5 (Typical for Unit 2 A,B,C,& D)
M-20 (SHT 12) / B-4 (Typical for Unit 2 A,B,C,& D)

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal OC Safety C Failsafe -

**Test Frequency (Direction):** ET-Q(R) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** The Starting Air Receiver inlet check valves have an active safety function in the closed position to prevent a loss of receiver pressure to an inoperative or damaged charging air header. Maintaining the charged condition ensures the capability of meeting the intended safety function of the Air Receiver which is to provide a five start capability reserve air supply.

These check valves do not perform a safety function in the open position. Air compressor operation is not required to support an emergency start of the diesel generator since the Air Receivers are sized to provide at least five consecutive normal starts (within ten seconds each) with an initial air pressure of 225 psig.

**Test Requirement(s):**

Quarterly exercise to the closed position.

**References:**

1. UFSAR Section 8.3.1.1.3, Standby Power Supply
2. UFSAR Section 9.5.6, Diesel Generator Starting System
3. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Starting Air Compressor Disch. Check Valve

**ID Nos.:** 020-1126A, 020-1126B, 020-1126C, 020-1126D,
020-1127A, 020-1127B, 020-1127C, 020-1127D,
020-2126A, 020-2126B, 020-2126C, 020-2126D,
020-2127A, 020-2127B, 020-2127C, 020-2127D

**P&ID/COORD** (respectively): M-20 (SHT 6) / B-5 (Typical for Unit 1, B, C, & D)
M-20 (SHT 6) / B-4 (Typical for Unit 1, B, C, & D)
M-20 (SHT 12) / B-5 (Typical for Unit 2, B, C, & D)
M-20 (SHT 12) / B-4 (Typical for Unit 2, B, C, & D)

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 1.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal OC Safety N/A Failsafe -

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** The Starting Air Compressor discharge check valves do not perform a safety function in either the open or closed positions. Their purpose is to prevent backflow of air from an operating compressor to a faulted compressor in the event that the normally closed compressor discharge crosstie manual isolation valve is open. If such a fault were to occur, Air Receiver pressure and the ability to start the associated Diesel Generator would be maintained by downstream check valves 020-1(2)118A-D and 020-1(2)122A-D.

Each diesel is provided with two independent Starting Air Systems, both of which have 100 % capacity. Therefore, a loss of one Air Start train would not compromise the ability of the associated Diesel Generator to start.

These check valves do not perform a safety function in the open position. Air compressor operation is not required to support an emergency start of the Diesel Generator since the air receivers are sized to provide at least five consecutive starts (within ten seconds each) with an initial air pressure of 225 psig. Additionally, the Starting Air Compressors are shed from their power supplies upon receipt of a LOCA signal or subsequent to a LOOP.

**Test Requirement(s):**

No testing requirements.

**References:**

1. UFSAR Section 8.3.1.1.3, Standby Power Supply
2. UFSAR Section 9.5.6, Diesel Generator Starting System
3. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Diesel Generator Engine Fuel Oil Disch. Flow Restriction Orifice/Check Valve

**ID Nos.:** 020-1162A, 020-1162B, 020-1162C, 020-1162D
020-2162A, 020-2162B, 020-2162C, 020-2162D

**P&ID/COORD** (respectively): M-20 (SHT 3) / H-6 (Typical for Unit 1, B, C, & D)
M-20 (SHT 9) / H-6 (Typical for Unit 2, B, C, & D)

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 0.75 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal_OC_ Safety_O_ Failsafe_-_

**Test Frequency (Direction):** ET-Q(F) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function:** These check valves have an active safety function in the open position to provide a flow path to the Day Tank for excessive fuel oil supplied to the fuel injection header. Both the DC motor-driven pump and the engine-driven pump supply more fuel to the engine than it consumes while in operation. Failure of this valve to open could adversely affect the operation of the engine by allowing too much fuel to be injected into the cylinders.

These check valves do not perform a safety function in the closed position. The purpose of the restriction orifice is to ensure that the engine fuel injection header is maintained at the appropriate operating pressure. The check valve prevents back leakage of the fuel oil remaining in the return line after the engine is shut down. A gravity return overflow line exists from the Day Tank to the Storage Tank to prevent fuel oil from reaching the engine via this return as a result of overfilling the Day Tank.

These check valves are mounted in the Diesel Generator fuel oil injection compartment and are considered to be a component subassembly of the Diesel Generator. As such, they are not tested as individual components.

Satisfactory monthly surveillance testing of the respective Diesel Generator is considered an acceptable means of verifying the operational readiness of these check valves. This position is supported by NUREG-1482, Section 3.4.

**Test Requirement(s):**

Quarterly exercise to the fully open position.

**References:**

1. UFSAR Section 8.3.1.1.3, Standby Power Supply
2. UFSAR Section 9.5.4, Diesel Generator Fuel Oil System
3. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems
4. NUREG-1482, Guidelines for Inservice Testing at Nuclear Power Plants

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Starting System Air Start Control (Flex-Flow) Valve

**ID Nos.:** 92-1302A,B,C,D 92-2302A,B,C,D
92-1303A,B,C,D 92-2303A,B,C,D

**P&ID/COORD** (respectively):
M-20 (SHT 6) / F-5 (Typical for Unit 1 A,B,C,& D)
M-20 (SHT 12) / F-5 (Typical for Unit 2 A,B,C,& D)
M-20 (SHT 6) / F-5 (Typical for Unit 1 A,B,C,& D)
M-20 (SHT 12) / F-5 (Typical for Unit 2 A,B,C,& D)

**Code Class:** 3 **Category:** B **Active/Passive:** A

**Size:** 1.50 **Valve Type:** DI **Act. Type:** AO

**Positions:** Normal_C_ Safety_O_ Failsafe_O_

**Test Frequency (Direction):** ET-Q, FS-Q(O) ST-Q(O) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** 20-VRR-1

**Remarks:** This relief request allows valve exercising to be satisfied by satisfactory engine start during monthly surveillance testing.

**Safety Function(s):** An Air Start Flex-Flo Valve is provided in each independent starting air header. These valves perform an active safety function in the open position to allow starting air to the engine. When the engine receives a start signal both the start relay and the cranking time relay are energized. Upon energizing the start relay, a signal is sent to a three-way solenoid operated pilot valve which changes position such that starting air pressure on the diaphragm of the air start (Flex-Flo) valve is vented via the pilot valve ports. This allows the air start valve to open. Starting air is then admitted to the engine. Failure of these valves to open could result in the inability of the diesel engine to start. However, a failed start attempt would only occur if air start valves in both headers failed to open.

These valves are maintained closed when the diesel is in a standby condition and are not provided with individual remote manual control switches or position indicating lights.

**Test Requirement(s):**

Quarterly full exercise test
Quarterly fail-safe test to the open position
Quarterly stroke time test to the open position (timing satisfied by successful engine starts)

**References:**

1. UFSAR Section 8.3.1.1.3, Standby Power Supply
2. UFSAR Section 9.5.6, Diesel Generator Starting System
3. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Air Start Header Vent Valve

**ID Nos.:** 92-1308A,B,C,D 92-2308A,B,C,D
92-1309A,B,C,D 92-2309A,B,C,D

**P&ID/COORD** (respectively): M-20 (SHT 6) / F-5 (Typical for Unit 1, B, C, & D)
M-20 (SHT 12) / F-5 (Typical for Unit 2, B, C, & D)
M-20 (SHT 6) / E-5 (Typical for Unit 1, B, C, & D)
M-20 (SHT 12) / E-5 (Typical for Unit 2, B, C, & D)

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 0.1875 (orifice) **Valve Type:** SO **Act. Type:** SO

**Positions:** Normal_O_ Safety_N/A_ Failsafe_-_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** The Air Start Header Vent Valves are located downstream of the normally closed air start (Flex-Flo) valves and do not perform a safety function in either the open or closed positions. During engine standby conditions the vent valves are maintained in the open position, thereby allowing the air start distributor pilot valves to withdraw from the cam, and air start check valves to be closed. Upon receipt of a signal from the engine start relay these vent valves automatically close. However, their failure to close would not compromise the start capability of the engine. Adequate starting air would still be supplied to the engine to facilitate starting. When the engine achieves 200 RPMs, where starting air is no longer required, the vent valves will automatically open when the air start valve closes, thereby venting the air start header downstream of the air start valve. Venting the air start header subsequent to engine starts, and during engine operation, allows the pilot valve cam followers to withdraw from the cam avoiding excessive wear. These solenoid vent valves are not actually required due to the existence of vent paths integral with the pilot valve and check valve housings.

**Test Requirement(s):**

No testing requirements.

**References:**

1. UFSAR Section 8.3.1.1.3, Standby Power Supply
2. UFSAR Section 9.5.6, Diesel Generator Starting System
3. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Diesel Oil Storage Tank Pressure/Vacuum Relief

**ID Nos.:** PSV-020-120A, PSV-020-120B, PSV-020-120C, PSV-020-120D, PSV-020-220A, PSV-020-220B, PSV-020-220C, PSV-020-220D

**P&ID/COORD** (respectively): M-20 (SHT 3) / D-3 (Typical for Unit 1, B, C, & D)
M-20 (SHT 9) / D-3 (Typical for Unit 2, B, C, & D)

**Code Class:** NC **Category:** N/A **Active/Passive:** N/A

**Size:** 4.00 **Valve Type:** RL/VR **Act. Type:** SA

**Positions:** Normal_C_ Safety_N/A_ Failsafe_-_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function:** These pressure/vacuum relief valves are Seismic IIA and are located outside the Class 3 boundary in the EDG fuel oil storage tank pits. They serve as a backup to the open vent lines which ensures proper tank filling without overpressurization, and transfer pump operation without creating a vacuum condition. Alternate vent paths do exist. Therefore these valves do not perform a safety function.

**Test Requirement(s):**

No test requirements.

**References:**

1. UFSAR Section 9.5.4, Diesel Generator Fuel Oil System
2. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Diesel Generator Day Tank Relief

**ID Nos.:** PSV-020-121A, PSV-020-121B, PSV-020-121C, PSV-020-121D, PSV-020-221A, PSV-020-221B, PSV-020-221C, PSV-020-221D

**P&ID/COORD** (respectively): M-20 (SHT 3) / E-7 (Typical for Unit 1, B, C, & D)
M-20 (SHT 9) / E-7 (Typical for Unit 2, B, C, & D)

**Code Class:** NC **Category:** N/A **Active/Passive:** N/A

**Size:** 6.00 **Valve Type:** RL **Act. Type:** SA

**Positions:** Normal C Safety N/A Failsafe -

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function:** These pressure/vacuum relief valves are attached to the Diesel Generator Day Tanks. They do not perform a safety function for overpressure protection. Overpressurization, due to a failed level switch or a room fire, is prevented by a gravity return from the Day Tank to the Storage Tank which is vented to atmosphere. The gravity return line has been downgraded to Seismic IIA. It was originally installed to Seismic I standards, thereby providing reasonable assurance it will remain intact during design basis events. These valves are installed to enhance fuel oil system reliability and are not credited as performing a safety function.

**Test Requirement(s):**

No test requirements.

**References:**

1. UFSAR Section 9.5.4, Diesel Generator Fuel Oil System
2. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** DC Motor Driven Fuel Pump Discharge Relief

**ID Nos.:** PSV-020-125A-1, PSV-020-125B-1, PSV-020-125C-1, PSV-020-125D-1, PSV-020-225A-1, PSV-020-225B-1, PSV-020-225C-1, PSV-020-225D-1

**P&ID/COORD** (respectively): M-20 (SHT 3) / F-7 (Typical for Unit 1, B, C, & D)
M-20 (SHT 9) / F-7 (Typical for Unit 2, B, C, & D)

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 0.75 **Valve Type:** RL **Act. Type:** SA

**Positions:** Normal C Safety N/A Failsafe -

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function:** These relief valves are located in the discharge piping of the DC motor-driven fuel pump. They function in the same manner as the engine-driven pump discharge relief valves which is to provide overpressure protection, and to regulate fuel oil pressure to the engine. However, the DC motor driven fuel pump is not credited as performing a safety function. Therefore, these valves do not perform a safety function.

**Test Requirement(s):**

No test requirements.

**References:**

1. UFSAR Section 9.5.4, Diesel Generator Fuel Oil System
2. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Engine Driven Fuel Pump Discharge Relief

**ID Nos.:** PSV-020-125A-2, PSV-020-125B-2, PSV-020-125C-2, PSV-020-125D-2, PSV-020-225A-2, PSV-020-225B-2, PSV-020-225C-2, PSV-020-225D-2

**P&ID/COORD** (respectively): M-20 (SHT 3) / G-7 (Typical for Unit 1, B, C, & D)
M-20 (SHT 9) / G-7 (Typical for Unit 2, B, C, & D)

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 0.75 **Valve Type:** RL **Act. Type:** SA

**Positions:** Normal_C_ Safety_T_ Failsafe_-_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function:** These relief valves are located in the discharge piping of the engine-driven fuel pump. They function in the open position to provide overpressure protection and to regulate fuel oil flow to the engine. During engine operation, the downstream duplex filter handles only the quantity of fuel consumed by the engine plus about one gallon per minute from the orifice at the end of the engine fuel header. The remainder of fuel is returned to the Day Tank through these relief valves which are open, or partially open, whenever the engine is running. Failure of these reliefs to open could result in an overpressure condition and compromise the operability of the engine.

These relief valves are mounted on the Diesel Generator skid and are considered to be a component subassembly of the Diesel Generator. As such, they are not tested as individual components. Satisfactory monthly surveillance testing of the respective Diesel Generator is considered an acceptable means of verifying the operational readiness of these valves. This position is supported by NUREG-1482, Section 3.4.

Although these are standard relief-type valves, their service application is to function as pressure-control or regulating valves. As such, they are exempt from IST requirements.

**Test Requirement(s):**

No test requirements.

**References:**

1. UFSAR Section 9.5.4, Diesel Generator Fuel Oil System
2. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems
3. NUREG-1482, Guidelines for Inservice Testing at Nuclear Power Plants

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Starting Air Receiver Relief Valves

**ID Nos.:** PSV-020-128A-1, PSV-020-128B-1, PSV-020-128C-1, PSV-020-128D-1, PSV-020-128A-2, PSV-020-128B-2, PSV-020-128C-2, PSV-020-128D-2, PSV-020-228A-1, PSV-020-228B-1, PSV-020-228C-1, PSV-020-228D-1, PSV-020-228A-2, PSV-020-228B-2, PSV-020-228C-2, PSV-020-228D-2

**P&ID/COORD** (respectively): M-20 (SHT 6) / C-5, C-5, C-5, C-5,
M-20 (SHT 6) / C-3, C-3, C-3, C-3,
M-20 (SHT 12) / C-5, C-5, C-5, C-5,
M-20 (SHT 12) / C-3, C-3, C-3, C-3

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 0.75 **Valve Type:** RL **Act. Type:** SA

**Positions:** Normal C Safety OC Failsafe -

**Test Frequency (Direction):** RT-P3 **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function:** These relief valves provide overpressure protection for the Emergency Diesel Generators Starting Air Reservoirs during all normal modes of Plant operation while the diesels are in standby. The Starting Air Reservoirs are required to maintain sufficient compressed air inventory and pressure to assure that the Emergency Diesel Generators are capable of starting following a loss of the normal Class 1E power supply. Operability of the Diesel Generators is essential in assuring the capability of shutting down the Reactor or in mitigating the consequences of an accident.

**Test Requirement(s):**

Relief valve testing once every 10 years

**References:**

1. UFSAR Section 8.3.1.1.3, Standby Power Supply
2. UFSAR Section 9.5.6, Diesel Generator Starting System
3. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems
4. Safety Evaluation for LGS Modification 5010, Relief Valve Reclassification

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Diesel Generator Cooling Water Relief Valves

**ID Nos.:** PSV-020-1522A, PSV-020-1522B, PSV-020-1522C, PSV-020-1522D, PSV-020-2522A, PSV-020-2522B, PSV-020-2522C, PSV-020-2522D

**P&ID/COORD** (respectively): M-20 (SHT. 4) / C-7, C-7, C-7, C-7,
M-20 (SHT. 10) / C-7, C-7, C-7, C-7

**Code Class:** 3 **Category:** N/A **Active/Passive:** N/A

**Size:** 0.75 **Valve Type:** RL **Act. Type:** SA

**Positions:** Normal_C_ Safety_N/A_ Failsafe_-_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These relief valves provide overpressure protection during post maintenance hydrotesting of the Diesel Generator Jacket Water System. During the testing, the portion of piping surrounding the turbochargers is isolated from the test. The piping could be subjected to higher pressure due to leakage past the isolation valves. These relief valves do not perform any function to protect the Emergency Diesel Generators during normal operation, testing or maintenance.

**Test Requirement(s):**

No testing requirements.

**Reference(s):**

1. UFSAR Section 9.5.5, Diesel Generator Cooling Water System
2. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems

**System (No):** Fuel & Diesel Oil Storage & Transfer and Starting Air (020)

**Component Description:** Diesel Generator Air Temperature Control System Relief Valves

**ID Nos.:** PSV-092-1315A, PSV-092-1315B, PSV-092-1315C, PSV-092-1315D, PSV-092-2315A, PSV-092-2315B, PSV-092-2315C, PSV-092-2315D

**P&ID/COORD** (respectively): M-20 (SHT. 6) / F-6, F-6, F-6, F-6,
M-20 (SHT. 12) / F-6, F-6, F-6, F-6

**Code Class:** N/A **Category:** N/A **Active/Passive:** N/A

**Size:** 0.75 **Valve Type:** RL **Act. Type:** SA

**Positions:** Normal C Safety N/A Failsafe -

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These relief valves are located in instrument lines to the pneumatic operators for Diesel Generator air cooler coolant three-way bypass valves 92-TCV-1(2)20A/B/C/D. Air in these lines is supplied by the Diesel Generator Air Start System. These valves protect the instrument lines from overpressure in the event that the associated upstream pressure control valve (92-PCV-1(2)316A/B/C/D) fails in the open position. These valves are non-ASME and are built to manufacturer's standards. In the event that they failed to lift, a rupture of the instrument line could result. Loss of control air to the TCV's has no adverse impact on the ability of the affected Diesel Generator to function. If the rupture occurred while the Diesel Generator was in standby, a loss of pressure could occur in the associated Air Start header. However, the ability of the affected Diesel Generator to start would not be compromised since the redundant air receiver could still start the engine.

**Test Requirement(s):**

No testing requirements.

**Reference(s):**

1. UFSAR Section 9.5.6, Diesel Generator Starting System
2. System Design Baseline Document L-S-07, Diesel Generator and Auxiliary Systems

# PROCESS RADIATION MONITORING SYSTEM (PRMS)

**System (No):** Process Radiation Monitoring System (26)

**Component Description:** Drywell Radiation Monitoring Leak Detection Supply and Return Isolation Valves - Inboard/Outboard PCIVs

**ID Nos.:** SV-26-190A, SV-26-190B, SV-26-190C, SV-26-190D, SV-26-290A, SV-26-290B, SV-26-290C, SV-26-290D

**P&ID/COORD** (respectively): M-26 (SHT 2) / G-3, M-26 (SHT 2) / F-3, M-26 (SHT 2) / G-4, M-26 (SHT 2) / F-4, M-26 (SHT 8) / G-3, M-26 (SHT 8) / F-3, M-26 (SHT 8) / G-4, M-26 (SHT 8) / F-4

**Code Class:** 2 **Category:** A **Active/Passive:** A

**Size:** 1.00 **Valve Type:** GL **Act. Type:** SO

**Positions:** Normal_O_ Safety_C_ Failsafe_C_

**Test Frequency (Direction):** ET-Q, FS-Q(C), ST-Q(C), LJ-B, PI-T **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally open, fail-closed, solenoid-operated valves are located in the supply and return lines for the Primary Containment Leak Detector Radiation Monitors. They perform an active safety function in the closed position. They are identified in UFSAR Table 6.2-17 as Primary Containment isolation valves for Penetrations X-117B-1 and X-117B-2. As such, they perform an active safety function in the closed position to maintain Primary Containment integrity and must be capable of automatic closure upon receipt of a Group VIC isolation signal. They have a maximum isolation time of 5 seconds.

These valves do not perform a safety function in the open position. They perform the non-safety related process function of monitoring radiation levels in the primary containment atmosphere during normal operation. The air is monitored to detect a leak in the Reactor Coolant pressure boundary which could result in an uncontrolled release of radioactive material to the environment. This function is not required to place or maintain the Reactor in a safe shutdown condition or to mitigate the consequences of an accident.

The stems of these valves are visually inaccessible due to the solenoid actuators. The vendor-recommended procedure for performing remote position indication verification testing is identical to the stroke time test procedure performed on these valves quarterly. Therefore, a separate position indication verification test is not required.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly fail-safe test to the closed position
Quarterly stroke time test to the closed position
Position indication verification once every two years
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification Table 3.3.2-2
2. LGS Technical Specification 3/4.6.3
3. UFSAR Section 6.2.4, Containment Isolation System
4. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
5. UFSAR Section 7.7.1.9, Process Radiation Monitoring System - Instrumentation and Controls
6. UFSAR Section 7.7.2.9.8, Leak Detection Radiation Monitoring System - Instrumentation and Controls
7. UFSAR Section 11.5, Process and Effluent Radiological Monitoring and Sampling Systems
8. Design Baseline Document L-S-43, Radiation Monitoring System

# NUCLEAR BOILER SYSTEM (NBS)

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** RWCU Alternate Return to the Reactor Vessel - Inboard/Outboard PCIVs

**ID Nos.:** 41-1016, 41-1017, 41-2016, 41-2017

**P&ID/COORD** (respectively): M-41 (SHT 1) / F-4, M-41 (SHT 1) / F-4, M-41 (SHT 4) / F-4, M-41 (SHT 4) / F-4

**Code Class:** 1 **Category:** A **Active/Passive:** P

**Size:** 4.00 **Valve Type:** GL **Act. Type:** MA

**Positions:** Normal_LC_ Safety_C_ Failsafe_AI

**Test Frequency (Direction):** LJ-B **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These locked closed manual valves are located in the RWCU alternate return line to the reactor vessel via feedwater loop A. The valves perform a passive safety function in the closed position. The valves are identified in UFSAR Table 6.2.17 as containment isolation valves for Penetration X-44. Additionally, 1(2)016 is also identified as the outboard PCIV for Penetrations X-9A and X-9B. As such, the valves must be capable of providing a leak tight barrier for Primary Containment and Reactor Coolant Pressure Boundary integrity.

The valves do not perform a safety function in the open position. These valves are placed in the open position only during refueling outages to provide an alternate return flow path for the RWCU pumps to the Reactor Vessel for maintaining water purity. This is a non-safety related function and is not required for safe shutdown or accident mitigation.

**Test Requirement(s):**

Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 5.4.8, Reactor Water Cleanup System
3. UFSAR Section 6.2.4, Containment Isolation System
4. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
5. Design Baseline Document L-S-36, Reactor Water Cleanup System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Safeguard Piping Fill Check Valves - Outboard PCIVs

**ID Nos.:** 41-1036A, 41-1036B, 41-2036A, 41-2036B

**P&ID/COORD** (respectively): M-41 (SHT 1) / D-5, M-41 (SHT 1) / B-4, M-41 (SHT 4) / D-5, M-41 (SHT 4) / B-4

**Code Class:** 1 **Category:** A/C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal C Safety OC Failsafe -

**Test Frequency (Direction):** ET-C(F&R), LJ-B **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 41-VCS-4

**Remarks:** 41-VCS-4 allows check valve exercising to be performed at cold shutdown due to feedwater flow and high energy conditions.

**Safety Function(s):** These check valves are located in the Safeguard Piping Fill System (SPFS) seal water injection line to primary containment isolation valves. They perform an active safety function in the open and closed positions.

These valves are identified in UFSAR Table 6.2.17 as containment isolation valves for Penetrations X-9A, 1(2)036A, and X-9B, 1(2)036B. As such, the valves must be capable of closure to maintain Primary Containment and Reactor Coolant Pressure Boundary integrity. Additionally, valve closure prevents the diversion of HPCI or RCIC flow.

These valves also perform an active safety function in the open position. They must be capable of opening to provide a path for SPFS flow to the feedwater lines to establish and maintain a water seal against discharge of containment atmosphere into the Reactor enclosure in the event of any line break other than a feedwater line break inside containment. This function is designed to prevent the release of radioactivity through the feedwater line isolation valves. The required flow rate which these check valves must pass is an undefined amount. The ability of the SPFS to establish a water seal on the associated feedwater piping boundary will satisfy forward exercising requirements.

**Test Requirement(s):**

Exercise test to the open and closed positions during cold shutdowns
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.3.2.3, Containment Bypass Leakage
3. UFSAR Section 6.2.4, Containment Isolation System
4. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
5. UFSAR Section 7.6.2.7, SPFS - Instrumentation and Controls
6. UFSAR Section 10.4.7, Condensate an Feedwater System
7. Design Baseline Document L-S-11, Feedwater System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Feedwater Headers A and B Injection Check Valves - Inboard PCIVs

**ID Nos.:** 41-1F010A, 41-1F010B, 41-2F010A, 41-2F010B

**P&ID/COORD** (respectively): M-41 (SHT 1) / D-4, M-41 (SHT 1) / C-4, M-41 (SHT 4) / D-4, M-41 (SHT 4) / C-4

**Code Class:** 1 **Category:** A/C **Active/Passive:** A

**Size:** 24.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal_O_ Safety_OC_ Failsafe_-_

**Test Frequency (Direction):** ET-Q(F), ET-R(R), LJ-B **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 41-ROJ-1

**Remarks:** 41-ROJ-1 allows check valve reverse exercising to be satisfied by Type C testing during refueling outages due to the interruption of feedwater flow and inaccessibility.

**Safety Function(s):** These check valves are located in the feedwater injection headers to the Reactor Vessel. They perform an active safety function in the open and closed positions.

These valves are identified in UFSAR Table 6.2.17 as inboard containment isolation valves for Penetrations X-9A, 1(2)F010A, and X-9B, 1(2)F010B. As such, the valves must be capable of closure to maintain Primary Containment pressure boundary integrity. These valves also serve as Reactor Coolant System boundary isolation valves. Therefore, valve closure also provides a protective barrier between the Reactor core and the environmental surroundings subsequent to; an accident involving failure of piping components, loss of feedwater, or HPCI/RCIC system isolation.

These valves also perform an active safety function in the open position. The HPCI System ties into the Feedwater System upstream of F010A, and utilizes feedwater piping as an injection flow path for 55 % of HPCI required accident flow. Therefore, F010A must be capable of opening upon HPCI System initiation to allow high pressure coolant injection to the Reactor Vessel core at a flow rate of at least 3000 gpm. Likewise, the Feedwater System B header is used by the RCIC system as an injection flow path. Therefore, F010B must be capable of opening upon RCIC initiation to allow injection of RCIC flow to the reactor vessel core at a flow rate of at least 600 gpm. During normal plant operation feedwater is delivered to the Reactor Vessel at a flow rate of 14,127,000 lb/hr (≈ 28,240 gpm) at 100 % power. Therefore, the ability to maintain proper reactor heat balance during power operation satisfies forward exercising for F010A&B.

**Test Requirement(s):**

Quarterly exercise test to the open position
Exercise test to the closed position during refueling
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.3.2.3, Containment Bypass Leakage
3. UFSAR Section 6.2.4, Containment Isolation System
4. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
5. UFSAR Section 10.5.4, Condensate and Feedwater system
6. Design Baseline Document L-S-03, High Pressure Coolant Injection System
7. Design Baseline Document L-S-11, Feedwater System
8. Design Baseline Document L-S-39, Reactor Core Isolation Cooling System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Inboard MSIVs Accumulator Inlet Check Valves

**ID Nos.:** 41-1F024A, 41-1F024B, 41-1F024C, 41-1F024D
41-2F024A, 41-2F024B, 41-2F024C, 41-2F024D

**P&ID/COORD** (respectively): M-41 (SHT 2) / G-5, M-41 (SHT 2) / G-5,
M-41 (SHT 2) / G-5, M-41 (SHT 2) / G-5,
M-41 (SHT 5) / G-4, M-41 (SHT 5) / G-4,
M-41 (SHT 5) / G-4, M-41 (SHT 5) / G-4

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 1.50 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal OC Safety C Failsafe -

**Test Frequency (Direction):** ET-R(R) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** 41-ROJ-3

**Remarks:** 41-ROJ-3 allows reverse exercising of valves to be performed during refueling outages when the primary containment is de-inerted.

**Safety Function(s):** These check valves are located in the instrument gas supply lines to the inboard MSIV accumulators. The valves perform an active safety function in the closed position. The valves must be capable of closure to maintain accumulator pressure in the event the non-Code seismic IIA PCIG system is unavailable, thereby ensuring that a safety related source of actuating air is available to the MSIVs. Each MSIV is provided with a gas accumulator to assist in its closure upon loss of air supply, loss of electrical power and/or failure of the MSIV fail-safe loading spring. The separate and independent action of either gas pressure or spring force is capable of closing the MSIVs with the Reactor at full pressure.

These check valves do not perform a safety function in the open position. Replenishment of accumulator volume is not required for accident mitigation. However, restoration of accumulator volume may be performed post-LOCA providing the non-Code seismic IIA instrument air or PCIG systems are available. Restoring the contents of the accumulator, if depleted, provides the operational flexibility to reopen the MSIVs to provide an alternate core cooling path through the main condenser. This capability is outside the licensing basis for the Plant.

**Test Requirement(s):**

Exercise test to the closed position during refueling outages when primary containment is de-inerted

**Reference(s):**

1. UFSAR Section 6.2.4, Containment Isolation System
2. UFSAR Section 9.3.1.3, Primary Containment Instrument Gas System
3. Design Baseline Document L-S-18, Instrument Air and Nitrogen Systems

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Outboard MSIVs Accumulator Inlet Check Valves

**ID Nos.:** 41-1F029A, 41-1F029B, 41-1F029C, 41-1F029D
41-2F029A, 41-2F029B, 41-2F029C, 41-2F029D

**P&ID/COORD** (respectively): M-41 (SHT 2) / G-4, M-41 (SHT 2) / G-4,
M-41 (SHT 2) / G-4, M-41 (SHT 2) / G-4,
M-41 (SHT 5) / H-4, M-41 (SHT 5) / H-4,
M-41 (SHT 5) / H-4, M-41 (SHT 5) / H-4

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 1.50 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal OC Safety C Failsafe -

**Test Frequency (Direction):** ET-R(R) - (Unit 1) ET-C(R) - (Unit 2) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** 41-ROJ-4 (Unit 1)
41-VCS-5 (Unit 2)

**Remarks:** 41-VCS-5 permits testing of 41-2F029A-D during cold shutdowns due to the harsh environment and the necessity to install test equipment. 41-ROJ-4 permits testing of 41-1F029A-D on a refueling outage frequency for the same reasons and because the Unit 1 configuration requires additional work for test preparation.

**Safety Function(s):** These check valves are located in the Instrument Air supply lines to the outboard MSIV accumulators. They perform an active safety function in the closed position. The valves must be capable of closure to maintain accumulator pressure in the event the non-Code seismic IIA Instrument Air System is unavailable, thereby ensuring that a safety related source of actuating air is available to the MSIVs. Each MSIV is provided with an air accumulator to assist in its closure upon loss of air supply, loss of electrical power and/or failure of the MSIV fail-safe loading spring. The separate and independent action of either air pressure or spring force is capable of closing the MSIVs with the Reactor at full pressure.

These check valves do not perform a safety function in the open position. Replenishment of accumulator volume is not required for accident mitigation. However, restoration of accumulator volume may be performed post-LOCA providing the non-Code seismic IIA instrument air system is available. Restoring the contents of the accumulator, if depleted, provides the operational flexibility to reopen the MSIVs to provide an alternate core cooling path through the main condenser. This capability is outside the licensing basis for the Plant.

**Test Requirement(s):**

Exercise test to the closed position during refueling outages (Unit 1).
Exercise test to the closed position during cold shutdowns (Unit 2).

**Reference(s):**

1. UFSAR Section 6.2.4, Containment Isolation System
2. UFSAR Section 9.3.1.3, Primary Containment Instrument Gas System
3. Design Baseline Document L-S-18, Instrument Air and Nitrogen Systems

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Feedwater Headers A and B Inlet Check Valves - Outboard PCIVs

**ID Nos.:** 41-1F032A, 41-1F032B, 41-2F032A, 41-2F032B

**P&ID/COORD** (respectively): M-41 (SHT 1) / D-7, M-41 (SHT 1) / C-8, M-41 (SHT 4) / D-7, M-41 (SHT 4) / C-8

**Code Class:** 2 **Category:** A/C **Active/Passive:** A

**Size:** 24.00 **Valve Type:** SK **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-C(R), LJ-B
PI-T
**Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 41-VCS-1

**Remarks:** 41-VCS-1 allows check valve reverse exercising to be performed during cold shutdown to prevent the interruption of Feedwater flow.

**Safety Function(s):** These stop-check valves are located in the Feedwater injection headers to the Reactor Vessel and perform an active safety function in the closed position. The valves are identified in UFSAR Table 6.2.17 as outboard containment isolation valves for Penetrations X-9A and X-9B. As such, the valves must be capable of closure to maintain primary containment integrity subsequent to an accident involving failure of piping components, loss of Feedwater, or HPCI/RCIC System isolation. Additionally, F032A must close upon HPCI System initiation to prevent the diversion of HPCI System flow to the non-Code, Seismic IIA Feedwater System piping. This function is required to ensure HPCI flow is properly directed to the Reactor Vessel. Likewise, F032B must close to prevent the diversion of RCIC System flow.

These valves function as check valves in fulfillment of their safety functions. The motor-operators are installed for operating convenience and to provide long-term isolation capability following an accident. They do not perform any safety function.

These valves do not perform a safety function in the open position. Their function in the open position is to provide a path for Feedwater flow to the Reactor Vessel during normal power operation.

**Test Requirement(s):**

Exercise test to the closed position during cold shutdowns
Position indication verification once every two years
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
4. UFSAR Section 10.5.4, Condensate and Feedwater system
5. Design Baseline Document L-S-03, High Pressure Coolant Injection System
6. Design Baseline Document L-S-11, Feedwater System
7. Design Baseline Document L-S-39, Reactor Core Isolation Cooling System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** ADS Valves Accumulator Inlet Check Valves

**ID Nos.:** 41-1F036E, 41-1F036H, 41-1F036K, 41-1F036M, 41-1F036S, 41-2F036E, 41-2F036H, 41-2F036K, 41-2F036M, 41-2F036S

**P&ID/COORD** (respectively): M-41 (SHT 2) / G-8, M-41 (SHT 2) / G-8, M-41 (SHT 2) / G-8, M-41 (SHT 2) / G-8, M-41 (SHT 2) / G-8, M-41 (SHT 5) / G-8, M-41 (SHT 5) / G-8, M-41 (SHT 5) / G-8, M-41 (SHT 5) / G-8, M-41 (SHT 5) / G-8

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 1.50 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal OC Safety OC Failsafe -

**Test Frequency (Direction):** ET-R(F&R) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** 41-ROJ-2

**Remarks:** 41-ROJ-2 allows exercising of valves to be performed during refueling outages when the Primary Containment is de-inerted.

**Safety Function(s):** These check valves are located in the instrument gas supply lines to the ADS valve accumulators. They perform active safety functions in the open and closed positions.

The valves must be capable of opening to allow flow from the safety grade nitrogen supply to the ADS valves if a low pressure condition is sensed in the PCIG system. The ADS long term nitrogen supply system is comprised of nitrogen bottles which are sized to provide an adequate amount of nitrogen to maintain ADS operation for seven days post-LOCA. Connections external to the primary containment are provided to allow additional bottles to be connected to support ADS operation for 100 days post-LOCA, thereby satisfying design requirements for ECCS operability. Accident flow rate associated with these valves is an undefined amount. Therefore, demonstration of the ability to restore ADS accumulator volume satisfies forward exercising.

These valves also perform an active safety function in the closed position to maintain ADS accumulator pressure boundary integrity. Their closure capability will ensure the ADS valve accumulators are capable of maintaining sufficient volume for two ADS valve actuations over a six hour period. This duration is sufficient to ensure the ADS valves can perform their safety functions during the initial stages of a small break LOCA in conjunction with the failure of HPCI. Per NRC commitment in response to FSAR Question 271.2, these valves are not required to be subject to seat leakage testing.

**Test Requirement(s):**

Exercise test to the open and closed positions during refueling outages when primary containment is de-inerted

**Reference(s):**

1. UFSAR Section 7.3.1.1.1.2, ADS Instrumentation and Controls
2. UFSAR Section 9.3.1.3, Primary Containment Instrument Gas System
3. Design Baseline Document L-S-18, Instrument Air and Nitrogen Systems
4. Design Baseline Document L-S-31, Automatic Depressurization System
5. LGS FSAR Question 271.2, Qualification of ADS Accumulators

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Feedwater Headers A and B Flush Isolation Valve - Outboard PCIV

**ID Nos.:** HV-41-109A, HV-41-109B, HV-41-209A, HV-41-209B

**P&ID/COORD** (respectively): M-41 (SHT 1) / D-7, M-41 (SHT 1) / D-7, M-41 (SHT 4) / D-7, M-41 (SHT 4) / D-7

**Code Class:** 2 **Category:** A **Active/Passive:** P

**Size:** 16.00 **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal LC Safety C Failsafe AI

**Test Frequency (Direction):** LJ-B, PI-T **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These locked closed motor-operated valves are located in the Feedwater flushing line. They are maintained in the closed position during normal plant operation to isolate Feedwater System pressure from the low pressure Condensate System. They perform passive safety functions in the closed position. They are identified in UFSAR Table 6.2.17 as outboard containment isolation valves for Penetrations X-9A and X-9B. As such, the valves must be capable of providing a leak tight barrier for primary containment integrity. These valves also have a safety function in the closed position to prevent diversion of HPCI or RCIC flow to the Condensate System.

The valves do not perform a safety function in the open position. They are only placed in the open position during Feedwater System flushing prior to plant startup. System flushing allows water quality to be improved to meet chemistry requirements prior to placing the Condensate or Feedwater Systems in service. This is a non-safety related function and not required for accident mitigation.

**Test Requirement(s):**

Seat leakage rate test per 10 CFR 50, Appendix J (Option B)
Position indication verification once every two years

**Reference(s):**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
4. UFSAR Section 10.5.4, Condensate and Feedwater system
5. Design Baseline Document L-S-11, Feedwater System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Safeguard Piping Fill Block Valves - Outboard PCIVs

**ID Nos.:** HV-41-130A, HV-41-130B, HV-41-230A, HV-41-230B

**P&ID/COORD** (respectively): M-41 (SHT 1) / B-5, M-41 (SHT 1) / C-5, M-41 (SHT 4) / B-5, M-41 (SHT 4) / C-5

**Code Class:** 1 **Category:** A **Active/Passive:** A

**Size:** 1.50 **Valve Type:** GL **Act. Type:** MO

**Positions:** Normal_C_ Safety_OC_ Failsafe_AI_

**Test Frequency (Direction):** ET-C, ST-C(O&C), LJ-B, PI-T **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 41-VCS-3

**Remarks:** 41-VCS-3 allows these valves to be exercise and stroke-time tested during cold shutdowns due to their requirement to maintain an isolation barrier between feedwater and low pressure SPFS.

**Safety Function(s):** These normally closed, motor-operated valves are located in the Safeguard Piping Fill System (SPFS) seal water injection line to primary containment isolation valves. They perform active safety functions in the open and closed positions.

These valves are identified in UFSAR Table 6.2.17 as outboard containment isolation valves for Penetrations X-9A and X-9B. As such, they must be capable of closure to maintain Primary Containment integrity following an accident. They also function in the closed position to isolate the high pressure Feedwater System from the low pressure SPFS piping. They have a maximum isolation time of 45 seconds.

These valves also perform an active safety function in the open position. They must be capable of opening to provide a path for SPFS flow to the Feedwater lines to maintain a water seal against discharge of containment atmosphere into the Reactor enclosure in the event of any line break other than a Feedwater line break inside containment. This function is designed to prevent the release of radioactivity through the Feedwater line isolation valves.

The valve motor-operators are powered from separate Class 1E ac emergency power supplies to ensure operability during a loss of offsite power. They are operated by remote manual switch actuation and do not receive any automatic isolation signals in order to ensure that they will be able to function as required.

**Test Requirement(s):**

Full stroke exercise test during cold shutdowns
Stroke time test to the open and closed positions during cold shutdowns
Position indication verification once every two years
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.3.2.3, Containment Bypass Leakage
3. UFSAR Section 6.2.4, Containment Isolation System
4. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
5. UFSAR Section 7.6.2.7, SPFS - Instrumentation and Controls
6. UFSAR Section 10.4.7, Condensate an Feedwater System
7. Design Baseline Document L-S-11, Feedwater System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Safeguard Piping Fill Isolation Valves - Outboard PCIVs

**ID Nos.:** HV-41-133A, HV-41-133B, HV-41-233A, HV-41-233B

**P&ID/COORD** (respectively): M-41 (SHT 1) / B-5, M-41 (SHT 1) / B-5, M-41 (SHT 4) / B-5, M-41 (SHT 4) / B-5

**Code Class:** 1 **Category:** A **Active/Passive:** A

**Size:** 1.50 **Valve Type:** GL **Act. Type:** MO

**Positions:** Normal C Safety OC Failsafe AI

**Test Frequency (Direction):** ET-C, ST-C(O&C), LJ-B, PI-T **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 41-VCS-3

**Remarks:** 41-VCS-3 allows these valves to be exercise and stroke-time tested during cold shutdowns due to their requirement to maintain an isolation barrier between feedwater and low pressure SPFS.

**Safety Function(s):** These normally closed, motor-operated valves are located in the Safeguard Piping Fill System (SPFS) seal water injection line to primary containment isolation valves. They perform active safety functions in the open and closed positions.

These valves are identified in UFSAR Table 6.2.17 as outboard containment isolation valves for Penetrations X-9A and X-9B. As such, they must be capable of closure to maintain Primary Containment integrity following an accident. They also function in the closed position to isolate the high pressure Feedwater System from the low pressure SPFS piping. They have a maximum isolation time of 45 seconds.

These valves also perform an active safety function in the open position. They must be capable of opening to provide a path for SPFS flow to the Feedwater lines to maintain a water seal against discharge of containment atmosphere into the Reactor enclosure in the event of any line break other than a Feedwater line break inside containment. This function is designed to prevent the release of radioactivity through the Feedwater line isolation valves.

The valve motor-operators are powered from separate Class 1E ac emergency power supplies to ensure operability during a loss of offsite power. They are operated by remote manual switch actuation and do not receive any automatic isolation signals in order to ensure that they will be able to function as required.

**Test Requirement(s):**

Full stroke exercise test during cold shutdowns
Stroke time test to the open and closed positions during cold shutdowns
Position indication verification once every two years
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.3.2.3, Containment Bypass Leakage
3. UFSAR Section 6.2.4, Containment Isolation System
4. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
5. UFSAR Section 7.6.2.7, SPFS - Instrumentation and Controls
6. UFSAR Section 10.4.7, Condensate an Feedwater System
7. Design Baseline Document L-S-11, Feedwater System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Steam Line Drain Bypass Leakage Barrier Vent Valves

**ID Nos.:** HV-41-140, HV-41-141, HV-41-240, HV-41-241

**P&ID/COORD** (respectively): M-41 (SHT 2) / D-3, M-41 (SHT 2) / D-2, M-41 (SHT 5) / D-3, M-41 (SHT 5) / D-2

**Code Class:** NC **Category:** B **Active/Passive:** A

**Size:** 1.00 **Valve Type:** GL **Act. Type:** MO

**Positions:** Normal C Safety O Failsafe AI

**Test Frequency (Direction):** ET-Q, ST-Q(O), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed, motor-operated valves are located in the Reactor enclosure in drain lines between the inboard MSIV upstream drains to the Condensate System and floor drains serviced by the Radwaste System. They perform an active safety function in the open position to provide a flow path during accident conditions for the leakage of effluents from the Main Steam Line drains to the Radwaste System, which is located in an area serviced by the Standby Gas Treatment System. This function prevents the potential release of radioactivity outside secondary containment, and subsequently to the environment, by directing leakage to the Reactor enclosure where effluents are processed prior to release, thereby ensuring limits are maintained within regulatory requirements.

These valves are maintained closed during startup, planned operation and shutdown to allow condensation from the inboard MSIV drains to be directed to the Main Condenser hotwell which minimizes the potential for carryover of water droplets to the Main Turbine. This function is not required for safe shutdown or accident mitigation and is therefore non-safety related.

The motor-operators for these valves are powered from separate Class 1E ac emergency power supplies to ensure operability during a loss of offsite power. They are operated manually and receive no automatic isolation signals in order to assure they will be capable of functioning as required.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the open position
Position indication verification once every two years

**Reference(s):**

1. UFSAR Section 6.2.3.2.3, Containment Bypass Leakage
2. UFSAR Table 6.2.5, Evaluation of Potential Secondary Containment Bypass Leakage Paths
3. Design Baseline Document L-S-42, Nuclear Boiler System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Steam Line Drain Bypass Leakage Barrier Block Valves

**ID Nos.:** HV-41-142, HV-41-143, HV-41-242, HV-41-243

**P&ID/COORD** (respectively): M-41 (SHT 2) / D-2, M-41 (SHT 2) / D-2, M-41 (SHT 5) / D-2, M-41 (SHT 5) / D-2

**Code Class:** NC **Category:** B **Active/Passive:** A

**Size:** 3.00 **Valve Type:** GL **Act. Type:** MO

**Positions:** Normal O Safety C Failsafe AI

**Test Frequency (Direction):** ET-Q, ST-Q(C), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally open, motor-operated valves are located in the inboard MSIV upstream drain lines to the Main Condenser hotwell. They perform an active safety function in the closed position. They must be capable of automatic closure upon receipt of a Group VIIIB isolation signal. Their closure capability provides for isolation of a potential path for effluents from the Main Steam Line drains to the Main Condenser hotwell during accident conditions. This function prevents the release of radioactivity outside secondary containment, and subsequently to the environment, by isolating a potential bypass leakage path.

The valves do not perform a safety function in the open position. They are maintained open during startup, planned operation and shutdown to allow condensation from the inboard MSIV drains to be directed to the Main Condenser hotwell which minimizes the potential for carryover of water droplets to the Main Turbine. This function is not required for safe shutdown or accident mitigation and is therefore non-safety related.

The valve motor-operators are powered from separate Class 1E ac emergency power supplies to ensure operability during a loss of offsite power.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the closed position
Position indication verification once every two years

**Reference(s):**

1. LGS Technical Specification Table 3.3.2-2
2. UFSAR Section 6.2.3.2.3, Containment Bypass Leakage
3. UFSAR Table 6.2.5, Evaluation of Potential Secondary Containment Bypass Leakage Paths
4. Design Baseline Document L-S-42, Nuclear Boiler System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** NBS Head Vent to Radwaste Isolation Valves

**ID Nos.:** HV-41-1F001, HV-41-1F002, HV-41-2F001, HV-41-2F002

**P&ID/COORD** (respectively): M-41 (SHT 1) / H-3, M-41 (SHT 1) / H-3, M-41 (SHT 4) / H-3, M-41 (SHT 4) / H-3

**Code Class:** 1 **Category:** B **Active/Passive:** P

**Size:** 2.00 **Valve Type:** GL **Act. Type:** MO

**Positions:** Normal C Safety C Failsafe AI

**Test Frequency (Direction):** PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed motor-operated valves are located in the Reactor Vessel Head vent line to the Drywell Equipment Drain Tank. They perform a passive safety function in the closed position. They serve as isolation valves between the Class 1, Seismic I NBS and the non-Code, Seismic IIA Radwaste piping. These valves must be capable of maintaining the RCS pressure boundary during a seismic event.

These valves do not perform a safety function in the open position. They are placed in the open position to allow the removal of non-condensible gases prior to removing the RPV head during refueling, and to facilitate filling the RPV for hydrostatic testing. This function also minimizes radiation exposure to personnel during head removal. These are non-safety related functions.

**Test Requirement(s):**

Position Indication Verification once every two years

**Reference(s):**

1. Design Baseline Document L-S-42, Nuclear Boiler System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** NBS Head Vent Main steam Line "C"

**ID Nos.:** HV-41-1F005, HV-41-2F005

**P&ID/COORD** (respectively): M-41 (SHT 1) / G-3, M-41 (SHT 4) / G-3

**Code Class:** 1 **Category:** N/A **Active/Passive:** N/A

**Size:** 2.00 **Valve Type:** GL **Act. Type:** MO

**Positions:** Normal_O_ Safety_N/A_ Failsafe_AI_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally open motor-operated valves are located in the Reactor Vessel Head vent line to Main Steam Line "C". The valves do not perform a safety function in either the open or closed positions. The open position aligns the top head of the Reactor Vessel to Main Steam Line "C", within the Drywell, to remove non-condensible gases that might accumulate in the vessel head space during power operation. This is a non-safety related function.

These valves are not required to be placed in the closed position during any postulated plant design event or accident.. They do not perform any safety function in the closed position.

**Test Requirement(s):**

No testing requirements

**Reference(s):**

1. Design Baseline Document L-S-42, Nuclear Boiler System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Feedwater Headers A and B Inboard Maintenance Valve

**ID Nos.:** HV-41-1F011A, HV-41-1F011B, HV-41-2F011A, HV-41-2F011B

**P&ID/COORD** (respectively): M-41 (SHT 1) / D-4, M-41 (SHT 1) / C-4, M-41 (SHT 4) / D-4, M-41 (SHT 4) / C-4

**Code Class:** 1 **Category:** B **Active/Passive:** P

**Size:** 24.00 **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal LO Safety O Failsafe AI

**Test Frequency (Direction):** PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These locked-open motor-operated valves are located in Feedwater Injection Headers A and B to the Reactor Vessel. The valves perform a passive safety function in the open position to allow HPCI and RCIC flow to the Reactor Vessel. They are disabled by locking open their circuit breakers at the Motor Control Center, and using administrative controls to assure that the valve is maintained in a locked open position whenever the Reactor is in operational conditions other than cold shutdown or refueling.

These valves do not perform a safety function in the closed position. They are closed during the performance of local leak rate testing on the Feedwater containment isolation valves, and during the performance of maintenance activities on the upstream Feedwater valves

**Test Requirement(s):**

Position Indication Verification once every two years

**Reference(s):**

1. Design Baseline Document L-S-42, Nuclear Boiler System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Main Steam Line Drain Isolation Valves - Inboard/Outboard PCIVs

**ID Nos.:** HV-41-1F016, HV-41-1F019, HV-41-2F016, HV-41-2F019

**P&ID/COORD** (respectively): M-41 (SHT 2) / D-5, M-41 (SHT 2) / D-5, M-41 (SHT 5) / D-5, M-41 (SHT 5) / D-5

**Code Class:** 1 **Category:** A **Active/Passive:** A

**Size:** 3.00 **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal OC Safety C Failsafe AI

**Test Frequency (Direction):** ET-Q, ST-Q(C), LJ-B, PI-T **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed, motor-operated valves are located in the inboard MSIV upstream drain lines to the Main Condenser hotwell. They perform an active safety function in the closed position. The valves are identified in UFSAR Table 6.2.17 as containment isolation valves for Penetration X-8. As such, the valves must be capable of automatic closure, if open, to maintain primary containment and main steam line pressure boundary integrity upon receipt of a Group IA containment isolation signal. These valves have a maximum isolation time of 30 seconds.

These valves do not perform a safety function in the open position. They are opened during startup, planned operation and shutdown to allow condensation from the inboard MSIV drains to be directed to the Main Condenser hotwell which minimizes the potential for carryover of water droplets to the Main Turbine. This function is not required for safe shutdown or accident mitigation and is therefore non-safety related.

The valve motor-operators are powered from separate Class 1E ac emergency power supplies to ensure operability during a loss of offsite power.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the closed position
Position indication verification once every two years
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification Table 3.3.2-2
2. LGS Technical Specification 3/4.6.4
3. UFSAR Section 6.2.3.2.3, Containment Bypass Leakage
4. UFSAR Section 6.2.4, Containment Isolation System
5. UFSAR Table 6.2.5, Evaluation of Potential Secondary Containment Bypass Leakage Paths
6. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
7. Design Baseline Document L-S-42, Nuclear Boiler System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** MSIV Leakage Alternate Drain Pathway Valve

**ID Nos.:** HV-41-1F021, HV-41-2F021

**P&ID/COORD** (respectively): M-41 (SHT 2) / D-1, M-41 (SHT 5) / D-1

**Code Class:** NC **Category:** B **Active/Passive:** A

**Size:** 3.00 **Valve Type:** GL **Act. Type:** MO

**Positions:** Normal C Safety O Failsafe AI

**Test Frequency (Direction):** ET-Q, ST-Q(O), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed, motor-operated valves are located in a section of the MSIV Alternate Drain Pathway which runs from the downstream side of the outboard MSIVs to the Main Condenser hotwell. These valves perform an active safety function in the open position to provide a flow path for MSIV leakage to be directed to the hotwell during postulated LOCA situations in order to prevent the direct release of fission products that could leak through the closed MSIVs, thereby limiting offsite doses to within the requirements of 10 CFR 100. A flow orifice in a bypass line around this valve assures that this function will be available in the event that the applicable valve fails to open.

These valves do not perform a safety function in the closed position. They are opened intermittently during startup, planned operation and shutdown to direct normal MSIV leakage or condensate accumulation to the Main Condenser hotwell. This minimizes the potential for carryover of water droplets to the Main Turbine which is not required for safe shutdown or accident mitigation and is therefore non-safety related. These valves do not receive any automatic isolation signals.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the open position
Position indication verification once every two years

**Reference(s):**

1. LGS Technical Specification 3/4.6.1.4
2. UFSAR Section 6.2.3.2.3, Containment Bypass Leakage
3. UFSAR Table 6.2.5, Evaluation of Potential Secondary Containment Bypass Leakage Paths
4. Design Baseline Document L-S-42, Nuclear Boiler System
5. LGS Modification P-00017, MSIV-LCS Elimination
6. ECR LG 95-004491
7. ECR LG 95-00717

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Main Steam Isolation Valves (MSIVs) - Inboard PCIVs

**ID Nos.:** HV-41-1F022A, HV-41-1F022B, HV-41-1F022C, HV-41-1F022D
HV-41-2F022A, HV-41-2F022B, HV-41-2F022C, HV-41-2F022D

**P&ID/COORD** (respectively): M-41 (SHT 2) / F-5, M-41 (SHT 2) / C-6,
M-41 (SHT 2) / C-6, M-41 (SHT 2) / C-6,
M-41 (SHT 5) / F-5, M-41 (SHT 5) / C-6,
M-41 (SHT 5) / C-6, M-41 (SHT 5) / C-6

**Code Class:** 1 **Category:** A **Active/Passive:** A

**Size:** 26.00 **Valve Type:** GL **Act. Type:** AO

**Positions:** Normal_O_ Safety_C_ Failsafe_C_

**Test Frequency (Direction):** ET-C, PT-Q, FS-C(C), ST-C(C), LJ-B, PI-T **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 41-VCS-2

**Remarks:** 41-VCS-2 allows full stroke exercising to be performed at cold shutdown to prevent Main Steam Line isolation at power.

**Safety Function(s):** The MSIVs are normally open, air-operated valves which are located in the Main Steam lines and perform active safety functions in the closed position. These valves are identified in UFSAR Table 6.2.17 as inboard containment isolation valves for Penetrations X-7A,B,C & D. As such, the valves must be capable of automatic closure upon receipt of a Group IA containment isolation signals.

Closure of the MSIVs is required to accomplish the following safety related functions:

1) prevent damage to the fuel barrier by limiting the loss of Reactor cooling water in case of a major leak from the steam piping outside the primary containment,
2) limit release of radioactive materials by closing the nuclear system process barrier in case of gross release of radioactive materials from the Reactor fuel to the Reactor cooling water and steam, and

3) limit the release of radioactive materials by closing the primary containment barrier in case of a major leak from the Nuclear Steam System inside the primary containment.

LGS Technical Specification 3.4.7 requires the MSIVs to stroke in no less than 3 and no more than 5 seconds when tested pursuant to T.S. 4.0.5. This establishes a minimum and maximum limiting value of full stroke time and supersedes the permissible stroke time acceptance range criteria of the Code. The MSIVs fail to the closed position upon loss of air or loss of electrical power.

The MSIVs do not perform a safety function in the open position. Their function in the open position is to provide a flow path for steam to the Main Turbine and auxiliary equipment for power generation.

**Test Requirement(s):**

Quarterly partial stroke exercise test
Full stroke exercise test during cold shutdown
Fail-safe test to the closed position during cold shutdown
Stroke time test to the closed position during cold shutdown
Position indication verification once every two years
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification Table 3.3.2-2
2. LGS Technical Specification 3/4.4.7
3. LGS Technical Specification 3/4.6.3
4. UFSAR Section 5.4.5, Main Steam Line Isolation System
5. UFSAR Section 6.2.4, Containment Isolation System
6. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
7. UFSAR Chapter 15, Accident analysis
8. Design Baseline Document L-S-42, Nuclear Boiler System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Main Steam Isolation Valves (MSIVs) - Outboard PCIVs

**ID Nos.:** HV-41-1F028A, HV-41-1F028B, HV-41-1F028C, HV-41-1F028D, HV-41-2F028A, HV-41-2F028B, HV-41-2F028C, HV-41-2F028D

**P&ID/COORD** (respectively): M-41 (SHT 2) / F-5, M-41 (SHT 2) / C-6, M-41 (SHT 2) / C-6, M-41 (SHT 2) / C-6, M-41 (SHT 5) / F-5, M-41 (SHT 5) / C-6, M-41 (SHT 5) / C-6, M-41 (SHT 5) / C-6

**Code Class:** 1 **Category:** A **Active/Passive:** A

**Size:** 26.00 **Valve Type:** GL **Act. Type:** AO

**Positions:** Normal_O_ Safety_C_ Failsafe_C_

**Test Frequency (Direction):** ET-C, PT-Q, FS-C(C), ST-C(C), LJ-B, PI-T **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 41-VCS-2

**Remarks:** 41-VCS-2 allows full stroke exercising to be performed at cold shutdown to prevent Main Steam Line isolation at power.

**Safety Function(s):** The MSIVs are normally open, air-operated valves which are located in the Main Steam lines and perform active safety functions in the closed position. These valves are identified in UFSAR Table 6.2.17 as outboard containment isolation valves for Penetrations X-7A,B,C & D. As such, the valves must be capable of automatic closure upon receipt of a Group IA containment isolation signal.

Closure of the MSIVs is required to accomplish the following safety related functions:

1) prevent damage to the fuel barrier by limiting the loss of Reactor cooling water in case of a major leak from the steam piping outside the primary containment,
2) limit release of radioactive materials by closing the nuclear system process barrier in case of gross release of radioactive materials from the Reactor fuel to the Reactor cooling water and steam, and

3) limit the release of radioactive materials by closing the primary containment barrier in case of a major leak from the Nuclear Steam System inside the primary containment.

LGS Technical Specification 3.4.7 requires the MSIVs to stroke in no less than 3 and no more than 5 seconds when tested pursuant to T.S. 4.0.5. This establishes a minimum and maximum limiting value of full stroke time and supersedes the permissible stroke time acceptance range criteria of the Code. The MSIVs fail to the closed position upon loss of air or loss of electrical power.

The MSIVs do not perform a safety function in the open position. Their function in the open position is to provide a flow path for steam to the Main Turbine and auxiliary equipment for power generation.

**Test Requirement(s):**

Quarterly partial stroke exercise test
Full stroke exercise test during cold shutdown
Fail-safe test to the closed position during cold shutdown
Stroke time test to the closed position during cold shutdown
Position indication verification once every two years
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification Table 3.3.2-2
2. LGS Technical Specification 3/4.4.7
3. LGS Technical Specification 3/4.6.3
4. UFSAR Section 5.4.5, Main Steam Line Isolation System
5. UFSAR Section 6.2.4, Containment Isolation System
6. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
7. UFSAR Chapter 15, Accident analysis
8. Design Baseline Document L-S-42, Nuclear Boiler System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Feedwater Headers A and B Inlet Check Valves - Outboard PCIVs

**ID Nos.:** HV-41-1F074A, HV-41-1F074B, HV-41-2F074A, HV-41-2F074B

**P&ID/COORD** (respectively): M-41 (SHT 1) / D-4, M-41 (SHT 1) / C-4, M-41 (SHT 4) / D-4, M-41 (SHT 4) / C-4

**Code Class:** 1 **Category:** A/C **Active/Passive:** A

**Size:** 24.00 **Valve Type:** TC **Act. Type:** SA

**Positions:** Normal O Safety OC Failsafe -

**Test Frequency (Direction):** ET-Q(F), ET-C(R), LJ-B, PI-T **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 41-VCS-1

**Remarks:** 41-VCS-1 allows check valve reverse exercising to be performed during cold shutdown to prevent the interruption of Feedwater flow.

**Safety Function(s):** These check valves are located in the Feedwater injection headers to the Reactor Vessel and perform active safety functions in the open and closed positions. The valves are identified in UFSAR Table 6.2.17 as outboard containment isolation valves for Penetrations X-9A and X-9B. As such, the valves must be capable of closure to maintain primary containment integrity. These valves also serve as Reactor Coolant System boundary isolation valves. Therefore, valve closure also provides a protective barrier between the Reactor core and the environmental surroundings subsequent to an accident involving failure of piping components, loss of Feedwater or HPCI/RCIC System isolation.

These valves also perform active safety functions in the open position. The HPCI System ties into Feedwater Header A upstream of F074A, and utilizes Feedwater piping as an injection flow path for 55 % of HPCI required accident flow. Therefore, F074A must be capable of opening upon HPCI System initiation to allow high pressure coolant injection to the Reactor Vessel core at a flow rate of at least 3000 gpm. Likewise, Feedwater Header B is used by the RCIC System as an injection flow path. Therefore, F074B must be capable of opening upon RCIC initiation to allow injection of RCIC flow to the Reactor

Vessel core at a flow rate of at least 600 gpm. During normal plant operation, Feedwater is delivered to the Reactor Vessel at a flow rate of 14,127,000 lb/hr (≈ 28,240 gpm) at 100% power. Therefore, the ability to maintain proper Reactor heat balance during power operation satisfies the forward exercising requirement for F074A&B.

**Test Requirement(s):**

Quarterly exercise test to the open position
Exercise test to the closed position during cold shutdowns
Position indication verification once every two years
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
4. UFSAR Section 10.5.4, Condensate and Feedwater system
5. Design Baseline Document L-S-03, High Pressure Coolant Injection System
6. Design Baseline Document L-S-11, Feedwater System
7. Design Baseline Document L-S-39, Reactor Core Isolation Cooling System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Main Steam Line "C" Sample Isolation Valves - Inboard/Outboard PCIVs

**ID Nos.:** HV-41-1F084, HV-41-1F085, HV-41-2F084, HV-41-2F085

**P&ID/COORD** (respectively): M-41 (SHT 2) / B-5, M-41 (SHT 2) / B-4, M-41 (SHT 5) / B-5, M-41 (SHT 5) / B-4

**Code Class:** 1 **Category:** A **Active/Passive:** A

**Size:** 1.00 **Valve Type:** GL **Act. Type:** AO

**Positions:** Normal OC Safety C Failsafe C

**Test Frequency (Direction):** ET-Q, FS-Q(C), ST-Q(C), LJ-B, PI-T **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed, air-operated valves are located in a sample line which connects to Main Steam Line "C" upstream of the inboard MSIV. They perform an active safety function in the closed position. They are identified in UFSAR Table 6.2.17 as containment isolation valves for Penetration X-43B. As such, they must be capable of automatic closure to maintain primary containment and Main Steam Line pressure boundary integrity upon receipt of a Group IB isolation signal. These valves fail to the closed position upon loss of air or loss of electric power. They have a maximum isolation time of 10 seconds.

These valves do not perform a safety function in the open position. The are opened periodically during normal operation to sample and analyze steam quality for the purposes of making overall plant operational decisions. This capability permits on-line analysis or continuous monitoring, as well as, discrete grab sampling for remote laboratory analysis of various system chemical parameters.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly fail-safe test to the closed position
Quarterly stroke time test to the closed position
Position indication verification once every two years
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification Table 3.3.2-2
2. LGS Technical Specification 3/4.6.3
3. UFSAR Section 6.2.4, Containment Isolation System
4. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
5. Design Baseline Document L-S-42, Nuclear Boiler System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Main Steam Line Pressure Equalizing Valve

**ID Nos.:** HV-C-41-1F020, HV-C-41-2F020

**P&ID/COORD** (respectively): M-41 (SHT 2) / D-3, M-41 (SHT 5) / D-3

**Code Class:** 2 **Category:** B **Active/Passive:** A

**Size:** 2.00 **Valve Type:** GL **Act. Type:** MO

**Positions:** Normal OC Safety O Failsafe AI

**Test Frequency (Direction):** ET-Q, ST-Q(O), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally open, motor-operated valves are located in the MSIV pressure equalizing line which is also utilized for the MSIV Leakage Alternate Drain Pathway. The line in which these valves are located connects to Main Steam Lines A through D downstream of the outboard MSIVs. These valves perform an active safety function in the open position. They must be capable of opening to provide a flow path for MSIV leakage to be directed to the Main Condenser hotwell during postulated LOCA situations. This function prevents the direct release of fission products that could leak through the closed MSIVs, thereby limiting offsite doses to within the requirements of 10 CFR 100.

These valves also function in the open position to provide pressure equalization across the inboard and outboard MSIVs, prior to restart following a steam line isolation. This is not a safety function.

These valves do not perform a safety function in the closed position. Although they comprise a boundary between the Class 2 Seismic I Main Steam piping and the non-Code Seismic IIA drain piping, the Seismic IIA piping downstream of the valve was analyzed and demonstrated to be capable of functioning during and after a seismic event. Therefore, closure capability is not necessary to isolate the non-Code portion of piping subsequent to a seismic event. These valves do not receive any automatic actuation signals.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly stroke time test to the open
Position indication verification once every two years

**Reference(s):**

1. LGS Technical Specification 3/4.6.1.4
2. UFSAR Section 6.2.3.2.3, Containment Bypass Leakage
3. UFSAR Table 6.2.5, Evaluation of Potential Secondary Containment Bypass Leakage Paths
4. Design Baseline Document L-S-42, Nuclear Boiler System
5. Special Event Procedure SE-10, LOCA
6. LGS Modification P-00017, MSIV-LCS Elimination
7. ECR LG 95-00717
8. ECR LG 95-03005

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** RWCU Alternate Return to the Reactor Vessel Pressure Relief Valve - Outboard PCIVs

**ID Nos.:** PSV-41-112, PSV-41-212

**P&ID/COORD** (respectively): M-41 (SHT 1) / E-5, M-41 (SHT 4) / E-5

**Code Class:** 1 **Category:** A/C **Active/Passive:** A

**Size:** 0.75 **Valve Type:** RL **Act. Type:** SA

**Positions:** Normal_C_ Safety_OC_ Failsafe_-_

**Test Frequency (Direction):** LJ-B, RT-P2 **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These pressure relief valves are located on the RWCU alternate return line to the Reactor Vessel via Feedwater Loop A. They perform an active safety function to provide overpressure protection to containment penetration piping which remains isolated during all postulated accident scenarios. Therefore, they must be capable of lifting to protect the associated penetration piping in the event of thermal expansion of trapped fluids, or due to seat leakage of inboard isolation valve 1(2)017. Failure of these valves to function properly could compromise the integrity of Primary Containment and the RCS.

These valves are also identified in UFSAR Table 6.2.17 as outboard containment isolation valves for Penetration X-44. As such, they perform a safety function in the closed position to provide a leak tight barrier for primary containment and reactor coolant pressure boundary integrity.

**Test Requirement(s):**

Relief valve test once every 5 years
Seat leakage rate test per 10 CFR50, Appendix J (Option B)

**Reference(s):**

1. T.S. Table 3.6.3-1, Primary Containment Isolation Valves
2. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
3. UFSAR Section 6.2.4, Containment Isolation System
4. UFSAR Section 5.4.8, Reactor Water Cleanup System
5. Design Baseline Document L-S-36, Reactor Water Cleanup System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Safeguard Piping Fill Pressure Relief Valve

**ID Nos.:** PSV-41-134A, PSV-41-134B, PSV-41-234A, PSV-41-234B

**P&ID/COORD** (respectively): M-41 (SHT 1) / B-6, M-41 (SHT 1) / C-5, M-41 (SHT 4) / B-6, M-41 (SHT 4) / C-5

**Code Class:** 2 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** RL **Act. Type:** SA

**Positions:** Normal_C_ Safety_OC_ Failsafe_-_

**Test Frequency (Direction):** RT-P3 **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These pressure relief valves are located in the portion of the Safeguard Piping Fill System (SPFS) that provides seal water to the Feedwater primary containment isolation valves. They perform an active safety function to provide overpressure protection to the SPFS during a postulated LOCA. During normal plant operation, when ECCS is in standby, any inleakage to the SPFS from the Feedwater System would not result in overpressurization due to the dissipation of pressure throughout the systems serviced by the SPFS. However, during an accident condition resulting in ECCS initiation, the total inleakage to the SPFS will likely be at a greater rate than the amount which would leak by the SPFS pump discharge check valves, thereby creating an overpressure condition. Failure of these relief valves to function properly under these conditions could result in rendering the SPFS inoperable due to ruptured piping or components. The SPFS must remain operable, subsequent to a Feedwater line break outside primary containment, to restore the water seal on the Feedwater primary containment isolation valves, and to restore the HPCI and RCIC Systems to a standby condition subsequent to a small break LOCA.

**Test Requirement(s):**

Relief valve test once every 10 years

**Reference(s):**

1. UFSAR Section 6.2.3.2.3, Containment Bypass Leakage
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Section 7.6.2.7, SPFS - Instrumentation and Controls
4. Design Baseline Document L-S-03, High Pressure Coolant Injection System
5. Design Baseline Document L-S-11, Feedwater System
6. Design Baseline Document L-S-39, Reactor Core Isolation Cooling System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Main Steam Line Safety/Relief Valves (SRVs)

**ID Nos.:** PSV-41-1F013A,B,C,D,F,G,J,L & N
PSV-41-2F013A,B,C,D,F,G,J,L & N

**P&ID/COORD** (respectively): M-41 (SHT 2) / F-7 (Unit 1),
M-41 (SHT 5) / F-7 (Unit 2)

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 6.00 **Valve Type:** RL **Act. Type:** SA

**Positions:** Normal_C_ Safety_O_ Failsafe_-_

**Test Frequency (Direction):** RT-P1 **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These 9 Main Steam Safety/Relief Valves (SRVs) perform an active safety function to protect the reactor coolant pressure boundary from overpressurization and subsequent failure. Each SRV discharge is piped to the Suppression Pool, with the discharge line terminating below the water level in order to permit the steam to condense in the pool. The SRV requirements are based on the ASME Code Section III required overpressure protection analysis to demonstrate the maximum peak RPV pressure will not exceed 110 % of the design pressure or 1375 psig. Credit is taken in the Overpressure Protection Analysis for the SRVs operating in the ASME Code qualified self-actuating safety mode. SRV opening setpoints range from 1170 to 1190 psig. These setpoints ensure the overpressure protection system will accommodate the most severe pressurization transient.

**Test Requirement(s):**

Main Steam Pressure Relief Valves Without Auxiliary Actuating Devices Testing

**Reference(s):**

1. LGS Technical Specification 3/4.4.2
2. UFSAR Section 5.2.2, Overpressure Protection
3. Design Baseline Document L-S-42, Nuclear Boiler System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Automatic Depressurization System - Safety Relief Valves (ADS-SRVs)

**ID Nos.:** PSV-41-1F013E,H,K,M & S
PSV-41-2F013E,H,K,M & S

**P&ID/COORD** (respectively): M-41 (SHT 2) / G-7 (Unit 1),
M-41 (SHT 5) / G-7 (Unit 2),

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 6.00 **Valve Type:** RL **Act. Type:** AO/SA

**Positions:** Normal_C_ Safety_O_ Failsafe_-_

**Test Frequency (Direction):** RT-P1 **Appendix J, Type C:** N

**VRR/VCS/ROJ:** 41-VRR-6

**Remarks:** This relief request eliminates the requirement to actuate these valves in-situ at reduced and normal system pressures which would result in excessive challenges to the ADS valves.

**Safety Function(s):** These 5 Main Steam Safety/Relief valves (per Unit) comprise the Automatic Depressurization System (ADS) which is an integral part of the ECCS. The ADS valves are dual purpose in that they relieve pressure by normal mechanical action or by automatic action of an electro-pneumatic control system. The relief by normal mechanical action is intended to prevent overpressurization of the RCPB. The depressurization, by automatic action of the control system, is intended to reduce the pressure during a LOCA in which the HPCI system is not available, in order that the CS System or LPCI System can inject water into the Reactor Vessel. The ADS function is initiated automatically upon receipt of a LOCA signal (low reactor water level - Level 1 and high drywell pressure), or by remote manual switches. In either mode, the ADS valves are prevented from opening unless both pumps in either of the two CS loops, or any of the four RHR pumps are running, in addition to the expiration of a 105 second ADS timer. The ADS timer ensures that enough time has elapsed to allow the HPCI System to operate, yet not so long that the RHR (LPCI mode) and CS Systems are unable to adequately cool the core if the HPCI System fails to start. Also, a high drywell pressure bypass timer is provided. The high drywell pressure bypass time delay of 450 seconds allows sufficient time for the operator to cancel the automatic depressurization signal if information indicates that the signal is false or ADS is not needed. An additional level signal (Reactor Vessel low water level - Level 3) is provided in the ADS initiating circuits. The Level 3 signal is provided so that an instrument line break inside containment does not inadvertently initiate auto blowdown.

The ADS valves function to maintain RCS pressure boundary integrity in the closed position.

The use of station batteries from the Class 1E dc system supports the ADS design requirements.

**Test Requirement(s):**

Main Steam Pressure Relief Valves With Auxiliary Actuating Devices Testing

**Reference(s):**

1. LGS Technical Specification Table 3.3.3-2
2. LGS Technical Specification 3/4.5
3. LGS Technical Specification Bases 3/4.5
4. UFSAR Section 5.2.2, Overpressure Protection
5. UFSAR Section 6.3, Emergency Cool Cooling Systems
6. UFSAR Section 7.3.1.1.1.2, ADS Instrumentation and Controls
7. UFSAR Chapter 15, Accident Analysis
8. Design Baseline Document L-S-03, High Pressure Coolant Injection System
9. Design Baseline Document L-S-18, Instrument Air and Nitrogen Systems
10. Design Baseline Document L-S-31, Automatic Depressurization System
11. Design Baseline Document L-S-39, Reactor Core Isolation Cooling System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** SRV Discharge Line Vacuum Relief Valves

**ID Nos.:** PSV-41-1F037A,B,C,D,E,F,G,H,J,K,L,M,N & S
PSV-41-1F097A,B,C,D,E,F,G,H,J,K,L,M,N & S
PSV-41-2F037A,B,C,D,E,F,G,H,J,K,L,M,N & S
PSV-41-2F097A,B,C,D,E,F,G,H,J,K,L,M,N & S

**P&ID/COORD** (respectively): M-41 (SHT 2) / B-6 (Unit 1),
M-41 (SHT 2) / B-6 (Unit 1),
M-41 (SHT 5) / B-6 (Unit 2),
M-41 (SHT 5) / B-6 (Unit 2)

**Code Class:** 3 **Category:** C **Active/Passive:** A

**Size:** 6.00 **Valve Type:** VR **Act. Type:** SA

**Positions:** Normal_C_ Safety_OC_ Failsafe_-_

**Test Frequency (Direction):** RT-P3 **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally closed vacuum relief valves are located in the SRV discharge lines to the Suppression Pool. The valves perform an active safety function in the open and closed positions. The valves must be capable of opening, subsequent to SRV steam discharge to the Suppression Pool, to prevent siphoning from the Suppression Pool into the SRV discharge piping due to the vacuum created by condensing steam. The vacuum breakers open to draw Suppression Chamber air into the SRV discharge piping, allowing the water in the SRV discharge piping to fall to the level of the Suppression Pool, thereby reducing the hydro-dynamic loads on the SRV discharge piping, Suppression Pool and submerged structures during subsequent SRV actuations. These vacuum breakers will open when a differential pressure of 0.2 psid is present between the internal pipe pressure and the Suppression Chamber atmosphere.

These vacuum relief valves also perform an active safety function in the closed position. The valves are required to remain closed during SRV operation to prevent steam release to the Suppression Chamber free space. Valve closure allows steam discharge to be properly condensed below the Suppression Pool water level. This function allows the primary containment Pressure Suppression System to accommodate the release of both controlled and uncontrolled steam discharges from the SRVs in order to limit primary containment post-accident peak pressures and temperatures within design limits, thereby maintaining primary containment integrity.

**Test Requirement(s):**

Relief valve (vacuum breaker) test

**Reference(s):**

1. UFSAR Section 5.2.2, Overpressure Protection
2. UFSAR Appendix A, Section 3A.1.1, Design Assessment Report
3. Design Baseline Document L-S-25A, Primary Containment Pressure Suppression System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Reactor Vessel Head Seal Leak Detection Pressure Indication PI-R001 and PSH-101 Sensing Line Excess Flow Check Valve - PCIV

**ID Nos.:** XV-41-1F009, XV-41-2F009

**P&ID/COORD** (respectively): M-41 (SHT 1) / F-4, M-41 (SHT 4) / F-4

**Code Class:** 1 **Category:** N/A **Active/Passive:** N/A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These valves are located at Penetration X-29A in the Reactor Vessel Head Seal leak detection line. They are not exposed to primary system pressure except in the unlikely event of a seal failure which would result in a slow pressure buildup in the line. Any leakage path is restricted at the source. A high pressure alarm indicates leakage into this line. These valves were identified in LGS Technical Specification Table 3.6.3-1 (Note 27) as not being subject to operability testing.

**Test Requirements:**

No testing requirements

**References:**

1. UFSAR Section 6.2.4, Containment Isolation System
2. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
3. Design Baseline Document L-S-42, Nuclear Boiler System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Main Steam Lines Pressure Differential Transmitter PDT-N086C&D, N087C&D, N088C&D, and N089C&D High Side Sensing Line Excess Flow Check Valves - PCIVs

**ID Nos.:** XV-41-1F070A, XV-41-1F070B, XV-41-1F070C, XV-41-1F070D, XV-41-2F070A, XV-41-2F070B, XV-41-2F070C, XV-41-2F070D

**P&ID/COORD** (respectively): M-41 (SHT 2) / E-4 (Typ), M-41 (SHT 5) / E-4 (Typ)

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-3D, X-52A, X-34A and X-3A. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
4. Design Baseline Document L-S-42, Nuclear Boiler System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Main Steam Lines Flow Transmitter FT-N003A,B,C & D and Pressure Differential Transmitter PDT-N086A&B, N087A&B, N088A&B, and N089A&B High Side Sensing Line Excess Flow Check Valves - PCIVs

**ID Nos.:** XV-41-1F071A, XV-41-1F071B, XV-41-1F071C, XV-41-1F071D, XV-41-2F071A, XV-41-2F071B, XV-41-2F071C, XV-41-2F071D

**P&ID/COORD** (respectively): M-41 (SHT 2) / E-4 (Typ), M-41 (SHT 5) / E-4 (Typ)

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal O Safety C Failsafe -

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-49A, X-49B, X-30B and X-30A. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
4. Design Baseline Document L-S-42, Nuclear Boiler System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Main Steam Lines Flow Transmitter FT-N003A,B,C & D and Pressure Differential Transmitter PDT-N086A&B, N087A&B, N088A&B, and N089A&B low Side Sensing Line Excess Flow Check Valves - PCIVs

**ID Nos.:** XV-41-1F072A, XV-41-1F072B, XV-41-1F072C, XV-41-1F072D, XV-41-2F072A, XV-41-2F072B, XV-41-2F072C, XV-41-2F072D

**P&ID/COORD** (respectively): M-41 (SHT 2) / E-4 (Typ), M-41 (SHT 5) / E-4 (Typ)

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-49A, X-49B, X-30B and X-30A. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
4. Design Baseline Document L-S-42, Nuclear Boiler System

**System (No):** Nuclear Boiler System (NBS) (41)

**Component Description:** Main Steam Lines Pressure Differential Transmitter PDT-N086C&D, N087C&D, N088C&D, and N089C&D Low Side Sensing Line Excess Flow Check Valves - PCIVs

**ID Nos.:** XV-41-1F073A, XV-41-1F073B, XV-41-1F073C, XV-41-1F073D, XV-41-2F073A, XV-41-2F073B, XV-41-2F073C, XV-41-2F073D

**P&ID/COORD** (respectively): M-41 (SHT 2) / E-4 (Typ), M-41 (SHT 5) / E-4 (Typ)

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-3D, X-52A, X-34A and X-3A. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
4. Design Baseline Document L-S-42, Nuclear Boiler System

# NUCLEAR BOILER VESSEL INSTRUMENTATION SYSTEM

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Reactor Vessel Reference Leg Backfill Check Valves

**ID Nos.:** 42-1044A, 42-1044B, 42-1044C, 42-1044D,
42-1046A, 42-1046B, 42-1046C, 42-1046D,
42-2044A, 42-2044B, 42-2044C, 42-2044D,
42-2046A, 42-2046B, 42-2046C, 42-2046D

**P&ID/COORD** (respectively): M-42 (SHT 5) / C-6, E-6, F-6, G-6,
M-42 (SHT 5) / C-5, E-5, F-5, G-5,
M-42 (SHT 6) / C-6, E-6, F-6, G-6,
M-42 (SHT 6) / C-6, E-6, F-6, G-6

**Code Class:** 2 **Category:** A/C **Active/Passive:** A

**Size:** 0.50 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(R), LP-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** 42-ROJ-1

**Remarks:** This refueling outage justification allows deferral of reverse exercising these check valves until refueling outages due to several potential problems which could result from spurious or false level indication.

**Safety Function(s):** These series check valves are located in the RPV level instrumentation reference leg backfill lines from the CRD system and perform an active safety function in the closed position. They must be capable of closure upon loss of supply from the CRD Drive Water Pumps in order to isolate the Reactor Vessel level instruments from the non-safety related portion of the CRD system and ensure reference leg inventory is maintained. This ensures the operability of the safety trip functions of the associated Reactor Vessel instrumentation and the automatic actuation of safety systems which receive their initiation signals from RPV level instrumentation. A maximum leakage rate has been assigned to these valves to ensure their leak tight integrity.

These valves do not perform a safety function in the open position. The CRD Drive Water Pumps are non-safety related and located in a Seismic IIA piping system. Their capability to pass flow allows for continued operation of the plant. Loss of this flow, however, would not impede the safe shutdown of the plant under normal or accident conditions.

**Test Requirement(s):**

Exercise test to the closed position during refueling outages
Seat leakage testing at least once every two years

**Reference(s):**

1. UFSAR Section 7.7.1.1.6, Water Level Instrument Line Failure
2. NRC Generic letter 92-04, Resolution of the Issues Related to Reactor Vessel water Level Instrumentation in BWRs Pursuant to 10CFR50.54(F)
3. Design Baseline Document L-S-16, Reactor Instrumentation System
4. LGS Modification P00132, RPV Instrumentation Reference Leg Backfill

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Containment Pressure Instrumentation Isolation Valves

**ID Nos.:** HV-42-147A, HV-42-147B, HV-42-147C, HV-42-147D, HV-42-247A, HV-42-247B, HV-42-247C, HV-42-247D

**P&ID/COORD** (respectively): M-42 (SHT 1) / B-6, B-4, A-6, A-4
M-42 (SHT 3) / B-6, B-3, A-6, A-3

**Code Class:** 1 **Category:** B **Active/Passive:** A

**Size:** 1.50 **Valve Type:** GL **Act. Type:** MO

**Positions:** Normal_O_ Safety_C_ Failsafe_AI_

**Test Frequency (Direction):** ET-C, ST-C(C), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** 42-VCS-1

**Remarks:** This Cold Shutdown Test Justification allows deferral of valve exercising due to the potential that valve failure in the closed position would isolate multiple safety related instruments used for the Reactor Protection and Emergency Core Cooling Systems.

**Safety Function(s):** These valves perform an active safety function in the closed position and a passive safety function in the open position.

These valves are identified in UFSAR Table 6.2-17 as containment isolation valves. As such, they must be capable of closure to maintain containment integrity in the event of the loss of the associated instrument loop. They have a maximum isolation time of 45 seconds.

These valves are normally open, and remain open for assessment of primary containment conditions following an accident. Various components rely upon containment pressure instrumentation to provide automatic actuation signals in order to accomplish their safety function. The containment pressure instrumentation also provides reliable information in the Control Room and at the Remote Shutdown Panel during and subsequent to accidents or transients. The valves do not receive automatic closure signals and would be required to close only in the event of the loss of the associated instrument loop. They close by remote manual switch actuation from the Control Room. If valve closure were necessary, there are no conditions which would require reopening. In addition, the piping and instruments outboard of the valve are considered an extension of the containment boundary since they must be available for long term usage following a design basis LOCA, and, as such, are designed to the same quality standards as the primary containment.

The valve operators receive their power from Class 1E ac emergency busses to ensure operability upon a loss of offsite power.

**Test Requirement(s):**

Full stroke exercise test during cold shutdown
Stroke time test to the closed position during cold shutdown
Position indication verification once every two years

**Reference(s):**

1. LGS Technical Specification 3/4.3.7
2. LGS Technical Specification Bases 3/4.3.7
3. LGS Technical Specification 3/4.6.3
4. UFSAR Table 6.2-17, Containment Penetration Data
5. UFSAR Section 6.3, Emergency Core Cooling Systems
6. UFSAR Section 7.1.2.1.3, ECCS - Instrumentation and Controls
7. UFSAR Section 7.3, Engineered Safety Features
8. Design Baseline Document L-S-16, Reactor Instrumentation System

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Excess Flow Check Valves (EFCV) for Reactor Vessel Level Instruments, LT-1(2)N085A&B - PCIVs

**ID Nos.:** XV-42-185A, XV-42-185B, XV-42-285A, XV-42-285B

**P&ID/COORD** (respectively): M-42 (SHT 1) / C-6, M-42 (SHT 2) / E-4, M-42 (SHT 3) / C-6, M-42 (SHT 4) / E-4

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal O Safety C Failsafe -

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-102A and X-107. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Table 6.2-17, Containment Penetration Data
4. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
5. Design Baseline Document L-S-16, Reactor Instrumentation System

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Excess Flow Check Valves (EFCV) for Reactor Vessel Level Instruments, LT-1(2)N027, LT-1(2)N017 - PCIVs

**ID Nos.:** XV-42-1F041, XV-42-2F041

**P&ID/COORD** (respectively): M-42 (SHT 1) / G-6, M-42 (SHT 3) / G-6

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetration X-67B-2. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Table 6.2-17, Containment Penetration Data
4. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
5. Design Baseline Document L-S-16, Reactor Instrumentation System

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Excess Flow Check Valves (EFCV) for Reactor Vessel Level Instruments, LT-1(2)N402A, LT-1(2)N091A/E, LT-1(2)N097A/E, LT-1(2)N010, LT-1(2)N095A, LT-1(2)N081A, - PCIVs

**ID Nos.:** XV-42-1F043A, XV-42-2F043A

**P&ID/COORD** (respectively): M-42 (SHT 1) / G-6, M-42 (SHT 3) / G-6

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal O Safety C Failsafe -

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetration X-67B-1. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument

line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Table 6.2-17, Containment Penetration Data
4. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
5. Design Baseline Document L-S-16, Reactor Instrumentation System

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Excess Flow Check Valves (EFCV) for Reactor Vessel Level Instruments, LT-1(2)N085B, LT-1(2)N091B/F, LT-1(2)N081B, LT-1(2)N080B, - PCIVs

**ID Nos.:** XV-42-1F043B, XV-42-2F043B

**P&ID/COORD** (respectively): M-42 (SHT 1) / G-4, M-42 (SHT 3) / G-3

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetration X-65A. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument

line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Table 6.2-17, Containment Penetration Data
4. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
5. Design Baseline Document L-S-16, Reactor Instrumentation System

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Excess Flow Check Valves (EFCV) for Reactor Vessel Level Instruments, LT-1(2)N085A, LT-1(2)N402A/B/E/F, LT-1(2)N091A/B/C/D/E/F/H/G, LT-1(2)N081B/C/D, LT-1(2)N097A/E, LT-115B - PCIVs

**ID Nos.:** XV-42-1F045A, XV-42-1F045B, XV-42-1F045C, XV-42-1F045D, XV-42-2F045A, XV-42-2F045B, XV-42-2F045C, XV-42-2F045D

**P&ID/COORD** (respectively): M-42 (SHT 1) / E-6, M-42 (SHT 1) / E-4, M-42 (SHT 1) / E-6, M-42 (SHT 1) / E-4, M-42 (SHT 3) / E-6, M-42 (SHT 3) / E-3, M-42 (SHT 3) / E-6, M-42 (SHT 3) / E-3

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal O Safety C Failsafe -

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-66B-1, X-20A-1, X-20B-1 and X-66A-1. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Table 6.2-17, Containment Penetration Data
4. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
5. Design Baseline Document L-S-16, Reactor Instrumentation System

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Excess Flow Check Valves (EFCV) for Reactor Vessel Level Instruments, LT-1(2)N095A/C, LT-1(2)N080A/C, LT-1(2)N004A/C, LT-1(2)N027, LT-1(2)N017 - PCIVs

**ID Nos.:** XV-42-1F047A, XV-42-1F047B, XV-42-2F047A, XV-42-2F047B

**P&ID/COORD** (respectively): M-42 (SHT 1) / E-6, M-42 (SHT 1) / E-4, M-42 (SHT 3) / E-6, M-42 (SHT 3) / E-3

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal O Safety C Failsafe -

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-48B and X-48A-1. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Table 6.2-17, Containment Penetration Data
4. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
5. Design Baseline Document L-S-16, Reactor Instrumentation System

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Excess Flow Check Valves (EFCV) for Reactor Vessel Level Instruments, LT-1(2)N091C/D/G/H, LT-1(2)N081C/D, LT-1(2)N080C/D, LT-1(2)N095C, LT-1(2)N004A, LT-1(2)N402F, LT-1(2)N403F - PCIVs

**ID Nos.:** XV-42-1F049A, XV-42-1F049B, XV-42-2F049A, XV-42-2F049B

**P&ID/COORD** (respectively): M-42 (SHT 1) / F-6, M-42 (SHT 1) / F-4, M-42 (SHT 3) / F-6, M-42 (SHT 3) / F-3

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-65B and X-67A. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Table 6.2-17, Containment Penetration Data
4. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
5. Design Baseline Document L-S-16, Reactor Instrumentation System

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Excess Flow Check Valves (EFCV) for Jet Pumps 16, 5, 20, & 10 High Pressure Flow Instruments, FT-1(2)N033A/B/C/D - PCIVs

**ID Nos.:** XV-42-1F051A, XV-42-1F051B, XV-42-1F051C, XV-42-1F051D, XV-42-2F051A, XV-42-2F051B, XV-42-2F051C, XV-42-2F051D

**P&ID/COORD** (respectively): M-42 (SHT 1) / C-6, M-42 (SHT 2) / E-4, M-42 (SHT 2) / F-5, M-42 (SHT 2) / D-5, M-42 (SHT 3) / C-6, M-42 (SHT 4) / E-4, M-42 (SHT 4) / F-5, M-42 (SHT 4) / D-5

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal O Safety C Failsafe -

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-40B, X-31B, X-51B, and X-32B. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Table 6.2-17, Containment Penetration Data
4. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
5. Design Baseline Document L-S-16, Reactor Instrumentation System

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Excess Flow Check Valves (EFCV) for Jet Pumps 16/5/20/10 High Pressure Flow Instruments, FT-1(2)N033A/B/C/D and Low Pressure Flow Instruments, FT-1(2)N034J/K/V/W - PCIVs

**ID Nos.:** XV-42-1F053A, XV-42-1F053B, XV-42-1F053C, XV-42-1F053D, XV-42-2F053A, XV-42-2F053B, XV-42-2F053C, XV-42-2F053D

**P&ID/COORD** (respectively): M-42 (SHT 1) / D-6, M-42 (SHT 2) / E-4, M-42 (SHT 2) / F-5, M-42 (SHT 2) / D-5, M-42 (SHT 3) / D-6, M-42 (SHT 4) / E-4, M-42 (SHT 4) / F-5, M-42 (SHT 4) / D-5

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-40B, X-31B, X-51B, and X-32B. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Table 6.2-17, Containment Penetration Data
4. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
5. Design Baseline Document L-S-16, Reactor Instrumentation System

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Excess Flow Check Valves (EFCV) for Above Reactor Core Plate Pressure Differential Transmitter, PDT-1(2)N032 - PCIVs

**ID Nos.:** XV-42-1F055, XV-42-2F055

**P&ID/COORD** (respectively): M-42 (SHT 1) / C-4, M-42 (SHT 3) / C-4

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal O Safety C Failsafe -

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetration X-33A-1. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument

line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Table 6.2-17, Containment Penetration Data
4. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
5. Design Baseline Document L-S-16, Reactor Instrumentation System

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Excess Flow Check Valves (EFCV) for Below Reactor Core Plate Flow Transmitters, FT-1(2)N034A/C/E/G/J/L - PCIVs

**ID Nos.:** XV-42-1F057, XV-42-2F057

**P&ID/COORD** (respectively): M-42 (SHT 1) / C-6, M-42 (SHT 3) / C-6

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetration X-40D-1. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Table 6.2-17, Containment Penetration Data
4. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
5. Design Baseline Document L-S-16, Reactor Instrumentation System

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Excess Flow Check Valves (EFCV) for Non-Calibrated Jet Pumps 11/1/12/2/13/3/14/4/15/6/17/7/18/8/19/9 Low Pressure Flow Instruments, FT-1N034A/B/C/D/E/F/G/H/L/M/N/P/R/S/T/U - PCIVs

**ID Nos.:** XV-42-1F059A, XV-42-1F059B, XV-42-1F059C, XV-42-1F059D, XV-42-1F059E, XV-42-1F059F, XV-42-1F059G, XV-42-1F059H, XV-42-1F059L, XV-42-1F059M, XV-42-1F059N, XV-42-1F059P, XV-42-1F059R, XV-42-1F059S, XV-42-1F059T, XV-42-1F059U

**P&ID/COORD** (respectively): M-42 (SHT 2) / D-5, M-42 (SHT 2) / F-5, M-42 (SHT 2) / D-6, M-42 (SHT 2) / F-4, M-42 (SHT 2) / D-6, M-42 (SHT 2) / F-4, M-42 (SHT 2) / D-6, M-42 (SHT 1) / D-3, M-42 (SHT 2) / E-6, M-42 (SHT 2) / D-4, M-42 (SHT 2) / F-6, M-42 (SHT 2) / D-4, M-42 (SHT 2) / F-6, M-42 (SHT 2) / D-4, M-42 (SHT 2) / F-6, M-42 (SHT 2) / D-4

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-40C, X-31A, X-40B, X-31B, X-40A, X-32A, X-51B, and X-32B. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Table 6.2-17, Containment Penetration Data
4. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
5. Design Baseline Document L-S-16, Reactor Instrumentation System

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Excess Flow Check Valves (EFCV) for Non-Calibrated Jet Pumps 11/1/12/2/13/3/14/4/15/6/17/7/18/8/19/9 Low Pressure Flow Instruments, FT-2N034A/B/C/D/E/F/G/H/L/M/N/P/R/S/T/U - PCIVs

**ID Nos.:** XV-42-2F059A, XV-42-2F059B, XV-42-2F059C, XV-42-2F059D, XV-42-2F059E, XV-42-2F059F, XV-42-2F059G, XV-42-2F059H, XV-42-2F059L, XV-42-2F059M, XV-42-2F059N, XV-42-2F059P, XV-42-2F059R, XV-42-2F059S, XV-42-2F053T, XV-42-2F053U

**P&ID/COORD** (respectively): M-42 (SHT 4) / D-6, M-42 (SHT 4) / F-4, M-42 (SHT 4) / D-6, M-42 (SHT 4) / F-4, M-42 (SHT 4) / D-6, M-42 (SHT 4) / F-4, M-42 (SHT 4) / D-6, M-42 (SHT 3) / D-3, M-42 (SHT 4) / E-6, M-42 (SHT 4) / D-3, M-42 (SHT 4) / F-6, M-42 (SHT 4) / D-4, M-42 (SHT 4) / F-6, M-42 (SHT 4) / D-4, M-42 (SHT 4) / F-6, M-42 (SHT 4) / D-4

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-40C, X-31A, X-40B, X-31B, X-40A, X-32A, X-51B, and X-32B. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Table 6.2-17, Containment Penetration Data
4. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
5. Design Baseline Document L-S-16, Reactor Instrumentation System

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Excess Flow Check Valves (EFCV) for Below Reactor Core Plate Pressure Differential Instrumentation, PDI-1(2)R005, PDT-1(2)N032 and Flow Transmitters, FT-1(2)N034B/D/F/H - PCIVs

**ID Nos.:** XV-42-1F061, XV-42-2F061

**P&ID/COORD** (respectively): M-42 (SHT 1) / B-4, M-42 (SHT 3) / B-4

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal O Safety C Failsafe -

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetration X-33A-2. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Table 6.2-17, Containment Penetration Data
4. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
5. Design Baseline Document L-S-16, Reactor Instrumentation System

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Excess Flow Check Valves (EFCV) for Reactor Vessel Level Instruments, LT-1(2)N008B/D, LT-1(2)N004B/D and Pressure Differential Instrumentation, PDI-1(2)R005 - PCIVs

**ID Nos.:** XV-42-1F065A, XV-42-1F065B, XV-42-2F065A, XV-42-2F065B

**P&ID/COORD** (respectively): M-42 (SHT 1) / F-6, M-42 (SHT 1) / F-4, M-42 (SHT 3) / F-6, M-42 (SHT 3) / F-3

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-48B and X-48A-1. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Table 6.2-17, Containment Penetration Data
4. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
5. Design Baseline Document L-S-16, Reactor Instrumentation System

**System (No):** Nuclear Boiler Vessel Instrumentation (NBVI) System (42)

**Component Description:** Excess Flow Check Valves (EFCV) for Above Reactor Core Plate to CRD System, Pressure Differential Transmitter, PDT-46-1(2)N008, PDT-46-1(2)N011 - PCIVs

**ID Nos.:** XV-42-1F076, XV-42-2F076

**P&ID/COORD** (respectively): M-42 (SHT 1) / C-4, M-42 (SHT 3) / C-3

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal O Safety C Failsafe -

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetration X-33A-1. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument

line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. UFSAR Table 6.2-17, Containment Penetration Data
4. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
5. Design Baseline Document L-S-16, Reactor Instrumentation System

# REACTOR RECIRCULATION SYSTEM

**System (No):** Reactor Recirculation (RR) System (43)

**Component Description:** Reactor Recirculation Pumps

**ID Nos.:** 1AP201, 1BP201, 2AP201, 2BP201

**P&ID/COORD** (respectively): M-43 (SHT 1) / Unit 1
M-43 (SHT 3) / Unit 2

**Pump Type:** Centrifugal **Test Parameters:** N/A

**Relief Request:** N/A

**Remarks:**

**Safety Function(s):** The Reactor Recirculation System is a power operation and control system. The Recirculation Pumps are not required to perform any function to place or maintain the plant in a safe shutdown condition or to mitigate the consequences of an accident. The system performs the following non-safety related power generation functions:

- Operates continuously during normal plant conditions, in conjunction with jet pumps, to provide forced coolant through the reactor core so that steam can be generated without exceeding safe temperature limits for the nuclear fuel.

- Provides for a convenient method of controlling the reactor power by varying the coolant flow rate through the core, over a limited range, without the need for control rod movement.

The Recirculation Pumps are manually started and receive no automatic initiation signals. However, they have a number of interlocks and receive a number of trip signals. The Anticipated Transient Without Scram (ATWS) Recirculation Pump trip (RPT) provides a means of limiting the consequences of the unlikely occurrence of a failure to scram during an anticipated transient. This feature provides backup to the scram system by tripping the Recirculation Pumps when either of the following setpoints are reached: Reactor Vessel pressure - High (≥ 1149 psig, Unit 2 and ≥ 1093 psig, Unit 1 ) or Reactor Vessel low water level - Level 2 (≤ -38 inches).

The end-of-cycle Recirculation Pump trip (EOC-RPT) is a supplement to the reactor trip. During turbine trip and generator load rejection events, the EOC-RPT will reduce the likelihood of Reactor Vessel level decreasing to Level 2. Similarly, a position switch for each of two stop valves provides input to one EOC-RPT system; a position switch for each of the other two stop valves provides input to the other EOC-RPT system.

The Recirculation Pumps are powered by non-essential station AC power through a variable-frequency, AC motor-generator set located outside the drywell for each Recirculation Pump motor. The combined rotating inertias of the Recirculation Pump and motor, the M-G set, and the variable speed coupling, provide a slow coastdown of flow following a loss of power to the drive motors so that the core is adequately cooled during the loss of power transient.

**Test Requirement(s):**

No testing requirements

**References:**

1. LGS Technical Specification 3/4.4.1
2. LGS Technical Specification 3/4.3.4
3. UFSAR Section 5.4.1, Reactor Recirculation Pumps
4. UFSAR Chapter 15, Accident Analysis
5. Design Baseline Document L-S-19, Recirculation System
6. GE Operations and Maintenance Instruction, Vol. III, Part 1, Control Systems, GEK-97020

**System (No):** Reactor Recirculation (RR) System (43)

**Component Description:** Recirculation Pump Seal Purge Supply Check Valve - Inboard PCIV

**ID Nos.:** 43-1004A, 43-1004B, 43-2004A, 43-2004B

**P&ID/COORD** (respectively): M-43 (SHT 1) / C-7, M-43 (SHT 1) / B-7, M-43 (SHT 3) / C-7, M-43 (SHT 3) / B-7

**Code Class:** 1 **Category:** A/C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal O Safety C Failsafe -

**Test Frequency (Direction):** ET-R(R), LJ-B **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 43-ROJ-1

**Remarks:** Refueling outage justification 43-ROJ-1 allows reverse exercising to be performed at refueling in conjunction with Type C testing.

**Safety Function(s):** The Reactor Recirculation Pumps A and B purge supply check valves perform an active safety function in the closed position to maintain primary containment and Reactor Coolant System pressure boundary integrity. These valves are identified in UFSAR Table 6.2.17 as containment isolation valves for Penetrations X-61-1 and X-61-2. As such, they must be capable of closure in the event of a loss of the attached non-Code piping to prevent the release of radioactivity outside primary containment subsequent to a Recirculation Pump seal failure.

These valves do not perform a safety function in the open position. They are open during normal operation to provide a flow path for the supply of seal purge water to the Recirc Pumps from the CRD System. The seal purge supply system is provided to improve the reliability of the Recirc Pumps by flushing out corrosion products and other impurities which could become lodged in the pump seals. The seal purge system also provides backup cooling to the seals on loss of the RECW System. However, since the Recirc Pumps are not required to function in shutting down or maintaining the Reactor in a safe shutdown condition or in mitigating the consequences of an accident, these check valves do not perform a safety function in the open position.

**Test Requirement(s):**

Exercise to the closed position during refueling outages
Seat leakage rate testing per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 5.4.1, Reactor Recirculation Pumps
3. UFSAR Section 6.2.4, Containment Isolation System
4. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
5. UFSAR Chapter 15, Accident Analysis
6. Design Baseline Document L-S-19, Recirculation System
7. GE Operations and Maintenance Instruction, Vol. III, Part 1, Control Systems, GEK-97020

**System (No):** Reactor Recirculation (RR) System (43)

**Component Description:** Recirc Loop Sample Isolation Valves - Inboard/Outboard PCIV

**ID Nos.:** HV-43-1F019, HV-43-1F020, HV-43-2F019, HV-43-2F020

**P&ID/COORD** (respectively): M-43 (SHT 1) / G-4, M-43 (SHT 1) / G-2, M-43 (SHT 3) / G-4, M-43 (SHT 3) / G-2

**Code Class:** 1 **Category:** A **Active/Passive:** A

**Size:** 1.00 **Valve Type:** GL **Act. Type:** AO

**Positions:** Normal_OC_ Safety_C_ Failsafe_C_

**Test Frequency (Direction):** ET-Q, FS-Q(C), ST-Q(C), LJ-B, PI-T **Appendix J, Type C:** Y

**VRR/VCS/ROJ:**

**Remarks:**

**Safety Function(s):** These fail-closed, air operated valves perform an active safety function in the closed position to maintain primary containment and Reactor Coolant System pressure boundary integrity. They are located in process sample lines from the Reactor Recirculation loops and are identified in UFSAR Table 6.2.17 as containment isolation valves for Penetration X-28A-1. As such, the valves must be capable of closure in the event of a loss of the attached non-Code piping to prevent the release of radioactivity outside primary containment. The valves must be capable of automatic closure upon receipt of a setpoint signal of Reactor Vessel low water level - Level 2. They have a maximum isolation time of 10 seconds. These valves also serve as a boundary between the Class 1 RCS and the non-Code, Seismic IIA Process Sample System.

These valves do not perform a safety function in the open position. They are opened periodically during normal operation to sample and analyze Reactor Coolant. This capability permits on-line analysis or continuous monitoring, as well as discrete grab sampling for remote laboratory analysis of various system chemical parameters. The Process Sampling System is designed to support the Reactor Recirculation System during normal startup, operation and shutdown.

**Test Requirement(s):**

Quarterly full stroke exercise test
Quarterly fail-safe test to the closed position
Quarterly stroke time test to the closed position
Position indication verification once every two years
Seat leakage rate testing per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 5.4.1, Reactor Recirculation Pumps
3. UFSAR Section 6.2.4, Containment Isolation System
4. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
5. UFSAR Chapter 15, Accident Analysis
6. Design Baseline Document L-S-19, Recirculation System
7. GE Operations and Maintenance Instruction, Vol. III, Part 1, Control Systems, GEK-97020

**System (No):** Reactor Recirculation (RR) System (43)

**Component Description:** Excess Flow Check Valves for FI-46-1(2)R020A&B Recirc Pump Seal Purge Line - PCIVs

**ID Nos.:** XV-43-103A, XV-43-103B, XV-43-203A, XV-43-203B

**P&ID/COORD** (respectively): M-43 (SHT 1) / C-8, M-43 (SHT 1) / B-8, M-43 (SHT 3) / C-8, M-43 (SHT 3) / B-8

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal O Safety C Failsafe -

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-61-1 and X-61-2. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a Recirc Pump seal failure. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice. The design configuration of the seal purge line includes an inboard swing check valve in lieu of a restricting orifice. The two check valves in series provides sufficient isolation capability for the postulated failure of the purge line.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the downstream check valves fail to seat. Leak tightness of the line is verified during the ILRT (Type A Test) and during the Type C testing of the check valves.

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
4. Design Baseline Document L-S-19, Recirculation System

**System (No):** Reactor Recirculation (RR) System (43)

**Component Description:** Recirculation Pumps A and B Seal Pressure PT-1(2)N005A&B/PI-1(2)R001A&B and PT-1(2)N006A&B/PI-1(2)R002A&B Sensing Lines Excess Flow Check Valves - PCIVs

**ID Nos.:** XV-43-1F003A, XV-43-1F003B, XV-43-1F004A, XV-43-1F004B, XV-43-2F003A, XV-43-2F003B, XV-43-2F004A, XV-43-2F004B

**P&ID/COORD** (respectively): M-43 (SHT 1) / E-8, M-43 (SHT 1) / D-8, M-43 (SHT 3) / E-8, M-43 (SHT 3) / D-8, M-43 (SHT 1) / A-8, M-43 (SHT 1) / A-8, M-43 (SHT 3) / A-8, M-43 (SHT 3) / A-8

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-3A-2, X-63-2 and X-50B-1. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
4. Design Baseline Document L-S-19, Recirculation System

**System (No):** Reactor Recirculation (RR) System (43)

**Component Description:** Recirculation Loop A Flow to FT-1(2)N014A,B,C&D Hi/Lo Side Sensing Lines Excess Flow Check Valves - PCIVs

**ID Nos.:** XV-43-1F009A, XV-43-1F009B, XV-43-1F009C, XV-43-1F009D,
XV-43-1F010A, XV-43-1F010B, XV-43-1F010C, XV-43-1F010D,
XV-43-2F009A, XV-43-2F009B, XV-43-2F009C, XV-43-2F009D,
XV-43-2F010A, XV-43-2F010B, XV-43-2F010C, XV-43-2F010D

**P&ID/COORD** (respectively): M-43 (SHT 2) / H-3, M-43 (SHT 2) / D-3,
M-43 (SHT 2) / F-3, M-43 (SHT 2) / C-3,
M-43 (SHT 2) / G-3, M-43 (SHT 2) / E-3,
M-43 (SHT 2) / F-3, M-43 (SHT 2) / C-3,
M-43 (SHT 4) / H-3, M-43 (SHT 4) / D-3,
M-43 (SHT 4) / F-3, M-43 (SHT 4) / C-3,
M-43 (SHT 4) / G-3, M-43 (SHT 4) / E-3,
M-43 (SHT 4) / F-3, M-43 (SHT 4) / C-3

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-51A-1, X-51A-2, X-34B-1 and X-34B-2. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
4. Design Baseline Document L-S-19, Recirculation System

**System (No):** Reactor Recirculation (RR) System (43)

**Component Description:** Recirculation Loop B Flow to FT-1(2)N024A,B,C&D Hi/Lo Side Sensing Lines Excess Flow Check Valves - PCIVs

**ID Nos.:** XV-43-1F011A, XV-43-1F011B, XV-43-1F011C, XV-43-1F011D, XV-43-1F012A, XV-43-1F012B, XV-43-1F012C, XV-43-1F012D, XV-43-2F011A, XV-43-2F011B, XV-43-2F011C, XV-43-2F011D, XV-43-2F012A, XV-43-2F012B, XV-43-2F012C, XV-43-2F012D

**P&ID/COORD** (respectively): M-43 (SHT 2) / F-3, M-43 (SHT 2) / D-3, M-43 (SHT 2) / E-3, M-43 (SHT 2) / B-3, M-43 (SHT 2) / G-3, M-43 (SHT 2) / C-3, M-43 (SHT 2) / E-3, M-43 (SHT 2) / B-3, M-43 (SHT 4) / F-3, M-43 (SHT 4) / D-3, M-43 (SHT 4) / E-3, M-43 (SHT 4) / B-3, M-43 (SHT 4) / G-3, M-43 (SHT 4) / C-3, M-43 (SHT 4) / E-3, M-43 (SHT 4) / B-3

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-50A-2, X-50A-3, X-52B-1 and X-52B-2. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
4. Design Baseline Document L-S-19, Recirculation System

**System (No):** Reactor Recirculation (RR) System (43)

**Component Description:** Recirculation Pump Suction and Discharge Isolation Valves

**ID Nos.:** HV-43-1F031A, HV-43-1F031B, HV-43-1F023A, HV-43-1F023B, HV-43-2F031A, HV-43-2F031B, HV-43-2F023A, HV-43-2F023B

**P&ID/COORD** (respectively): M-43 (SHT 1) / C-4, M-43 (SHT 1) / A-5, M-43 (SHT 1) / B-6, M-43 (SHT 1) / A-6, M-43 (SHT 3) / C-4, M-43 (SHT 3) / A-5, M-43 (SHT 3) / B-6, M-43 (SHT 3) / A-6,

**Code Class:** 1 **Category:** N/A **Active/Passive:** N/A

**Size:** 28.00 **Valve Type:** GT **Act. Type:** MO

**Positions:** Normal_O_ Safety_N/A_ Failsafe_AI_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally open motor-operated valves have no active safety function in either the open or closed positions, and are not required to change state to mitigate the consequences of an accident or to bring, or maintain the plant in a cold shutdown condition. The primary purpose of these valves is for isolation to perform Recirculation Pump maintenance. However, discharge isolation valve, F031A, performs a process function in the closed position to support alternate backup supply to fuel pool cooling from Loop A RHR as directed in LGS Site Engineering procedure S51.8.J. This function is not considered safety related. Fuel pool cooling is attributed to allowing the pool to boil in conjunction with the ESW system supplying makeup.

Trip circuitry is provided for these valves, whereas the Recirculation Pump M/G set drive motor breakers are automatically tripped if the respective pump suction valves, F023A or B, are less than or equal to 90% open and/or discharge valves, F031A or B, are less than 100% open. This feature is provided to protect the Recirculation Pumps from either cavitation or dead heading if the valves should become fully closed, and to protect the valves since they are not designed for throttling.

**Test Requirement(s):**

No testing requirements

**Reference(s):**

1. UFSAR Section 5.4.1, Reactor Recirculation Pumps
2. UFSAR Section 9.1.3, Fuel Pool Cooling and Cleanup
3. UFSAR Chapter 15, Accident Analysis
4. Design Baseline Document L-S-19, Recirculation System
5. LGS Site Engineering Procedure S51.8.J, A RHR System Backup to Fuel Pool Cooling
6. GE Operations and Maintenance Instruction, Vol. III, Part 1, Control Systems, GEK-97020

**System (No):** Reactor Recirculation (RR) System (43)

**Component Description:** Recirculation Pumps A and B Pressure Differential PDT-1(2)N015A/B Hi/Lo Side Sensing Lines Excess Flow Check Valves - PCIVs

**ID Nos.:** XV-43-1F040A, XV-43-1F040B, XV-43-1F040C, XV-43-1F040D, XV-43-2F040A, XV-43-2F040B, XV-43-2F040C, XV-43-2F040D

**P&ID/COORD** (respectively): M-43 (SHT 1) / B-2, M-43 (SHT 1) / A-2, M-43 (SHT 1) / B-2, M-43 (SHT 1) / A-2, M-43 (SHT 3) / B-2, M-43 (SHT 3) / A-2, M-43 (SHT 3) / B-2, M-43 (SHT 3) / A-2

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal <u>O</u> Safety <u>C</u> Failsafe <u>-</u>

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-43A, X-58A and X-63-1. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
4. Design Baseline Document L-S-19, Recirculation System

# REACTOR WATER CLEANUP (RWCU) SYSTEM

**System (No):** Reactor Water Cleanup (RWCU) System (44)

**Component Description:** Reactor Water Cleanup Inboard and Outboard PCIVs

**ID Nos.:** HV-44-1F001, HV-44-1F004, HV-44-2F001, HV-44-2F004

**P&ID/COORD** (respectively): M-44 (SHT 1) / E-7, M-44 (SHT 1) / E-6, M-44 (SHT 3) / E-7, M-44 (SHT 3) / E-6

**Code Class:** 1 **Category:** A **Active/Passive:** A

**Size:** 6.00 **Valve Type:** GL **Act. Type:** MO

**Positions:** Normal O Safety C Failsafe AI

**Test Frequency (Direction):** ET-C, ST-C(C), LJ-B, PI-T **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 44-VCS-1

**Remarks:** Cold shutdown justification 44-VCS-1 defers testing due to various adverse consequences which could occur as a result of valve closure during plant operation.

**Safety Function(s):** These normally open RWCU inlet containment isolation valves have no safety function in the open position. The RWCU system is non-safety related, and is not required to bring the Reactor to a safe shutdown condition or to mitigate the consequences of an accident. The primary function of the RWCU system is to remove solid and dissolved impurities from the Reactor Coolant, maintain Reactor water purity, and to provide a means of measuring Reactor water conductivity.

These valves are identified in UFSAR Table 6.2.17 as containment isolation valves for Penetration X-14. As such, they perform an active safety function in the closed position to maintain containment integrity. They must be capable of remote manual actuation or automatic closure upon receipt of a containment isolation signal. This isolation capability prevents the loss of Reactor Coolant and release of radioactive material from the Reactor, prevents the removal of liquid reactivity control material by the clean up system if the SLCS is in operation, and prevents damage of the filter/demineralizer resins due to high temperature. Additionally, the RWCU pumps receive an automatic trip signal when these valves are not fully open. These valves have a maximum isolation time of 10 seconds.

The valves' motor operators receive their control power from separate Class 1E emergency buses to satisfy single failure criteria.

**Test Requirement(s):**

Full stroke exercise test during cold shutdown
Stroke time test to the closed position during cold shutdown
Position indication verification once every two years
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification Table 3.3.2-1 and 3.3.2-2
2. LGS Technical Specification 3/4.6.3
3. UFSAR Section 5.4.8, Reactor Water Cleanup System
4. UFSAR Section 6.2.4, Containment Isolation System
5. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
6. UFSAR Section 7.1.2.1.20, RWCU System - Instrumentation and Controls
7. UFSAR Figure 7.7-11, RWCU System - Functional Control Diagram (FCD)
8. Design Baseline Document L-S-36, Reactor Water Cleanup System
9. GE Operations and Maintenance Instruction, Vol. VI, Clean Up and Filtering, GEK-97020

**System (No):** Reactor Water Cleanup (RWCU) System (44)

**Component Description:** Reactor Feedwater Supply from Regenerative HTX - PCIV (Return Isolation)

**ID Nos.:** HV-44-1F039, HV-44-2F039

**P&ID/COORD** (respectively): M-44 (SHT 2) / H-7, M-44 (SHT 4) / H-7

**Code Class:** 2 **Category:** A/C **Active/Passive:** A

**Size:** 4.00 **Valve Type:** TC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-C(R), LJ-B **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 44-VCS-2

**Remarks:** Cold shutdown justification 44-VCS-2 allows deferral of testing due to adverse consequences which may result from RWCU System isolation during plant operation.

**Safety Function(s):** These RWCU return check valves have no safety function in the open position. The RWCU system is non-safety related, and is not required to bring the Reactor to a safe shutdown condition or to mitigate the consequences of an accident. The primary function of the RWCU system is to remove solid and dissolved impurities from the Reactor Coolant, maintain Reactor water purity, and to provide a means of measuring Reactor water conductivity.

These Category AC check valves are identified in UFSAR Table 6.2.17 as containment isolation valves for Penetrations X-9A and X-9B. As such, they perform an active safety function in the closed position to maintain containment integrity.

These check valves also serve to prevent diversion of HPCI and RCIC which utilize the feedwater headers for injection purposes. The RWCU return line ties into the Reactor Feedwater System outside of primary containment and upstream of the Reactor Feedwater outboard check valve, HV-41-F074.

**Test Requirement(s):**

Exercise test in the reverse direction during cold shutdowns
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**Reference(s):**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 5.4.8, Reactor Water Cleanup System
3. UFSAR Section 6.2.4, Containment Isolation System
4. UFSAR Tables 6.2-17, and 6.2-25, Containment Penetration Data
5. UFSAR Section 7.1.2.1.20, RWCU System - Instrumentation and Controls
6. Design Baseline Document L-S-36, Reactor Water Cleanup System
7. GE Operations and Maintenance Instruction, Vol. VI, Clean Up and Filtering, GEK-97020

**System (No):** Reactor Water Cleanup (RWCU) System (44)

**Component Description:** RWCU Inlet Isolation Valve

**ID Nos.:** HV-44-1F105, HV-44-2F105

**P&ID/COORD** (respectively): M-44 (SHT 1) / E-7, M-44 (SHT 3) / E-7

**Code Class:** 1 **Category:** N/A **Active/Passive:** N/A

**Size:** 6.00 **Valve Type:** GL **Act. Type:** MO

**Positions:** Normal O Safety N/A Failsafe AI

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These normally open, motor-operated valves are located in the RWCU inlet lines upstream of inboard containment isolation valves, HV-44-1(2)F001. They do not perform a safety function in either the open or closed position. They permit the operator to align the RWCU System to its normal supply source, i.e., the Reactor Recirc Pump suction header. They receive no automatic actuation signals, but may be closed for long term leakage control. This function is not required for safe shutdown or accident mitigation. Adequate isolation capability is provided by F001 and F004, which are designated as containment isolation valves and periodically tested for verification of operability.

**Test Requirement(s):**

No testing requirements

**Reference(s):**

1. UFSAR Section 5.4.8, Reactor Water Cleanup System
2. UFSAR Section 6.2.4, Containment Isolation System
3. Design Baseline Document L-S-36, Reactor Water Cleanup System
4. GE Operations and Maintenance Instruction, Vol. VI, Clean Up and Filtering, GEK-97020

**System (No):** Reactor Water Cleanup System (RWCU) System (44)

**Component Description:** Excess Flow Check Valves for RWCU Inlet Flow from Reactor Recirculation Pump Suction, FE-44-1(2)N035 and FE-44-1(2)N036A&D

**ID Nos.:** XV-44-102A, XV-44-102B, XV-44-102C, XV-44-102D
XV-44-202A, XV-44-202B, XV-44-202C, XV-44-202D

**P&ID/COORD** (respectively): M-44 (SHT 1) / E-6, M-44 (SHT 1) / D-6,
M-44 (SHT 1) / D-6, M-44 (SHT 1) / C-6,
M-44 (SHT 3) / E-6, M-44 (SHT 3) / D-6,
M-44 (SHT 3) / C-6, M-44 (SHT 3) / C-6

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetrations X-41, X-47 and X-57. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
4. Design Baseline Document L-S-36, Reactor Water Cleanup System
5. GE Operations and Maintenance Instruction, Vol. VI, Clean Up and Filtering, GEK-97020

**System (No):** Reactor Water Cleanup System (RWCU) System (44)

**Component Description:** Excess Flow Check Valves for Bottom Drain Flow Measurement, FT-44-1(2)N037

**ID Nos.:** XV-44-170, XV-44-171, XV-44-270, XV-44-271

**P&ID/COORD** (respectively): M-44 (SHT 1) / C-6, M-44 (SHT 1) / B-6, M-44 (SHT 3) / B-6, M-44 (SHT 3) / B-6

**Code Class:** 1 **Category:** C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** XC **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** GVROJ-2

**Remarks:** Refueling outage justification GVROJ-2 allows functional testing of excess flow check valves to be performed at refueling.

**Safety Function(s):** Per Regulatory Guide 1.11 (Safety Guide 11), an excess flow check valve may satisfy the containment isolation criteria of 10CFR50, Appendix A (General Design Criteria 55 and 56). For instrument lines penetrating containment that are part of the protection system, excess flow check valves are acceptable provided the instrument sensing lines are sized or orificed such that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical consistent with other safety requirements, (2) the rate and extent of coolant loss is within the capability of the reactor coolant makeup system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained and (4) the potential offsite exposure will be substantially less than 10CFR100 requirements.

These normally open, 1 inch excess flow check valves are located at Penetration X-40D. They have an active safety function to close in order to provide containment isolation and Reactor Coolant pressure boundary (RCPB) integrity subsequent to a loss of the instrument loop. The UFSAR stipulates that instrument lines from the RCPB which penetrate the containment shall conform with Reg. Guide 1.11, which requires that they be equipped with a restricting orifice located inside the drywell, and an EFCV located outside and as close as practicable to the containment. In the event that an instrument

line that communicates with the RCPB develops a leak outside the containment, a flow rate that results in a differential pressure across the valve of 3-10 psi causes the EFCV to close automatically. If an EFCV fails to close when required, the main flow path through the valve has a resistance to flow at least equivalent to a .375 inch diameter orifice.

These valves do not require Type C leak rate testing. The line does not isolate during a LOCA, and only leaks if the line or instrument ruptures. Leak tightness of the line is verified during the ILRT (Type A Test).

**Test Requirements:**

Exercise test in the forward direction during refueling outages.
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR Section 6.2.4, Containment Isolation System
3. Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment
4. Design Baseline Document L-S-36, Reactor Water Cleanup System
5. GE Operations and Maintenance Instruction, Vol. VI, Clean Up and Filtering, GEK-97020

# CONTROL ROD DRIVE HYDRAULIC SYSTEM

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** Control Rod Drive (CRD), Drive Water Pumps

**ID Nos.:** 1AP158, 1BP158, 2AP158, 2BP158

**P&ID/COORD** (respectively): M-46 (SHT 1) / C-6, M-46 (SHT 1) / B-6, M-46 (SHT 2) / C-6, M-46 (SHT 2) / B-6

**Pump Type:** **Test Parameters:** None

**Relief Request:** N/A

**Remarks:**

**Safety Function(s):** The Control Rod Drive Hydraulic (CRDH) System Drive Water Pumps supply clean high pressure water to each of the 185 Control Rod Drives (CRDs) per Unit via their individual Hydraulic Control Units (HCUs) in order to position the control rods within the core and to cool the CRDMs when there is no drive motion. The pumps supply water for normal rod insertion and withdraw operations and to maintain the HCU accumulators filled and pressurized. They also supply seal cooling and purge water to the Reactor Recirculation Pumps and backfill to the Reactor Vessel level reference legs.

The safety objective of the CRDH System is to provide rapid insertion (i.e., scram) of the control rods with sufficient speed to limit fuel barrier damage in order to accomplish Reactor shutdown. The safety-related portion of the system includes the Scram Discharge Volume (SDV), the Scram Discharge Instrument Volume (SDIV), the SDV vent and drain valves, the HCU accumulators, the scram inlet and outlet valves, the CRDs, and the associated piping components.

The HCU accumulators and Reactor Vessel pressure provide the motive force for control rod scram. A check valve upstream of each accumulator maintains pressure in the accumulator in the event of a loss of the pumps. The CRDH Drive Water Pumps are not necessary for the system to perform its safety function. Therefore, these pumps are not required to be included in the Inservice Testing Program.

**Test Requirements:**

No Testing Requirements.

**References:**

1. UFSAR, Section 4.6.1, Control Rod Drive System
2. UFSAR, Section 7.0, Instrumentation an Controls
3. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032
4. Design Baseline Document, L-S-15, Control Rod Drive System

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** CRD Charging Water Header Valve

**ID Nos.:** 46-1101, 46-1102, 46-2101, 46-2102

**P&ID/COORD** (respectively): M-46 (SHT 1) / E-2, M-46 (SHT 1) / E-2, M-46 (SHT 2) / E-2, M-46 (SHT 2) / E-2

**Code Class:** 2 **Category:** A/C **Active/Passive:** A

**Size:** 2.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal O Safety C Failsafe -

**Test Frequency (Direction):** ET-C(R), LJ-B **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 46-VCS-1

**Remarks:** Cold shutdown justification 46-VCS-1 defers exercise testing of these valves due to the necessity of stopping the Drive Water Pumps to perform the tests.

**Safety Function(s):** These CRD charging water header check valves perform an active safety function in the closed position to provide containment isolation following a Reactor scram, or subsequent to a loss of the Drive Water Pumps. UFSAR Table 6.2-17 identifies these valves as containment isolation valves for Penetration X-37. Additionally, these check valves must be capable of closure to prevent a possible release path through the CRD system piping outside secondary containment in the event of a LOCA. This safety function satisfies the isolation capabilities of unidentified release paths for CRD units as discussed in NRC IN. 90-78.

These valves do not perform a safety function in the open position. They are not required to open to support safe shutdown or accident mitigation. Maintaining charging water supply during normal plant operation is not a safety function.

**Test Requirements:**

Exercise test to the closed position during cold shutdown
Seat leakage rate testing per 10 CFR 50, Appendix J (Option B)

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR, Section 4.6.1, Control Rod Drive System
3. UFSAR, Table 6.2-17, Containment Penetration Data
4. UFSAR, Section 7.0, Instrumentation an Controls
5. NRC Information Notice 90-78, Previously Unidentified Release Path From Boiling Water Reactor Control Rod Hydraulic Units
6. Design Baseline Document, L-S-15, Control Rod Drive System
7. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** CRD Cooling Water Valve

**ID Nos.:** 46-1108, 46-1109, 46-2108, 46-2109

**P&ID/COORD** (respectively): M-46 (SHT 1) / F-6, M-46 (SHT 1) / F-9, M-46 (SHT 2) / F-6, M-46 (SHT 2) / F-9

**Code Class:** 2 **Category:** A/C **Active/Passive:** A

**Size:** 2.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal O Safety C Failsafe -

**Test Frequency (Direction):** ET-C(R), LJ-B **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 46-VCS-1

**Remarks:** Cold shutdown justification 46-VCS-1 defers exercise testing of these valves due to the necessity of stopping the Drive Water Pumps to perform the tests.

**Safety Function(s):** These CRD cooling water header check valves perform an active safety function in the closed position to provide containment isolation following a Reactor scram, or subsequent to a loss of the Drive Water Pumps. UFSAR Table 6.2-17 identifies these valves as containment isolation valves for Penetration X-37. Additionally, these check valves must be capable of closure to prevent a possible release path through the CRD system piping outside secondary containment in the event of a LOCA. This safety function satisfies the isolation capabilities of unidentified release paths for CRD units as discussed in NRC IN. 90-78.

These valves do not perform a safety function in the open position. They are not required to open to support safe shutdown or accident mitigation. Maintaining cooling water supply during normal plant operation is not a safety function.

**Test Requirements:**

Exercise test to the closed position during cold shutdown
Seat leakage rate testing per 10 CFR 50, Appendix J (Option B)

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR, Section 4.6.1, Control Rod Drive System
3. UFSAR, Table 6.2-17, Containment Penetration Data
4. UFSAR, Section 7.0, Instrumentation an Controls
5. NRC Information Notice 90-78, Previously Unidentified Release Path From Boiling Water Reactor Control Rod Hydraulic Units
6. Design Baseline Document, L-S-15, Control Rod Drive System
7. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** CRD Drive Water Header Valve

**ID Nos.:** 46-1115, 46-1116, 46-2115, 46-2116

**P&ID/COORD** (respectively): M-46 (SHT 1) / F-2, M-46 (SHT 1) / F-3, M-46 (SHT 2) / F-2, M-46 (SHT 2) / F-3

**Code Class:** 2 **Category:** A/C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-C(R), LJ-B **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 46-VCS-1

**Remarks:** Cold shutdown justification 46-VCS-1 defers exercise testing of these valves due to the necessity of stopping the Drive Water Pumps to perform the tests.

**Safety Function(s):** These CRD drive water header check valves perform an active safety function in the closed position to provide containment isolation following a Reactor scram, or subsequent to a loss of the Drive Water Pumps. UFSAR Table 6.2-17 identifies these valves as containment isolation valves for Penetration X-38. Additionally, these check valves must be capable of closure to prevent a possible release path through the CRD system piping outside secondary containment in the event of a LOCA. This safety function satisfies the isolation capabilities of unidentified release paths for CRD units as discussed in NRC IN. 90-78.

These valves do not perform a safety function in the open position. They are not required to open to support safe shutdown or accident mitigation. Maintaining drive water supply during normal plant operation is required to support normal rod insertion and withdrawal functions, but is not a safety function.

**Test Requirements:**

Exercise test to the closed position during cold shutdown
Seat leakage rate testing per 10 CFR 50, Appendix J (Option B)

**References:**

1. LGS Technical Specification 3/4.6.3
2. UFSAR, Section 4.6.1, Control Rod Drive System
3. UFSAR, Table 6.2-17, Containment Penetration Data
4. UFSAR, Section 7.0, Instrumentation an Controls
5. NRC Information Notice 90-78, Previously Unidentified Release Path From Boiling Water Reactor Control Rod Hydraulic Units
6. Design Baseline Document, L-S-15, Control Rod Drive System
7. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** CRD Exhaust Water Header Valve

**ID Nos.:** 46-1122, 46-1123, 46-2122, 46-2123

**P&ID/COORD** (respectively): M-46 (SHT 1) / G-6, M-46 (SHT 1) / G-6, M-46 (SHT 2) / G-6, M-46 (SHT 2) / G-6

**Code Class:** 2 **Category:** A/C **Active/Passive:** A

**Size:** 1.00 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal O Safety C Failsafe -

**Test Frequency (Direction):** ET-C(R), LJ-B **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** 46-VCS-1

**Remarks:** Cold shutdown justification 46-VCS-1 defers exercise testing of these valves due to the necessity of stopping the Drive Water Pumps to perform the tests.

**Safety Function(s):** These CRD exhaust water header check valves perform an active safety function in the closed position to provide containment isolation following a Reactor scram, or subsequent to a loss of the Drive Water Pumps. UFSAR Table 6.2-17 identifies these valves as containment isolation valves for Penetration X-38. Additionally, these check valves must be capable of closure to prevent a possible release path through the CRD system piping outside secondary containment in the event of a LOCA. This safety function satisfies the isolation capabilities of unidentified release paths for CRD units as discussed in NRC IN. 90-78.

These valves do not perform a safety function in the open position. They are not required to open to support safe shutdown or accident mitigation. Maintaining an exhaust water flow path during normal plant operation is required to support normal rod insertion and withdrawal functions, but is not a safety function.

**Test Requirements:**

Exercise test to the closed position during cold shutdown
Seat leakage rate testing per 10 CFR 50, Appendix J (Option B)

**References:**


1. LGS Technical Specification 3/4.6.3
2. UFSAR, Section 4.6.1, Control Rod Drive System
3. UFSAR, Table 6.2-17, Containment Penetration Data
4. UFSAR, Section 7.0, Instrumentation an Controls
5. NRC Information Notice 90-78, Previously Unidentified Release Path From Boiling Water Reactor Control Rod Hydraulic Units
6. Design Baseline Document, L-S-15, Control Rod Drive System
7. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** CRD Flow Control Valve

**ID Nos.:** FV-C-046-1F002A, FV-C-046-1F002B,
FV-C-046-2F002A, FV-C-046-2F002B

**P&ID/COORD** (respectively): M-46 (SHT 1) / D-2, M-46 (SHT 1) / C-2,
M-46 (SHT 2) / D-2, M-46 (SHT 2) / C-2

**Code Class:** NC **Category:** N/A **Active/Passive:** N/A

**Size:** 1.5 **Valve Type:** GL **Act. Type:** AO

**Positions:** Normal_TH_ Safety_N/A_ Failsafe_C_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These valves have no safety function in the open or closed positions. They are normally maintained such that one valve is in service during plant operation to provide a constant flow rate to the system, while the other valve is isolated. These valves close after a reactor scram, because of sensed high flow, to prevent pump run out. However, they are not required to function in order to accomplish a reactor scram. Additionally, these valves are located in a non-Code portion of CRD piping.

**Test Requirements:**

No Testing Requirements.

**References:**

1. UFSAR, Section 4.6.1, Control Rod Drive System
2. UFSAR, Section 7.0, Instrumentation an Controls
3. Design Baseline Document, L-S-15, Control Rod Drive System
4. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** Recirc. PP. Seal Purge Supply Vent Valve ( Vent to Radwaste)

**ID Nos.:** HV-46-125, HV-46-126, HV-46-225, HV-46-226

**P&ID/COORD** (respectively): M-46 (SHT 1) / C-3, M-46 (SHT 2) / C-3, M-46 (SHT 1) / C-3, M-46 (SHT 2) / C-3

**Code Class:** NC **Category:** B **Active/Passive:** A

**Size:** 1.00 **Valve Type:** GL **Act. Type:** MO

**Positions:** Normal_C_ Safety_O_ Failsafe_AI_

**Test Frequency (Direction):** ET-R, ST-R(O), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** 46-ROJ-1

**Remarks:** Refueling outage justification 46-ROJ-1 allows deferral of full-stroke exercise and stroke-time testing of these valves due to interruption of flow to the Recirc Pump shaft seals.

**Safety Function(s):** These non-ASME, motor-operated vent valves are located in a non-Code portion of the CRD System. However, they perform an active safety function in the open position. These valves must be capable of opening to prevent a possible release path through the CRD system piping outside secondary containment in the event of a failure to the Recirc Pump shaft seals . This is accomplished by providing a flow path for any leakage to be directed to radwaste.

These valves have no safety function in the closed position. During normal plant operation, these valves remain closed to ensure CRD flow is directed to the Recirc Pump seals.

**Test Requirements:**

Full stroke exercise test during refueling
Stroke time measurement to the open position during refueling
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 4.1.3.2
2. UFSAR, Section 4.6.1, Control Rod Drive System
3. UFSAR Section 5.4.1, Reactor Recirculation Pumps
4. UFSAR, Section 7.0, Instrumentation an Controls
5. Design Baseline Document, L-S-15, Control Rod Drive System
6. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** CRD to Recirc. Pump Seals Header Isolation Valve

**ID Nos.:** HV-46-127, HV-46-128, HV-46-227, HV-46-228

**P&ID/COORD** (respectively): M-46 (SHT 1) / C-4, M-46 (SHT 1) / C-4, M-46 (SHT 2) / C-4, M-46 (SHT 2) / C-4

A **Code Class:** NC **Category:** B **Active/Passive:** A

**Size:** 1.00 **Valve Type:** GL **Act. Type:** MO

**Positions:** Normal_O_ Safety_C_ Failsafe_AI_

**Test Frequency (Direction):** ET-C, ST-C(C), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** 46-VCS-2

**Remarks:** Cold shutdown justification 46-VCS-2 allows deferral of full-stroke exercise and stroke-time testing of these valves due to interruption of flow to the Recirc Pump shaft seals.

**Safety Function(s):** These non-ASME, motor-operated valves are located in a non-Code portion of the CRD piping. However, they perform an active safety function in the closed position. They must be capable of closing to prevent a possible release path through the CRD System piping beyond the Reactor enclosure areas that are served by the SGTS. This is accomplished by providing isolation between the Recirc Pump shaft seals and that portion of the CRD piping outside secondary containment, including the Condensate Storage Tank. The valves automatically close upon receipt of isolation signals with the following setpoints: low reactor water level - Level 2 (≤ -38 inches), drywell pressure high (≥ 1.68 psig), reactor enclosure ventilation exhaust radiation - high (≥ 1.35 Mr/h), or refueling floor ventilation exhaust radiation - high (≥ 2.0 Mr/h).

These valves have no safety function in the open position. During normal plant operation they remain open to support Recirc Pump operation which is not safety-related.

**Test Requirements:**

Full stroke exercise test during cold shutdown
Stroke time measurement to the closed position during cold shutdown
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 4.1.3.2
2. UFSAR, Section 4.6.1, Control Rod Drive System
3. UFSAR Section 5.4.1, Reactor Recirculation Pumps
4. UFSAR, Section 7.0, Instrumentation an Controls
5. Design Baseline Document, L-S-15, Control Rod Drive System
6. Design Baseline Document, L-S-19, Recirculation System
7. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032
8. Engineering change Requests LG 94-11636 and LG 94-11984

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** Drive Water Pressure Control Valve

**ID Nos.:** HV-046-1F003, HV-046-2F003

**P&ID/COORD** (respectively): M-46 (SHT 1) / F-4, M-46 (SHT 2) / F-4

**Code Class:** NC **Category:** N/A **Active/Passive:** N/A

**Size:** 1.5 **Valve Type:** GL **Act. Type:** MO

**Positions:** Normal_TH_ Safety_N/A_ Failsafe_AI_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These valves have no safety function in the open or closed positions. They provide the differential required for normal control rod movement. They are manually adjusted from the Control Room, and after the accumulators are charged, they are adjusted to maintain drive water pressure at 260 psig above reactor pressure. Upon achieving this pressure, no further adjustment should be required if flow is maintained constant. These valves are located in a non-Code portion of CRD piping, and are not required to support any safe shutdown or accident mitigation function.

**Test Requirements:**

No testing requirements.

**References:**

1. UFSAR, Section 4.6.1, Control Rod Drive System
2. UFSAR, Section 7.0, Instrumentation an Controls
3. Design Baseline Document, L-S-15, Control Rod Drive System
4. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** CRD Insert and Withdraw Stabilizing Valves

**ID Nos.:** SV-046-1F007A-A, SV-046-1F007A-B, SV-046-1F007B-A, SV-046-1F007B-B, SV-046-2F007A-A, SV-046-2F007A-B, SV-046-2F007B-A, SV-046-2F007B-B

**P&ID/COORD** (respectively): M-46 (SHT 1) / H-4, G-4, G-4, G-4
M-46 (SHT 2) / H-4, H-4, G-4, G-4

**Code Class:** NC **Category:** N/A **Active/Passive:** N/A

**Size:** .75 **Valve Type:** SO **Act. Type:** SO

**Positions:** Normal OC Safety N/A Failsafe FC

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These valves have no safety function in the open or closed positions. They provide flow stability in the CRD system during normal insertion or withdrawal of a control rod. A flow rate of 6 gpm, the sum of the flow rates required to insert and to withdraw a control rod, normally passes from the drive water pressure header through two parallel solenoid operated stabilizing valves and then passes into the cooling water line. One stabilizing valve passes flow equal to the drive insert flow; the other passes flow equal to the drive withdrawal flow. The appropriate stabilizing valve is closed when operating a drive to divert the required flow to the drive. Thus, flow through the drive water pressure control valve is always constant. These valves are not required to function in support of a scram signal. Additionally, these valves are located in a non-Code portion of CRD piping.

**Test Requirements:**

No testing requirements.

**References:**

1. UFSAR, Section 4.6.1, Control Rod Drive System
2. UFSAR, Section 7.0, Instrumentation an Controls
3. Design Baseline Document, L-S-15, Control Rod Drive System
4. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** Scram Discharge Riser Check Valve

**ID Nos.:** 47-1-14, 47-2-14 (Typical of 185 each)

**P&ID/COORD** (respectively): M-47 (SHT 1) / D-6, M-47 (SHT 2) / D-6

**Code Class:** 2 **Category:** C **Active/Passive:** A

**Size:** .75 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal_C_ Safety_O_ Failsafe_-_

**Test Frequency (Direction):** ET-R(F) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** 47-ROJ-1

**Remarks:** Refueling outage justification 47-ROJ-1 documents performance of valve exercise testing in conjunction with control rod scram insertion time testing per T.S. 4.1.3.2, as approved by G.L. 89-04, Position 7.

**Safety Function(s):** The CRD scram discharge riser check valve performs an active safety function in the open position during a scram to provide a flow path from the overpiston area of the drive to the Scram Discharge Volume, allowing rapid rod insertion. The ability of this check valve to perform its safety function is verified during performance of Technical Specification 4.1.3.2 surveillance testing as described above.

This check valve has no safety function in the closed position. It functions to prevent flow from the volume to the overpiston area of the drive. Flow from the CRD to the SDV occurs throughout the entire scram stroke of the control rod and continues until SDV pressure equals Reactor Vessel pressure. There would normally be no demand for check valve closure until after the rod is fully inserted and latched. Additionally, any condition that would require check valve closure would prevent further control rod insertion regardless of the position of this check valve. Therefore, failure of the scram outlet check valves to close would not prevent the system from performing its safety function.

**Test Requirements:**

Check valve exercise test to the open position per T.S 4.1.3.2

**References:**

1. LGS Technical Specification 4.1.3.2
2. UFSAR, Section 4.6.1, Control Rod Drive System
3. UFSAR, Section 7.0, Instrumentation an Controls
4. Generic Letter 89-04, Guidance On Developing Acceptable Inservice Testing Programs, Position 7
5. Design Baseline Document, L-S-15, Control Rod Drive System
6. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** Accumulator Water Check Valve

**ID Nos.:** 47-1-15, 47-2-15 (Typical of 185 each)

**P&ID/COORD** (respectively): M-47 (SHT 1) / B-4, M-47 (SHT 2) / B-4

**Code Class:** 2 **Category:** A/C **Active/Passive:** A

**Size:** .50 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal OC Safety C Failsafe -

**Test Frequency (Direction):** ET-C(R), LP-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** 47-VCS-1

**Remarks:** Cold shutdown justification 47-VCS-1 allows valve closure exercising to be performed when the Drive Water Pumps can be removed from service.

**Safety Function(s):** This check valve performs an active safety function in the closed position to prevent a loss of HCU accumulator water pressure in the event supply pressure is lost, and to prevent diversion of pressurized accumulator water in the event of a scram.

This check valve has no safety function in the open position. During a scram reset or system startup it opens to allow flow to the HCU accumulator for recharging purposes. This places the accumulator in a standby condition to support a reactor scram. The opening capability for accumulator recharging purposes is not a safety-related function.

**Test Requirements:**

Check valve exercise test to the closed position during cold shutdown and measurement of seat leakage (accumulator pressure).

**References:**

1. LGS Technical Specification 4.1.3.2
2. UFSAR, Section 4.6.1, Control Rod Drive System
3. UFSAR, Section 7.0, Instrumentation an Controls

4. Generic Letter 89-04, Guidance On Developing Acceptable Inservice Testing Programs, Position 7
5. Design Baseline Document, L-S-15, Control Rod Drive System
6. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** Cooling Water Check Valve

**ID Nos.:** 47-1-38, 47-2-38 (Typical of 185 each)

**P&ID/COORD** (respectively): M-47 (SHT 1) / B-6, M-47 (SHT 2) / B-6

**Code Class:** 2 **Category:** C **Active/Passive:** A

**Size:** .50 **Valve Type:** CK **Act. Type:** SA

**Positions:** Normal_O_ Safety_C_ Failsafe_-_

**Test Frequency (Direction):** ET-Q(R) **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** The CRD cooling water header check valve performs an active safety function in the closed position to prevent diversion of water from the CRD insert header during a Reactor scram. This valve provides separation of the scram insert header from the CRD cooling water supply header. It must be capable of closure in the event of a scram to prevent the diversion of pressurized HCU accumulator water to the cooling water header. Failure of this valve to close could render the CRD system incapable of accomplishing a scram function. Normal control rod movement verifies that this check valve is capable of closure and satisfies quarterly IST requirements. Further assurance is provided by performance of scram insertion time testing in accordance with Technical Specification surveillance requirement 4.1.3.2.

This valve does not perform a safety function in the open position. During normal operation, it is in the open position to allow the cooling water header to provide a continuous flow of cooling water to all the CRDs at a rate of approximately 0.20 to 0.34 gpm to each drive unit. Cooling water flow to the CRDs is not required to support a reactor scram.

**Test Requirements:**

Quarterly check valve exercise test to the closed position.

**References:**

1. LGS Technical Specification 4.1.3.2
2. UFSAR, Section 4.6.1, Control Rod Drive System
3. UFSAR, Section 7.0, Instrumentation an Controls
4. Generic Letter 89-04, Guidance On Developing Acceptable Inservice Testing Programs, Position 7
5. Design Baseline Document, L-S-15, Control Rod Drive System
6. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** Scram Discharge Vent Vacuum Valve

**ID Nos.:** PSV-047-120, PSV-047-220

**P&ID/COORD** (respectively): M-47 (SHT 1) / H-3, M-47 (SHT 2) / H-3

**Code Class:** NC **Category:** N/A **Active/Passive:** N/A

**Size:** 1.00 **Valve Type:** VR **Act. Type:** SA

**Positions:** Normal C Safety N/A Failsafe -

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These vacuum relief valves are located in non-Code piping upstream of the SDV vent valves. Their purpose is to facilitate proper draining of the scram discharge volume following testing. They do not perform any safety function.

**Test Requirements:**

No Testing Requirements

**References:**

1. UFSAR, Section 4.6.1, Control Rod Drive System
2. Design Baseline Document, L-S-15, Control Rod Drive System
3. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** Directional Control Valve (Withdraw and Settle),SV-20
Directional Control Valve (Insert) ,SV-21
Directional Control Valve (Withdraw),SV-22
Directional Control Valve (Insert) ,SV-23

**ID Nos.:** SV-047-1-20, SV-047-1-21, SV-047-1-22, SV-047-1-23
SV-047-2-20, SV-047-2-21, SV-047-2-22, SV-047-2-23
(Typical of 185 each)

**P&ID/COORD** (respectively): M-47 (SHT 1) / C-5, D-5, C-5, C-5
M-47 (SHT 2) / C-5, D-5, C-5, C-5

**Code Class:** 2 **Category:** N/A **Active/Passive:** N/A

**Size:** .50 **Valve Type:** GT **Act. Type:** SO

**Positions:** Normal_OC_ Safety_N/A_ Failsafe_C_

**Test Frequency (Direction):** N/A **Appendix J, Type C:** N

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** These solenoid valves are located in the drive and exhaust water headers leading to the underpiston and overpiston areas of the CRDs. They do not have any safety function in the open or closed positions. During normal rod insertion activities the insert drive valve, SV-23, opens to apply drive water to the bottom side of the CRDM drive piston, while the insert exhaust valve, SV-21, opens to allow water from above the drive piston to discharge to the exhaust header. During normal rod withdrawal activities the withdrawal drive valve, SV-22, opens to apply drive water to the top side of the CRDM drive piston, while the withdrawal exhaust valve, SV-20, opens to allow water from below the drive piston to discharge to the exhaust header. These valves operate in support of normal rod insertion and withdrawal functions only.

**Test Requirements:**

No Testing Requirements

**References:**

1. UFSAR, Section 4.6.1, Control Rod Drive System
2. UFSAR, Section 7.0, Instrumentation an Controls
3. Design Baseline Document, L-S-15, Control Rod Drive System
4. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** Inlet and Outlet Scram Valves

**ID Nos.:** XV-47-1-26, XV-47-1-27, XV-47-2-26, XV-47-2-27
(Typical of 185 each)

**P&ID/COORD** (respectively): M-47 (SHT 1) / B-5, M-47 (SHT 1) / D-6,
M-47 (SHT 2) / B-5, M-47 (SHT 2) / D-6

**Code Class:** 2 **Category:** B **Active/Passive:** A

**Size:** .75 (Outlet)
.50 (Inlet) **Valve Type:** GL **Act. Type:** AO

**Positions:** Normal_C_ Safety_O_ Failsafe_O_

**Test Frequency (Direction):** ET-R, ST-R(O), FS-R(O), PI-T **Appendix J, Type C:** N

**VRR/VCS/ROJ:** 47-ROJ-1

**Remarks:** Refueling outage justification 47-ROJ-1 documents performance of valve exercise testing in conjunction with control rod scram insertion time testing per T.S. 4.1.3.2, as approved by G.L. 89-04, Position 7.

**Safety Function(s):** The scram inlet and outlet isolation valves are air operated, fail-open valves which perform an active safety function in the open position. The scram inlet valve, XV-26, must be capable of opening when a scram signal is present, thereby allowing water from the pressurized accumulator to be injected to the CRD underpiston area for control rod insertion. The scram outlet valve, XV27, must be capable of opening to allow the CRD overpiston area to be vented to the scram discharge volume (SDV). The scram outlet valve will open quicker than the scram inlet valve to prevent a buildup of high pressure in the CRD which could occur if the accumulator contents were injected prior to venting the overpiston area to the SDV. Both valves are required to open subsequent to a scram signal. The control circuitry for the scram valves is completely independent of the circuitry controlling the Reactor manual control system in order to prevent failures in the manual control circuitry from affecting the scram circuitry. No single failure in the Reactor manual control system can result in the prevention of a Reactor scram.

These valves have no active safety function in the closed position. During normal plant operation the scram outlet valves are maintained in the closed position to isolate the CRD withdrawal header from the SDV header. The scram inlet valves are maintained closed to isolate the insert header from the scram accumulator. Leakage past the scram outlet header isolation valve would result in the associated control rod drifting inward, thereby affecting Reactor control.

**Test Requirements:**

Exercise test per T.S 4.1.3.2
Stroke time measurement to the open position per T.S 4.1.3.2
Fail-safe test to the open position per T.S 4.1.3.2
Position indication verification at least once every 2 years

**References:**

1. LGS Technical Specification 4.1.3.2
2. UFSAR, Section 4.6.1, Control Rod Drive System
3. UFSAR, Section 7.0, Instrumentation an Controls
4. Generic Letter 89-04, Guidance On Developing Acceptable Inservice Testing Programs, Position 7
5. Design Baseline Document, L-S-15, Control Rod Drive System
6. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** Scram Discharge Volume Piping Vent SOV PCIV

**ID Nos.:** XV-47-1F010, XV-47-1F180, XV-47-2F010, XV-47-2F180

**P&ID/COORD** (respectively): M-47 (SHT 1) / H-4, M-47 (SHT 1) / H-4, M-47 (SHT 2) / H-4, M-47 (SHT 2) / H-4

**Code Class:** 2 **Category:** A **Active/Passive:** A

**Size:** 1.00 **Valve Type:** GL **Act. Type:** AO

**Positions:** Normal O Safety C Failsafe C

**Test Frequency (Direction):** ET-Q, ST-Q(C), FS-Q(C), LJ-B, PI-T **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** The Scram Discharge Volume (SDV) vent isolation valves perform an active safety function in the closed position to isolate the Scram Discharge Volume following a Reactor scram. During normal plant operation these air-operated, fail-closed valves are maintained in the open position to vent the SDV so that any liquid accumulation can drain to the Reactor Building Equipment Drain Collection Tank. This ensures that there is sufficient volume available to contain Control Rod Drive (CRD) discharge during a scram. The SDV drain valves must be capable of closure upon receipt of a scram signal. During a scram the discharge volumes are partially filled with water which is discharged from above the CRD drive pistons, thus limiting the loss of water from the Reactor Pressure Vessel. When the scram signal is cleared the discharge volumes are drained. The control circuitry for the scram valves is completely independent of the circuitry controlling the Reactor manual control system. This separation of the scram and normal rod control functions prevents failures in the manual control circuitry from affecting the scram circuitry. No single failure in the Reactor manual control system can result in the prevention of a Reactor scram. UFSAR Table 6.2-17 identifies these valves as containment isolation valves. Also, XV-47-1(2)F010 have a maximum allowable closure time of 25 seconds, and XV-47-1(2)F180 have a maximum allowable closure time of 30 seconds.

These valves do not perform a safety function in the open position. They are not required to open to support a scram. Maintaining the SDVs empty during normal plant operation is also not a safety function.

**Test Requirements:**

Quarterly full stroke exercise test
Quarterly stroke time measurement to the closed position
Quarterly fail-safe test to the closed position
Position indication verification at least once every 2 years
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**References:**

1. LGS Technical Specification 4.1.3.1.1b
2. LGS Technical Specification 3/4.6.3
3. UFSAR, Section 4.6.1, Control Rod Drive System
4. UFSAR, Table 6.2-17, Containment Penetration Data
5. UFSAR, Section 7.0, Instrumentation an Controls
6. Generic Letter 89-04, Guidance On Developing Acceptable Inservice Testing Programs, Position 7
7. Design Baseline Document, L-S-15, Control Rod Drive System
8. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032

**System (No):** Control Rod Drive (CRD) Hydraulic-Parts A and B (46 and 47)

**Component Description:** Scram Discharge Volume Piping Drain SOV PCIV

**ID Nos.:** XV-47-1F011, XV-47-1F181, XV-47-2F011, XV-47-2F181

**P&ID/COORD** (respectively): M-47 (SHT 1) / D-6, M-47 (SHT 1) / D-6, M-47 (SHT 2) / D-6, M-47 (SHT 2) / D-6

**Code Class:** 2 **Category:** A **Active/Passive:** A

**Size:** 2.00 **Valve Type:** GL **Act. Type:** AO

**Positions:** Normal_O_ Safety_C_ Failsafe_C_

**Test Frequency (Direction):** ET-Q, ST-Q(C), FS-Q(C), LJ-B, PI-T **Appendix J, Type C:** Y

**VRR/VCS/ROJ:** N/A

**Remarks:**

**Safety Function(s):** The Scram Discharge Volume (SDV) drain isolation valves perform an active safety function in the closed position to isolate the Scram Discharge Volume following a Reactor scram. During normal plant operation these air-operated, fail-closed valves are maintained in the open position to drain any liquid accumulation in the Scram Discharge Volume to the Reactor Building Equipment Drain Collection Tank. This ensures that there is sufficient volume available to contain Control Rod Drive (CRD) discharge during a scram. The SDV drain valves must be capable of closure upon receipt of a scram signal. During a scram the discharge volumes are partially filled with water which is discharged from above the CRD drive pistons, thus limiting the loss of water from the Reactor Pressure Vessel. When the scram signal is cleared the discharge volumes are drained. The control circuitry for the scram valves is completely independent of the circuitry controlling the Reactor manual control system. This separation of the scram and normal rod control functions prevents failures in the manual control circuitry from affecting the scram circuitry. No single failure in the Reactor manual control system can result in the prevention of a Reactor scram. UFSAR Table 6.2-17 identifies these valves as containment isolation valves. Also, XV-47-1(2)F011 have a maximum allowable closure time of 25 seconds, and XV-47-1(2)F181 have a maximum allowable closure time of 30 seconds.

These valves do not perform a safety function in the open position. They are not required to open to support a scram. Maintaining the SDVs empty during normal plant operation is also not a safety function.

**Test Requirements:**

Quarterly full stroke exercise test
Quarterly stroke time measurement to the closed position
Quarterly fail-safe test to the closed position
Position indication verification at least once every 2 years
Seat leakage rate test per 10 CFR 50, Appendix J (Option B)

**References:**

1. LGS Technical Specification 4.1.3.1.1b
2. LGS Technical Specification 3/4.6.3
3. UFSAR, Section 4.6.1, Control Rod Drive System
4. UFSAR, Table 6.2-17, Containment Penetration Data
5. UFSAR, Section 7.0, Instrumentation an Controls
6. Generic Letter 89-04, Guidance On Developing Acceptable Inservice Testing Programs, Position 7
7. Design Baseline Document, L-S-15, Control Rod Drive System
8. GE Operation and Maintenance Instructions, Vol. III, Part 3, Control Systems, GEKs-97031 and 97032