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U S Nuclear Regulatory Commission
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DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT
TECHNICAL SPECIFICATION CHANGE REQUEST
CONVERSION TO OPTION B CONTAINMENT LEAK RATE TESTING

This letter proposes Technical Specifications changes that allow use of 10 CFR 50, Appendix J, Option B for Types B and C containment leak rate testing. Palisades Technical Specifications presently require the use of Option A requirements for Types B and C testing. A previous amendment approved the use of Option B requirements for Type A testing.

The proposed Technical Specifications changes revise Surveillance Requirements in Section 3.6 and program requirements in Specification 5.5.14 to reflect the use of Option B requirements for Types B and C testing. Three exceptions are proposed to the requirements of program documents referenced in Option B. These exceptions allow alternate testing methods for the air lock door seals and allow leakage rate testing frequency of the Containment purge exhaust and supply valves to be based on component performance. The proposed changes also add a note to the air lock interlock Surveillance Requirement to preclude testing if the air lock door(s) have not been opened.

The proposed changes affect only the Improved Technical Specifications (ITS), because the proposed changes are not needed until the upcoming refueling outage. The next refueling outage is scheduled after implementation of ITS. Consumers Energy requests the amendment be approved in time to support planning for the next Palisades refueling outage, presently scheduled to start March 31, 2001, and requests 60 days after approval for implementation.

A copy of this letter has been sent to the appropriate official of the State of Michigan.

SUMMARY OF COMMITMENTS

This letter establishes no new commitments and makes no revisions to existing commitments.

Nathan L. Haskell
Director, Licensing and Performance Assessment

CC: Administrator, Region III, USNRC
Project Manager, NRR, USNRC
NRC Resident Inspector - Palisades
Lou Brandon, Michigan Department of Environmental Quality

Enclosure

A017

ENCLOSURE 1

CONSUMERS ENERGY COMPANY
PALISADES PLANT
DOCKET 50-255

TECHNICAL SPECIFICATION CHANGE REQUEST
CONVERSION TO OPTION B CONTAINMENT LEAK RATE TESTING

CONSUMERS ENERGY COMPANY
Docket 50-255
License DPR-20

Request for Change to the Technical Specifications
CONVERSION TO OPTION B CONTAINMENT LEAK RATE TESTING

It is requested that the Technical Specifications contained in the Facility Operating License DPR-20, Docket 50-255, issued to Consumers Power Company on February 21, 1991, for the Palisades Plant be changed as described below. The proposed changes reflect the use of 10 CFR 50, Appendix J, Option B, for Type B and C Containment leak rate testing.

The following attachments have been included with this change request :

1. The proposed pages. The changed area is marked with a vertical line in the margin.

2. The existing pages marked to show the proposed change. Deleted text is shown as strike-out; added text is shown with a shaded background.

3. The proposed Bases pages. The changed areas are marked with a vertical line in the margin. The entire Bases section for 3.6.1, 3.6.2, and 3.6.3 are included due to the changes being distributed through those pages.

4. The existing Bases pages marked to show the proposed changes. Deleted text is shown as strike-out; added text is shown with a shaded background.

I. Changes Proposed

1. Changes are proposed to allow Type B and C containment leak rate testing to be performed in accordance with 10 CFR 50, Appendix J, Option B. The conversion to Option B affects Surveillance Requirements, SR 3.6.1.1, SR 3.6.1.3, SR 3.6.2.1, and Specification 5.5.14. The proposed changes follow the model approved by the NRC staff in a letter to NEI dated November 2, 1995. The changes are:

   a. SR 3.6.1.1 currently addresses Type A containment leakage rate testing only; the reference to "Type A" has been deleted. All containment leakage rate testing will be performed under SR 3.6.1.1.

   b. SR 3.6.1.3 currently addresses Types B and C containment leakage rate testing, which is to be performed in accordance with 10 CFR 50, Appendix J, Option A. SR 3.6.1.3 has been deleted; all containment leakage rate testing will be performed under SR 3.6.1.1.

   c. SR 3.6.2.1 has been revised to require air lock leakage rate testing in accordance with the Containment Leak Rate Testing Program instead of the current for testing in accordance with 10 CFR 50, Appendix J, Option A. The explicit acceptance criteria currently in SR 3.6.2.1 have been deleted; the Containment Leak Rate Testing Program contains the appropriate acceptance criteria.

d. The Containment Leak Rate Testing Program, Specification 5.5.14, currently requires Type A testing to be performed in accordance with Option B, and Types B and C testing to be performed in accordance with Option A. All reference to Option A has been deleted, and the specification reworded to require all types of containment leakage rate testing to be in accordance with Option B.

e. The Containment Leak Rate Testing Program, Specification 5.5.14, currently specifies testing pressures for local leakage rate testing. The testing pressure requirements have been deleted. Testing methodology is specified in the documents referenced by Option B and by the Containment Leak Rate Testing Program procedures.

f. The information currently in Note 3 of SR 3.6.2.1 has been moved to 5.5.14.a Exception 1.

g. The Containment Leak Rate Testing Program statement equating "Containment OPERABILITY" and "Containment Integrity" has been revised to delete reference to 10 CFR 50, Appendix J, because reference to containment integrity does not appear in Option B; it appears in the referenced document NEI 94-01 (and is not limited to air lock testing).

2. The proposed changes to Specification 5.5.14 include two exceptions to the air lock testing methodology contained in NEI 94-01,and ANSI 56.8 - 1994.

   a. Exception 1 would allow a door seal contact check to be performed in place of additional leak rate testing for the Emergency Escape Air Lock under certain conditions. The door seal contact checks would be acceptable testing following door openings and seal contact adjustments which are part of the restoration subsequent to local leak rate testing. Technical Specifications currently specify these door seal contact checks as an appropriate testing alternative to additional leak rate testing.

   b. Exception 2 would allow Personnel Air Lock leak rate testing to be performed by pressurizing between the door seals at a pressure $\geq$ 10 psig following door seal contact adjustments. The proposed alternative reduced pressure testing will result in a continuation of the currently successful practice which provides a high degree of confidence in door seal performance.

3. The proposed changes to Specification 5.5.14 also include an exception to the isolation valve testing frequency contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program:"

   a. Exception 3 would allow the testing frequency for the Containment 4-inch purge exhaust, 8-inch purge exhaust, and 12-inch air room supply valves to be extended. The change would allow the testing interval to be extended to a frequency not to exceed 60 months based on component performance. This test interval is consistent with other Option B Type C test intervals and is supported by Palisades design, historical test results and other required testing.

4. The change proposed to SR 3.6.2.2, for the containment air lock door interlock, adds a note which precludes opening and closing air lock doors, and performing the consequential leak rate testing, simply to test door interlocks. SR 3.6.2.2 states, "Verify only one door in the air lock can be opened at a time, [every] 18 months." The proposed note is, "Only required to be performed upon entry or exit through the containment air lock." The proposed note is the same as the note in SR 3.6.2.2 of the Standard Technical Specifications [for] Combustion Engineering Plants, NUREG 1432, Rev. 1 (STS).

   When testing under Option A, the note is not necessary, because each air lock has to be entered each 6 months to perform the required full pressure test. It is necessary when testing under Option B, however, since the full pressure air lock test interval could be extended beyond the 18 month interlock surveillance interval.

II. Safety Evaluation and Discussion

1. Change 1 proposes revisions that adopt performance based containment leakage rate testing in accordance with 10 CFR 50, Appendix J, Option B, for Types B and C containment leak rate testing. (Palisades adopted Option B for Type A tests on approval of Amendment 174.) Upon approval of this proposed change, all containment leakage rate testing will be performed in accordance with Option B.

   The proposed change to a performance based program will allow a relaxation in the frequency of testing containment penetrations and containment isolation valves based on the performance history of leakage tests. The extension of the testing frequency resulting from the performance based approach will be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," and, as referenced in RG 1.163, NEI 94-01, "Industry Guideline for implementing Performance-Based Option of 10 CFR 50, Appendix J."

   These proposed changes will implement the approved Option B performance based testing for Types B and C leak rate testing, avoiding unnecessary testing and thereby affording a reduction in cost and personnel radiation exposure. These changes involve only changes to testing frequency, and do not change testing methodology. Option B testing frequencies are based on the overall and individual component leakage rate performance. The change in risk due to the lengthening of the intervals between leakage rate tests was evaluated in NUREG-1493, "Performance-Based Leak-Test Program," and determined to be acceptable.

   Palisades will develop administrative leakage limits in accordance with the program requirements. These limits will be selected based on performance history. A failure to meet these administrative limits will require a return to the minimum 30 month test interval value.

   The proposed change is based on the STS and the model approved by the NRC in a letter to NEI dated November 2, 1995. The model specifications were developed for licensees to use in preparation of plant specific change requests for Option B.

2. Change 2 proposes two exceptions to the testing requirements contained within documents that are referenced by Option B, one for the Emergency Air Lock doors and the other for the Personnel Air Lock Doors. Acceptance criteria associated with these exceptions are included in Specification 5.5.14, "Containment Leak Rate Testing Program." The exceptions are needed to avoid entering into a endless cycle of seal "adjustment" following testing and testing following seal adjustment (ie. seal maintenance).

   Air lock design requires installation of strongbacks on the inner door to be able to pressurize the air lock to P_a for leak testing, and the compression of the door seals caused by the strongback forces require post-test "adjustment" of the seals to assure leak tight integrity after strongback removal. The Option B testing methodology (contained in the referenced NEI 94-01, Revision 0, Section 10.2.2.2, and ANSI 56.8 - 1994, Section 3.3.4.2) requires testing at P_a (53 psig for Palisades) following maintenance on the air lock door seals. The combination of air lock design, and the stipulated testing requirements, therefore, create an endless cycle of seal "adjustment" following testing and testing following seal adjustment.

   Testing for both the Emergency Escape Air Lock and the Personnel Escape Air Lock has shown that testing at an internal pressure of 55 psig (with the strongbacks in place) causes the seals to take a set. The applied pressure of the strongbacks on the inner door and the 55 psig test pressure on the outer door forces the door sealing lips (beads) approximately three-eighths of an inch into the seal. For a full barrel air lock 55 psig test the seal remains in this compressed condition for the 12-24 hour period while the test is being performed causing the seal to take a set in the seal groove of the Air Lock bulkhead. After completion of the full barrel test the doors must be opened for seal restoration and strongback removal. At this time it is necessary to verify door to seal contact in order to assure that the seals rebound to their pre-test condition. Seal contact adjustments may be required after this testing because of set induced by the forces exerted during testing. Past test performance has shown that the seals may not completely rebound to their pretest condition without adjustments to restore the seal contact. These seal adjustments are performed as required to ensure that subsequent seal contact testing on the Emergency Escape Air Lock, or unrestrained between-the-seals door testing at $\geq$ 10 psig on the Personnel Air Lock, is successful. The seal contact adjustments are considered a normal part of the full barrel test restoration and are controlled by an approved plant procedure. Seal contact adjustments may include mechanically manipulating the seal, shimming the seals, adjusting the latch pin brackets or other minor door to seal interface adjustments. (Replacement of the door seals or maintenance on any other Personnel Air Lock components will be tested at P_a.) These adjustments are routinely followed by a seal contact testing (on the Emergency Escape Air Lock) or unrestrained between-the-seals testing (on the Personnel Air Lock).

a. The first exception allows performance of a seal contact check in lieu of Option B requirements for leak testing following post-test door seal adjustments (or door openings) on the Emergency Escape Air Lock:

> *Leakage rate testing is not necessary after opening the Emergency Escape Air Lock doors for post-test restoration or post-test adjustment of the air lock door seals. However, a seal contact check shall be performed instead.*
>
> *Emergency Escape Airlock door opening, solely for the purpose of strongback removal and performance of the seal contact check, does not necessitate additional pressure testing.*

This practice was approved by the NRC on September 30, 1997 as an exemption to certain requirements of 10 CFR 50, Appendix J, Option A, and Technical Specification Amendment No. 177. The exemption provides relief from the requirement to perform additional air lock leakage rate testing after opening the Emergency Escape Air Lock doors for post-test restoration or seal adjustment following air lock leakage rate testing. The amendment revised the Technical Specifications testing requirements for the containment Emergency Escape Air Lock to permit performance of a seal contact check in lieu of a between the seals leakage rate test.

The letters requesting that exemption and amendment, dated January 10, 1996 and February 20, 1997, provide detailed discussions of the Emergency Escape Air Lock and the associated testing practice.

The proposed alternative seal contact testing will result in a continuation of the currently successful practice, which provides a high degree of confidence in door seal performance. Seal contact adjustments may include mechanically manipulating the seal, shimming the seals, adjusting the latch pin brackets or other minor door to seal interface adjustments. Replacement of the door seals will require testing at Pa. Likewise maintenance on all other Emergency Escape Air Lock components will require testing at Pa.

Although Option B, paragraph V.B.1 states that exemptions to the requirements of Option A are applicable under Option B, the proposed exception is requested to assure that the practice of performance of a seal contact check in lieu of leak testing at P_a following post-test seal adjustment or door openings is not considered to be in conflict with testing methodology contained in referenced documents.

b. A similar exception is proposed for the Personnel Air Lock, again to avoid entering into a endless cycle of seal adjustment following testing and testing following seal adjustment:

> *Leakage rate testing at P_a is not necessary after adjustment of the Personnel Air Lock door seals. However, a between-the-seals test shall be performed at $\geq$10 psig instead.*

For air lock doors which are opened during periods when containment integrity is required by the plant's technical specifications, Option A, Section III.D.2.(b)(iii), allows reduced pressure, between-the-seals testing performed in lieu of testing at P_a. The Palisades Technical Specifications state that this testing shall be performed at $\geq$10 psig with an acceptance criteria of $\leq$0.023 L_a. This requirement would apply to door openings for seal adjustments, as well as for other reasons. Option B (and the referenced NEI 94-01 Revision 0, Section 10.2.2.2, and ANSI 56.8 - 1994, Section 3.3.4.2), requires testing at $\geq P_a$ (53 psig for Palisades) following maintenance on the air lock door seals. Option B requirements do not include a provision for this testing to be performed at a reduced pressure.

Leak rate testing of the Personnel Air Lock at an internal pressure of $\geq P_a$ is accomplished by installation of strongbacks on the inner door. The strongbacks simulate accident pressure on the inner door and protect the inner door latching pins from the forces generated by the air lock internal test pressure. Following door openings for strongback removal, Palisades performs an unrestrained (no strongbacks installed) reduced pressure ($\geq$10 psig) between-the-seals tests. A full pressure between-the-seals leak rate test can not be performed with out strongbacks installed, because the door latching pins and associated mechanism, by themselves, do not provide enough closing force to allow successful unrestrained between-the-seals testing at 55 psig. Therefore, between-the-seals testing at 55 psig is not performed at Palisades.

Because Option B requires periodic air lock testing at $\geq P_a$, and air lock design requires seal adjustment following testing at $\geq P_a$, the Option B requirement to perform additional testing at $\geq P_a$ following door seal maintenance results in entering into a endless cycle of seal "adjustment" following testing and testing following seal adjustment (ie. seal maintenance).

Reduced pressure between-the-seals testing of the Personnel Air Lock has been routinely performed at Palisades since 1987. Since that practice has been in place, no full pressure Personnel Air Lock leak rate test has failed due to seal leakage. This testing is performed $\geq$10 psig with the doors unrestrained by strongbacks and is, therefore, very sensitive to changes in the door to seal contact.

Under normal conditions, with the door beads forced into the seal by the door closing mechanism, the seals assume a small amount of set over time. Because of the sensitivity of this testing, this small amount of seal set reduces the door to seal contact and could cause elevated leakage rates it left unadjusted. The test results from the between the seals tests are tracked and used to determine the need for these seal contact adjustments. These seal contact adjustments are controlled by an approved plant procedure. The adjustments are routinely followed by unrestrained between the seals testing.

Testing of the door seals performed at ≥10 psig after seal contact adjustments, is not substantially different than routine periodic operability testing performed at ≥10 psig. Testing of the Personnel Air Lock door seals at ≥10 psig is valid as an operability test of these seals regardless of when it is performed. An acceptance criteria of 0.23 L_a is used for each door to ensure the leakage limiting function of the Containment is maintained.

3. The proposed changes to Specification 5.5.14 include a third exception:

Leakage rate testing frequency for the Containment 4 inch purge exhaust valves, the 8 inch purge exhaust valves, and the 12 inch air room supply valves may be extended up to 60 months based on component performance.

The proposed exception allows the testing frequency for the Containment, 4-inch purge exhaust, 8-inch purge exhaust and 12-inch air room supply valves to use performance based test intervals consistent with other Type C tested components. These particular containment isolation valves have no special design features or operating history which makes then more likely to develop seat leakage than the containment isolation valves used in other systems.

Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995, Section C.2 requires that the test interval for purge and vent valves in PWRs be limited to 30 months as specified in ANSI 56.8 - 1994, Section 3.3.4. This 30 month Local Leak Rate Testing requirement appears to be based primarily on the use by the industry's use of large bore 24 to 42-inch soft seated butterfly purge and vent valves. Numerous NRC and industry experience documents are available which have documented, for more than 20 years, the propensity of the these valves to leak. The valve seats are frequently described as T-seats and their design in conjunction with their large size makes them difficult to adjust and maintain in a leak tight manner.

Palisades design no longer includes large diameter purge or vent valves. The two 48-inch diameter purge exhaust penetrations were modified in 1981. One penetration was sealed, the other was converted into two 8-inch penetrations. The Palisades containment vent and purge system utilizes one 12-inch "air room supply" penetration, and two 8-inch "purge exhaust" penetrations. Each of these penetrations is isolated by two air-operated butterfly valves. A 4-inch bypass line around the isolation valves in one 8-inch penetration line is also installed; it is isolated by two 4-inch manual gate valves.

The 8-inch and 12-inch valves are air operated butterfly valves which have EPT (ethylene propylene terpolymer) seats. The valve seats are not a T-seat design. The valves are installed as air to open valves and as such fail closed on a loss of air. The 8-inch and 12-inch valves are designated as a 150 psig design. Palisades containment is designed for 55 psig. The valves are a flanged design and are installed in the system with flexitallic type gaskets.

The 4-inch gate valves are manually operated valves which have stellite faced split wedges. These valves are designated as a 150 psig design. Palisades containment is designed for 55 psig. The valves are welded into the system.

The local leak rate testing of all these valves can only be performed during Mode 5 or 6 and would normally be performed during refueling outages. The local leak rate testing is performed from inside the containment by pressurizing each individual valve in accident direction and determining a leak rate. The performance of local leak rate testing requires the installation and removal of two 8-inch and one 12-inch test flanges inside of Containment to perform the testing. One scaffold approximately 40 feet high is required to install the two 8-inch test flanges. A separate scaffold approximately 12 feet high is required to install the 12 inch test flange. These areas are very difficult to access. Therefore, this testing is costly in terms of resources and dose, and represents some personnel safety hazard. The direct cost for performing these tests one time is approximately $50,000 for scaffolding (contractor) in addition to 85 hours of plant operations and mechanical maintenance personnel time. Radiation exposure is typically about 90 mrem.

The 8-inch and 12-inch valves all receive containment isolation signals but the valves are never opened in Mode 1, 2, 3, or 4; they are required to be locked closed by LCO 3.6.3. The 4-inch valves are maintained locked closed by plant procedures for Mode 1, 2, 3, or 4 and are not normally opened in any plant condition. These valves are verified locked closed prior to entering Mode 4 from Mode 5.

Technical Specifications Surveillance Requirement 3.6.3.1 requires the 8-inch and 12-inch valves to be verified locked closed every 31 days. Surveillance Requirement (SR) 3.6.3.5 further requires verification that the 8-inch and 12-inch valves are closed by performance of a leakage rate test each 184 days. The leakage rate testing is performed to ensure the valves are closed and the valve seats have not degraded. This testing is performed outside of containment and does not require scaffolding or test flanges. This testing is presently performed $\geq$ 55 psig.

Effectively, the only difference between the testing performed each 184 days on the 8-inch and 12-inch valves and the Local Leak Rate testing performed for Appendix J is the direction of testing on the inner most containment isolation valves. The Local Leak Rate Test is performed by pressurizing between the tested valve and the test flange inside the containment; the closure verification (SR 3.6.3.5) is performed by pressurizing between the valves. Therefore, the inner valve has test pressure applied in the opposite direction to that which would be applied under accident conditions. The valves are designed to seal effectively regardless of direction of flow. Palisades has never experienced evidence of leakage between the valves that would indicate the test results would be different based on direction of applied test pressure. Seat leakage is readily detectable when testing from either direction. Because of the valve orientation, the shaft seals on the inner most containment isolation valves are exposed to test pressure when test pressure is applied from between the valves.

Since the modification of these purge penetrations in 1981,Type C leak rate testing has indicated that all these valves (4-inch, 8-inch and 12-inch) have remained essentially leak tight. The largest maximum-pathway Type C leak rate associated with any of these penetrations since 1981 is < 0.012 La. The typical maximum-

pathway Type C leak rate associated with each of these penetration has been < 0.005 La.

These valves are suitable for service in many other Palisades Containment penetrations. These valves have a Local Leak Rate Testing frequency limit of 30 months only because they are associated with Containment purge penetrations. If these valves were installed in any other process piping penetrating the containment, the 30 month test frequency limitation would not be imposed. The additional testing requirements imposed on Palisades purge valves by Regulatory Guide 1.163 C.2 will cost the plant approximately $200,000 in contractor scaffolding cost, 340 hours for operations and mechanical maintenance personnel and 360 mrem of radiation exposure over the next 10 years. The approval of the exception proposed to Specification 5.5.14 for purge valve testing frequencies would result in potential savings these substantial amounts.

The 184 day closure verification (leak rate test) surveillance of the 8-inch purge exhaust and 12-inch air room supply valves, coupled with the 60 month frequency limit for local leak rate testing of the valves provides adequate assurance that these penetrations will remain effective as Containment barriers.

4. The proposed change adds a note to SR 3.6.2.2 (the containment air lock interlock test) which suspends the interlock testing requirement during periods when the air lock doors have not been opened since the last interlock surveillance test.

   The interlock is a mechanical device which prevents opening the opposite door in that interlock when either air lock door is open. Since the interlock serves no function unless the air lock doors are opened, and can only fail during the opening of an air lock door, performing an interlock test when the doors have not been opened since the last test is not necessary or useful.

   This proposed change is consistent with the note in SR 3.6.2.2 of STS.

III. Analysis of No Significant Hazards Consideration

Consumers Energy finds the activities associated with this proposed Technical Specifications change involve no significant hazards and accordingly, a no significant hazards determination in accordance with 10 CFR 50.92(c) is justified. Four changes have been proposed:

First, changes are proposed to allow Type B and C containment leak rate testing to be performed in accordance with 10 CFR 50, Appendix J, Option B.

Second, exceptions are proposed to the Option B testing methodology for containment air lock door seals.

Third, an exception is proposed to the Option B testing frequency for small diameter containment purge valves.

Fourth, a change is proposed that will defer containment door interlock testing during periods when the air lock doors have not been opened.

The following evaluation supports the finding that operation of the facility in accordance with the four proposed changes would not:

a. Involve a significant increase in the probability or consequences of an accident previously evaluated.

All four groups of proposed changes deal exclusively with testing of features related to containment isolation. The changes only affect testing frequency and methodology. The proposed testing methodologies are acceptable under the existing Technical Specifications. None of the devices involved are assumed as an initiator of any accident previously evaluated. Therefore, operation of the facility in accordance with the proposed changes would not involve a significant increase in the probability of an accident.

1. The first group of proposed changes is based on the model Technical Specifications approved by the NRC staff in a letter to NEI letter dated November 2, 1995. Test intervals will be established based on performance history of the components tested. The frequency of testing the containment penetrations and containment isolation valves will be extended in accordance with program requirements and 10 CFR 50, Appendix J, Option B, with reference to Regulatory Guide 1.163, and NEI 94-01, Rev 0. The change in risk resulting from the proposed changes was evaluated by the NRC in the rule making process for implementing the Option B requirements and are characterized in NUREG-1493. For Type B and C tests the NRC concluded that the extension of test intervals as allowed by Option B would lead to only minor increases in potential offsite dose consequences. These increases are offset by the expected decrease in worker dose received during Type A, B, and C testing, and were found to be acceptable. Therefore, operation of the facility in accordance with the first group proposed changes will not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. The second group of proposed changes would allow air lock door seal leak rate testing to be performed by a seal contact check (for the Emergency Escape Air Lock) or by pressurizing between the door seals at a pressure $\geq$ 10 psig (for the Personnel Air Lock) following door seal contact adjustments. Both proposed alternative testing methods are allowed by existing Technical Specifications (while testing under Option A) and both will result in a continuation of the currently successful testing practice which has provided a high degree of confidence in door seal performance. Plant operating history has shown that air lock door seals which have been successfully tested in accordance with the proposed methodology have passed subsequent full pressure air lock leakage tests in virtually every case. Since the proposed methodology has been demonstrated to successfully detect leaking door seals, the continued use of that methodology for testing under the requirements of Option B will not cause an increase in the probability of a leaking air lock door seal going undetected. Since there will be no increase in the rate of occurance of undetected leakage due to the continued utilization of current practices under Option B, operation of the facility in accordance with the second group of proposed changes will not involve a

significant increase in the probability or consequences of an accident previously evaluated.

3. The third proposed change allow the testing frequency for the Containment 4-inch purge exhaust, 8-inch purge exhaust and 12-inch air room supply valves to be consistent with other 10 CFR 50, Appendix J, Option B, Type C test intervals and is supported by Palisades design, historical test results and other required testing. This would allow the test interval to be extended to a maximum of 60 months from the 30 month interval allowed without this exception.

   The change in risk resulting from the third proposed change is essentially the same as that evaluated by the NRC in the rule making process for implementing the Option B Type C testing requirements, which are characterized in NUREG-1493. As discussed under change 1, above, the NRC concluded that the extension of test intervals as allowed by Option B for Type C testing would lead to only minor increases in potential offsite dose consequences. These increases were found to be acceptable. The third proposed change applies this longer interval to moderate diameter valves in the containment purge system. That longer interval would apply to these valves, without the proposed exception, if they were installed as containment isolation valves in a different system. Furthermore, the 8-inch and 12-inch valves are effectively leak rate tested on a 184 day frequency as part of their required closure verification. Therefore, the proposed changes will not involve a significant increase in the probability or consequences of an accident previously evaluated.

4. The fourth proposed change, which allows deferral of air lock door interlock testing during periods when the air lock doors have not been opened, will only extend a test interval in the instance where an air lock door has not had its mechanical interlock challenged by opening of a door. Since the only actions which can lead to failure of the interlock, opening the air lock door, will result in the surveillance being performed, the proposed change will not affect any parameters or conditions that contribute to the mitigation of previously evaluated accidents. Therefore, operation of the facility in accordance with the fourth proposed change would not involve a significant increase in the consequences of an accident previously evaluated.

b. <u>Create the possibility of a new or different kind of accident from any previously evaluated.</u>

All four groups of proposed changes deal exclusively with testing of features related to containment isolation. The changes only affect testing frequency and methodology. The proposed testing methodologies are acceptable under the existing Technical Specifications. The proposed changes would not result in any physical alterations to the plant configuration, no new equipment is added, no equipment interfaces are modified, no changes to any equipment's function or the method of operating the equipment are being made. As the proposed changes would not change the design, configuration or operation of the plant, they would not cause the containment leak rate testing to become an accident initiator. No new or

different kinds of accident modes are created. Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any previously evaluated.

c. Involve a significant reduction in a margin of safety

All four groups of proposed changes deal exclusively with testing of features related to containment isolation. The changes only affect testing frequency and methodology. The proposed testing methodologies are acceptable under the existing Technical Specifications. None of the devices involved are assumed as an initiator of any accident previously evaluated. The proposed changes only affect the methodology and frequency of Type B and C testing. The methods for performing the tests are not changed from those specified in existing Technical Specifications. The proposed performance based approach, provided by using Option B to 10 CFR 50, Appendix J, would continue to ensure that the containment leakage rates would not exceed the maximum allowable leakage rates defined in the Technical Specifications and assumed in the accident analysis. Testing the interlocks only when an associated door has been opened cannot alter the margin of safety because the opening of a door is the only possible cause for failure of an door interlock. Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

IV Conclusion

The Plant Review Committee has reviewed this Technical Specifications change request and has determined that the change involves no significant hazards consideration. The Plant Review Committee has determined that a request for an amendment to the Technical Specifications does not constitute an unreviewed safety question.

CONSUMERS ENERGY COMPANY

TECHNICAL SPECIFICATION CHANGE REQUEST
CONVERSION TO OPTION B CONTAINMENT LEAK RATE TESTING

To the best of my knowledge, the content of this Technical Specifications change request, which: 1) revises the Palisades Technical Specifications to reflect use of 10 CFR 50, Appendix J, Option B requirements for containment leak rate testing, is truthful and complete.

Nathan L. Haskell
Director, Licensing and Performance Assessment

Sworn and subscribed to before me this 28th day of July 2000

Janice M. Milan, Notary Public
Allegan County, Michigan
(Acting in Van Buren County, Michigan)
My commission expires September 6, 2003

ENCLOSURE 1
ATTACHMENT 1

CONSUMERS ENERGY COMPANY
PALISADES PLANT
DOCKET 50-255

TECHNICAL SPECIFICATION CHANGE REQUEST
CONVERSION TO OPTION B CONTAINMENT LEAK RATE TESTING

IMPROVED TECHNICAL SPECIFICATIONS
PROPOSED PAGES

3.6 CONTAINMENT SYSTEMS

3.6.1 Containment

LCO 3.6.1 Containment shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Containment inoperable.	A.1	Restore containment to OPERABLE status.	1 hour
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.1	Perform required visual examinations and leakage rate testing in accordance with the Containment Leak Rate Testing Program.	In accordance with the Containment Leak Rate Testing Program

SURVEILLANCE		FREQUENCY
SR 3.6.1.2	Verify containment structural integrity in accordance with the Containment Structural Integrity Surveillance Program.	In accordance with the Containment Structural Integrity Surveillance Program

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.2.1	----------NOTES---------- 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria applicable to SR 3.6.1.1. ---------- Perform required air lock leakage rate testing in accordance with the Containment Leak Rate Testing Program.	In accordance with the Containment Leak Rate Testing Program
SR 3.6.2.2	----------NOTE---------- Only required to be performed upon entry or exit through the containment air lock. ---------- Verify only one door in the air lock can be opened at a time.	18 months

5.5 Programs and Manuals

5.5.13 Safety Functions Determination Program (SFDP) (continued)

c. A required system redundant to support system(s) for the supported systems (a) and (b) above is also inoperable.

The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

5.5.14 Containment Leak Rate Testing Program

a. A program shall be established to implement the leak rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines of Regulatory Guide 1.163, "Performance-Based Containment Leakage-Test Program," dated September 1995, as modified by the following exceptions:

1. Leakage rate testing is not necessary after opening the Emergency Escape Air Lock doors for post-test restoration or post-test adjustment of the air lock door seals. However, a seal contact check shall be performed instead.

   Emergency Escape Airlock door opening, solely for the purpose of strongback removal and performance of the seal contact check, does not necessitate additional pressure testing.

2. Leakage rate testing at P_a is not necessary after adjustment of the Personnel Air Lock door seals. However, a between-the-seals test shall be performed at $\geq$10 psig instead.

3. Leakage rate testing frequency for the Containment 4 inch purge exhaust valves, the 8 inch purge exhaust valves, and the 12 inch air room supply valves may be extended up to 60 months based on component performance.

b. The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a, is 53 psig. The containment design pressure is 55 psig.

c. The maximum allowable containment leak rate, L_a, at P_a, shall be 0.1% of containment air weight per day.

5.5 Programs and Manuals

5.5.14 Containment Leak Rate Testing Program (continued)

d. Leak rate acceptance criteria are:

1. Containment leak rate acceptance criteria is $\leq$ 1.0 L_a. During the first plant startup following testing in accordance with this program, the leak rate acceptance criteria are $\leq$ 0.60 L_a for the Type B and Type C tests and $\leq$ 0.75 L_a for Type A tests.

2. Air lock testing acceptance criteria:

a. The leakage for a Personnel Airlock door seal test is $\leq$ 0.023 L_a when pressurized to $\geq$ 10 psig.

b. An acceptable Emergency Escape Airlock door seal contact check consists of a verification of continuous contact between the seals and the sealing surfaces.

e. "Containment OPERABILITY" is equivalent to "Containment Integrity" for the purposes of the testing requirements.

f. The provisions of SR 3.0.2 are not applicable to the Containment Leak Rate Testing Program requirements.

g. The provisions of SR 3.0.3 are applicable to the Containment Leak Rate Testing Program requirements.

5.5.15 Process Control Program

a. The Process Control Program shall contain the current formula, sampling, analyses, tests, and determinations to be made to ensure that the processing and packaging of solid radioactive wastes based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to assure compliance with 10 CFR 20, 10 CFR 71, Federal and State regulations, and other requirements governing the disposal of the radioactive waste.

5.5 Programs and Manuals

5.5.15 Process Control Program (continued)

b. Changes to the Process Control Program:

1. Shall be documented and records of reviews performed shall be retained as required by the Quality Program, CPC-2A. This documentation shall contain:

a) Sufficient information to support the change together with the appropriate analyses or evaluation justifying the change(s) and

b) A determination that the change will maintain the overall conformance of the solidified waste product to existing requirements of Federal, State, or other applicable regulations.

2. Shall become effective after approval by the plant superintendent.

ENCLOSURE
ATTACHMENT 2

CONSUMERS ENERGY COMPANY
PALISADES PLANT
DOCKET 50-255

TECHNICAL SPECIFICATION CHANGE REQUEST
CONVERSION TO OPTION B CONTAINMENT LEAK RATE TESTING

IMPROVED TECHNICAL SPECIFICATIONS
EXISTING PAGES MARKED TO SHOW PROPOSED CHANGES

3.6 CONTAINMENT SYSTEMS

3.6.1 Containment

LCO 3.6.1 Containment shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Containment inoperable.	A.1	Restore containment to OPERABLE status.	1 hour
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.1	Perform required visual examinations and ~~Type A~~ leakage rate testing in accordance with the Containment Leak Rate Testing Program.	In accordance with the Containment Leak Rate Testing Program

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.1.2	Verify containment structural integrity in accordance with the Containment Structural Integrity Surveillance Program.	In accordance with the Containment Structural Integrity Surveillance Program
~~SR 3.6.1.3~~	~~NOTE~~ ~~Local leak rate tests shall be performed at $\geq$ 55 psig.~~	~~NOTE~~ ~~SR 3.0.2 is not applicable.~~
	~~Perform required Type B and C leakage rate testing, except for containment air lock testing, in accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions.~~	~~In accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions~~
	~~The leakage rate acceptance criterion is $\leq$ 1.0 L_a. However, during the first unit startup following testing performed in accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions, the leakage rate acceptance criteria are < 0.6 L_a for the Type B and Type C tests.~~	

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.2.1 ----------NOTES---------- 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria ~~of~~ applicable to SR 3.6.1.~~3~~1 ~~in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions~~. ~~3. A seal contact check shall be performed on the emergency escape air lock following each full pressure test. Emergency escape air lock door opening, solely for the purpose of strongback removal and performance of the seal contact check, does not necessitate additional pressure testing.~~ ~~4. Local leak rate tests, other than personnel air lock doors between the seals test, shall be performed at ≥ 55 psig.~~ ----------	~~--------NOTE--------~~ ~~SR 3.0.2 is not applicable~~ ~~----------~~
Perform required air lock leakage rate testing in accordance with ~~10 CFR 50, Appendix J, Option A, as modified by approved exemptions~~ the Containment Leak Rate Testing Program. ~~The acceptance criteria for air lock testing are:~~ ~~a. Overall air lock leakage rate is ≤ 1.0 L_a when tested at ≥ P_a and combined with all penetrations and valves subjected to Type B and C tests. However, during the first unit startup following testing performed in accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions, the leakage rate acceptance criteria is < 0.6 L_a when combined with all penetrations and valves subjected to Type B and C tests.~~	In accordance with ~~10 CFR 50, Appendix J, Option A, as modified by approved exemptions~~ the Containment Leak Rate Testing Program ~~(continued)~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
~~SR 3.6.2.1 (continued)~~ ~~b. For each personnel air lock door between the seals test, leakage rate is $\leq$ 0.023 L_a when tested at $\geq$ 10.0 psig.~~ ~~c. An acceptable emergency escape air lock door seal contact check consists of a verification of continuous contact between the seals and the sealing surfaces.~~		
SR 3.6.2.2	----------NOTE---------- Only required to be performed upon entry or exit through the containment air lock. ---------- Verify only one door in the air lock can be opened at a time.	18 months

5.5 Programs and Manuals

5.5.13 Safety Functions Determination Program (SFDP) (continued)

c. A required system redundant to support system(s) for the supported systems (a) and (b) above is also inoperable.

The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

5.5.14 Containment Leak Rate Testing Program

a. A programs shall be established to implement the leak rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. ~~The Type A test~~ This program ~~shall meet the requirements of 10 CFR 50, Appendix J, Option B and~~ shall be in accordance with the guidelines of Regulatory Guide 1.163, "Performance-Based Containment Leakage-Test Program," dated September 1995," as modified by the following exceptions:

1. Leakage rate testing is not necessary after opening the Emergency Escape Air Lock doors for post-test restoration or post-test adjustment of the air lock door seals. However, a seal contact check shall be performed instead.

   Emergency Escape Airlock door opening, solely for the purpose of strongback removal and performance of the seal contact check, does not necessitate additional pressure testing.

2. Leakage rate testing at P_a is not necessary after adjustment of the Personnel Air Lock door seals. However, a between-the-seals test shall be performed at $\geq$ 10 psig instead.

3. Leakage rate testing frequency for the Containment 4 inch purge exhaust valves, the 8 inch purge exhaust valves, and the 12 inch air room supply valves may be extended up to 60 months based on component performance.

~~The Type B and Type C test program shall meet the requirements of 10 CFR 50, Appendix J, Option A, as modified by the exemption from certain requirements of 10 CFR 50 Appendix J which was granted in an NRC letter to Consumers Power Company dated December 6, 1989.~~

b. The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a, is 53 psig. The containment design pressure is 55 psig.

5.5 Programs and Manuals

c. The maximum allowable containment leak rate, L_a, at P_a, shall be 0.1% of containment air weight per day.

~~Local leak rate tests, other than Personnel Airlock doors between the seals tests, shall be performed at ≥ 55 psig.~~

~~Local leak rate tests for checking airlock doors seals within 72 hours of each door opening shall be performed as follows:~~

~~a. A between the seals test shall be performed on the Personnel Airlock at ≥ 10 psig.~~

~~b. A full pressure test shall be performed on the Emergency Escape Airlock at ≥ 55 psig. A seal contact check shall be performed on the Emergency Escape Airlock following each full pressure test. Emergency Escape Airlock door opening, solely for the purpose of strongback removal and performance of the seal contact check, does not necessitate additional pressure testing.~~

5.5.14 Containment Leak Rate Testing Program (continued)

d. Leak rate acceptance criteria are:

~~a~~1. Containment leak rate acceptance criteria is ≤ 1.0 L_a. During the first plant startup following testing in accordance with this program, the leak rate acceptance criteria are ≤ 0.60 L_a for the Type B and Type C tests and ≤ 0.75 L_a for Type A tests~~;~~.

2. Air lock testing acceptance criteria:

~~b~~a. The leakage for a Personnel Airlock door seal test ~~shall not exceed~~ is ≤ 0.023 L_a when pressurized to ≥ 10 psig.

~~e~~b. An acceptable Emergency Escape Airlock door seal contact check consists of a verification of continuous contact between the seals and the sealing surfaces.

e. "Containment OPERABILITY" is equivalent to "Containment Integrity" for the purposes of the ~~air lock~~ testing requirements ~~in 10 CFR 50, Appendix J~~.

f. The provisions of SR 3.0.2 are not applicable to the Containment Leak Rate Testing Program requirements.

g. The provisions of SR 3.0.3 are applicable to the Containment Leak Rate Testing Program requirements.

5.5.15 Process Control Program

a. The Process Control Program shall contain the current formula, sampling, analyses, tests, and determinations to be made to ensure that the processing and packaging of solid radioactive wastes based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to assure compliance with 10 CFR 20, 10 CFR 71, Federal and State regulations, and other requirements governing the disposal of the radioactive waste.

b. Changes to the Process Control Program:

1. Shall be documented and records of reviews performed shall be retained as required by the Quality Program, CPC-2A. This documentation shall contain:

a) Sufficient information to support the change together with the appropriate analyses or evaluation justifying the change(s) and

ENCLOSURE
ATTACHMENT 3

CONSUMERS ENERGY COMPANY
PALISADES PLANT
DOCKET 50-255

TECHNICAL SPECIFICATION CHANGE REQUEST
CONVERSION TO OPTION B CONTAINMENT LEAK RATE TESTING

IMPROVED TECHNICAL SPECIFICATIONS BASES
PROPOSED PAGES

B 3.6 CONTAINMENT SYSTEMS

B 3.6.1 Containment

BASES

BACKGROUND

The containment consists of a concrete structure lined with steel plate, and the penetrations through this structure. The structure is designed to contain radioactive material that may be released from the reactor core following a Loss of Coolant Accident (LOCA). Additionally, this structure provides shielding from the fission products that may be present in the containment atmosphere following accident conditions.

The containment is a reinforced concrete structure with a cylindrical wall, a flat foundation mat, and a shallow dome roof. The foundation slab is reinforced with conventional mild-steel reinforcing. The internal pressure loads on the base slab are resisted by both the external soil pressure and the strength of the reinforced concrete slab. The cylinder wall is prestressed with a post tensioning system in the vertical and horizontal directions. The dome roof is prestressed utilizing a three way post tensioning system. The inside surface of the containment is lined with a carbon steel liner to ensure a high degree of leak tightness during operating and accident conditions.

The concrete structure is required for structural integrity of the containment under Design Basis Accident (DBA) conditions. The steel liner and its penetrations establish the leakage limiting boundary of the containment. Maintaining the containment OPERABLE limits the leakage of fission product radioactivity from the containment to the environment. SR 3.6.1.1 leakage rate requirements comply with 10 CFR 50, Appendix J, Option B (Ref. 4) as modified by approved exemptions.

The isolation devices for the penetrations in the containment boundary are a part of the containment leak tight barrier. To maintain this leak tight barrier:

a. All penetrations required to be closed during accident conditions are either:

   1. capable of being closed by an OPERABLE automatic containment isolation system, or

   2. closed by manual valves, blind flanges, or de-activated automatic valves secured in their closed positions, except as provided in LCO 3.6.3, "Containment Isolation Valves";

BASES

BACKGROUND (continued)

b. Each air lock is OPERABLE, except as provided in LCO 3.6.2, "Containment Air Locks";

c. The equipment hatch is properly closed and sealed.

APPLICABLE SAFETY ANALYSES

The safety design basis for the containment is that the containment must withstand the pressures and temperatures of the limiting DBA without exceeding the design leakage rate.

The DBAs that result in a release of radioactive material within containment are a Loss of Coolant Accident (LOCA), a Main Steam Line Break (MSLB), and a control rod ejection accident (Ref. 1). In the analysis of each of these accidents, it is assumed that containment is OPERABLE such that release of fission products to the environment is controlled by the rate of containment leakage. The containment was designed with an allowable leakage rate of 0.10% of containment air weight per day (Ref. 3). This leakage rate is defined in 10 CFR 50, Appendix J, Option B as L_a: the maximum allowable leakage rate at pressure Pa. The Pa value of 53 psig represents the analytical value found in Reference 1, rounded up to the next whole number.

Satisfactory leakage rate test results are a requirement for the establishment of containment OPERABILITY.

The containment satisfies Criterion 3 of 10 CFR 50.36(c)(2).

LCO

Containment OPERABILITY is maintained by limiting leakage to $\leq 1.0\ L_a$, except prior to the first startup after performing a required Containment Leak Rate Testing Program leakage test. At this time, the applicable leakage limits must be met.

Compliance with this LCO will ensure a containment configuration, including the equipment hatch, that is structurally sound and that will limit leakage to those leakage rates assumed in the safety analysis.

BASES

LCO (continued)

Individual leakage rates specified for the containment air lock (LCO 3.6.2) and purge valves which have resilient seals (LCO 3.6.3) are not specifically part of the acceptance criteria of 10 CFR 50, Appendix J. Therefore, leakage rates exceeding these individual limits only result in the containment being inoperable when the leakage results in exceeding the overall acceptance criteria of 1.0 L_a.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material into containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, containment is not required to be OPERABLE in MODE 5 to prevent leakage of radioactive material from containment. The requirements for containment during MODE 6 are addressed in LCO 3.9.3, "Containment Penetrations."

ACTIONS

A.1

In the event containment is inoperable, containment must be restored to OPERABLE status within 1 hour. The 1 hour Completion Time provides a period of time to correct the problem commensurate with the importance of maintaining containment OPERABILITY during MODES 1, 2, 3, and 4. This time period also ensures that the probability of an accident (requiring containment OPERABILITY) occurring, during periods when containment is inoperable, is minimal.

B.1 and B.2

If containment cannot be restored to OPERABLE status within the required Completion Time, 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.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.1

Maintaining the containment OPERABLE requires compliance with the visual examinations and leakage rate test requirements of the Containment Leak Rate Testing Program. Failure to meet air lock and containment isolation valve leakage limits does not invalidate the acceptability of the overall leakage determination unless their contribution to overall Type A, B, or C leakage causes that to exceed limits. As left leakage prior to the first startup after performing a required Containment Leak Rate Testing Program leakage test is required to be $\leq 0.6\ L_a$ for combined B and C leakage, and $\leq 0.75\ L_a$ for overall Type A leakage. At all other times between required leakage rate tests, the acceptance criteria is based on an overall Type A leakage limit of $\leq 1.0\ L_a$. At $\leq 1.0\ L_a$ the offsite dose consequences are bounded by the assumptions of the safety analysis. SR Frequencies are as required by the Containment Leak Rate Testing Program. These periodic testing requirements verify that the containment leakage rate does not exceed the leakage rate assumed in the safety analysis. Regulatory Guide 1.163 and NEI 94-01 include acceptance criteria for as -left and as-found Type A leakage rates and Type B and C leakage rates.

SR 3.6.1.2

This SR ensures that the structural integrity of the containment will be maintained in accordance with the provisions of the Containment Structural Integrity Surveillance Program.

REFERENCES

1. FSAR, Chapter 14
2. FSAR, Section 14.18
3. FSAR, Section 5.8
4. 10 CFR 50, Appendix J, Option B

B 3.6 CONTAINMENT SYSTEMS

B 3.6.2 Containment Air Locks

BASES

BACKGROUND

Containment air locks form part of the containment pressure boundary and provide a means for personnel access during all MODES of operation.

Two air locks provide access into the containment. Each air lock is nominally a right circular cylinder, with a door at each end. The personnel air lock doors are 3 foot, 6 inches by 6 foot, 8 inches. The emergency escape air lock doors are 30 inches in diameter. The doors are interlocked to prevent simultaneous opening. During periods when containment is not required to be OPERABLE, the door interlock mechanism may be disabled, allowing both doors of an air lock to remain open for extended periods when frequent containment entry is necessary. Each air lock door has been designed and tested to certify its ability to withstand a pressure in excess of the maximum expected pressure following a Design Basis Accident (DBA) in containment. As such, closure of a single door supports containment OPERABILITY. Each of the doors contains double gasketed seals and local testing capability to ensure pressure integrity. To effect a leak tight seal, the air lock design uses pressure seated doors (i.e., an increase in containment internal pressure results in increased sealing force on each door).

The containment air locks form part of the containment pressure boundary. As such, air lock integrity and leak tightness is essential for maintaining the containment leakage rate within limit in the event of a DBA. Not maintaining air lock integrity or leak tightness may result in a leakage rate in excess of that assumed in the plant safety analysis.

BASES

APPLICABLE SAFETY ANALYSES

The DBAs that result in a release of radioactive material within containment are a Loss of Coolant Accident (LOCA), a Main Steam Line Break (MSLB) and a control rod ejection accident (Ref. 1). In the analysis of each of these accidents, it is assumed that containment is OPERABLE such that release of fission products to the environment is controlled by the rate of containment leakage. The containment was designed with an allowable leakage rate of 0.10% of containment air weight per day (Ref. 2). This leakage rate is defined in 10 CFR 50, Appendix J, Option B, as L_a : the maximum allowable containment leakage rate at the calculated maximum peak containment pressure (P_a). For a LOCA, the calculated maximum peak containment pressure is approximately 53 psig. This allowable leakage rate forms the basis for the acceptance criteria imposed on the SRs associated with the air lock.

The containment air locks satisfy Criterion 3 of 10 CFR 50.36(c)(2).

LCO

Each containment air lock forms part of the containment pressure boundary. As part of the containment pressure boundary, the air lock safety function is related to control of the containment leakage rate resulting from a DBA. Thus, each air lock's structural integrity and leak tightness are essential to the successful mitigation of such an event.

Each air lock is required to be OPERABLE. For the air lock to be considered OPERABLE, the air lock interlock mechanism must be OPERABLE, the air lock must be in compliance with the Type B air lock leakage test, and both air lock doors must be OPERABLE. The interlock allows only one air lock door of an air lock to be opened at one time. This provision ensures that a gross breach of containment does not exist when containment is required to be OPERABLE. Closure of a single OPERABLE door in each air lock is sufficient to provide a leak tight barrier following postulated events. Nevertheless, both doors are kept closed when the air lock is not being used for normal entry into or exit from containment.

BASES

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, the containment air locks are not required in MODE 5 to prevent leakage of radioactive material from containment. The requirements for the containment air locks during MODE 6 are addressed in LCO 3.9.3, "Containment Penetrations."

ACTIONS

The ACTIONS are modified by three notes. The first note allows entry and exit to perform repairs on the affected air lock component. If the outer door is inoperable, then it may be easily accessed for most repairs. It is preferred that the air lock be accessed from inside containment by entering through the other OPERABLE air lock. However, if this is not practicable, or if repairs on either door must be performed from the barrel side of the door then it is permissible to enter the air lock through the OPERABLE door, even if this door has been locked to comply with ACTIONS. This means there is a short time during which the containment boundary is not intact (during access through the OPERABLE door). The ability to open the OPERABLE door, even if it means the containment boundary is temporarily not intact, is acceptable because of the low probability of an event that could pressurize the containment during the short time in which the OPERABLE door is expected to be open. After each entry and exit, the OPERABLE door must be immediately closed. If ALARA conditions permit, entry and exit should be via an OPERABLE air lock.

A second Note has been added to provide clarification that, for this LCO, separate Condition entry is allowed for each air lock. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable air lock. Complying with the Required Actions may allow for continued operation, and a subsequent inoperable air lock is governed by subsequent Condition entry and application of associated Required Actions. A third Note has been included that requires entry into the applicable Conditions and Required Actions of LCO 3.6.1, "Containment," when leakage results in exceeding the overall containment leakage limit.

BASES

ACTIONS (continued)

A.1, A.2, and A.3

With one air lock door inoperable in one or more containment air locks, the OPERABLE door must be verified closed (Required Action A.1) in each affected containment air lock. This ensures that a leak tight containment barrier is maintained by the use of an OPERABLE air lock door. This action must be completed within 1 hour. This specified time period is consistent with the ACTIONS of LCO 3.6.1, which requires containment be restored to OPERABLE status within 1 hour.

In addition, the affected air lock penetration must be isolated by locking closed an OPERABLE air lock door within the 24 hour Completion Time. The 24 hour Completion Time is considered reasonable for locking the OPERABLE air lock door, considering the OPERABLE door of the affected air lock is being maintained closed.

Required Action A.3 verifies that an air lock with an inoperable door has been isolated by the use of a locked and closed OPERABLE air lock door. This ensures that an acceptable containment leakage boundary is maintained. The Completion Time of once per 31 days is based on engineering judgment and is considered adequate in view of the low likelihood of a locked door being mispositioned and other administrative controls. Required Action A.3 is modified by a Note that applies to air lock doors located in high radiation areas and allows these doors to be verified locked closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted. Therefore, the probability of misalignment of the door, once it has been verified to be in the proper position, is small.

The Required Actions have been modified by two Notes. Note 1 ensures that only the Required Actions and associated Completion Times of Condition C are required if both doors in the same air lock are inoperable. With both doors in the same air lock inoperable, an OPERABLE door is not available to be closed. Required Actions C.1 and C.2 are the appropriate remedial actions. The exception provided by Note 1 does not affect tracking the Completion Time from the initial entry into Condition A; only the requirement to comply with the Required Actions.

BASES

ACTIONS

A.1, A.2, and A.3 (continued)

Note 2 allows use of the air lock for entry and exit for 7 days under administrative controls if both air locks have an inoperable door. This 7 day restriction begins when the second air lock is discovered inoperable. Containment entry may be required to perform Technical Specifications (TS) Surveillances and Required Actions, as well as other activities on equipment inside containment that are required by TS or activities on equipment that support TS-required equipment. This Note is not intended to preclude performing other activities (i.e., non-TS-required activities) if the containment was entered, using the inoperable air lock, to perform an allowed activity listed above. This allowance is acceptable due to the low probability of an event that could pressurize the containment during the short time that the OPERABLE door is expected to be open.

B.1, B.2, and B.3

With an air lock interlock mechanism inoperable in one or more air locks, the Required Actions and associated Completion Times are consistent with those specified in Condition A.

The Required Actions have been modified by two Notes. Note 1 ensures that only the Required Actions and associated Completion Times of Condition C are required if both doors in the same air lock are inoperable. With both doors in the same air lock inoperable, an OPERABLE door is not available to be closed. Required Actions C.1 and C.2 are the appropriate remedial actions. Note 2 allows entry into and exit from containment under the control of a dedicated individual stationed at the air lock to ensure that only one door is opened at a time (i.e., the individual performs the function of the interlock).

Required Action B.3 is modified by a Note that applies to air lock doors located in high radiation areas and allows these doors to be verified locked closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted. Therefore, the probability of misalignment of the door, once it has been verified to be in the proper position, is small.

BASES

ACTIONS (continued)

C.1, C.2, and C.3

With one or more air locks inoperable for reasons other than those described in Condition A or B, Required Action C.1 requires action to be initiated immediately to evaluate previous combined leakage rates using current air lock test results. If the overall containment leakage rate exceeds the limits of LCO 3.6.1, the conditions of that LCO must be entered in accordance with Actions Note 3. An evaluation is acceptable since it is overly conservative to immediately declare the containment inoperable if both doors in an air lock have failed a seal test or if the overall air lock leakage is not within limits. In many instances (e.g., only one seal per door has failed), containment remains OPERABLE, yet only 1 hour (per LCO 3.6.1) would be provided to restore the air lock door to OPERABLE status prior to requiring a plant shutdown. In addition, even with both doors failing the seal test, the overall containment leakage rate can still be within limits.

Required Action C.2 requires that one door in the affected containment air lock must be verified to be closed. This action must be completed within the 1 hour Completion Time. This specified time period is consistent with the ACTIONS of LCO 3.6.1, which requires that containment be restored to OPERABLE status within 1 hour.

Additionally, the affected air lock(s) must be restored to OPERABLE status within the 24 hour Completion Time. The specified time period is considered reasonable for restoring an inoperable air lock to OPERABLE status, assuming that at least one door is maintained closed in each affected air lock.

D.1 and D.2

If the inoperable containment air lock cannot be restored to OPERABLE status within the required Completion Time, 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.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1

Maintaining containment air locks OPERABLE requires compliance with the leakage rate test requirements of the Containment Leak Rate Testing Program. This SR reflects the leakage rate testing requirements with regard to air lock leakage (Type B leakage tests). The acceptance criteria, were established during initial air lock and containment Operability testing. Subsequent amendments to the Technical Specifications revised the acceptance criteria for overall Type B and C leakage limits and provided new acceptance criteria for the personnel air lock doors and the emergency air lock doors (Ref. 2). The periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall containment leakage rate. The Frequency is required by the Containment Leak Rate Testing Program.

An exemption to the requirements of 10 CFR 50, Appendix J has been granted for the containment air locks. The exemption, granted by letter dated September 30, 1997, applies only to the emergency escape air lock and "grants the exemption from 10 CFR 50 Appendix J, Option A, Sections III.D.2.(b)(ii) and III.D.2.(b)(iii), to the extent that leakage rate testing is not necessary after opening the emergency escape air lock doors for post-test restoration or post-test adjustment of the airlock door seals." 10 CFR 50 Appendix J, Option B, Section V.B.1. states "Specific exemptions to Option A of this appendix that have been formally approved by the AEC or NRC, according to 10 CFR 50.12, are still applicable to Option B of this appendix if necessary, unless specifically revolked by the NRC. This exemption permits the performance of a door seal contact verification check in lieu of the final pressure test following the opening of the emergency escape air lock doors for post-test restoration or seal adjustment.

The SR has been modified by two Notes. Note 1 states that an inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. This is considered reasonable since either air lock door is capable of providing a fission product barrier in the event of a DBA.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1 (Continued)

Note 2 has been added to this SR requiring the results to be evaluated against the acceptance criteria of SR 3.6.1.1. This ensures that air lock leakage is properly accounted for in determining the combined Type B and C containment leakage rate.

SR 3.6.2.2

The air lock interlock is designed to prevent simultaneous opening of both doors in a single air lock. Since both the inner and outer doors of an air lock are designed to withstand the maximum expected post accident containment pressure, closure of either door will support containment OPERABILITY. Thus, the door interlock feature supports containment OPERABILITY while the air lock is being used for personnel transit into and out of containment. Periodic testing of this interlock demonstrates that the interlock will function as designed and that simultaneous opening of the inner and outer doors will not inadvertently occur. Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is not normally challenged when the airlock is used for entry and exit (procedures require strict adherence to single door opening), this test is only required to be performed upon entering an air lock, but is not required more frequently than 18 months.

The 18 month Frequency for the interlock is justified based on generic operating experience. The Frequency is based on engineering judgment and is considered adequate given that the interlock is not normally challenged during use of the airlock.

REFERENCES

1. FSAR, Chapter 14
2. FSAR, Section 5.8
3. 10 CFR 50, Appendix J, Option B

B 3.6 CONTAINMENT SYSTEMS

B 3.6.3 Containment Isolation Valves

BASES

BACKGROUND

The containment isolation valves and devices form part of the containment pressure boundary and provide a means for isolating penetration flow paths. These 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 analysis. One of these barriers may be a closed system.

Containment isolation occurs upon receipt of a Containment High Pressure (CHP) signal or a Containment High Radiation (CHR) signal. However, not all containment isolation valves are actuated by both signals. The signals close automatic containment isolation valves in fluid penetrations not required for operation of Engineered Safety Feature systems in order to prevent leakage of radioactive material. Other penetrations are isolated by the use of valves or check valves in the closed position, or blind flanges. As a result, the containment isolation valves (and blind flanges) help ensure that the containment atmosphere will be isolated in the event of a release of radioactive material to containment atmosphere from the Primary Coolant System (PCS) following a Design Basis Accident (DBA).

The OPERABILITY requirements for containment isolation valves and devices help ensure that containment is isolated within the time limits assumed in the safety analysis. Therefore, the OPERABILITY requirements provide assurance that the containment leakage limits assumed in the accident analysis will be not exceeded in a DBA.

BASES

BACKGROUND (continued)

The 8 inch purge exhaust valves are designed for purging the containment atmosphere to the stack while introducing filtered makeup, through the 12 inch air room supply valves from the outside, when the plant is shut down during refueling operations and maintenance. The purge exhaust valves and air room supply valves are air operated isolation valves located outside the containment. These valves are operated manually from the control room. These valves will close automatically upon receipt of a CHP or CHR signal. The air operated valves fail closed upon a loss of air. These valves are not qualified for automatic closure from their open position under DBA conditions. Therefore, these valves are locked closed in MODES 1, 2, 3, and 4 to ensure the containment boundary is maintained.

Open purge exhaust or air room supply valves, following an accident that releases contamination to the containment atmosphere, would cause a significant increase in the containment leakage rate.

APPLICABLE SAFETY ANALYSES

The containment isolation valve 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 (LOCA), a Main Steam Line Break (MSLB), and a control 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 (including containment purge valves) are minimized. The safety analysis assumes that the purge exhaust and air room supply valves are closed at event initiation.

The DBA analysis assumes that, within 25 seconds after receiving a CHP or CHR signal each automatic power operated valve is closed and containment leakage terminated except for the design leakage rate, L_a.

BASES

APPLICABLE SAFETY ANALYSES (continued)

The single failure criterion required to be imposed in the conduct of plant safety analyses was considered in the design of the containment purge valves. Two valves in series on each line provide assurance that both the supply and exhaust lines could be isolated even if a single failure occurred. Both isolation valves on the 8 inch and 12 inch lines are pneumatically operated spring closed valves.

The 8 inch purge exhaust and 12 inch air room supply valves may be unable to close in the environment following a LOCA. Therefore, each of the purge valves is required to remain locked closed during MODES 1, 2, 3, and 4. In this case, the single failure criterion remains applicable to the containment purge valves due to the potential for failure in the control circuit associated with each valve. Again, the purge system valve design precludes a single failure from compromising the containment boundary as long as the system is operated in accordance with the subject LCO.

The containment isolation valves satisfy Criterion 3 of 10 CFR 50.36(c)(2).

LCO

Containment isolation valves form a part of the containment boundary. The containment isolation valve safety function is related to minimizing the loss of primary coolant inventory and establishing the containment boundary during a DBA.

The automatic power operated isolation valves are required to have isolation times within limits and to actuate upon receipt of a CHP or CHR signal as appropriate. The purge exhaust and air room supply valves must be locked closed. The valves covered by this LCO are listed with their associated stroke times in the FSAR (Ref. 1).

The normally closed isolation valves are considered OPERABLE when manual valves are closed, automatic valves are de-activated and secured in their closed position, blind flanges are in place, and closed systems are intact. These passive isolation valves or devices are those listed in Reference 1.

The purge exhaust and air room supply valves with resilient seals must meet the same leakage rate testing requirements as other Type C tested containment isolation valves addressed by LCO 3.6.1, "Containment."

BASES

LCO (continued)

This LCO provides assurance that the containment isolation valves and purge valves will perform their designed safety functions to minimize the loss of primary coolant inventory and establish the containment boundary during accidents.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, the containment isolation valves are not required to be OPERABLE in MODE 5. The requirements for containment isolation valves during MODE 6 are addressed in LCO 3.9.3, "Containment Penetrations."

ACTIONS

The ACTIONS are modified by four notes. Note one allows isolated penetration flow paths, except for 8 inch exhaust and 12 inch air room supply purge valve penetration flow paths, to be unisolated intermittently under administrative controls. These administrative controls consist of stationing a dedicated operator at the valve controls, who is in continuous communication with the control room. In this way, the penetration can be rapidly isolated when a need for containment isolation is indicated. Due to the fact that the 8 inch purge exhaust valves and the 12 inch air room supply valves may be unable to close in the environment following a LOCA and the fact that those penetrations exhaust directly from the containment atmosphere to the environment, these valves may not be opened under administrative controls.

A second Note has been added to provide clarification that, for this LCO, separate Condition entry is allowed for each penetration flow path. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable containment isolation valve. Complying with the Required Actions may allow for continued operation, and subsequent inoperable containment isolation valves are governed by subsequent Condition entry and application of associated Required Actions.

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

A fourth Note has been added that requires entry into the applicable Conditions and Required Actions of LCO 3.6.1 when leakage results in exceeding the overall containment leakage limit.

BASES

ACTIONS

A.1 and A.2 (continued)

In the event one containment isolation valve in one or more penetration flow paths is inoperable (except for purge exhaust or air room supply valves), 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 containment isolation valve, a closed manual valve, a blind flange, and a check valve with flow through the valve secured. For penetrations 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 the 4 hour Completion Time. 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.

For affected penetration flow paths that cannot be restored to OPERABLE status within the 4 hour 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 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 containment isolation valves. For penetration flow paths with only one containment isolation valve and a closed system, Condition C provides appropriate actions.

BASES

ACTIONS (continued)

A.1 and A.2

Required Action A.2 is modified by a Note that 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. Therefore, the probability of misalignment of these devices, once they have been verified to be in the proper position, is small.

B.1

With two containment isolation valves in one or more penetration flow paths inoperable (except for purge exhaust valve or air room supply valve not locked closed), 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, the affected penetration must be verified to be isolated on a periodic basis per Required Action A.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 controls and the probability of their misalignment is low.

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

BASES

ACTIONS (continued)

C.1 and C.2

With one or more penetration flow paths with one containment isolation valve inoperable, the inoperable valve 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. 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 supporting containment OPERABILITY during MODES 1, 2, 3, and 4. In the event the affected penetration 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 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 considering 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 Reference 2. 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 a Note that 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. Therefore, the probability of misalignment of these valves, once they have been verified to be in the proper position, is small.

BASES

ACTIONS (continued)

D.1

The purge exhaust and air room supply isolation valves have not been qualified to close following a LOCA and are required to be locked closed. If one or more of these valves is found not locked closed, the potential exists for the valves to be inadvertently opened. One hour is provided to lock closed the affected valves. The 1 hour Completion Time provides a period of time to correct the problem commensurate with the importance of maintaining these valves closed.

E.1 and E.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

This SR ensures that the 8 inch purge exhaust and 12 inch air room supply valves are locked closed as required. If a valve is open, or closed but not locked, in violation of this SR, the valve is considered inoperable. Valves may be locked closed electrically, mechanically, or by other physical means. These valves may be unable to close in the environment following a LOCA. Therefore, each of the valves is required to remain closed during MODES 1, 2, 3, and 4. The 31 day Frequency is consistent with other containment isolation valve requirements discussed in SR 3.6.3.2.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.2

This SR requires verification that each manual containment isolation valve and blind flange located outside containment, and not locked, sealed, or otherwise secured in position, and required to be closed during accident conditions, is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside the containment boundary is within design limits. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those containment isolation valves outside containment and capable of being mispositioned are in the correct position. Since verification of valve position for containment isolation valves outside containment is relatively easy, the 31 day Frequency is based on engineering judgment and was chosen to provide added assurance of the correct positions. Containment isolation valves that are open under administrative controls are not required to meet the SR during the time the valves are open. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing.

The Note 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 during MODES 1, 2, 3, and 4 for ALARA reasons. Therefore, the probability of misalignment of these containment isolation valves, once they have been verified to be in the proper position, is small.

SR 3.6.3.3

This SR requires verification that each containment isolation manual valve and blind flange located inside containment and not locked, sealed or otherwise secured in position, and required to be closed during accident conditions, is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside the containment boundary is within design limits. For containment isolation valves inside containment, the Frequency of "prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days" is appropriate, since these containment isolation valves are operated under administrative controls and the probability of their misalignment is low. Containment isolation valves that are open under administrative controls are not required to meet the SR during the time that they are open. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.3 (continued)

The Note allows valves and blind flanges located in high radiation areas 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 during MODES 1, 2, and 3 for ALARA reasons. Therefore, the probability of misalignment of these containment isolation valves, once they have been verified to be in their proper position, is small.

SR 3.6.3.4

Verifying that the isolation time of each automatic power operated containment isolation valve is within limits is required to demonstrate OPERABILITY. The isolation time test ensures the valve will isolate in a time period less than or equal to that assumed in the safety analysis. The isolation time and Frequency of this SR are in accordance with the Inservice Testing Program.

SR 3.6.3.5

For containment 8 inch purge exhaust and 12 inch air room supply valves with resilient seals, additional leakage rate testing beyond the test requirements of 10 CFR 50, Appendix J, Option B (Ref. 3), is required to ensure the valves are physically closed (SR 3.6.3.1 verifies the valves are locked closed). 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. 4) as specified in the Safety Evaluation for Amendment No. 90 to the Facility Operating License.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.6

Automatic containment isolation valves close on a containment isolation signal to prevent leakage of radioactive material from containment following a DBA. This SR ensures each automatic containment isolation valve will actuate to its isolation position on an actual or simulated actuation signal, i.e., CHP or CHR. 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 was developed considering it is prudent that this SR be performed only during a plant outage, since isolation of penetrations would eliminate cooling water flow and disrupt normal operation of many critical components. Operating experience has shown that these components usually pass this SR when performed on the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section 5.8
2. FSAR, Section 6.7.2
3. 10 CFR 50, Appendix J, Option B
4. Generic Issue B-20

ENCLOSURE
ATTACHMENT 4

CONSUMERS ENERGY COMPANY
PALISADES PLANT
DOCKET 50-255

TECHNICAL SPECIFICATION CHANGE REQUEST
CONVERSION TO OPTION B CONTAINMENT LEAK RATE TESTING

IMPROVED TECHNICAL SPECIFICATIONS BASES
EXISTING PAGES MARKED TO SHOW PROPOSED CHANGES

B 3.6 CONTAINMENT SYSTEMS

B 3.6.1 Containment

BASES

BACKGROUND

The containment consists of a concrete structure lined with steel plate, and the penetrations through this structure. The structure is designed to contain radioactive material that may be released from the reactor core following a Loss of Coolant ~~design basis~~ Accident (~~LOCA~~). Additionally, this structure provides shielding from the fission products that may be present in the containment atmosphere following accident conditions.

The containment is a reinforced concrete structure with a cylindrical wall, a flat foundation mat, and a shallow dome roof. The foundation slab is reinforced with conventional mild-steel reinforcing. The internal pressure loads on the base slab are resisted by both the external soil pressure and the strength of the reinforced concrete slab. The cylinder wall is prestressed with a post tensioning system in the vertical and horizontal directions. The dome roof is prestressed utilizing a three way post tensioning system. The inside surface of the containment is lined with a carbon steel liner to ensure a high degree of leak tightness during operating and accident conditions.

The concrete structure is required for structural integrity of the containment under Design Basis Accident (DBA) conditions. The steel liner and its penetrations establish the leakage limiting boundary of the containment. Maintaining the containment OPERABLE limits the leakage of fission product radioactivity from the containment to the environment. SR 3.6.1.1 ~~and SR 3.6.1.3~~ leakage rate requirements comply with 10 CFR 50, Appendix J, Option B ~~for Type A tests and Option A for Type B and C tests,~~ (Ref. 4) as modified by approved exemptions.

The isolation devices for the penetrations in the containment boundary are a part of the containment leak tight barrier. To maintain this leak tight barrier:

a. All penetrations required to be closed during accident conditions are either:

   1. capable of being closed by an OPERABLE automatic containment isolation system, or

   2. closed by manual valves, blind flanges, or de-activated automatic valves secured in their closed positions, except as provided in LCO 3.6.3, "Containment Isolation Valves";

BASES

BACKGROUND (continued)

b. Each air lock is OPERABLE, except as provided in LCO 3.6.2, "Containment Air Locks";

c. The equipment hatch is properly closed and sealed.

APPLICABLE SAFETY ANALYSES

The safety design basis for the containment is that the containment must withstand the pressures and temperatures of the limiting DBA without exceeding the design leakage rate.

The DBAs that result in a release of radioactive material within containment are a Loss of Coolant Accident (LOCA), a Main Steam Line Break (MSLB), and a control rod ejection accident (Ref. 1). In the analysis of each of these accidents, it is assumed that containment is OPERABLE such that release of fission products to the environment is controlled by the rate of containment leakage. The containment was designed with an allowable leakage rate of 0.10% of containment air weight per day (Ref. 3). This leakage rate is defined in 10 CFR 50, Appendix J, Option B as L_a: ~~the maximum allowable containment leakage rate at the calculated maximum peak containment pressure (P_a) of 53 psig, which results from the limiting design basis LOCA. (Ref. 2). For the Palisades Nuclear Plant, the calculated maximum peak containment pressure results from a MSLB accident. However, since the limiting accident from an offsite dose perspective is a LOCA, this pressure is used as P_a.~~ the maximum allowable leakage rate at pressure P_a. The P_a value of 53 psig represents the analytical value found in Reference 1, rounded up to the next whole number.

Satisfactory leakage rate test results are a requirement for the establishment of containment OPERABILITY.

The containment satisfies Criterion 3 of 10 CFR 50.36(c)(2).

LCO

Containment OPERABILITY is maintained by limiting leakage to $\leq 1.0\ L_a$, except prior to the first startup after performing a required Containment Leak Rate Testing Program ~~10 CFR 50, Appendix J~~ leakage test. At this time, the applicable leakage limits must be met.

Compliance with this LCO will ensure a containment configuration, including the equipment hatch, that is structurally sound and that will limit leakage to those leakage rates assumed in the safety analysis.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.1

Maintaining the containment OPERABLE requires compliance with the visual examinations and ~~Type A~~ leakage rate test requirements of the Containment Leak Rate Testing Program. Failure to meet air lock and containment isolation valve leakage limits does not invalidate the acceptability of the overall ~~Type A~~ leakage determination unless their contribution to overall Type A, B, or C leakage causes that to exceed limits. As left leakage prior to the first startup after performing a required Containment Leak Rate Testing Program leakage test is required to be $\leq$ 0.6 L_a for combined B and C leakage, and $\leq$ 0.75 L_a for overall Type A leakage. At all other times between required leakage rate tests, the acceptance criteria is based on an overall Type A leakage limit of $\leq$ 1.0 L_a. At $\leq$ 1.0 L_a the offsite dose consequences are bounded by the assumptions of the safety analysis. SR Frequencies are as required by the Containment Leak Rate Testing Program. These periodic testing requirements verify that the containment leakage rate does not exceed the leakage rate assumed in the safety analysis. Regulatory Guide 1.163 and NEI 94-01 include acceptance criteria for as -left and as-found Type A leakage rates and Type B and C leakage rates.

SR 3.6.1.2

This SR ensures that the structural integrity of the containment will be maintained in accordance with the provisions of the Containment Structural Integrity Surveillance Program.

~~SR 3.6.1.3~~

~~Maintaining the containment OPERABLE requires compliance with the Type B and C leakage rate test requirements of 10 CFR 50, Appendix J, Option A (Ref. 4), as modified by approved exemptions. Testing is performed at pressures $\geq$ 55 psig. Failure to meet air lock and containment isolation valve leakage limits does not invalidate the acceptability of the overall Type B and C leakage determination. As left leakage prior to the first startup after performing a required 10 CFR 50, Appendix J, Option A, leakage test is required to be $<$ 0.6 L_a for combined Type B and C leakage. At all other times between required leakage rate tests, the acceptance criteria is based on an overall Type A leakage limit of $\leq$ 1.0 L_a. At $\leq$ 1.0 L_a the offsite dose consequences are bounded by the assumptions of the safety analysis. SR Frequencies are as required by Appendix J, Option A, as modified by approved exemptions. Thus, SR 3.0.2 (which allows Frequency extensions) does not apply. These periodic testing requirements verify that the containment leakage rate does not exceed the leakage rate assumed in the safety analysis.~~

BASES

~~SURVEILLANCE REQUIREMENTS~~

~~SR 3.6.1.3 (continued)~~

~~SR 3.6.1.3 is modified by a Note which states that local leak tests shall be performed at pressures ≥ 55 psig. This value corresponds to the design pressure of the containment and bounds the maximum expected internal pressure resulting from an MSLB or design basis LOCA.~~

REFERENCES

1. FSAR, Chapter 14
2. FSAR, Section 14.18
3. FSAR, Section 5.8
4. 10 CFR 50, Appendix J, Option B

BASES

APPLICABLE SAFETY ANALYSES

The DBAs that result in a release of radioactive material within containment are a Loss of Coolant Accident (LOCA), a Main Steam Line Break (MSLB) and a control rod ejection accident (Ref. 1). In the analysis of each of these accidents, it is assumed that containment is OPERABLE such that release of fission products to the environment is controlled by the rate of containment leakage. The containment was designed with an allowable leakage rate of 0.10% of containment air weight per day (Ref. 2). This leakage rate is defined in 10 CFR 50, Appendix J, Option ~~A~~B, as L_a : the maximum allowable containment leakage rate at the calculated maximum peak containment pressure (P_a). For a LOCA, the calculated maximum peak containment pressure is approximately 53 psig. ~~For an MSLB, the calculated maximum peak containment pressure is approximately 54 psig. However, to ensure sufficient margin and to bound all DBAs, Type B leakage rate testing is performed at or above the containment design pressure of 55.0 psig.~~ This allowable leakage rate forms the basis for the acceptance criteria imposed on the SRs associated with the air lock.

The containment air locks satisfy Criterion 3 of 10 CFR 50.36(c)(2).

LCO

Each containment air lock forms part of the containment pressure boundary. As part of the containment pressure boundary, the air lock safety function is related to control of the containment leakage rate resulting from a DBA. Thus, each air lock's structural integrity and leak tightness are essential to the successful mitigation of such an event.

Each air lock is required to be OPERABLE. For the air lock to be considered OPERABLE, the air lock interlock mechanism must be OPERABLE, the air lock must be in compliance with the Type B air lock leakage test, and both air lock doors must be OPERABLE. The interlock allows only one air lock door of an air lock to be opened at one time. This provision ensures that a gross breach of containment does not exist when containment is required to be OPERABLE. Closure of a single OPERABLE door in each air lock is sufficient to provide a leak tight barrier following postulated events. Nevertheless, both doors are kept closed when the air lock is not being used for normal entry into or exit from containment.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1

Maintaining containment air locks OPERABLE requires compliance with the leakage rate test requirements ~~of 10 CFR 50, Appendix J, Option A (Ref. 3), as modified by approved exemptions. For the purpose of air lock testing in accordance with 10 CFR 50, Appendix J, "Containment OPERABILITY" is equivalent to "Containment Integrity."~~ of the Containment Leak Rate Testing Program. This SR reflects the leakage rate testing requirements with regard to air lock leakage (Type B leakage tests). The acceptance criteria, were established during initial air lock and containment Operability testing. Subsequent amendments to the Technical Specifications revised the acceptance criteria for overall Type B and C leakage limits and provided new acceptance criteria for the personnel air lock doors and the emergency air lock doors (Ref. 2). The periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall containment leakage rate. ~~Leak rate tests, other than the personnel air lock doors between the seals test, are performed at pressure $\geq$ 55 psig.~~ The Frequency is required by ~~10 CFR 50, Appendix J, Option A, as modified by approved exemptions. Thus, SR 3.0.2 (which allows Frequency extensions) does not apply.~~ the Containment Leak Rate Testing Program.

An ~~Two~~ exemptions to the requirements of 10 CFR 50, Appendix J ~~have~~ has been granted for the containment air locks. ~~The exemption granted by letter dated December 6, 1989 provides partial relief from the requirement of Paragraph III.D.2.(b)(ii) to leak test, at or above the calculated design basis accident peak containment pressure (P_a), containment air locks which were opened during a period when containment integrity was not required. This exemption permits the substitution of a between-the-seal leak test at a reduced pressure, but not less than 10 psig, provided that no maintenance, modification, or other activity has been performed which could affect the sealing capability of the air locks.~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1 (continued)

The exemption granted by letter dated September 30, 1997 applies only to the emergency escape air lock and "grants the exemption from 10 CFR 50 Appendix J, Option A, Sections III.D.2.(b)(ii) and III.D.2.(b)(iii), to the extent that leakage rate testing is not necessary after opening the emergency escape air lock doors for post-test restoration or post-test adjustment of the airlock door seals." 10 CFR 50 Appendix J, Option B, Section V.B.1. states "Specific exemptions to Option A of this appendix that have been formally approved by the AEC or NRC, according to 10 CFR 50.12, are still applicable to Option B of this appendix if necessary, unless specifically revoked by the NRC.

~~provides partial relief from the requirement of Paragraph III.D.2.(b)(ii) and Paragraph III.D.2.(b)(iii). The requirement of Paragraph III.D.2.(b)(ii) is discussed above. Paragraph III.D.2.(b)(iii) requires air locks opened during periods when containment integrity is required to undergo a full air lock pressure test within 3 days after being opened.~~ This exemption permits the performance of a door seal contact verification check in lieu of the final pressure test following the opening of the emergency escape air lock doors for post-test restoration or seal adjustment. This exemption does not affect compliance with the requirement to perform a full pressure air lock test at ~~6~~ 30 month intervals, or the requirement to perform a full pressure air lock test within 7~~2 hours~~ days of opening either air lock door during periods when containment integrity is required.

The SR has been modified by ~~four~~ two Notes. Note 1 states that an inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. This is considered reasonable since either air lock door is capable of providing a fission product barrier in the event of a DBA. Note 2 has been added to this SR requiring the results to be evaluated against the acceptance criteria of SR 3.6.1.3~~1~~. This ensures that air lock leakage is properly accounted for in determining the combined Type B and C containment leakage rate. ~~Note 3 clarifies that iterative pressure testing of the emergency escape air lock is not required when the air lock doors are opened solely for the purpose of strongback removal and performance of the seal contact check. Note 4 ensures that air lock testing, other that door seal testing, is performed at a pressure ≥ 55 psig consistent with other Type B and C tests.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.2.2

The air lock interlock is designed to prevent simultaneous opening of both doors in a single air lock. Since both the inner and outer doors of an air lock are designed to withstand the maximum expected post accident containment pressure, closure of either door will support containment OPERABILITY. Thus, the door interlock feature supports containment OPERABILITY while the air lock is being used for personnel transit into and out of containment. Periodic testing of this interlock demonstrates that the interlock will function as designed and that simultaneous opening of the inner and outer doors will not inadvertently occur. Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is not normally challenged when the airlock is used for entry and exit (procedures require strict adherence to single door opening), this test is only required to be performed ~~every~~upon entering an air lock, but is not required more frequently than 18 months. ~~The 18 month frequency is based on the need to perform this Surveillance under the conditions that apply during plant outage, and the potential for loss of containment OPERABILITY if the Surveillance were performed with the reactor at power.~~

The 18 month Frequency for the interlock is justified based on generic operating experience. The Frequency is based on engineering judgment and is considered adequate given that the interlock is not normally challenged during use of the airlock.

REFERENCES

1. FSAR, Chapter 14
2. FSAR, Section 5.8
3. 10 CFR 50, Appendix J, Option B

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.6

Automatic containment isolation valves close on a containment isolation signal to prevent leakage of radioactive material from containment following a DBA. This SR ensures each automatic containment isolation valve will actuate to its isolation position on an actual or simulated actuation signal, i.e., CHP or CHR. 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 was developed considering it is prudent that this SR be performed only during a plant outage, since isolation of penetrations would eliminate cooling water flow and disrupt normal operation of many critical components. Operating experience has shown that these components usually pass this SR when performed on the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section 5.8
2. FSAR, Section 6.7.2
3. 10 CFR 50, Appendix J, Option B
4. Generic Issue B-20