Industry/TSTF Standard Technical Specification Change Traveler

Risk Informed Evaluation of Extensions to Containment Isolation Valve Completion Times (WCAP-15791)

NUREGs Affected: ☐ 1430 ☑ 1431 ☐ 1432 ☐ 1433 ☐ 1434

Classification: 1) Technical Change — Recommended for CLIIP?: Yes

Priority: 1)High

Simple or Complex Change: Complex — Correction or Improvement: Improvement

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See attached justification.

Revision History

OG Revision 0 Revision Status: Active Next Action: NRC

Revision Proposed by: WOG

Revision Description:
Original Issue

Owners Group Review Information

Date Originated by OG: 17-Jul-02

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 17-Jul-02

TSTF Review Information

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OG Review Completed: ☐ BWOG ☑ WOG ☑ CEOG ☐ BWROG

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(No Comments)

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NRC Review Information

NRC Received Date: 25-Oct-02

Affected Technical Specifications

LCO 3.6.3	Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual)
Ref. 3.6.3 Bases	Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual)

Action 3.6.3.A	Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual)
Action 3.6.3.A Bases	Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual)
Action 3.6.3.B	Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual) Change Description: Renamed C
Action 3.6.3.B	Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual) Change Description: New
Action 3.6.3.B Bases	Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual) Change Description: Renamed C
Action 3.6.3.B Bases	Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual) Change Description: New
Action 3.6.3.C	Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual) Change Description: Deleted
Action 3.6.3.C Bases	Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual) Change Description: Deleted
Action 3.6.3.E Bases	Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual) Change Description: Deleted
SR 3.6.3.1 Bases	Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual)
SR 3.6.3.7 Bases	Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual)

1.0 DESCRIPTION

WCAP-15791 provides the technical justification for extending the Completion Time, also referred to as the allowed outage time (AOT), from 4 hours to 168 hours (7 days) (for isolation valves that cannot demonstrate acceptable results for 168 hours, shorter times are considered and evaluated), for Technical Specification (TS) 3.6.3, "Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual)." The current Completion Times are generally insufficient to respond to containment isolation valve inoperability and perform preventative maintenance activities at power.

The TS Bases for TS 3.6.3 are modified for consistency with the changes to the Technical Specifications.

Letter OG-02-022, dated June, 6, 2002, transmitted WCAP-15791-P, Rev. 0 (Proprietary) and WCAP-15792-NP, Rev. 0 (Non-Proprietary), both entitled "Risk-Informed Evaluation of Extensions to Containment Isolation Valve Completion Times," to the NRC for review and approval.

2.0 PROPOSED CHANGE

WCAP-15791 provides the justification for the following changes to TS 3.6.3, "Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual)," of NUREG-1431, Westinghouse Standard Technical Specifications, Rev. 2:

- Condition A is revised to delete the NOTE and to be applicable when the containment isolation valve pressure boundary is intact.
- The Completion Time for Required Action A.1 is revised to allow a Completion Time from 4 hours up to a Completion Time of 7 days.
- A new Condition B is added for one or more penetration flow paths with one containment isolation valve inoperable and the containment isolation valve pressure boundary not intact. Existing Condition B is revised to Condition C.
- Existing Condition C for penetration flow paths with only one containment isolation valve and a closed system is deleted.

3.0 BACKGROUND

The containment isolation valves are used to isolate containment penetration flow paths. Typically there is one containment isolation valve inside and one containment isolation valve outside each penetration that performs this function. Depending on the purpose of the system, the containment isolation valves may be normally open or closed. Systems can be closed or open inside and outside of containment. An open system inside containment is one that is directly connected to the containment atmosphere. An open system outside containment is one that is directly connected to the outside environment. A closed system inside containment is one that is not directly connected to the containment atmosphere and may consist of only a run of pipe inside containment. A closed system outside containment has no direct connection to the outside environment. Closed systems, either inside or outside containment, may not have an associated containment isolation valve.

The containment isolation valves form part of the containment pressure boundary and provide a means for fluid penetrations not serving accident consequence limiting systems to be provided with two isolation barriers that are closed on a containment isolation signal. The isolation devices are either passive or active (automatic). Manual valves, de-activated automatic valves secured in their closed position (including check valves with flow through the valve secured), blind flanges, and closed systems are considered passive devices. Check valves, or other automatic valves designed to close without operator action following an accident, are considered active devices. Two barriers in series are provided for each penetration so that no single credible failure or malfunction of an active component can result in a loss of isolation or leakage that exceeds limits assumed in the safety analyses. One of these barriers may be a closed system. These barriers (typically containment isolation valves) make up the Containment Isolation System.

Automatic isolation signals are produced during accident conditions. Containment Phase “A” isolation occurs upon receipt of a safety injection signal. Phase “A” isolation signal isolates nonessential process lines in order to minimize leakage of fission product radioactivity. Containment Phase “B” isolation occurs upon receipt of a containment pressure high signal and isolates the remaining process lines, except systems required for accident mitigation. In addition to the isolation signals listed above, the purge and exhaust valves receive an isolation signal on a containment high radiation condition. As a result, the containment isolation valves (and blind flanges) help ensure that the containment atmosphere will be isolated from the environment in the event of a release of fission product radioactivity to the containment atmosphere as a result of a Design Basis Accident (DBA).

The OPERABILITY requirements for containment isolation valves help ensure that containment is isolated within the time limits assumed in the safety analysis. Therefore, the OPERABILITY requirements provide assurance that the containment function assumed in the safety analysis will be maintained.

The containment isolation valve Limiting Condition for Operation (LCO) was derived from the assumptions related to minimizing the loss of reactor coolant inventory and establishing the containment boundary during major accidents. As part of the containment boundary, containment isolation valve OPERABILITY supports leak tightness of the containment. Therefore, the safety analysis of any event requiring isolation of containment is applicable to this LCO.

The DBAs that result in a release of radioactive material within containment are a loss of coolant accident and a rod ejection accident. In the analysis for each of these accidents, it is assumed that containment isolation valves are either closed or function to close within the required isolation time following event initiation. This ensures that potential paths to the environment through containment isolation valves are minimized.

As discussed in Regulatory Guide 1.177, “An Approach for Plant-Specific, Risk-Informed Decision-Making: Technical Specifications,” acceptable reasons for requesting Technical Specification changes fall into one or more of the following categories:

> <u>Improvement to operational safety:</u> A change to the TS can be made due to reductions in the plant risk or a reduction in the occupational exposure of plant personnel in complying with the TS requirements.
>
> <u>Consistency with risk basis in regulatory requirements:</u> TS requirements can be changed to reflect improved design features in a plant or to reflect equipment reliability improvements that make a previous requirement unnecessarily stringent or ineffective. TSs may be changed to establish consistently based requirements across the industry or across an industry group.

Reduce unnecessary burdens: The change may be requested to reduce unnecessary burdens in complying with current TS requirements, based on operating history of the plant or the industry in general. This includes extending Completion Times 1) that are too short to complete repairs when components fail with the plant at-power, 2) to complete additional maintenance activities at-power to reduce plant down time, and 3) provide increased flexibility to plant operators.

The Completion Time extensions in WCAP-15791 are requested primarily to provide an improvement to operational safety, reduce unnecessary burden and provide a more consistent risk basis in regulatory requirements. In addition, the assumption that shutting the plant down is the safest course of action is not always valid and depending on the component or system of interest, it may be safer to complete component repairs at power. During shutdown, the transfer from auxiliary feedwater (AFW) to the residual heat removal (RHR) system represents an increased risk level due to system alignment changes that could lead to loss of inventory events. This transition can be avoided by completing the repair at-power. Potential risks associated with plant shutdown need to be considered when determining an appropriate course of action. Extended Completion Times enable this shutdown risk to be averted.

With regard to the regulatory basis consistency, containment isolation valves are typically not as risk significant as many other plant safety systems and components. Often these other systems more important to risk have Completion Times that are longer than the Completion Times for containment isolation valves. Shorter Completion Times should be imposed on systems or components that are considered to be highly risk significant. Containment penetrations do not rely on single valves to perform their isolation function, but are designed with multiple isolation valves or involve a closed system. A four hour Completion Time is too restrictive and potentially forces plant operators to focus on containment isolation valve inoperability ahead of other inoperabilities that may be more risk significant, but have longer Completion Times.

4.0 TECHNICAL ANALYSIS

4.1 Impact on Defense-in-Depth and Safety Margins

In addition to discussing the impact of the changes on plant risk, the traditional engineering considerations need to be addressed. These include defense-in-depth and safety margins. The fundamental safety principles on which the plant design is based cannot be compromised. Design basis accidents are used to develop the plant design. These are a combination of postulated challenges and failure events that are used in the plant design to demonstrate safe plant response. Defense-in-depth, the single failure criterion, and adequate safety margins may be impacted by the proposed change and consideration needs to be given to these elements.

Impact on Defense-in Depth

The proposed change needs to meet the defense-in-depth principle which consists of a number of elements. These elements and the impact of the proposed change on each follow:

- A reasonable balance among prevention of core damage, prevention of containment failure, and consequence mitigation is preserved.

  The containment isolation valves are part of the plant design to primarily ensure containment integrity following an accident. By closing the containment isolation valves, inventory required to cool the core is also maintained. The containment isolation valves are not included in the plant design for consequence mitigation. Therefore, the proposed Completion Time change for the containment isolation valves has a negligible impact on Core Damage Frequency (CDF), no direct impact on consequence mitigation, and only a small impact on Large Early Release Frequency (LERF). This change does not significantly degrade the ability of one barrier to fission product release and compensate with an improvement of another barrier. The balance between prevention of core damage and prevention of containment failure and consequence mitigation is maintained. Furthermore, no new accident or transients are introduced with the requested change and the likelihood of an accident or transient is not impacted.

- Over-reliance on programmatic activities to compensate for weaknesses in plant design.

  The plant design will not be modified with this proposed change. All safety systems, including the containment isolation valves, will still function in the same manner with the same reliability, and there will be no additional reliance on additional systems, procedures, or operator actions. The calculated risk increase for the Completion Time changes is very small and additional control processes are not required to be put into place to compensate for any risk increase.

- System redundancy, independence, and diversity are maintained commensurate with the expected frequency and consequences of challenges to the system.

  There is no impact on the redundancy, independence, or diversity of the containment isolation valves or on the ability of the plant to isolate containment penetrations with diverse systems. The redundant and diverse containment isolation designs will not be changed. The containment isolation valves are reliable components and will remain reliable after these proposed changes.

- Defenses against potential common cause failures are maintained and the potential for introduction of new common cause failure mechanisms is assessed.

  Defenses against common cause failures are maintained. The completion time extensions requested are not significantly increased such that any new common cause failure mechanisms would occur. In addition, the operating environment for these components remains the same, therefore, new common cause failures modes are not expected. The number, design, and types of valves used for containment isolation remain the same with these changes so the containment isolation system maintains the potential against common cause failures.

- Independence of barriers is not degraded.

  The barriers protecting the public and the independence of these barriers are maintained. It is not expected that multiple systems will be out of service simultaneously during the extended Completion Times that could lead to degradation of these barriers, and an increase in risk to the public. In addition, the extended Completion Times do not provide a mechanism that degrades the independence of the barriers; fuel cladding, Reactor Coolant System, and containment.

- Defenses against human errors are maintained.

  No new operator actions related to the Completion Time extensions are required to maintain plant safety. No changes to current operating, maintenance, or test procedures are required due to these changes. The increase in Completion Times provides additional time to complete troubleshooting, and test and repair activities which will lead to improved operator and maintenance personnel performance, resulting in reduced system re-alignment and restoration errors.

Impact on Safety Margins

The safety analysis acceptance criteria as stated in the FSAR are not impacted by this change. Redundant and diverse containment isolation valves, where applicable, and closed systems, will be maintained. The proposed changes will not allow plant operation in a configuration outside the design basis. Isolation of all containment penetrations will remain single failure proof. Containment isolation valve operation and testing requirements and containment leakage requirements are not impacted by this change. There is no impact on safety margins.

4.2 Generic Assessment of Impact on Risk

This section presents the analysis and assumptions used to determine the impact on plant risk of increasing the Completion Times specified in Section 2.0. This section addresses the three tiered approach to the evaluation of risk-informed TS changes. The three tiered approach is defined in Regulatory Guide 1.177. The first tier addresses Probabilistic Safety Assessment (PSA) insights and includes the risk analyses to support the Completion Time change. The second tier addresses avoidance of risk-significant plant configurations. The third tier, which addresses risk-informed plant configuration control and management, is covered by each utility's Maintenance Rule Program.

Tier 1: Approach to the Evaluation

The Tier 1 analysis provides the impact of the Completion Time changes on the incremental conditional large early release probability (ICLERP) and LERF. Since the containment isolation valves are used to maintain containment integrity, any change to their availability will directly impact releases from containment following a core damage event. The impact of these changes on CDF, and as measured by the change in CDF and incremental conditional core damage probability (ICCDP) values, is not important since this impact would be a secondary effect related to a long-term loss of inventory for core cooling.

The approach used in this program applies both deterministic and probabilistic evaluations. A deterministic approach is used to determine the minimum containment hole size that will result in a large release from the containment atmosphere. Penetration flow paths connected to the containment atmosphere smaller than this size are allowed a Completion Time of 7 days. The minimum hole size is determined for large dry, subatmospheric, and ice condenser containment types. All other penetrations are evaluated on a probabilistic basis to demonstrate if a Completion Time of 7 days is acceptable or to determine an appropriate lesser Completion Time. The probabilistic evaluation is consistent with the Nuclear Regulatory Commission's (NRC) approach for using PRA in RI decisions on plant-specific changes to the current licensing basis. This approach is discussed in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," and Regulatory Guide 1.177.

Both the deterministic and probabilistic analyses were completed on a generic basis. Input parameters used in the analyses were picked based on the most conservative plant design or plant design parameters available, that is, the set of design parameters that results in the most conservative results (shortest Completion Time). Application of the generic analysis on a plant specific basis requires each utility implementing this change to demonstrate that their plant is within the bounds of the analysis.

The following types of containment penetration flow paths are evaluated:

- Penetration flow paths connected to the containment atmosphere
- Penetration flow paths connected to the Reactor Coolant System
- Penetration flow paths connected to the Steam Generators

Probabilistic Evaluation of the Containment Penetrations

The probabilistic evaluation involves the calculation of the ICLERP and ΔLERF for each type of containment isolation valve penetration. Through finding acceptable ICLERP and ΔLERF values per Regulatory Guides 1.177 and 1.174 (less than 5.0E-08 and 1.0E-07, respectively), the maximum Completion Times were determined. For those penetrations that could not be justified to the target 7 day Completion Time, shorter Completion Times were evaluated at 72, 48, 24, 12, and 8 hours.

The ICLERP is defined in Regulatory Guide 1.177 as:

> ICLERP = [(conditional LERF with the subject equipment out of service) – (baseline LERF with nominal expected equipment unavailabilities)] x duration of a single CT under consideration

The ICLERP was found for each penetration with the assumption that one containment isolation valve within the penetration is in maintenance. If there was more than one containment isolation valve within the penetration, the calculation was performed as many times as there are valves because any one of those valves could be in maintenance.

For the ΔLERF calculations, a fault tree analysis using the Westinghouse tool WesSAGE was performed to evaluate all combinations of non-isolated penetration possibilities for each penetration. Non-isolations can be a result of valve failure as well as a valve being in maintenance. This was done for the current 4 hour Completion Time and the proposed 168 hour Completion Time or lesser times as necessary to meet the 1.0E-07/yr ΔLERF criteria. The increase in the probability of failing to isolate the penetration was then multiplied by the CDF to find the final ΔLERF.

The specific calculations for the ICLERPs and ΔLERFs for the containment isolation valves vary from penetration to penetration. The variations are dependent upon the conditions and configurations of the penetration.

For generic applicability, a large variety of possible containment penetrations flow paths were identified, including connections to containment atmosphere, the Reactor Coolant System and the Steam Generators. Different valve types (solenoid-operated valves, motor-operated valves, air-operated valves, check valves, and safety relief valves) and valve positioning (normally open or normally closed) were taken into account for each penetration type. Common cause due to valves within a flow path being of the same valve type and performing a similar function was also included. In addition, unavailability due to maintenance of the containment isolation valves was included in the analysis.

Deterministic Evaluation of Containment Hole Size

This section provides the evaluation to determine the minimum containment hole size that will result in a large release. Penetration flow paths connected to the containment atmosphere (this excludes all Reactor Coolant System and Steam Generator connections) that have piping diameters smaller than this minimum threshold value are assumed of insufficient size to result in a large release. These penetrations automatically default to the 7 day Completion Time and no detailed probabilistic analysis is required.

A large release is defined as a pathway of sufficient size to release the contents of the containment (i.e., one volume change) within one hour. This criteria is provided in the EPRI PSA Applications Guide. The vent diameter, or containment hole size, was calculated that met this criteria. For this program, all releases are considered early.

A series of leak rate calculations were done using assumed initial conditions inside containment prior to an accident. The vent diameter was altered until the leak rate, at containment design pressure, equals 100 percent per hour, which is defined as a large release. All calculations were done for sub-atmospheric, ice condenser, and dry containments using the worst set of parameters to ensure a conservative containment hole size would be calculated that would be applicable to all Westinghouse Owners Group (WOG) plants.

Tier 2: Avoidance of Risk-Significant Plant Conditions

The objective of the second tier, which is applicable to Completion Time extensions, is to provide reasonable assurance that risk-significant plant equipment outage configurations will not occur when equipment is out of service. If risk-significant configurations do occur, then enhancements to Technical Specifications or procedures, such as limiting unavailability of backup systems, increased surveillance frequencies, or upgrading procedures or training, can be made that avoid, limit, or lessen the importance of these configurations.

The containment isolation valves form part of the containment barrier limiting releases to the environment. Other containment systems, such as the containment cooling system and containment spray system, also function to mitigate releases to the environment, but by different mechanisms. These other systems typically are used to preserve containment integrity by limiting containment pressure increase or to remove radioactive material from the containment atmosphere. The containment cooling and containment spray systems are generally not considered backup to the containment isolation function. Given that containment isolation has failed, releases from containment are independent of the success or failure of containment cooling. The containment is already breached and containment pressure limitation is no longer an issue. On the other hand if containment isolation has failed, then containment sprays could be a factor in limiting releases via their scrubbing effect. This would be of limited benefit, because a large portion of the core damage sequences in which containment spray was functional at the time of the initiating event do not have effective scrubbing by sprays at the time of fission product release to the containment. Thus, efforts taken to assure the availability of containment spray when containment isolation may be impaired, do little to assure that containment spray will be effective in reducing releases if a core damage accident occurs. Also, when analyzed on a realistic basis, only a small fraction of the core damage sequences with containment isolation failures would result in fission product releases that are risk significant. Therefore, no Tier 2 limitations need to be imposed.

Tier 3: Risk-Informed Plant Configuration Control and Management

The objective of the third-tier is to ensure that the risk impact of out-of-service equipment is evaluated prior to performing any maintenance activity. As stated in RG-1.174, "a viable program would be one that is able to uncover risk-significant plant equipment outage configurations as they evolve during real-time, normal plant operation." The third-tier requirement is an extension of the second-tier requirement, but addresses the limitation of not being able to identify all possible risk-significant plant configurations in the second-tier evaluation.

Addressing third-tier requirements is outside the scope of this proposed traveler. This will be addressed on a utility specific basis when the changes in WCAP-15791 are implemented at each plant and will be addressed through each plant's Maintenance Rule Program (A.4 requirement).

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

The proposed changes to the Improved Standard Technical Specifications (ISTS) will revise Technical Specifications 3.6.3 to extend selected Completion Times.

In accordance with the criteria set forth in 10 CFR 50.92, the proposed changes to NUREG-1431 have been evaluated and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated.

Response: No

The proposed changes to the Completion Times do not change the response of the plant to any accidents and have an insignificant impact on the reliability of the containment isolation valves. The containment isolation valves will remain highly reliable and the proposed changes will not result in a significant increase in the risk of plant operation. This is demonstrated by showing that the impact on plant safety as measured by core damage frequency (CDF) and large early release frequency (LERF) is acceptable. In addition, for the Completion Time change, the incremental conditional core damage probabilities (ICCDP) and incremental conditional large early release probabilities (ICLERP) are also acceptable. These changes are consistent with the acceptance criteria in Regulatory Guides 1.174 and 1.177. Therefore, since the containment isolation valves will continue to perform their functions with high reliability as originally assumed, and the increase in risk as measured by CDF, LERF, ICCDP, ICLERP is acceptable, there will not be a significant increase in the consequences of any accidents.

The proposed changes do not adversely affect accident initiators or precursors nor alter the design assumptions, conditions, or configuration of the facility or the manner in which the plant is operated and maintained. The proposed changes do not alter or prevent the ability of structures, systems, and components (SSCs) from performing their intended function to mitigate the consequences of an initiating event within the assumed acceptance limits. The proposed changes do not affect the source term, containment isolation, or radiological release assumptions used in evaluating the radiological consequences of an accident previously evaluated. Further, the proposed changes do not increase the types or amounts of radioactive effluent that may be released offsite, nor significantly increase individual or cumulative occupational/public radiation exposures. The proposed changes are consistent with the safety analysis assumptions and resultant consequences.

Therefore, it is concluded that this change does not significantly increase the probability of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated.

Response: No

The proposed changes do not result in a change in the manner in which the containment isolation valves provide plant protection. There are no design changes associated with the proposed changes. The changes to Completion Times do not change any existing accident scenarios, nor create any new or different accident scenarios.

The changes do not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. In addition, the changes do not impose any new or different requirements or eliminate any existing requirements. The changes do not alter assumptions made in the safety analysis. The proposed changes are consistent with the safety analysis assumptions and current plant operating practice.

Therefore, the possibility of a new or different kind of accident from any accident previously evaluated is not created.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No

The proposed changes do not alter the manner in which safety limits, limiting safety system settings or limiting conditions for operation are determined. The safety analysis acceptance criteria are not impacted by these changes. The proposed changes will not result in plant operation in a configuration outside the design basis. The calculated impact on risk is insignificant and is consistent with the acceptance criteria contained in Regulatory Guides 1.174 and 1.177.

Therefore, it is concluded that this change does not involve a significant reduction in the margin of safety.

5.2 Applicable Regulatory Requirements/Criteria

General Design Criteria 54 – Piping Systems Penetrating Containment

Piping Systems penetrating the primary reactor containment shall be provided with leak detection, isolation, and containment capabilities having redundancy, reliability, and performance capabilities which reflect the importance to safety of isolating of isolating these piping systems. Such piping systems shall be designed with a capability to test periodically the operability of the isolation valves and associated apparatus and to determine if valve leakage is within acceptable limits.

General Design Criteria 55 – Reactor Coolant Pressure Boundary Penetrating Containment

Each line that is part of the reactor coolant pressure boundary and that penetrates primary reactor containment shall be provided with containment isolation valves as follows, unless it can be demonstrated that the containment isolation provisions for a specific class of lines, such as instrument lines, are acceptable on some other defined basis:

(1) One locked closed isolation valve inside and one locked closed isolation valve outside containment; or
(2) One automatic isolation valve inside and one locked closed isolation valve outside containment; or
(3) One locked closed isolation valve inside and one automatic isolation valve outside containment. A simple check valve may not be used as the automatic isolation valve outside containment; or
(4) One automatic isolation valve inside and one automatic isolation valve outside containment. A simple check valve may not be used as the automatic isolation valve outside containment.

Isolation valves outside containment shall be located as close to containment as practical and upon loss of actuating power, automatic isolation valves shall be designed to take the position that provides greater safety.

Other appropriate requirements to minimize the probability or consequences of an accidental rupture of those lines or of lines connected to them shall be provided as necessary to assure adequate safety. Determination of the appropriateness of these requirements, such as higher quality in design, fabrication and testing, additional provisions for inservice inspection, protection against more severe natural phenomena, and additional isolation valves and containment, shall include consideration of the population density, use characteristics, and physical characteristics of the site environs.

General Design Criteria 56 – Primary Containment Isolation

Each line that connects directly to the containment atmosphere and penetrates primary reactor containment shall be provided with containment isolation valves as follows, unless it can be demonstrated that the containment isolation provisions for a specific class of lines, such as instrument lines, are acceptable on some other defined basis:

(1) One locked closed isolation valve inside and one locked closed isolation valve outside containment; or
(2) One automatic isolation valve inside and one locked closed isolation valve outside containment; or
(3) One locked closed isolation valve inside and one automatic isolation valve outside containment. A simple check valve may not be used as the automatic isolation valve outside containment; or
(4) One automatic isolation valve inside and one automatic isolation valve outside containment. A simple check valve may not be used as the automatic isolation valve outside containment.

Isolation valves outside containment shall be located as close to the containment as practical and upon loss of actuating power, automatic isolation valves shall be designed to take the position that provides greater safety.

General Design Criteria 57 – Closed System Isolation Valves

Each line that penetrates the primary reactor containment and is neither part of the reactor coolant pressure boundary nor connected directly to the containment atmosphere shall have at least one containment isolation valve which shall be either automatic, or locked closed, or capable of remote manual operation. This valve shall be outside containment and located as close to the containment as practical. A simple check valve may not be used as the automatic isolation valve.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the approval of the proposed change will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATIONS

A review has determined that the proposed change would change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 REFERENCES

1. WCAP-15791-P, Rev. 0 (Proprietary) and WCAP-15792-NP, Rev. 0 (Non-Proprietary), both entitled "Risk-Informed Evaluation of Extensions to Containment Isolation Valve Completion Times.

3.6 CONTAINMENT SYSTEMS

3.6.3 Containment Isolation Valves (Atmospheric, Subatmospheric, Ice Condenser, and Dual)

LCO 3.6.3 Each containment isolation valve (CIV) shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

- NOTES -

1. Penetration flow path(s) [except for [42] inch purge valve flow paths] may be unisolated intermittently under administrative controls.

2. Separate Condition entry is allowed for each penetration flow path.

3. Enter applicable Conditions and Required Actions for systems made inoperable by containment isolation valves.

4. Enter applicable Conditions and Required Actions of LCO 3.6.1, "Containment," when isolation valve leakage results in exceeding the overall containment leakage rate acceptance criteria.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ~~- NOTE - Only applicable to penetration flow paths with two [or more] containment isolation valves.~~ [One or more penetration flow paths with one containment isolation valve inoperable [for reasons other than Condition[s] D [and E]]. AND Containment isolation valve pressure boundary intact.	A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured. AND	~~4 hours~~ INSERT 1

<u>INSERT 1</u>

4 hours for Category 1 CIVs

<u>AND</u>

8 hours for Category 2 CIVs

<u>AND</u>

12 hours for Category 3 CIVs

<u>AND</u>

24 hours for Category 4 CIVs

<u>AND</u>

48 hours for Category 5 CIVs

<u>AND</u>

72 hours for Category 6 CIVs

<u>AND</u>

7 days for Category 7 CIVs

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	A.2 ---------------------------- **- NOTES -** 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means. ---------------------------- Verify the affected penetration flow path is isolated.	Once per 31 days for isolation devices outside containment <u>AND</u> Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days for isolation devices inside containment 1

INSERT 2

INSERT 2

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. [One or more penetration flow paths with one containment isolation valve inoperable [for reasons other than Condition[s] D [and E]]. AND Containment isolation valve pressure boundary not intact.	B.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured. AND	4 hours for Category 8 CIVs AND 8 hours for Category 9 CIVs AND 12 hours for Category 10 CIVs AND 24 hours for Category 11 CIVs AND 48 hours for Category 12 CIVs AND 72 hours for Category 13 CIVs AND 7 days for Category 14 CIVs

INSERT 2 (continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.2 ------------------------------------ - NOTES - 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by administrative means. ----------------------------------- Verify the affected penetration flow path is isolated.	Once per 31 days for isolation devices outside containment AND Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days for isolation devices inside containment]

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. ~~B.~~ ------------------------- **- NOTE -** Only applicable to penetration flow paths with two [or more] containment isolation valves. ------------------------- One or more penetration flow paths with two [or more] containment isolation valves inoperable [for reasons other than Condition[s] D [and E]].	~~B~~.1 C. Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.	1 hour
~~C. ------------------------- **- NOTE -** Only applicable to penetration flow paths with only one containment isolation valve and a closed system. ------------------------- One or more penetration flow paths with one containment isolation valve inoperable.~~	~~C.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.~~ ~~AND~~	~~72 hours~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
	~~C.2~~	~~-NOTES- 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means. Verify the affected penetration flow path is isolated.~~	~~Once per 31 days~~
D. [One or more shield building bypass leakage [or purge valve leakage] not within limit.	D.1	Restore leakage within limit.	4 hours for shield building bypass leakage AND 24 hours for purge valve leakage]
E. [One or more penetration flow paths with one or more containment purge valves not within purge valve leakage limits.	E.1 AND	Isolate the affected penetration flow path by use of at least one [closed and de-activated automatic valve, closed manual valve, or blind flange].	24 hours

BASES

ACTIONS (continued)

The ACTIONS are further modified by a third Note, which ensures appropriate remedial actions are taken, if necessary, if the affected systems are rendered inoperable by an inoperable containment isolation valve.

In the event the isolation valve leakage results in exceeding the overall containment leakage rate, Note 4 directs entry into the applicable Conditions and Required Actions of LCO 3.6.1.

INSERT 7

[A.1 and A.2

[and the containment isolation valve pressure boundary is intact,]

In the event one containment isolation valve in one or more penetration flow paths is inoperable, [except for purge valve or shield building bypass leakage not within limit], the affected penetration flow path must be isolated. INSERT 3 The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic containment isolation valve, a closed manual valve, a blind flange, and a check valve with flow through the valve secured. For a penetration flow path isolated in accordance with Required Action A.1, the device used to isolate the penetration should be the closest available one to containment. Required Action A.1 must be completed within ~~4 hours. The 4 hour Completion Time is reasonable, considering the time required to isolate the penetration and the relative importance of supporting containment OPERABILITY during MODES 1, 2, 3, and 4.~~ INSERT 4

For affected penetration flow paths that cannot be restored to OPERABLE status within the ~~4 hour~~ specified Completion Time and that have been isolated in accordance with Required Action A.1, the affected penetration flow paths must be verified to be isolated on a periodic basis. This is necessary to ensure that containment penetrations required to be isolated following an accident and no longer capable of being automatically isolated will be in the isolation position should an event occur. This Required Action does not require any testing or device manipulation. Rather, it involves verification, through a system walkdown, that those isolation devices outside containment and capable of being mispositioned are in the correct position. The Completion Time of "once per 31 days for isolation devices outside containment" is appropriate considering the fact that the devices are operated under administrative controls and the probability of their misalignment is low. For the isolation devices inside containment, the time period specified as "prior to entering MODE 4 from MODE 5 if not performed within the

INSERT 3

The containment isolation valve pressure boundary is considered to be intact when the inoperable containment isolation valve is capable of maintaining the boundary between the contained fluid and the containment or outside atmosphere. An example of when a containment isolation valve would be inoperable and the pressure boundary is considered to be intact is when work is being performed on a valve actuator.

INSERT 4

the Completion Time specified for each Category of containment isolation valve identified in [a licensee controlled document]. The Completion Time is justified in Reference 4.

REVIEWERS NOTE

The plant specific determination of the containment isolation valve Completion Time categories is performed by comparing the plant specific penetration types to the generic penetration types evaluated that are identified in Table E-1 of Reference 4.

The plant specific application of the generic analysis that justified the generic Completion Time categories is discussed in Section 9.0 of Reference 4.

Plant specific Completion Time categories may also be calculated in lieu of the generic Completion Time categories. This approach is discussed in Section 10.0 of Reference 4.

For plants not adopting the risk-informed extended Completion Time for containment isolation valves, a Completion Time of 4 hours is maintained. The 4 hour Completion Time is reasonable, considering the time required to isolate the penetration and the relative importance of supporting containment OPERABILITY during MODES 1, 2, 3, and 4. A Condition for one or more penetration flow paths with one containment isolation valve inoperable for penetrations with one containment isolation valve and a closed system would be required.

INSERT 7

Condition A is applicable to penetration flow paths with two [or more] containment isolation valves, and penetration flow paths with only one containment isolation valve and a closed system. The closed system must meet the requirements of Reference 3.

BASES

ACTIONS (continued)

previous 92 days" is based on engineering judgment and is considered reasonable in view of the inaccessibility of the isolation devices and other administrative controls that will ensure that isolation device misalignment is an unlikely possibility.

~~Condition A has been modified by a Note indicating that this Condition is only applicable to those penetration flow paths with two [or more] containment isolation valves. For penetration flow paths with only one containment isolation valve and a closed system, Condition C provides the appropriate actions.~~

Required Action A.2 is modified by two Notes. Note 1 applies to isolation devices located in high radiation areas and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted. Note 2 applies to isolation devices that are locked, sealed, or otherwise secured in position and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since the function of locking, sealing, or securing components is to ensure that these devices are not inadvertently repositioned. Therefore, the probability of misalignment of these devices once they have been verified to be in the proper position, is small.]

INSERT 5

C.

~~B~~.1

With two [or more] containment isolation valves in one or more penetration flow paths inoperable, [except for purge valve or shield building bypass leakage not within limit,] the affected penetration flow path must be isolated within 1 hour. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic valve, a closed manual valve, and a blind flange. The 1 hour Completion Time is consistent with the ACTIONS of LCO 3.6.1. In the event the affected penetration is isolated in accordance with Required Action ~~B.1~~ C.1, the affected penetration must be verified to be isolated on a periodic basis per Required Action A.2 or B.2, which remains in effect. This periodic verification is necessary to assure leak tightness of containment and that penetrations requiring isolation following an accident are isolated. The Completion Time of once per 31 days for verifying each affected penetration flow path is isolated is appropriate considering the fact that the valves are operated under administrative control and the probability of their misalignment is low.

INSERT 5

[B.1 and B.2

Condition B is applicable to penetration flow paths with two [or more] containment isolation valves, and penetration flow paths with only one containment isolation valve and a closed system. The closed system must meet the requirements of Reference 3.

In the event one containment isolation valve in one or more penetration flow paths is inoperable, [except for purge valve or shield building bypass leakage not within limit,] and the containment isolation valve pressure boundary is not intact, the affected penetration flow path must be isolated. The containment isolation valve pressure boundary is considered not to be intact when the inoperable containment isolation valve is not capable of maintaining the boundary between the contained fluid and the containment or outside atmosphere. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic containment isolation valve, a closed manual valve, a blind flange, and a check valve with flow through the valve secured. For a penetration flow path isolated in accordance with Required Action B.1, the device use to isolate the penetration should be the closest available one to containment. Required Action B.1 must be completed within [the Completion Time specified for each Category of containment isolation valve identified in [a licensee controlled document]. The Completion Time is justified in Reference 4.

REVIEWERS NOTE

The plant specific determination of the containment isolation valve Completion Time categories is performed by comparing the plant specific penetration types to the generic penetration types evaluated that are identified in Table E-2 of Reference 4.

The plant specific application of the generic analysis that justified the generic Completion Time categories is discussed in Section 9.0 of Reference 4.

Plant specific Completion Time categories may also be calculated in lieu of the generic Completion Time categories. This approach is discussed in Section 10.0 of Reference 4.

For plants not adopting the risk-informed extended Completion Time for containment isolation valves, a Completion Time of 4 hours is maintained. The 4 hour Completion Time is reasonable, considering the time required to isolate the penetration and the relative importance of supporting containment OPERABILITY during MODES 1, 2, 3, and 4. A Condition for one or more penetration flow paths with one containment isolation valve inoperable for penetrations with one containment isolation valve and a closed system would be required.

For affected penetration flow paths that cannot be restored to OPERABLE status within the specified Completion Times and that have been isolated in accordance with Required Action B.1, the affected penetration flow paths must be verified to be isolated on a periodic basis. This is necessary to ensure that containment penetrations required to be isolated following an accident and no longer capable of being automatically isolated, will be in an isolated position should an event occur. This Required Action does not require any testing or device manipulation. Rather, it involves verification that those isolation devices outside containment and capable of being mispositioned, are in the correct position. The Completion Time of “once per 31 days for isolation devices outside containment” is appropriate considering the fact that the devices are operated under administrative controls and the probability of

INSERT 5 (continued)

their misalignment is low. For isolation devices inside containment, the time period specified as “prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days” is based on engineering judgment, and is considered reasonable in view of the inaccessibility of the isolation devices and other administrative controls that will ensure that isolation device misalignment is an unlikely possibility.

Required Action B.2 is modified by two Notes. Note 1 applies to isolation devices located in high radiation areas and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted. Note 2 applies to isolation devices that are locked, sealed, or otherwise secured in position and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since the function of locking, sealing, or securing components is to ensure that the devices are not inadvertently repositioned. Therefore, the probability of misalignment of these devices once they have been verified to be in the proper position is small.]

BASES

ACTIONS (continued)

Condition ~~B~~ C is modified by a Note indicating this Condition is only applicable to penetration flow paths with two [or more] containment isolation valves. ~~Condition A of this LCO addresses the condition of one containment isolation valve inoperable in this type of penetration flow path.~~

~~C.1 and C.2~~

~~With one or more penetration flow paths with one containment isolation valve inoperable, the inoperable valve flow path must be restored to OPERABLE status or the affected penetration flow path must be isolated. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic valve, a closed manual valve, and a blind flange. A check valve may not be used to isolate the affected penetration flow path. Required Action C.1 must be completed within the 72 hour Completion Time. The specified time period is reasonable considering the relative stability of the closed system (hence, reliability) to act as a penetration isolation boundary and the relative importance of maintaining containment integrity during MODES 1, 2, 3, and 4. In the event the affected penetration flow path is isolated in accordance with Required Action C.1, the affected penetration flow path must be verified to be isolated on a periodic basis. This periodic verification is necessary to assure leak tightness of containment and that containment penetrations requiring isolation following an accident are isolated. The Completion Time of once per 31 days for verifying that each affected penetration flow path is isolated is appropriate because the valves are operated under administrative controls and the probability of their misalignment is low.~~

~~Condition C is modified by a Note indicating that this Condition is only applicable to those penetration flow paths with only one containment isolation valve and a closed system. The closed system must meet the requirements of Ref. 3. This Note is necessary since this Condition is written to specifically address those penetration flow paths in a closed system.~~

~~Required Action C.2 is modified by two Notes. Note 1 applies to valves and blind flanges located in high radiation areas and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted. Note 2 applies to isolation devices that are locked, sealed, or otherwise secured in position and allows these devices~~

BASES

ACTIONS (continued)

~~to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since the function of locking, sealing, or securing components is to ensure that these devices are not inadvertently repositioned. Therefore, the probability of misalignment of these valves, once they have been verified to be in the proper position, is small.~~

[D.1

With the shield building bypass leakage rate (SR 3.6.3.11) [or purge valve leakage rate (SR 3.6.3.7)] not within limit, the assumptions of the safety analyses are not met. Therefore, the leakage must be restored to within limit. Restoration can be accomplished by isolating the penetration(s) that caused the limit to be exceeded by use of one closed and de-activated automatic valve, closed manual valve, or blind flange. When a penetration is isolated the leakage rate for the isolated penetration is assumed to be the actual pathway leakage through the isolation device. If two isolation devices are used to isolate the penetration, the leakage rate is assumed to be the lesser actual pathway leakage of the two devices. The 4 hour Completion Time for shield building bypass leakage is reasonable considering the time required to restore the leakage by isolating the penetration(s) and the relative importance of secondary containment bypass leakage to the overall containment function. [The 24 hour Completion time for purge valve leakage is acceptable considering the purge valves remain closed so that a gross breach of the containment does not exist.]

- REVIEWER'S NOTE -

[The bracketed options provided in ACTION D reflect options in plant design and options in adopting the associated leakage rate Surveillances.

The options (in both ACTION D and ACTION E) for purge valve leakage, are based primarily on the design - if leakage rates can be measured separately for each purge valve, ACTION E is intended to apply. This would be required to be able to implement Required Action E.3. Should the design allow only for leak testing both purge valves simultaneously, then the Completion Time for ACTION D should include the "24 hours for purge valve leakage" and ACTION E should be eliminated.]]

BASES

ACTIONS (continued)

[E.1, E.2, and E.3

In the event one or more containment purge valves in one or more penetration flow paths are not within the purge valve leakage limits, purge valve leakage must be restored to within limits, or the affected penetration flow path must be isolated. The method of isolation must be by the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a [closed and de-activated automatic valve, closed manual valve, or blind flange]. A purge valve with resilient seals utilized to satisfy Required Action E.1 must have been demonstrated to meet the leakage requirements of SR 3.6.3.7. The specified Completion Time is reasonable, considering that one containment purge valve remains closed so that a gross breach of containment does not exist.

In accordance with Required Action E.2, this penetration flow path must be verified to be isolated on a periodic basis. The periodic verification is necessary to ensure that containment penetrations required to be isolated following an accident, which are no longer capable of being automatically isolated, will be in the isolation position should an event occur. This Required Action does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those isolation devices outside containment capable of being mispositioned are in the correct position. For the isolation devices inside containment, the time period specified as "prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days" is based on engineering judgment and is considered reasonable in view of the inaccessibility of the isolation devices and other administrative controls that will ensure that isolation device misalignment is an unlikely possibility.

For the containment purge valve with resilient seal that is isolated in accordance with Required Action E.1, SR 3.6.3.7 must be performed at least once every [92] days. This assures that degradation of the resilient seal is detected and confirms that the leakage rate of the containment purge valve does not increase during the time the penetration is isolated. The normal Frequency for SR 3.6.3.7, 184 days, is based on an NRC
5 initiative, Generic Issue B-20 (Ref. 4). Since more reliance is placed on a single valve while in this Condition, it is prudent to perform the SR more often. Therefore, a Frequency of once per [92] days was chosen and has been shown to be acceptable based on operating experience.

BASES

ACTIONS (continued)

Required Action E.2 is modified by two Notes. Note 1 applies to isolation devices located in high radiation areas and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted. Note 2 applies to isolation devices that are locked, sealed, or otherwise secured in position and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since the function of locking, sealing, or securing components is to ensure that these devices are not inadvertently repositioned.]

F.1 and F.2

If the Required Actions and associated Completion Times are not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

[SR 3.6.3.1

Each [42] inch containment purge valve is required to be verified sealed closed at 31 day intervals. This Surveillance is designed to ensure that a gross breach of containment is not caused by an inadvertent or spurious opening of a containment purge valve. Detailed analysis of the purge valves failed to conclusively demonstrate their ability to close during a LOCA in time to limit offsite doses. Therefore, these valves are required to be in the sealed closed position during MODES 1, 2, 3, and 4. A containment purge valve that is sealed closed must have motive power to the valve operator removed. This can be accomplished by de-energizing the source of electric power or by removing the air supply to the valve operator. In this application, the term "sealed" has no connotation of leak tightness. The Frequency is a result of an NRC initiative, Generic 6 Issue B-24 (Ref. 6), related to containment purge valve use during plant operations. In the event purge valve leakage requires entry into Condition E, the Surveillance permits opening one purge valve in a penetration flow path to perform repairs.]

BASES

SURVEILLANCE REQUIREMENTS (continued)

valves will remain closed when the inside containment atmosphere returns to subatmospheric conditions following a DBA. SR 3.6.3.6 requires verification of the operation of the check valves that are testable during unit operation. The Frequency of 92 days is consistent with the Inservice Testing Program requirement for valve testing on a 92 day Frequency.]

[SR 3.6.3.7

For containment purge valves with resilient seals, additional leakage rate testing beyond the test requirements of 10 CFR 50, Appendix J, Option [A][B], is required to ensure OPERABILITY. Operating experience has demonstrated that this type of seal has the potential to degrade in a shorter time period than do other seal types. Based on this observation and the importance of maintaining this penetration leak tight (due to the direct path between containment and the environment), a Frequency of 184 days was established as part of the NRC resolution of Generic Issue B-20, "Containment Leakage Due to Seal Deterioration" (Ref. ~~[illegible]~~). 5

Additionally, this SR must be performed within 92 days after opening the valve. The 92 day Frequency was chosen recognizing that cycling the valve could introduce additional seal degradation (beyond that occurring to a valve that has not been opened). Thus, decreasing the interval (from 184 days) is a prudent measure after a valve has been opened.]

SR 3.6.3.8

Automatic containment isolation valves close on a containment isolation signal to prevent leakage of radioactive material from containment following a DBA. This SR ensures that each automatic containment isolation valve will actuate to its isolation position on a containment isolation signal. This surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass this Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

BASES

SURVEILLANCE REQUIREMENTS (continued)

If both isolation valves in the penetration are closed, the actual leakage rate is the lesser leakage rate of the two valves. The Frequency is required by the Containment Leakage Rate Testing Program. This SR simply imposes additional acceptance criteria.

[Bypass leakage is considered part of L_a.

- REVIEWER'S NOTE -

Unless specifically exempted.]]

REFERENCES

1. FSAR, Section [15].

2. FSAR, Section [6.2].

3. Standard Review Plan 6.2.4.

5. ~~4.~~ Generic Issue B-20, "Containment Leakage Due to Seal Deterioration."

6. ~~5.~~ Generic Issue B-24.

4. WCAP-15791, Rev. 0, "Risk-Informed Evaluation of Extensions to Containment Isolation Valve Completion Times," February 2002.