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P.O. Box 968 • Richland, WA • 99352-0968

April 18, 2006
GO2-06-061

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397; REQUEST FOR AMENDMENT TO TECHNICAL SPECIFICATIONS SURVEILLANCE REQUIREMENTS FOR THE SUPPRESSION CHAMBER-TO-DRYWELL VACUUM BREAKERS AND THE DRYWELL-TO-SUPPRESSION CHAMBER BYPASS LEAKAGE TEST**

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Energy Northwest hereby requests an amendment to the Columbia Generating Station (Columbia) Technical Specifications (TS).

Specifically, the proposed amendment would modify TS Surveillance Requirement (SR) 3.6.1.1.2 by changing the test frequency of the drywell-to-suppression chamber bypass leakage test from 24 months to 120 months. This proposed amendment also includes the addition of two new TS SRs, SR 3.6.1.1.3 and SR 3.6.1.1.4, to test the suppression chamber-to-drywell vacuum breakers on a 24-month frequency.

TS SR 3.6.1.1.2 drywell-to-suppression chamber bypass leakage test monitors the combined leakage of three types of pathways: (1) the drywell floor and downcomers, (2) piping externally connected to both the drywell and suppression chamber air space, and (3) the suppression chamber-to-drywell vacuum breakers. This amendment would extend the surveillance interval on the passive components of the test (drywell floor, downcomers and connected piping), while retaining the current surveillance interval on the active components (suppression chamber-to-drywell vacuum breakers).

Successful drywell-to-suppression chamber bypass leakage test history at Columbia, coupled with success at other BWRs with similar designs, has demonstrated that extending the drywell-to-suppression chamber bypass leakage test frequency is acceptable. This change is similar to the LaSalle Station amendment approved by the NRC on November 7, 2001.

The next refueling outage at Columbia (R-18) is currently scheduled to begin May 12, 2007. In order to facilitate scheduling and avoid preparatory costs associated with conducting a drywell-to-suppression chamber bypass leakage test during the next refueling outage at Columbia, approval of this submittal is requested by February 15, 2007.

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Attachment 1 provides a description of the proposed amendment, the supporting technical analysis, the no significant hazards consideration determination and the environmental consideration. Attachment 2 provides a mark-up of the Technical Specification pages. Attachment 3 provides an informational copy of the proposed Technical Specification Bases changes.

This request for amendment has been approved by the Columbia Generating Station Plant Operations Committee and reviewed by the Energy Northwest Corporate Nuclear Safety Review Board. Pursuant to 10 CFR 50.91(b), the State of Washington has been provided a copy of this amendment request.

No commitments are made in the submittal. Should you have any questions or desire additional information regarding this matter, please call Mr. MP Hedges at (509) 377-8277.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the date of this letter.

Respectfully,

WS Oxenford
Vice President, Technical Services
Mail Drop PE04

Attachments:
1. Evaluation of the Proposed Changes
2. Marked-up Affected Pages from the Technical Specifications
3. Proposed Pages for Technical Specification Bases

cc: BS Mallett - NRC - RIV
BJ Benney - NRC – NRR
NRC Sr. Resident Inspector - 988C
RN Sherman - BPA/1399
WA Horin - Winston & Strawn
JO Luce - EFSEC
RR Cowley - WDOH

Evaluation of the Proposed Changes

1.0 DESCRIPTION

This letter is a request to amend Operating License Number NPF-21 for Columbia Generating Station (Columbia) in accordance with 10 CFR 50.90, "Application for amendment of license or construction permit." The next refueling outage at Columbia (R-18) is currently scheduled to begin May 12, 2007. In order to facilitate scheduling and avoid preparatory costs associated with conducting a drywell-to-suppression chamber bypass leakage test during the next refueling outage at Columbia, approval of this license amendment request is requested by February 15, 2007.

The proposed amendment would modify Technical Specification (TS) Surveillance Requirement (SR) 3.6.1.1.2, to conduct drywell-to-suppression chamber bypass leakage tests, and add two new TS SRs, SR 3.6.1.1.3 and SR 3.6.1.1.4, covering leakage testing of suppression chamber-to-drywell vacuum breakers. The proposed amendment would change the frequency of the drywell-to-suppression chamber bypass leakage test and establish a leakage test frequency for individual pathways (SR 3.6.1.1.3) and aggregate (SR 3.6.1.1.4) leakage acceptance criteria for the suppression chamber-to-drywell vacuum breakers.

2.0 PROPOSED CHANGES

The proposed Technical Specification changes are summarized below and in further detail in this Attachment. The marked-up TS pages are shown in Attachment 2.

The proposed amendment would modify the required frequency for the drywell-to-suppression chamber bypass leakage test in SR 3.6.1.1.2, and add two new SRs, SR 3.6.1.1.3 and SR 3.6.1.1.4, associated with suppression chamber-to-drywell vacuum breaker bypass leakage tests.

The current frequency associated with the drywell-to-suppression chamber bypass leakage test in TS SR 3.6.1.1.2 is 24 months or 12 months if two consecutive tests fail and continues at 12 months until two consecutive tests pass. The proposed modification to SR 3.6.1.1.2 would change the drywell-to-suppression chamber bypass leakage test frequency to 120 months or 48 months following one test failure or 24 months if two consecutive tests fail and continues at 24 months until two consecutive are less than or equal to the bypass leakage limit. The 120 month test frequency is consistent with the current frequency of the Columbia Primary Containment Leakage Rate Testing Program for Type A Tests.

The proposed new SR 3.6.1.1.3 establishes a leak rate test frequency of 24 months for each suppression chamber-to-drywell vacuum breaker pathway, except when the leakage test of SR 3.6.1.1.2 has been performed (i.e., Note to SR 3.6.1.1.3). Thus, each suppression chamber-to-drywell vacuum breaker pathway will have a leak test

frequency of 24 months by either SR 3.6.1.1.2 or SR 3.6.1.1.3. The proposed new SR 3.6.1.1.3 specifies a leakage limit for each suppression chamber-to-drywell vacuum breaker pathway of less than or equal to 1.2% of the allowable design limit of 0.050 ft^2 when a drywell-to-suppression chamber bypass leakage test is not performed.

The proposed new SR 3.6.1.1.4 will establish a leakage test frequency of 24 months to determine the suppression chamber-to-drywell vacuum breaker total bypass leakage, except when the bypass leakage test of SR 3.6.1.1.2 has been performed (i.e., Note to SR 3.6.1.1.4). Thus, the determination of suppression chamber-to-drywell vacuum breaker total leakage will have a leak test frequency of 24 months by either SR 3.6.1.1.2 or SR 3.6.1.1.4. Surveillance Requirement 3.6.1.1.4 specifies a leakage limit for suppression chamber-to-drywell vacuum breaker total leakage of less than or equal to 3.0% of the acceptable design value of 0.050 ft^2 when the drywell-to-suppression chamber bypass leakage test has not been conducted.

In summary, TS SR 3.6.1.1.2 drywell-to-suppression chamber bypass leakage test monitors the combined leakage of three types of pathways: (1) the drywell floor and downcomers, (2) piping externally connected to both the drywell and suppression chamber air space, and (3) the suppression chamber-to-drywell vacuum breakers. This amendment would extend the surveillance interval on the passive components of the test (drywell floor, downcomers and connected piping), while retaining the current surveillance interval on the active components (suppression chamber-to-drywell vacuum breakers).

A marked-up modification to Technical Specification 3.6.1.1, "Primary Containment," is included in Attachment 2.

3.0 BACKGROUND

The proposed changes are similar to TS changes approved by the NRC for LaSalle County Station on November 7, 2001 (References 1, 2, and 3).

3.1 Description

Columbia is a General Electric Boiling Water Reactor (BWR) design plant. It is a BWR-5 with a Mark II Primary Containment. Drywell-to-suppression chamber bypass leakage tests are required for BWR5/Mark II plants to ensure the public health and safety in the event of an accident that would release radioactivity into the containment.

The Mark II primary containment consists of two compartments, the drywell and the suppression chamber. The drywell has the shape of a truncated cone, and is located above the cylindrically shaped suppression chamber. The primary containment is penetrated by access piping, electrical penetrations, an equipment hatch, and personnel hatch. The drywell floor separates the drywell and the suppression chamber. The suppression chamber contains a pool of water. The drywell floor is penetrated by downcomers. The downcomers originate in the drywell air space and terminate below

the water level of the suppression chamber pool of water. The Safety Relief Valve (SRV) discharge lines originate at the SRVs located on the steam lines and terminate below the water level of the suppression chamber pool of water via the downcomers.

The suppression chamber-to-drywell vacuum breakers (nine 24 inch vacuum relief valve assemblies consisting of two discs and seats which operate independently) are located in the suppression chamber airspace. These vacuum breakers connect the drywell airspace and suppression chamber airspace to prevent exceeding the drywell floor negative differential design pressure and back-flooding of suppression pool water into the drywell.

During a Loss of Coolant Accident (LOCA), the downcomers direct steam from the drywell airspace to below the water level of the suppression chamber pool of water to condense the steam and thus, limit the containment pressure response. Steam that enters the suppression chamber airspace directly from the drywell airspace will bypass the condensing capabilities of the suppression chamber pool of water, thereby causing a higher containment pressure response. The drywell-to-suppression chamber bypass leakage test verifies that the total bypass leakage between the drywell airspace and suppression chamber airspace is consistent with accident assumptions. Containment pressure response evaluations determine the limit for the allowed drywell-to-suppression chamber bypass leakage specified in SR 3.6.1.1.2.

3.2 Drywell-to-Suppression Chamber Bypass Leakage Test Changes

The drywell-to-suppression chamber bypass leakage test is currently required by TS SR 3.6.1.1.2 to be performed every 24 months unless two consecutive tests fail, in which case the frequency is changed to 12 months until two consecutive tests pass. This test is performed during refueling outages usually after the reactor pressure vessel leak test and a few days before plant start up and involves isolating and pressurizing the drywell to 1.5 psid and recording the pressure drop over a minimum of four hours. The drywell-to-suppression chamber bypass leakage test verifies that the overall leakage between the drywell and suppression chamber is less than or equal to 10 percent of the $A/\sqrt{K}$ design value of 0.050 ft^2, at an initial differential pressure of greater than or equal to 1.5 pounds per square inch (psid). The wording of the surveillance limit was changed from "less than or equal to the equivalent leakage rate through an orifice 0.005 ft^2" to "less than or equal to 10 percent of the $A/\sqrt{K}$ design value of 0.050 ft^2". This effectively is an editorial change made to reference the surveillance limit to the design limit. The technical bases for the limit remain the same.

Successful drywell-to-suppression chamber bypass leakage test history at Columbia has demonstrated that extending the drywell-to-suppression chamber bypass leakage test frequency is acceptable. The drywell-to-suppression chamber bypass leakage test is conducted as an individual test or as part of the Primary Containment Leakage Rate Testing Program for Type A Tests (i.e., Integrated Leakage Rate Test). The frequency

of Type A Tests at Columbia, is in accordance with 10 CFR 50 Appendix J, Option B, "Performance-Based Requirements."

Extension of the drywell-to-suppression chamber bypass leakage test frequency from the current 24 months to 120 months will allow removal of this outage impacting test from the 2007 refueling outage, provided all nine pairs of vacuum breakers are successfully tested for leakage (SR 3.6.1.1.3). The drywell-to-suppression chamber bypass leakage test is a time consuming task that restricts personnel access to the drywell for approximately 12 to 18 hours during the final phases of a refueling outage. Performance of the drywell-to-suppression chamber bypass leakage test is typically critical path on the refueling outage schedule and therefore is equivalent to replacement power costs of approximately $500,000.00. This cost savings, along with increased outage schedule flexibility would be realized during the 2007 outage with the extended frequency. Replacement power cost savings of approximately $2.0 million every 10 years would result from changing the drywell-to-suppression chamber bypass leakage test frequency from once every 24 months to once every 120 months. The proposed suppression chamber-to-drywell vacuum breaker leakage test (SR 3.6.1.1.3 and 3.6.1.1.4) will also be conducted during refueling outages. However, the conduct of this test will not significantly affect other outage work that is occurring simultaneously. An evaluation of the results from previous drywell-to-suppression chamber bypass leakage tests has shown the amount of bypass leakage has been minimal and the proposed TS changes are consistent with efforts to increase outage work efficiencies.

4.0 TECHNICAL ANALYSIS

The proposed amendment would modify SR 3.6.1.1.2, to conduct drywell-to-suppression chamber bypass leakage tests, and add two new SRs, SR 3.6.1.1.3 and SR 3.6.1.1.4, covering leakage testing of suppression chamber-to-drywell vacuum breakers. The proposed amendment would modify the frequency of the drywell-to-suppression chamber bypass leakage test and establish a leakage test frequency for individual (SR 3.6.1.1.3) and aggregate (SR 3.6.1.1.4) leakage acceptance criteria for the suppression chamber-to-drywell vacuum breaker pathways. The proposed amendment is supported by deterministic considerations.

4.1 Drywell-to-Suppression Chamber Bypass Leakage Sources

Bypass leakage between the drywell airspace and suppression chamber airspace originates from three potential sources.

- Drywell floor and floor penetrations.
- Cross-connected piping systems.
- Suppression chamber-to-drywell vacuum breakers.

4.1.1 Drywell Floor

The drywell floor located between the drywell and suppression chamber is a 2 foot thick reinforced-concrete slab, which is supported by structural steel beams in composite action, by reinforced-concrete columns, and by a 5 foot inner circular reinforced-concrete slab, inside the reactor pedestal. Additional supporting elements include: 1) a continuous circular closure girder embedded in the drywell floor along its outer periphery; 2) a drywell floor peripheral seal assembly; and 3) shear lugs intermittently located along the outer periphery of the drywell floor. A special decontaminable epoxy coating is applied to the drywell floor to reduce the permeability of the concrete slab and to provide additional leak-tightness between the drywell and the suppression chamber.

The drywell floor is designed for a downward differential pressure of 25 pounds per square inch (psid), and an upward differential pressure of 6.4 psid.

The drywell floor structural integrity proof test was performed after construction of the primary containment, concrete structures, all electrical and piping penetrations, equipment hatch, and personnel airlock. This test was performed in February of 1984 after completion of the initial ILRT and a 45 pounds per square inch, gauge (psig) pressure test of the primary containment. During this drywell floor proof test, the pressure inside the drywell was increased to 25 psig and held for 15 minutes. Following, the satisfactory completion of the drywell floor proof test, four separate drywell-to-suppression chamber bypass leakage tests were successfully performed. These tests were performed at 25, 15, 5, and 1.5 psig.

4.1.2 Drywell Floor Penetrations

The drywell floor is penetrated by 102 carbon steel, standard schedule downcomer pipes, of which 84 are 24-inch outside diameter (OD) and 18 are 28-inch OD. Three of these downcomers (one 24-inch and two 28-inch) have been capped. All downcomer ends are stainless steel and terminate in the suppression chamber pool, 11.67 feet below the pool surface minimum level. The eighteen 10-inch carbon steel SRV discharge lines penetrate the 28-inch OD downcomer jet deflector plates (which include the two capped 28-inch downcomers) and then penetrate the downcomer pipe wall below the drywell floor and terminate in the suppression chamber pool of water.

The downcomers are designed and constructed in accordance with ASME Section III Class 2 requirements from the top of the downcomers to a point one inch above the circumferential weld joining the stainless-steel extension pieces to the bottom of the downcomers. Below this point the downcomers are designed and constructed to ASME Section III Class 3 requirements.

The SRV discharge piping is constructed in accordance with the ASME Code, Section III, Subsection ND for Class 3 piping within the drywell and Subsection NC for Class 2 piping within the suppression pool.

In addition to the 102 downcomers, two 3-inch drain lines pass through the floor of the reactor pressure vessel pedestal. These drain lines originate at the equipment drain and floor drain sumps in the drywell and pass through the suppression chamber and exit the containment with containment isolation valves.

The SRV discharge lines and downcomers, which were designed to the requirements of ASME Code Section III Class 2, did not require a fatigue analysis by the code. However, a fatigue analysis was performed at the request of the NRC since these lines are subjected to a significant number of severe cyclic loads during normal safety relief valve actuations and a small break LOCA. A through-wall crack in these lines resulting from a fatigue load could result in bypassing the pressure suppression function of the suppression pool. This could result in an unacceptable over-pressurization of the primary containment. The fatigue analysis confirmed that these lines would maintain their structural integrity for all postulated loading conditions.

A comprehensive periodic visual examination program of the primary containment structure is already in place and being implemented as part of the Columbia Inservice Inspection (ISI) Program. The ISI Program complies with the requirements stipulated in the ASME Code, Section XI, Subsection IWE. The periodic inspections are conducted three times within each 10-year ISI testing interval as required by ASME Section XI. The primary focus of these inspections is to identify defects that will jeopardize the leak tightness and structural integrity of the containment structures.

In conclusion, the high quality construction of the drywell floor, suppression chamber, and drywell floor penetrations provide an effective barrier against the potential for current and future bypass leakage from the drywell airspace to the suppression chamber airspace.

4.1.3 Cross-Connected Piping Systems

Cross-connected piping systems are systems with piping in the drywell airspace and suppression chamber airspace that do not penetrate the drywell floor. The system piping is connected external to the primary containment. These systems are listed below.

- Containment vent and purge lines include the nitrogen inerting/de-inerting makeup lines (two flow paths of 24-inch and 30-inch diameter piping, and one flow path of 1-inch diameter piping).
- Drywell and suppression chamber Residual Heat Removal (RHR) system spray lines (two flow paths of 16-inch and 6-inch diameter piping).
- Hydrogen and oxygen analyzer lines (two flow paths of one half-inch diameter piping).

- Hydrogen Recombiner lines (two flow paths of 4-inch diameter piping).

These cross-connected piping systems have multiple in series containment isolation valves that are designed to meet leakage criteria specified in 10CFR50, Appendix J. Periodic local leak rate testing is performed on the containment isolation valves in these systems to ensure that valve leakage complies with 10CFR50, Appendix J leakage criteria. The leak rate testing of these valves is controlled by the Columbia Primary Containment Leak Rate Testing Program Plan.

In conclusion, the design and testing of the cross-connected piping systems provides confidence that bypass leakage from the drywell airspace to the suppression chamber airspace will be limited to a small fraction of the allowed leakage.

4.1.4 Suppression Chamber-to-Drywell Vacuum Breakers

Suppression chamber-to-drywell vacuum breakers connect the drywell airspace and the suppression chamber airspace to prevent exceeding the 6.4 psid drywell floor negative design pressure and backflooding of suppression pool water into the drywell. The suppression chamber-to-drywell vacuum breakers are located in the suppression chamber airspace of the primary containment. Nine 24 inch suppression chamber-to-drywell vacuum breakers are mounted in downcomer piping which connect the drywell airspace and suppression chamber airspace and are evenly distributed around the suppression chamber airspace. Each suppression chamber to drywell vacuum relief valve assembly consists of two discs and seats which operate independently. The IST program currently credits the drywell-to-suppression chamber bypass leakage test for their biennial leakage tests.

Other BWRs with Mark II Containments, (Susquehanna 1 & 2, Limerick 1 & 2, and Nine Mile Point 2) have similarly designed suppression chamber-to-drywell vacuum breakers installed in their downcomers. They are located in the suppression chamber in the same basic design configuration as at Columbia. These other Mark II BWRs have also extended the surveillance interval for the Bypass Leakage Test and perform individual leakage tests on their valves (References 4, 5 and 6).

In conclusion, the suppression chamber-to-drywell vacuum breakers provide an effective barrier against the potential for current and future bypass leakage from the drywell airspace to the suppression chamber airspace. The test methodology to be used to perform leak tests at Columbia is consistent with those employed at the above Mark II BWRs, to quantify individual valve leakages.

4.2 Previous Drywell-to-Suppression Chamber Bypass Leakage Test Results

To date, Columbia has performed a total of 23 drywell-to-suppression chamber bypass leakage tests. All of the tests had successful results with significant margin. The initial drywell-to-suppression chamber bypass leakage tests were performed in 1984 during

preoperational testing. The tests were conducted at differential pressures of 25, 15, 5, and 1.5 psid. Subsequently, Columbia has performed three additional tests at 5 psid and 17 tests at 1.5 psid.

YEAR OF TEST	25 PSID (Test Limit of 128.5)	15 PSID (Test Limit of 128.4)	5 PSID (Test Limit of 116.8)	1.5 PSID (Test Limit of 78.4)
1984	28.3	22.9	8	4
1985				5.7
1986			10.9	5.5
1987				6.5
1988				7.44
1989				7.5
1990				11.1
1991				9.78
1992				10.9
1993			23.9	11.395
1994			24.03	11.75
1996				13.3
1998				9.89
1999				11.15
2001				11.66
2003				11.41
2005				13.4

As expected, the highest leakage was recorded during the test conducted at the highest differential pressure of 25 psid (in 1984). That test resulted in leakage of 28.3 weight percent per day, which is 22 percent of the test acceptance criteria of 128.56 weight percent per day. The test acceptance criterion of 128.56 weight percent per day is based on an equivalent orifice size of 0.0045 square feet (sq. ft). This test acceptance criterion is extremely conservative since it is only 9 percent of the 0.05 sq. ft. design basis value.

The Columbia drywell-to-suppression chamber bypass leakage test results demonstrate that the measured bypass leakage has consistently been a small percentage of the TS allowable limits (design basis values). Bypass leakage has consistently been a small percentage of TS allowable leakage and design limits have not been approached.

4.3 Containment Over-Pressurization

The Columbia primary containment relies on steam condensation in the suppression chamber pool of water for pressure suppression. Steam that bypasses the suppression pool will not be condensed and will contribute to containment pressurization. The dominant failure mode of pressure suppression for the primary containment is the failure of the suppression chamber-to-drywell vacuum breakers to operate as designed. The proposed changes will establish a leakage test frequency of 24 months for each

suppression chamber-to-drywell vacuum breaker pathway, which is consistent with the current drywell to suppression chamber bypass leakage test frequency. Thus, the proposed changes would continue the current test frequency of the suppression chamber-to-drywell vacuum breakers and will not significantly increase the risk of primary containment over-pressurization.

In addition to steam condensation in the suppression chamber pool of water, there are other mechanisms available to achieve steam condensation. Columbia is equipped with drywell and suppression chamber sprays. Columbia procedure PPM 5.2.1, "Primary Containment Control Flowchart," directs control room operators to initiate suppression chamber sprays when primary containment pressure is between 1.68 psig and 12.0 psig. Suppression chamber spray operation will cause the condensation of steam in the suppression chamber air space. Columbia procedure PPM 5.2.1, "Primary Containment Control Flowchart," directs control room operators to initiate drywell sprays if the suppression chamber sprays cannot be initiated or if they are ineffective in reversing an increasing containment pressure trend.

In the unlikely event that the drywell and suppression chamber sprays fail to terminate a primary containment pressure increase, PPM 5.2.1 directs control room operators to emergency depressurize the reactor pressure vessel. If primary containment pressure continues to increase, then PPM 5.2.1 directs operators to vent the primary containment prior to the suppression chamber pressure reaching the Primary Containment Pressure Limit (PCPL).

Based on the discussion above there is negligible impact related to containment over-pressurization concerns due to extending the drywell-to-suppression chamber bypass leakage test interval.

4.4 Conclusions

The current frequency associated with a drywell-to-suppression chamber bypass leakage test in SR 3.6.1.1.2 is 24 months or 12 months if two consecutive tests fail and continues at this frequency until two consecutive tests pass. The proposed amendment will modify the leakage test frequency to 120 months or 48 months following one test failure, or 24 months if two consecutive tests fail and continues at this frequency until two consecutive tests pass. The 120 month test frequency is consistent with the current Type A test frequency specified in the Columbia Primary Containment Leakage Rate Testing Program. The proposed amendment is acceptable as the results from the previous 23 drywell-to-suppression chamber bypass leakage tests at Columbia show that the measured drywell-to-suppression chamber bypass leakage at the current TS frequency has been a small percentage of the allowable leakage. Acceptability of this change is further demonstrated by the design of the primary containment components and other periodically performed primary containment inspections.

The proposed new SR 3.6.1.1.3 will establish a leakage test frequency of 24 months for each suppression chamber-to-drywell vacuum breaker pathway except when the leakage test of SR 3.6.1.1.2 has been performed within the past 24 months. SR 3.6.1.1.3 specifies a leakage limit for each suppression chamber-to-drywell vacuum breaker pathway of less than or equal to 12 percent of the bypass leakage limit of SR 3.6.1.1.2. The proposed new SR 3.6.1.1.4 will establish a total leakage limit for all suppression chamber-to-drywell vacuum breakers of less than or equal to 30 percent of the bypass leakage limit of SR 3.6.1.1.2 when the suppression chamber-to-drywell vacuum breakers are tested in accordance with SR 3.6.1.1.3.

The proposed changes to establish leakage limits for the suppression chamber-to-drywell vacuum breakers are acceptable as demonstrated by the results from other Mark II BWR suppression chamber-to-drywell vacuum breaker leakage tests. These test results show that measured leakage has been a small percentage of the allowable leakage.

4.5 Impact on Previous Submittals

There is no impact on any outstanding submittal from Energy Northwest.

5.0 REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration Determination

Energy Northwest has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, Issuance of amendment," as discussed below:

1. **Does the operation of Columbia Generating Station in accordance with the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?**

   Response: No

   The proposed changes would modify Technical Specification (TS) Surveillance Requirement (SR) 3.6.1.1.2 and add two new SRs, SR 3.6.1.1.3 and SR 3.6.1.1.4. The proposed changes will extend the frequency for the drywell-to-suppression chamber bypass leakage test while maintaining the current leakage testing frequency for the suppression chamber-to-drywell vacuum breakers, and establish leakage acceptance criteria for the suppression chamber-to-drywell vacuum breakers when the valves are tested individually.

   The performance of a drywell-to-suppression chamber bypass leakage test or suppression chamber-to-drywell vacuum breaker leakage test is not a precursor to any accident previously evaluated. Thus, the proposed changes to the

performance of the leakage tests do not have any affect on the probability of an accident previously evaluated.

The performance of a drywell-to-suppression chamber bypass leakage test or a suppression chamber-to-drywell vacuum breaker leakage test continues to provide assurance that the containment will perform as designed. Thus, the radiological consequences of any accident previously evaluated are not impacted.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Does the operation of Columbia Generating Station in accordance with the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?**

   Response: No

   The proposed changes to TS SR 3.6.1.1.2, and the addition of SR 3.6.1.1.3, and SR 3.6.1.1.4 do not affect the assumed performance of any Columbia Generating Station structure, system or component previously evaluated. The proposed changes do not introduce any new modes of system operation or any new failure mechanisms. This is an administrative change and does not involve the modification, addition or removal of any plant equipment.

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

3. **Does the operation of Columbia Generating Station in accordance with the proposed amendment involve a significant reduction in the margin of safety?**

   Response: No

   The current frequency associated with a drywell-to-suppression chamber bypass leakage test in TS SR 3.6.1.1.2 is 24 months or 12 months if two consecutive tests fail and continues at this frequency until two consecutive tests pass. The proposed change will modify this leakage test frequency to 120 months, or 48 months following one test failure or 24 months if two consecutive tests fail and continues at this frequency until two consecutive tests pass. The proposed change in SR 3.6.1.1.2 frequency is acceptable as the results from previous tests show that the measured drywell-to-suppression chamber bypass leakage at the current TS frequency has been a small percentage of the allowable leakage. Acceptability is further demonstrated by the design requirements applied to the primary containment components and other periodically performed primary containment inspections.

The proposed SR 3.6.1.1.3 will establish a leakage test frequency of 24 months for each suppression chamber-to-drywell vacuum breaker except when the leakage test of SR 3.6.1.1.2 has been performed within the past 24 months. SR 3.6.1.1.3 specifies a leakage limit for each suppression chamber-to-drywell vacuum breaker pathway of less than or equal to 12 percent of the bypass leakage limit of SR 3.6.1.1.2. The proposed SR 3.6.1.1.4 will establish a total leakage limit of less than or equal to 30 percent of the bypass leakage limit of SR 3.6.1.1.2 when the suppression chamber-to-drywell vacuum breakers are tested in accordance with SR 3.6.1.1.3.

TS SR 3.6.1.1.2 drywell-to-suppression chamber bypass leakage test monitors the combined leakage of three types of pathways: (1) the drywell floor and downcomers, (2) piping externally connected to both the drywell and suppression chamber air space, and (3) the suppression chamber-to-drywell vacuum breakers. This amendment would extend the surveillance interval on the passive components of the test (the first two types of pathways), while retaining the current surveillance interval on the active components (suppression chamber-to-drywell vacuum breakers). The proposed changes establish leakage limits for both individual suppression chamber-to-drywell vacuum breakers and the total leakage. Additional testing is required if acceptable results are not achieved.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based on the above, Energy Northwest concludes that the proposed amendments present no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements

There are no specific regulatory requirements for the surveillance frequency of this test. Based on that and the considerations discussed above, (1) there is a reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and, (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 Environmental Consideration

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance

requirement. However, the proposed amendment does not involve; (i) a significant hazards consideration; (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite; or, (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the proposed amendment.

7.0 REFERENCES

1. Letter from R.M. Krich to NRC, "Application for Amendment to Technical Specifications Surveillance Requirements for the Suppression Chamber-Drywell Vacuum Breaker and Drywell-to-Suppression Chamber Bypass Leakage Test," dated May 30, 2001.
2. Letter from K.A. Ainger to NRC, "Supplement to Application for Amendment to Technical Specifications Surveillance Requirements for the Suppression Chamber-Drywell Vacuum Breaker and Drywell-to-Suppression Chamber Bypass Leakage Test," dated September 10, 2001.
3. Letter from William A. Macon (NRC) to Oliver D. Kingsley (Exelon Nuclear), "LaSalle County Station, Units 1 and 2 – Issuance of Amendments (TAC Nos. MB2187 and MB2188)," dated November 7, 2001.
4. Letter from Chester Poslusny (NRC) to Robert G. Byram (Pennsylvania Power and Light), "Susquehanna Steam Electric Station, Units 1 and 2, - Issuance of Amendments (TAC Nos. M94922 and M94923)," dated September 6, 1996.
5. Letter from Frank Rinaldi (NRC) to George A. Hunger, Jr. (PECO Energy Company), "Limerick Generating Station, Units 1 and 2, - Issuance of Amendments (TAC Nos. M92613 and M92614), dated January 25, 1996.
6. Letter from Darl S. Hood (NRC) to B. Ralph Silva (Niagara Mohawk Power Corporation), Nine Mile Point Nuclear Station, Unit 2, - Issuance of Amendment (TAC No. M95083), dated August 27, 1996.

Marked-up Affected Pages from the Technical Specifications

TS Page 3.6.1.1-2
Insert A
Insert B

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.1.1	Perform required visual examinations and leakage rate testing except for primary containment air lock testing, in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.1.2	Verify drywell to suppression chamber bypass leakage rate is less than or equal to the equivalent leakage rate through an orifice 0.005 ft^2 at an initial differential pressure of $\geq$ 1.5 psid. See Insert A	24 months AND -----NOTE------ Only required after two consecutive tests fail and continues until two consecutive tests pass ---------- 12 months

Add Insert B

Insert A

SR 3.6.1.1.2	Verify drywell to suppression chamber bypass leakage is $\leq$ 10% of the acceptable $A/\sqrt{K}$ design value of 0.050 ft^2 at an initial pressure of $\geq$ 1.5 psid.	120 months AND 48 months following a test with bypass leakage greater than the bypass leakage limit AND 24 months following two consecutive tests with bypass leakage greater than the bypass leakage limit until two consecutive tests are less than or equal to the bypass leakage limit

Insert B

SR 3.6.1.1.3	----------NOTE---------- Performance of SR 3.6.1.1.2 satisfies this surveillance. ----------	
	Verify individual drywell to suppression chamber vacuum relief valve bypass pathway leakage is $\leq$ 1.2% of the acceptable $A/\sqrt{K}$ design value of 0.050 ft^2 at an initial differential pressure of $\geq$ 1.5 psid.	24 months
SR 3.6.1.1.4	----------NOTE---------- Performance of SR 3.6.1.1.2 satisfies this surveillance. ----------	
	Verify total drywell to suppression chamber vacuum relief valve bypass leakage is $\leq$ 3.0% of the acceptable $A/\sqrt{K}$ design value of 0.050 ft^2 at an initial differential pressure of $\geq$ 1.5 psid.	24 months

Proposed Pages for Technical Specifications Bases

TS Bases Page B 3.6.1.1-4
TS Bases Page B 3.6.1.1-5
Insert "A"

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.1.1.1

Maintaining the primary containment OPERABLE requires compliance with the visual examinations and leakage rate test requirements of the Primary Containment Leakage Rate Testing Program. Failure to meet air lock leakage (SR 3.6.1.2.1), secondary containment bypass leakage (SR 3.6.1.3.10), or main steam isolation valve leakage (SR 3.6.1.3.10) limit does not necessarily result in a failure of this SR. The impact of the failure to meet these SRs must be evaluated against the Type A, B, and C acceptance criteria of the Primary Containment Leakage Rate Testing Program.

As left leakage prior to the first startup after performing a required leakage test is required to be $< 0.6\ L_a$ for combined Type B and C leakage, and $< 0.75\ L_a$ 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. The Frequency is required by the Primary Containment Leakage Rate Testing Program.

SR 3.6.1.1.2

Maintaining the pressure suppression function of primary containment requires limiting the leakage from the drywell to the suppression chamber. Thus, if an event were to occur that pressurized the drywell, the steam would be directed through the downcomers into the suppression pool. This SR measures drywell to suppression chamber differential pressure during a 4 hour period to ensure that the leakage paths that would bypass the suppression pool are within allowable limits.

Satisfactory performance of this SR can be achieved by establishing a known differential pressure ($\geq$ 1.5 psid) between the drywell and the suppression chamber and verifying that the bypass leakage is equivalent to that through an area $\leq$ ~~0.005 ft²~~ 10% of the acceptable design value of 0.050 ft² The leakage test is performed every ~~24~~ 120 months. The ~~24 month~~ Frequency was developed considering it is prudent that this Surveillance be performed during a unit outage and also in view of the fact

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.1.2 (continued)

that component failures that might have affected this test are identified by other primary containment SRs. ~~Two~~ consecutive ~~test~~ failures, however, would indicate unexpected primary containment degradation; in this event, ~~as the Note indicates,~~ increasing the Frequency to once every ~~12~~ 24 months is required until the situation is remedied as evidenced by passing two consecutive tests.

as found

Insert "A"

one test failure increases the Surveillance Frequency to 48 months

REFERENCES

1. FSAR, Section 6.2.1.1.3.
2. FSAR, Section 15.F.6.
3. 10 CFR 50, Appendix J, Option B.
4. FSAR, Section 6.2.6.1.
5. 10 CFR 50.36(c)(2)(ii).

Insert "A"

SR 3.6.1.1.3

Maintaining the pressure suppression function of the primary containment requires limiting the leakage from the drywell to the suppression chamber. Thus, if an event were to occur that pressurizes the drywell, the steam would be directed through the downcomers into the suppression pool. This SR measures the drywell to suppression chamber vacuum relief valve bypass leakage to ensure that these leakage paths that would bypass the suppression pool are within allowable limits.

Satisfactory performance of this SR can be achieved by establishing a known initial differential pressure ($\geq$ 1.5 psid) between the drywell side and the suppression chamber side of the suppression to drywell chamber vacuum relief valve and verifying that the measured bypass leakage is $\leq$ 1.2% of the acceptable design value of 0.050 ft^2. The leakage test is performed every 24 months. The 24 month Frequency was developed considering it is prudent that this Surveillance be performed during a unit refueling outage.

The SR is modified by a Note stating that performance of SR 3.6.1.1.2 satisfies this Surveillance Requirement. This is acceptable since drywell to suppression chamber vacuum relief valve leakage is included in the measurement of the drywell to suppression chamber bypass leakage required by SR 3.6.1.1.2.

SR 3.6.1.1.4

Maintaining the pressure suppression function of the primary containment requires limiting the leakage from the drywell to the suppression chamber. Thus, if an event were to occur that pressurizes the drywell, the steam would be directed through the downcomers into the suppression pool. This SR determines the total drywell to suppression chamber vacuum relief valve bypass leakage to ensure that these leakage paths that would bypass the suppression pool are within allowable limits.

For those outages where the drywell to suppression chamber bypass leak rate test (BLRT) is not conducted, the suppression chamber to drywell vacuum breaker (CVB) leakage test verifies that even with the maximum allowable CVB leakage, a margin of 70% remains for potential passive structural leakage. Previous drywell to suppression chamber bypass test data indicates that the bypass leakage through the passive structural components will be a small fraction of the remaining 70% margin. The CVB leakage limit, combined with negligible leakage from the passive structural area, ensures that the drywell to suppression chamber bypass leakage limit is met for those outages in which the BLRT is not performed.

Satisfactory performance of this SR is achieved by summing the individual drywell to suppression chamber vacuum relief valve bypass leakages from SR 3.6.1.1.3 and verifying that the total measured bypass leakage is $\leq$ 3.0% of the acceptable design value of 0.050 ft^2. The acceptable bypass leakage determination of this Surveillance is

performed every 24 months. The 24 month Frequency was developed considering it is prudent that this Surveillance be performed during a unit refueling outage.

The SR is modified by a Note stating that performance of SR 3.6.1.1.2 satisfies this Surveillance Requirement. This is acceptable since drywell to suppression changer vacuum relief valve leakage is included in the measurement of the drywell to suppression chamber bypass leakage required by SR 3.6.1.1.2.