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United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Perry Nuclear Power Plant
Docket No. 50-440
License Amendment Request: Drywell Leak Rate Testing Requirements

Gentlemen:

Amendment of the Perry Nuclear Power Plant (PNPP) Unit 1 Facility Operating License (NPF-58) is requested. The proposed changes affect Technical Specification requirements for drywell leak rate testing.

On September 12, 1995, Boiling Water Reactor (BWR)-6 licensees (for Clinton Power Station, Grand Gulf Nuclear Station, PNPP, and River Bend Station) met with Nuclear Regulatory Commission (NRC) Staff to discuss generic aspects and justification for proposed drywell leak rate testing Technical Specification changes. Other BWR-6 licensees have requested, or are planning to request, Technical Specification changes consistent with these proposed changes. To support having this change approved in time for use during the upcoming refueling outage, we request NRC Staff review and approval of the proposed PNPP changes by March 1, 1996.

This proposed amendment is being submitted in accordance with the Cost Beneficial Licensing Action (CBLA) program established within the NRC Office of Nuclear Reactor Regulation, where increased review priority is assigned to requests reducing requirements that involve high cost without a commensurate safety benefit. The proposed changes were developed to decrease the burden placed on refueling outage resources. This change is expected to result in cost reductions in excess of the $100,000 threshold established under the CBLA program without resulting in a reduction of the regulatory margin of safety.

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Attachment 1 provides a summary, description of proposed changes, safety analysis, and an environmental consideration. Attachment 2 provides the significant hazards consideration. Attachment 3 provides a copy of the marked-up Technical Specification pages, in both the present format and the format required following implementation of Amendment 69 (improved technical specifications). In Attachment 4, marked-up Bases pages are provided for information only, since the Bases are not part of the Technical Specifications as identified in 10 CFR 50.36(a). Attachment 5 provides a reference list.

If you have questions or require additional information, please contact Mr. James D. Kloosterman, Manager - Regulatory Affairs at (216) 280-5833.

Very truly yours,

Robert W Schrauder

for Donald C. Shelton

BSF:bf

Attachments

cc: NRC Project Manager
NRC Resident Inspector Office
NRC Region III
State of Ohio

I, Robert W. Schrauder, being duly sworn state that (1) I am Director, Perry Nuclear Services Department of the Cleveland Electric Illuminating Company, (2) I am duly authorized to execute and file this certification on behalf of The Cleveland Electric Illuminating Company and Toledo Edison Company, and as the duly authorized agent for Duquesne Light Company, Ohio Edison Company, and Pennsylvania Power Company, and (3) the statements set forth herein are true and correct to the best of my knowledge, information and belief.

Robert W. Schrauder

Robert W. Schrauder

Sworn to and subscribed before me, the 16th day of January, 1996.

Jane E. Mott

JANE E. MOTT
Notary Public, State of Ohio
My Commission Expires Feb. 20, 2000
(Recorded in Lake County)

ATTACHMENT 1

SUMMARY, DESCRIPTION OF PROPOSED CHANGES, SAFETY ANALYSIS, AND AN ENVIRONMENTAL CONSIDERATION

SUMMARY

A performance-based approach is proposed for the drywell bypass leakage test program. This approach models the philosophy and objectives of the recently approved performance-based containment leak-test program methodology. As noted in NUREG-1493, "Performance-Based Containment Leak-Test Program," decreasing the prescriptiveness of some regulations may increase effectiveness by providing flexibility to implement more cost-effective safety measures. The NUREG also indicates that performance-based testing provides for system/component performance goals which are more effective than previous presciptive regulatory approaches. It introduces program flexibility necessary to optimize performance objectives. The primary proposed change involves a performance-based drywell bypass leakage rate test. Several minor changes are also proposed including increasing the intervals to 24 months for the surveillances on air lock leakage, the interlock, and the seal pneumatic system. The proposed change also deletes the requirement for the air lock seal and barrel tests to meet a specific leakage limit.

DESCRIPTION OF PROPOSED CHANGES

The following Specifications, contained within Section 3/4.6 "Containment Systems," are affected by the proposed change. Specification numbers in brackets [ ] are from the improved technical specifications, issued in Amendment 69 to the PNPP Unit 1 Operating License.

3/4.6.2.1 [3.6.5.1] Drywell Integrity
3/4.6.2.2 [3.6.5.1] Drywell Bypass Leakage
3/4.6.2.3 [3.6.5.2] Drywell Air Lock

The proposed changes to the Technical Specifications and associated Bases are provided in Attachments 3 and 4. Specific changes to the Technical Specifications include the following.

1. The surveillance frequency for the drywell bypass leakage rate test (4.6.2.2) [SR 3.6.5.1.1] is changed from 18 months to 10 years (120 months) with a more frequent testing requirement if performance degrades. Application of the Surveillance Requirement (SR) 4.0.2 [SR 3.0.2] allowance to extend the surveillance interval by 25% is restricted to 12 months on the 10 year (120 month) frequency.

2. The following changes are requested for the drywell air lock testing:

    a. Move the leak rate surveillances for the air lock seals and barrel (4.6.2.3.a and 4.6.2.3.c) [SR 3.6.5.2.1 and 3.6.5.2.4] to the drywell specification (3/4.6.2.1) [3.6.5.1].

    b. Delete requirements for the air lock seal and barrel tests (LCO 3.6.2.3.b and SRs 4.6.2.3.a and 4.6.2.3.c) [SRs 3.6.5.2.1 and 3.6.5.2.4] to meet specific leakage limits.

c. Change several air lock surveillances to a 24 month frequency. Specifically:

- the surveillance frequencies for the air lock barrel leakage test is changed from "each COLD SHUTDOWN if not performed within the previous 6 months" to "at least once per 24 months" (4.6.2.3.c) and from "18 months" to "24 months" [3.6.5.2.4];

- the surveillance frequencies for the air lock interlock test (4.6.2.3.d) [3.6.5.2.3] and seal pneumatic system leak test (4.6.2.3.e) [3.6.5.2.5] are changed from "18 months" to "24 months."

3. The ACTIONS Notes in the drywell air lock specification [LCO 3.6.5.2] and the drywell isolation valve specification [LCO 3.6.5.3], which identify that the Actions required by the drywell specification [LCO 3.6.5.1] must be taken when the drywell bypass leakage limit is not met, are deleted. These Notes are no longer required due to the relocation of the various drywell leakage rate tests to the drywell specification [LCO 3.6.5.1]. Also, for the same reason, Required Action C.1 of the drywell air lock specification [LCO 3.6.5.2] and its associated completion time is deleted.

SAFETY ANALYSIS

PRIMARY CONTAINMENT AND DRYWELL DESIGN OVERVIEW

The BWR Mark III primary containment is an improved design compared to the Mark I and Mark II designs. An objective of the Mark III design is to locate more of the high energy auxiliary systems within the pressure-suppression primary containment. The Mark III primary containment features a separate volume within the primary containment to encapsulate the reactor coolant system and other high energy system piping. This volume is referred to as the drywell. The volume outside the drywell, but within the primary containment, is known as the wetwell.

The drywell is a Class I seismic structure and features reinforced concrete walls and floor in a vertical right cylinder geometry. The ceiling is also reinforced concrete with a removable steel dome known as the drywell head. The floor is common with the primary containment basemat. The drywell is designed to divert energy released during a design basis large break loss-of-coolant-accident (LOCA) to the suppression pool via multiple vents in the drywell wall which are below the water level of the suppression pool. High energy lines passing through the wetwell, such as the main steam lines and feedwater lines, are encapsulated by guard pipes to direct energy back to the drywell in case of a piping rupture.

The suppression pool is common to the drywell and wetwell volumes and serves as a heat sink for the energy released during a large break LOCA. The suppression pool forms a water seal between the drywell and wetwell volumes. Suppression pool volumes are assured by adhering to the Technical Specifications which specify the suppression pool water levels.

Satisfying the primary containment safety function during a LOCA in the drywell is contingent on the integrity of the drywell. Leakage through the drywell which bypasses the suppression pool has a direct impact on the primary containment peak pressure analysis. Primary containment design analyses assumed limited drywell bypass leakage and evaluated a spectrum of break sizes to assure the primary containment would perform its safety function.

The small break LOCA within the drywell was determined to be the limiting fault accident for the drywell bypass leakage design criterion and is discussed in Updated Safety Analysis Report (USAR) Section 6.2.1.1. The limiting case for drywell integrity is based on total leakage through all drywell paths other than the drywell-to-suppression pool vents. The maximum allowable bypass leakage rate for the limiting fault accident, small break LOCA, is identified in Table 1.

TABLE 1
PNPP DESIGN PARAMETERS

Drywell Design Pressure	30 psi
Primary Containment Design Pressure	15 psi
Design Drywell Bypass Leakage - small break LOCA with one containment spray	1.68 ft^2 ($A/k^{1/2}$) approximately 58,000 scfm* at 2.5 psig

* standard cubic feet per minute

Penetrations through the drywell enable the passage of piping, ventilation systems, and electrical cables. Electrical penetrations feature a sealing medium surrounding the cables which pass through the penetration. Ventilation and piping penetrations feature manual or automatic isolation valves; some piping penetrations and the vacuum breakers feature check valves and/or isolation valves. Valves which prevent leakage from the drywell into the primary containment are considered drywell isolation valves and leakage through these valves contributes to the maximum allowable drywell bypass leakage. Valves which prevent leakage from the drywell and primary containment to the secondary containment or environment are considered primary containment isolation valves. Leakage through these valves is tested in accordance with 10 CFR

50 Appendix J and contributes to the maximum allowable primary containment leakage. Leakage through primary containment isolation valves is not considered drywell bypass leakage in the design basis analyses.

The drywell equipment hatch and air lock also penetrate the drywell boundary. The drywell equipment hatch is designed to be removed during plant outages. The equipment hatch utilizes two compression seals to maintain leak tightness. The drywell air lock is designed to provide personnel access to the drywell for maintenance. The drywell air lock features two doors. Each air lock door closes positively against the air lock structure by means of a latching mechanism. The drywell air lock door latching mechanisms are interlocked to each other to ensure that at least one door is maintained in the latched closed position. The latching and interlock mechanisms ensure that the drywell air lock does not provide a gross leakage path compromising drywell integrity. The drywell air lock doors also feature two inflatable seals to minimize leakage.

JUSTIFICATION

Drywell Bypass Test Interval

Justification is provided below for changing the surveillance frequency for the drywell bypass leakage rate test (4.6.2.2) [SR 3.6.5.1.1] from every refueling outage to every 10 years (120 months) with an increased testing frequency required if performance degrades.

Basis for Current Surveillance Requirements

Surveillances for drywell bypass leakage were established to ensure that the primary containment will be capable of performing its safety function when subjected to accident conditions. Surveillance criteria and schedules were developed without previous operating experience for the Mark III primary containment design. Since limited operating experience existed, drywell surveillance frequencies were developed using engineering judgment which resulted in conservative acceptance criteria and operation.

Surveillance requirements developed for new designs were established in order to conservatively satisfy regulatory practices until reliable design performance was established. The surveillance frequency for drywell bypass leakage was typically specified at once per 18 months to coincide with refueling outage schedules. In addition, drywell bypass leakage surveillance program requirements were developed with correlations to the 10 CFR 50 Appendix J requirements with increased conservatism. The added conservatism is excessive because the design basis allowable leakage for the drywell (approximately 58,000 scfm) is much greater than for the primary containment (approximately 3.0 scfm). This causes unnecessary and costly surveillances for equipment and structures which are primarily passive when performing their safety function.

Current activities to ensure drywell functionality include drywell penetration configuration surveillances (valve line-ups); drywell structural integrity inspections; drywell bypass leakage rate tests; multiple drywell air lock tests, including air lock volume leakage rate testing, door interlock mechanism functional verification, and seal leak rate testing; drywell temperature monitoring; drywell differential pressure monitoring in relation to the primary containment; and suppression pool temperature and level monitoring.

Drywell Bypass Leakage Surveillance History

The surveillance history for drywell bypass leakage demonstrates the high reliability and integrity of the drywell. Drywell reliability and integrity has been demonstrated by multiple bypass leakage tests, both at PNPP and at other BWR-6 plants. Seven drywell bypass leakage tests, spanning a ten year period have been successfully completed at PNPP. PNPP drywell bypass leakage surveillance results are included in Table 2.

TABLE 2
PNPP DRYWELL BYPASS LEAKAGE SURVEILLANCE

TEST DATE	LEAK-RATE in scfm	PERCENT OF DESIGN LIMIT	CALCULATED $A/k^{1/2}$ in ft^2
9/85	passed*	N/A	N/A
8/87	124	0.2	0.003
7/89	123	0.2	0.003
12/90	797	1.4	0.023
5/92	253	0.4	0.007
6/94	2450	4.2	0.071
7/94	111	0.2	0.003

* Pre-operational test; specific scfm leak rate not recorded in test documents

The most recent performance of the test in July of 1994 will serve as the scheduling baseline for the first surveillance interval under the revised Specification.

Applicability of Performance-Based Approach to Drywell Bypass Leakage Testing

A performance-based approach is proposed for the drywell bypass leakage test program. As noted in NUREG-1493, decreasing the prescriptiveness of some requirements may increase effectiveness by providing flexibility to implement more cost-effective safety measures. Performance-based testing allows for system/component performance goals which are more effective than previous regulatory approaches. It introduces program flexibility necessary to optimize performance objectives.

Bypass leakage tests have confirmed that leakage does not exceed the design basis limit, nor does it even approach the significantly more conservative Technical Specification limit. Test data also confirms structure and isolation component reliability.

The intent of the drywell bypass leakage test is to ensure that leakage from the drywell to primary containment will be within acceptable limits should the drywell become pressurized under postulated accident conditions. Technical Specifications include Surveillance Requirement acceptance criteria for drywell bypass leakage which help establish a high level of confidence that the leakage will be within the design basis limit if challenged. No change to the Surveillance Requirement acceptance criteria is proposed by this submittal; however, a surveillance test frequency extension is proposed. Both the current and proposed programs help ensure that excessive drywell bypass leakage, which could compromise primary containment, is effectively eliminated and not a significant contributor to overall plant risk. The proposed changes consider several factors important for an effective performance-based test program.

1. The program recognizes that past performance measures are important for identifying and correcting performance problems. Over its operating history, PNPP has not exceeded nor even approached the conservatively established drywell bypass leakage limits.

2. Plant administrative and maintenance programs identify and correct performance problems in a timely manner.

3. The drywell is essentially a passive barrier. Consequently, the proposed test program, which is based on performance criteria, provides assurance that the overall performance goals will be met. Performance problems will be addressed and the testing schedule adjusted, if necessary, to ensure ongoing acceptable performance.

4. The risk impact of postulated drywell bypass leakage is small. This is due to:

   (a) the low frequency of events which would challenge containment integrity due to drywell bypass leakage,
   (b) the high probability that the drywell will perform its intended function, and
   (c) design margins available to primary containment failure due to overpressurization caused by drywell bypass leakage

Risk Impact of Proposed Changes

The proposed changes do not introduce any new accident scenarios, do not affect other accident mitigation functions, nor do they contribute to the probability of an initiating accident. Although drywell bypass leakage could occur through drywell isolation valves or through defects that might develop in the drywell structures, the proposed changes do not significantly increase the probability that the drywell design function will be compromised.

The probability that drywell bypass leakage paths could develop between tests that would be excessive enough to lead to primary containment failure is evaluated more fully below.

Drywell Structure (Passive Structural Integrity)

The drywell preoperational testing program included extensive monitoring for structural deformation while the drywell was pressurized to its rated pressure. Results indicated that the drywell was not stressed as much as predicted and responded in the elastic stress range. Additionally, no signs of distress or damage to either the concrete or liner were detected. Therefore, the design and construction of the drywell was determined to be sufficient to withstand the design pressure load.

The drywell is typically exposed to essentially 0 psig during normal plant operation and 2.5 psig during drywell bypass leak rate testing. These pressures are considerably lower than the structural integrity test pressure and are less likely to initiate a leakage path or cause an existing path to grow. Potential cracking of the BWR-6 drywell was studied and summarized in NEDO-10977 (Ref. 3). The study concluded that under normal operating conditions, only minor concrete surface cracking will occur as a result of drying shrinkage, and that no through wall cracking will occur. Visual inspections of the accessible drywell surfaces have been regularly performed and have not revealed abnormal cracking. Abnormal cracking of the drywell structure is not expected due to future testing or plant operation.

Another passive barrier is provided by flexible "boot seals" that are installed in the annular space between the Safety Relief Valve Discharge Lines and the Drywell wall. Calculations performed at the time of the original boot seal installation determined that even if all the boot seals (nineteen total) were to fail catastrophically during the small break LOCA, the resultant $A/k^{1/2}$ would be only 1.36 ft^2, which is below the design basis value of 1.68 ft^2. Such a catastrophic failure, assuming no material remains, is unrealistic. Leakage past these seals has been low enough that the Technical Specification acceptance criteria has not been challenged. During the fourth refueling outage, some leakage was identified and a decision was made to replace the leaking seals. Longer term actions are being considered under the PNPP Corrective Action Program. These actions are consistent with the "effective performance-based test program factors" identified above, which noted that administrative and maintenance programs identify and correct performance problems in a timely manner. In addition to ongoing actions determined to be appropriate by the Corrective Action Program, future degradation that could comprise a significant fraction of the drywell design basis bypass limit will be identified by periodic, qualitative assessments, as discussed below under the heading "Qualitative Assessments."

Based on the above discussions, it is not credible for the drywell structure to begin to leak sufficiently to impact the design drywell bypass leakage limit.

Issues associated with the passive structural integrity of the drywell are quite similar to those addressed for the primary containment in determining the appropriate Type A testing interval under 10 CFR Part 50, Appendix J. Similar to the primary containment, absent actual accident conditions, structural deterioration is a gradual phenomenon which requires periods of time well in excess of the proposed 10 year drywell bypass testing interval.

Drywell Penetration Isolation (Active Drywell Integrity)

The allowable design basis drywell bypass leakage for the small break LOCA is extremely high (approximately 58,000 scfm). Even higher allowable drywell bypass leakage can be accommodated by the primary containment due to the margin between the analysis results and the 15 psi primary containment design limit. In addition, when taking into account the containment design margin between the 15 psi design pressure and the pressure in excess of 50 psi which calculations have shown the primary containment can withstand, the amount of drywell bypass leakage which can occur without causing primary containment failure is significantly higher. By comparison, the limit on primary containment leakage is approximately 3 scfm. The primary containment's insensitivity to drywell bypass leakage rate provides a substantial safety margin, more than is normally available for safety systems.

The active components which could potentially contribute to drywell bypass leakage, and should be examined for their possible effect on exceeding the acceptable drywell bypass leakage rate, are the drywell isolation valves. These valves prevent leakage from the drywell into the primary containment and leakage through these valves contributes to the maximum allowable drywell bypass leakage.

Penetration Flow Paths $\leq$ 10 inches:

The effect of drywell isolation valve leakage on the total drywell bypass leakage rate is dependent on the size of the associated penetration flow path. The drywell allowable leakage rate is so large that penetration flow paths less than or equal to 10 inches in diameter will have a negligible impact on the total bypass leakage.

To demonstrate the effect of an excessively leaking 10 inch drywell penetration on the allowable drywell bypass leakage, the PNPP drywell vacuum relief subsystem will be used as an example. Each of the two drywell vacuum relief subsystems has 2 valves isolating its drywell penetration. Each penetration is isolated by a motor-operated butterfly valve and a check valve. To verify the ability of these systems to perform their drywell vacuum relief function, calculations of the effective $A/k^{1/2}$ for these systems for forward flow (i.e., flow from the primary containment into the drywell) were performed for the Grand Gulf Nuclear Station. The calculated $A/k^{1/2}$ was 0.255 ft^2. For purposes of the following example, this Grand Gulf $A/k^{1/2}$ value for forward flow is utilized. Even if both 10 inch penetration flow paths failed full open ($2 \times 0.255 = 0.51$ ft^2), it would not challenge the allowable drywell bypass leakage (1.68 ft^2). In fact, it would take seven such 10 inch penetrations simultaneously failing full open to exceed the allowable drywell bypass $A/k^{1/2}$ value of 1.68 ft^2. This result is conservative since it does not take into account the lower effective $A/k^{1/2}$ the penetration flow paths would have if the flow through the penetration was reverse flow (the direction that drywell bypass flow would be) through check valves. Also, it does not take into account margins to actual containment failure due to the containment's ability to withstand pressures greater than 50 psi versus just 15 psi.

The probability that a penetration flow path will leak excessively due to valve failure, thereby contributing to compromising the drywell safety functions, is the probability that the isolation valves in the flow path fail open plus the probability that the valves close but leak excessively, which is represented by the following equation.

$$P_{pent} = P_{open\ pent} + P_{leak\ pent}$$

WHERE:

P_{pent} = Probability that a penetration flow path will leak excessively due to valve failure
$P_{open\ pent}$ = Probability that the isolation valves in the penetration flow path fail open
$P_{leak\ pent}$ = Probability the isolation valves in the penetration flow path leak excessively

NUREG-4550 identified that the generic probability a check valve in one of these lines would fail to close is approximately 1E-3, and the generic probability of a motor-operated valve failing to close is approximately 3E-3, resulting in a failure probability ($P_{open\ pent}$) of 3E-6 per penetration flow path. This failure probability ($P_{open\ pent}$) is not affected by the proposed changes. The surveillance interval for verification of the valves' ability to close is set by the Inservice Testing Program. This submittal does not change the Inservice Testing Program frequencies; therefore, this submittal does not affect the probability that a valve will fail to close or is failed open prior to an event.

Work performed to support Grand Gulf Nuclear Station's recent Appendix J exemption determined the probability that a penetration flow path would leak excessively considering a 10 year (120 month) surveillance interval ($P_{leak\ pent}$) is 1E-4. This "excessive leakage" probability of 1E-4 is very conservative for application to this drywell evaluation, since "excessive leakage" in terms of 10 CFR 50 Appendix J is much smaller than "excessive leakage" for drywell integrity. For leakage to be considered "excessive" for a drywell penetration flow path, the leakage must be on the order of the flow through a fully open penetration flow path. However, this conservative value is used in the following determination of P_{pent}.

$$P_{pent} = 3E\text{-}6 + 1E\text{-}4 \approx 1E\text{-}4$$

As noted earlier, it would still take multiple penetration flow paths leaking excessively to impact the drywell bypass leakage limit. With a probability that a penetration flow path will leak excessively due to valve failure (P_{pent}) of 1E-4, the probability of multiple flow paths (x) leaking excessively is $[1E\text{-}4]^x$. Therefore, the probability of having seven penetrations simultaneously leaking excessively is negligible ($[1E\text{-}4]^7 \approx 1E\text{-}28$). Consequently, the potential that excessive leakage through penetration flow paths $\leq$ 10 inches will challenge the ability of the drywell to perform its safety function is insignificant.

Penetration Flow Paths > 10 inches:

Having screened out the flow paths ≤ 10 inches, the remaining penetration flow paths which could affect the ability of the drywell to perform its safety function can be individually reviewed. The following are the active drywell penetration flow paths which are >10 inches:

1. Drywell Air Purge Supply and Exhaust

   These penetrations are 24 inch supply and 36 inch exhaust flow paths. These valves are required to be maintained closed in MODES 1, 2, and 3, and verified closed every 31 days. They are water sealed and administratively controlled with keylock switches in MODES 1, 2, and 3. Therefore, the requested change does not affect the probability of these valves having excessive leakage.

2. Drywell air lock

   Leakage through the drywell air lock will continue to be tested every refueling outage by Technical Specifications. Therefore, this requested change does not affect the probability of this pathway having excessive leakage.

The proposed Technical Specification changes have no significant impact on the PNPP Individual Plant Examination (IPE) conducted per NRC Generic Letter 88-20. The IPEs considered overpressurization failure of primary containment as part of the primary containment performance assessment. Due to the magnitude of acceptable drywell bypass leakage and the extremely low probabilities of experiencing excessive leakage, primary containment failure due to preexisting excessive drywell bypass leakage was considered a non-significant contributor to primary containment failure. In a beyond design-basis "severe accident," primary containment overpressurization failure can occur with or without pre-existing excessive drywell bypass leakage. This is due to physical phenomena associated with potentially extreme environmental conditions inside primary containment following a severe accident. However, the calculated frequency of such extreme conditions is very small. The proposed changes do not impact the IPE evaluated phenomena causing primary containment overpressurization failure nor significantly increase the probability that the drywell has preexisting excessive leakage, and therefore would not contribute to these accident scenarios.

Increased Surveillance Frequency

Following a drywell bypass test where the drywell bypass leakage is greater than the limit, the next test will be required at an increased frequency of 48 months. As previously discussed, in order for a failure to result in exceeding drywell bypass leakage rate limits, gross failures of several systems would be required. Due to the gross nature of the failure mechanism, the corrective action would likely consist of program modifications to prevent reoccurrence. Additionally, a large margin for degradation will be provided by restoring the leakage to ≤ 10% of the drywell bypass leakage limit, as required by the proposed Technical Specifications. The proposed forty-eight month interval following a single test failure provides adequate assurance of drywell availability.

Following two consecutive drywell bypass leakage test failures, the proposed changes would shorten the surveillance interval to every refueling outage. This frequency will continue until two consecutive tests are performed that indicate the drywell bypass leakage rate is less than the leakage limit.

Qualitative Assessments

In order to provide added assurance that the drywell has not seriously degraded between the bypass test intervals, a qualitative assessment of the drywell bypass leak tightness will be performed at least once per operating cycle. The first assessment will be performed prior to Operating Cycle 6. This assessment will provide an indication of the ability of the drywell to perform it's design function, by checking for gross drywell bypass leakage. The check may not identify drywell bypass leakage that is masked by plant conditions, or identify leakage through systems which are not communicating with the drywell atmosphere at the time of the assessment. For example, minor increases in drywell bypass leakage could be masked by a small leak in the instrument air system inside the drywell. The assessment would not be detailed enough to account for these minor changes that are masked by the plant conditions.

Drywell Air Lock Surveillances

The movement of the air lock leakage rate tests to the Drywell Specification are proposed because drywell leakage rate requirements are the essence of drywell operability. Leakage rates discovered outside limits will now clearly result in entering the actions for drywell inoperability since the drywell leakage rate surveillances will be grouped under Specification 3/4.6.2.1 [3.6.5.1]. LCO 3.6.2.1 [3.6.5.1] requires commencement of a shutdown to COLD SHUTDOWN if leakage in excess of the limit is not corrected within one hour. The Notes in the improved technical specifications drywell air lock Specification [LCO 3.6.5.2] and the drywell isolation valve Specification [LCO 3.6.5.3] which identify that the Actions required by the drywell Specification [LCO 3.6.5.1] must be taken when the drywell bypass leakage limit is not met are deleted. These Notes are no longer required due to the relocation of the various drywell leakage rate tests to the drywell Specification [LCO 3.6.5.1]. For the same reason, Required Action C.1 of the drywell air lock Specification [LCO 3.6.5.2] and its associated completion time is deleted.

Additionally, the requirements for the drywell air lock seal and barrel tests to meet specific leakage limits are deleted since the ability of the drywell to perform its safety function is not dependent on the air lock meeting a specific leakage limit. The limiting case for drywell bypass leakage is based on total leakage through all drywell paths other than the suppression pool vents. Total drywell bypass leakage from such paths (including the air lock) should not exceed the acceptable design limit of drywell bypass leakage. The extremely conservative drywell air lock leakage acceptance criteria should not be included in the Technical Specifications to single out leakage paths from the total drywell bypass leakage criteria. The proposed Technical

Specifications still require performance of seal and barrel leak tests to determine if corrective actions are necessary due to air lock seal or barrel leakage.

Several air lock surveillances are changed to a 24 month frequency. The drywell air lock barrel leakage surveillance is changed from "each COLD SHUTDOWN if not performed within the previous 6 months" to "at least once per 24 months," in the current technical specification and from "18 months" to "24 months" in the improved technical specifications. The interlock and pneumatic seal test frequencies are also changed from "18 months" to "24 months." The proposed testing frequency is consistent with NEI 94-01 guidance for testing primary containment air locks (Ref. 4). The BWR-6 drywell air lock is typically tested similar to primary containment air locks, even though the drywell air lock is not a direct leakage path from primary containment and, therefore, 10 CFR 50 Appendix J test requirements do not apply.

The drywell air lock's use is limited during plant operation due to radiation and temperature in the BWR-6 drywell. Since sufficient confidence in the door's sealing capability is assured considering past performance, and the air lock door usage is very low throughout an operating cycle, it is justified to allow performance of the leakage rate, interlock, and pneumatic seal tests at refueling-outage intervals whether the unit is on an 18 month or a 24 month refueling cycle.

SIGNIFICANT HAZARDS CONSIDERATION

The standards used to arrive at a determination that a request for amendment involves no significant hazards considerations are included in the Commission's regulations, 10CFR50.92. This regulation states that a proposed amendment involves no significant hazards considerations if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. The significant hazards consideration for the proposed changes is included in Attachment 2.

ENVIRONMENTAL CONSIDERATION

The proposed Technical Specification change request has been reviewed against 10 CFR 51.22 criteria for environmental considerations. As shown above and in Attachment 2, the proposed change does not involve a significant hazards consideration, does not increase the types or amounts of effluents that may be released offsite, and does not significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, it is concluded that the proposed Technical Specification change request meets the criteria given in 10 CFR 51.22(c)(9) for a categorical exclusion from the requirement for an Environmental Impact Statement.

ATTACHMENT 2

SIGNIFICANT HAZARDS CONSIDERATION

SIGNIFICANT HAZARDS CONSIDERATION

This proposed amendment to the PNPP Technical Specifications revises specifications associated with drywell testing requirements. Specifically, the surveillance frequency for the drywell bypass leakage rate test is changed from 18 months to 10 years (120 months), with more frequent testing requirements if performance degrades. Additionally, changes are made to the drywell air lock testing requirements: the seal and barrel leakage rate surveillances are moved from the air lock LCO to the drywell LCO; the requirement for the air lock leakage rate surveillances to meet specific overall leakage limits is deleted; and the surveillance intervals for the air lock leakage test, interlock test, and seal pneumatic system leak test are changed to 24 months. Also, the Notes in the drywell air lock Specification and the drywell isolation valve Specification which identify that the Actions required by the drywell LCO must be taken when the drywell bypass leakage limit is not met are deleted. Also, Specification [LCO 3.6.5.2] Required Action C.1 and its associated completion time is deleted.

The proposed changes involve revision of operating restrictions previously imposed because acceptable operation of the Mark III primary containment design had not been demonstrated at the time of licensing. As published in the Federal Register regarding no significant hazards consideration criteria, granting of a relief, based upon demonstration of acceptable operation, from an operating restriction that was imposed because acceptable operation had not yet been demonstrated, does not involve a significant hazards consideration (Ref. 48 FR 14870).

The Commission has provided standards for determining whether a no significant hazards consideration exists as stated in 10 CFR 50.92(c). A proposed amendment to an operating license involves no significant hazards if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

The proposed change has been reviewed with respect to these three factors and it has been determined that the proposed change does not involve a significant hazard because:

1. The proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed changes in frequency for the drywell bypass leakage and drywell air lock surveillances will continue to ensure that no paths exist through drywell boundary components that would permit gross leakage from the drywell to bypass the containment pressure-suppression feature (the suppression pool) and result in exceeding the primary design basis limit. The Mark III primary containment system satisfies General Design Criterion 16 of Appendix A to 10 CFR Part 50. Maximum drywell bypass leakage was determined previously by reviewing the full range of postulated primary system break sizes. The limiting case was a primary system small break LOCA that yielded a design allowable drywell bypass leakage rate limit of approximately 58,000 scfm. The Technical Specification acceptable limit for the bypass leakage following a surveillance is less than 10% of the design basis value. The most recent bypass leakage value was approximately 0.2% of the design allowable leakage rate limit for the limiting event. Programmatic and oversight controls are maintained that ensure drywell bypass leakage remains a fraction of the design allowable leakage limit.

The drywell is exposed to essentially 0 psig during normal plant operation and 2.5 psig during drywell bypass leak rate testing. These pressures are considerably lower than the structural integrity test pressure and are not likely to initiate a crack or cause an existing crack to grow. Visual inspections of the accessible drywell surfaces that have been performed since the structural integrity tests have not revealed the presence of abnormal cracking or other abnormalities. Therefore, drywell degradation is not expected due to testing or operation and it is not considered credible for the passive drywell structure to begin to leak sufficiently to impact the design drywell bypass leakage limit.

The primary containment's ability to perform its safety function is fairly insensitive to the amount of drywell bypass leakage, thereby providing a margin to loss of the drywell safety function that is not normally available for safety systems. This insensitivity is demonstrated by the extremely high limiting event design basis allowable leakage for the drywell (approximately 58,000 scfm as discussed above). An even higher allowable leakage can be accommodated by the primary containment due to containment design margin. It would take valves in multiple penetration flow paths leaking excessively to cause the primary containment to fail as a result of overpressurization. Therefore, the probability that drywell isolation valve leakage will result in primary containment failure due to excessive drywell bypass leakage is not significant and this drywell/primary containment failure mode is not credible.

The proposed Technical Specification changes have no significant impact on the IPE conducted in accordance with NRC Generic Letter 88-20. The IPE considered primary containment overpressurization failure as part of the primary containment performance assessment. Due to the magnitude of acceptable drywell bypass leakage and the extremely low probabilities of experiencing excessive leakage, preexisting excessive drywell bypass leakage was considered a non-significant contributor to primary containment failure. In a beyond-design-basis "severe accident," the surveillance frequencies for the air lock failure can occur with or without preexisting excessive drywell bypass leakage. This is due to physical phenomena associated with potentially extreme environmental conditions inside primary containment following a severe accident. However, the calculated frequency of such extreme conditions is very small. The proposed changes do not impact the IPE evaluated phenomena causing primary containment overpressurization failure and do not significantly increase the probability that the drywell has preexisting excessive leakage. The proposed changes therefore, would not contribute to these accident scenarios.

The movement of the air lock leakage rate tests to the Drywell Specification and the elimination of the Notes in the Improved Technical Specifications are proposed because drywell leakage rate requirements are the essence of drywell operability. Leakage rates discovered outside limits will always clearly result in entering the actions for drywell inoperability. Additionally, the requirements for the drywell air lock seal and barrel tests to meet specific leakage limits are deleted since the ability of the drywell to perform its safety function is not dependent on the air lock meeting a specific leakage limit. The limiting case for drywell bypass leakage is based on total leakage through all drywell paths other than the suppression pool vents. Total drywell bypass leakage from such paths (including the air lock) should not exceed the acceptable design limit of drywell bypass leakage. The proposed Technical Specifications will still require performance of seal and barrel leak tests. Additionally, the proposed changes include minor administrative changes which clarify the requirement format or change the requirement to match the plant design bases.

For the reasons discussed above, the proposed changes do not have any significant risk impact to accidents previously evaluated and do not significantly increase the consequences of an accident previously evaluated. Additionally, drywell bypass leakage is not the initiator of any accident evaluated; therefore, changes in the frequency of the surveillance for drywell bypass leakage does not increase the probability of any accident evaluated.

II. The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed changes will impact the test frequencies and will not result in any change in equipment response in the unlikely event of an accident. The changes do not alter equipment design or capabilities. The changes do not present any new or additional failure mechanisms. The drywell is passive in nature and the surveillance will continue to verify that its integrity has not degraded. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

III. The proposed change does not involve a significant reduction in a margin of safety.

Drywell integrity and reliability have been demonstrated during past drywell bypass leakage surveillances. Appropriate design basis assumptions will be maintained. Drywell integrity will continue to be tested by the proposed periodic drywell bypass leakage test, the drywell air lock door latching and interlock mechanism surveillance, and additional surveillances including exercising the drywell isolation valves. In combination, these surveillances will provide adequate assurance that drywell bypass leakage will not exceed the design basis limit. Margins of safety will not be reduced. Therefore, the proposed change does not cause a reduction in the margin of safety.