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Dominion

August 14, 2008

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

Serial No. 07-0051
KPS/LIC/JF: R2
Docket No. 50-305
License No. DPR-43

DOMINION ENERGY KEWAUNEE, INC.
KEWAUNEE POWER STATION
LICENSE AMENDMENT REQUEST 229
SUBJECT: CHANGE TECHNICAL SPECIFICATIONS TO REQUIRE TESTING CONTAINMENT PURGE AND VENT ISOLATION VALVES WHEN THE REACTOR IS ABOVE COLD SHUTDOWN

Pursuant to 10 CFR 50.90, Dominion Energy Kewaunee, Inc. (DEK) requests an amendment to Facility Operating License (OL) Number DPR-43 for Kewaunee Power Station (KPS). The proposed amendment would align the KPS Technical Specifications (TS) with industry standards concerning the testing of the 36-inch containment purge and vent isolation valves. The proposed amendment would change KPS TS 4.4.f.1, "Containment Isolation Device Verification," to require verification that the 36-inch containment purge and vent isolation valves are sealed closed when the reactor is at greater than Cold Shutdown conditions.

The current KPS TS require the 36-inch containment purge and vent isolation valves to be operable when the reactor is at greater than Cold Shutdown conditions. However, performance of the associated surveillance requirement to verify these valves are sealed closed (TS 4.4.f.1) is only required when the reactor is critical. This is not consistent with industry standards, which require these valves to be verified closed when they are required to be operable. The proposed amendment brings the KPS TS into alignment with industry standards and is consistent with NRC NUREG-0737, "Clarification of TMI Action Plan Requirements," Item II.E.4.2 (reference 1) and NUREG-0800, "Standard Review Plan," Section 6.2.4 (reference 2).

Attachment 1 to this letter contains a description, a safety evaluation, a significant hazards determination, and environmental considerations for the proposed amendment. Attachment 2 contains the marked-up KPS TS page. Attachment 3 contains the marked-up TS Bases page. Attachment 3 is provided "for information only."

The KPS Facility Safety Review Committee has approved the proposed amendment and a copy of this submittal has been provided to the State of Wisconsin in accordance with 10 CFR 50.91(b). DEK requests approval of the proposed amendment by August 15, 2009. Once approved, the amendment will be implemented within 60 days.

If you have any questions or require additional information, please contact Mr. Craig Sly at (804) 273-2784.

Very truly yours,

Gerald T. Bischof
Vice President – Nuclear Engineering

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Gerald T. Bischof, who is Vice President – Nuclear Engineering of Dominion Energy Kewaunee, Inc. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of that Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 14th day of August, 2008.

My Commission Expires: August 31, 2008.

MARGARET B. BENNETT
Notary Public 354302
Commonwealth of Virginia
My Commission Expires Aug 31, 2008

Margaret B. Bennett
Notary Public

Attachments:

1. Discussion of Change, Safety Evaluation, Significant Hazards Determination and Environmental Considerations
2. Marked-up Technical Specifications Page
3. Marked-up Technical Specifications Bases Pages

Commitments made in this letter: None

References:

1. NUREG-0737, "Clarification of TMI Action Plan Requirements," Item II.E.4.2, "Containment Isolation Dependability," dated November 1980.
2. NUREG-0800, "Standard Review Plan," Section 6.2.4, "Containment Isolation System," Revision 2, dated July 1981.

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ATTACHMENT 1

LICENSE AMENDMENT REQUEST 229

CHANGE TECHNICAL SPECIFICATIONS TO REQUIRE TESTING CONTAINMENT PURGE AND VENT ISOLATION VALVES WHEN THE REACTOR IS ABOVE COLD SHUTDOWN

DISCUSSION OF CHANGE, SAFETY EVALUATION, SIGNIFICANT HAZARDS DETERMINATION AND ENVIRONMENTAL CONSIDERATIONS

KEWAUNEE POWER STATION

DOMINION ENERGY KEWAUNEE, INC.

CHANGE TECHNICAL SPECIFICATIONS TO REQUIRE TESTING CONTAINMENT PURGE AND VENT ISOLATION VALVES WHEN THE REACTOR IS ABOVE COLD SHUTDOWN

INTRODUCTION

1.0 DESCRIPTION

Pursuant to 10 CFR 50.90, Dominion Energy Kewaunee, Inc. (DEK) requests an amendment to Facility Operating License (OL) Number DPR-43 for Kewaunee Power Station (KPS). The proposed amendment would align the KPS Technical Specifications (TS) with industry standards concerning the closure and testing of the 36-inch containment purge and vent isolation valves. The proposed amendment would change KPS TS 4.4.f.1, "Containment Isolation Device Verification," to require verification that the 36-inch containment purge and vent isolation valves are sealed closed when the reactor is at greater than Cold Shutdown conditions.

The current KPS TS require the 36-inch containment purge and vent isolation valves to be operable when the reactor is at greater than Cold Shutdown conditions. However, performance of the associated surveillance requirement to verify the valves are sealed closed (TS 4.4.f.1) is only required when the reactor is critical. This is not consistent with industry standards, which would have these valves be verified closed when they are required to be operable. The proposed changes to TS 4.4.f.1 will align with TS 3.6.b.1 and plant practices to require verification that the valves are sealed closed every 31 days when the reactor is at greater than Cold Shutdown conditions. When the reactor is at or below Cold Shutdown conditions, opening of these valves would continue to be permitted.

The proposed changes are consistent with NUREG-0737, "Clarification of TMI Action Plan Requirements," Item II.E.4.2 (reference 1) and NUREG-0800, "Standard Review Plan," Section 6.2.4 (reference 2). Both documents indicate that the containment purge and vent isolation valves should be sealed closed when the reactor is at greater than Cold Shutdown conditions.

The proposed TS amendment qualifies for a no significant hazards consideration under the standards set forth in 10 CFR 50.92(c). The proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the proposed amendment.

2.0 PROPOSED CHANGE

The proposed amendment would modify KPS TS 4.4.f.1.

Currently, KPS TS 3.6.b.1 requires that all containment isolation valves and blind flanges be operable when containment system integrity (CSI) is required. CSI is required by TS 3.6.a when the reactor is not in the Cold Shutdown or Refueling modes. This equates to CSI being required when the reactor is in any mode greater than Cold Shutdown.*

The current KPS TS 4.4.f.1 reads as follows:

> *f. Containment Isolation Device Position Verification*
>
> *1. When the reactor is critical, verify each 36 inch containment purge and vent isolation valve is sealed closed every 31 days.*

Thus, there is currently a mismatch between the mode of applicability for TS 4.4.f.1 and the mode of applicability for TS 3.6.b.1. The term "*greater than Cold Shutdown condition*" (as specified in TS 3.6.b.1) equates to KPS operating modes: Intermediate Shutdown, Hot Shutdown, Hot Standby and Operating. Whereas, the term "*when the reactor is critical*" (as specified in TS 4.4.f.1) equates to operating modes: Hot Standby and Operating. This leaves a gap in the TS when in the Intermediate Shutdown and Hot Shutdown modes, the containment purge and vent isolation valves are required to be operable, but are not required to be verified sealed closed. To remedy this mismatch, the proposed amendment would remove the word *"critical"* in TS 4.4.f.1 and replace it with *"greater than Cold Shutdown condition."* The final changed TS 4.4.f.1 would read as follows:

> *f. Containment Isolation Device Position Verification*
>
> *1. When the reactor is greater than Cold Shutdown condition, verify each 36 inch containment purge and vent isolation valve is sealed closed every 31 days.*

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* Note that KPS modes differ from Standard Technical Specifications (NUREG-1431) modes. KPS operating modes as defined in TS 1.0.j are: Operating, Hot Standby, Hot Shutdown, Intermediate Shutdown, Cold Shutdown and Refueling (see KPS TS section 1.0 for further details). NUREG-1431 operating modes are: Power Operation, Startup, Hot Standby, Hot Shutdown, Cold Shutdown and Refueling.

3.0 BACKGROUND

3.1 System Function and Design Requirements

The Primary Containment system consists of a steel structure and its associated-engineered safety features systems. The Primary Containment system, also referred to as the Reactor Containment Vessel, is a low-leakage steel shell, including all its penetrations, designed to confine the radioactive materials that could be released by accidental loss of integrity of the Reactor Coolant system pressure boundary. The principal function of the Containment Isolation system is to confine the fission products within the Primary Containment system boundary.

Containment integrity is assumed in the following design basis accidents (DBA):

- The steam line break containment integrity analysis was performed to demonstrate that the energy release to containment does not cause failure of the containment structure following a steam line break event. All cases analyzed result in a maximum containment pressure that is less than 46 psig and a containment vessel shell temperature that is less than 268°F.
- The rupture of a Control Rod Drive Mechanism Housing (also called Rod Cluster Control Assembly (RCCA Ejection) accident) is the result of an extremely unlikely mechanical failure of a control rod drive mechanism pressure housing such that Reactor Coolant System (RCS) pressure would eject the RCCA and drive shaft. The consequences of this mechanical failure, in addition to being a minor Loss of Coolant Accident (LOCA), may also include a rapid reactivity insertion and an adverse core power distribution, possibly leading to localized fuel rod damage. From the containment response standpoint, this accident mimics the LOCA accident. However, some amount of leakage (release) outside containment must be postulated.
- By definition, LOCA's (including both large-break and small-break LOCAs) are very infrequent events which may happen during the life of the plant. A LOCA event will not, by itself, result in a consequential loss of function of the RCS or of containment barriers. Should a major break occur, rapid depressurization of the RCS to a pressure nearly equal to the containment pressure occurs with a nearly complete loss of system inventory. Containment pressure is evaluated to ensure the containment safeguards systems are capable of limiting the peak containment pressure to less than 46 psig.

The KPS containment system is designed so that for all LOCA break sizes, up to and including the double-ended severance of a reactor coolant pipe, the containment peak pressure remains below the design pressure. The containment response analysis demonstrates the acceptability of the containment safeguards system to mitigate the consequences of a LOCA inside containment. The impact of LOCA mass and energy releases is addressed to ensure containment pressure remains below 46 psig at

licensed core power conditions. In support of equipment design and licensing criteria (for example, qualified operating life in post-accident environmental conditions) long-term containment pressure and temperature transients are generated to conservatively bound potential post-LOCA conditions.

The safety function of the containment purge and vent isolation valves is to support the Containment Isolation system by confining fission products within the Primary Containment system boundary during a DBA. This is accomplished by minimizing the loss (leakage) of reactor coolant inventory and radioactive material outside of primary containment. Another function of the containment purge and ventilation system is to provide fresh, tempered air for comfort during maintenance and refueling operations and to purge contaminated air from the reactor containment vessel when access is required. Containment purging and ventilation is achieved using plant procedures and in accordance with commitments made to the NRC. The current KPS TS permit the reactor containment vessel to be vented using the 36-inch containment purge and vent valves when the reactor is operating at or below Cold Shutdown conditions.

There are four 36-inch diameter containment purge supply and exhaust isolation valves in the containment purge and ventilation system. Two valves are in the containment air supply duct (RBV-1 and RBV-2) and two valves are in the exhaust air ducts (RBV-3 and RBV-4). One of the two valves per duct is installed on each side of the containment boundary and each valve is considered a containment isolation valve. These QA Type 1 butterfly valves are designed and installed to preclude valve seat leakage and to withstand the projected seismic accelerations due to a design basis earthquake. Closure of the purge and vent valves will automatically occur in the event of high radiation in the containment system vent. Containment purge and vent valves close upon receipt of a containment ventilation isolation signal (Train A: RBV-1 and RBV-4 or Train B: RBV-2 and RBV-3), loss of electrical power, loss of instrument air, or manual initiation by a control room switch.

A containment ventilation isolation signal is generated from any of the following:

- A safety injection signal.
- A containment isolation signal.
- A containment spray signal.
- Detection of high particulates by radiation monitor R-11 (Containment System Vent - Air Particulate).
- Detection of high radiation by radiation monitor R-12 (Containment System Vent - Radioactivity Gas).
- Detection of high radiation by radiation monitor R-21 (Containment System Vent - Air Activity).

Current plant practice is to seal closed the containment purge supply and exhaust isolation valves before the RCS is heated above 200°F. This is verified by procedure.

3.2 Regulatory Requirements

NUREG-0737, Item II.E.4.2, "Containment Isolation Dependability," (reference 1) describes the NRC position regarding use of containment purge valves. Specifically, positions 6 and 7 of Item II.E.4.2 require:

(6) *Containment purge valves that do not satisfy the operability criteria set forth in Branch Technical Position CSB 6-4 or the Staff Interim Position of October 23, 1979 must be sealed closed as defined in SRP 6.2.4, item II.3.f during operational conditions 1, 2, 3, and 4. Furthermore, these valves must be verified to be closed at least every 31 days. (A copy of the Staff Interim Position is enclosed as Attachment 1.)*

(7) *Containment purge and vent isolation valves must close on a high radiation signal.*

The staff interim position referred to in position (6) above provides the following two restrictions regarding use of the containment purge and vent system:

(1) *Whenever the containment integrity is required, emphasis should be placed on ... limiting all purging and venting times to as low as achievable. ...*

(2) *Maintain the containment purge and vent isolation valves closed whenever the reactor is not in the cold shutdown or refueling mode until such time as you can show that: (a) All isolation valves greater than 3-in. nominal diameter used for containment purge and venting operations are operable under the most severe design-basis-accident (DBA) flow-condition loading and can close within the time limit stated in the technical specifications, ... and (b) ... at least one of the automatic safety injection actuation signals is uninhibited and operable to initiate valve closure when any other isolation signal may be blocked, reset or overridden.*

NUREG-0800, Standard Review Plan (SRP), Section 6.2.4, "Containment Isolation System," (reference 2) also addresses the use of containment purge and venting systems. The SRP Section 6.2.4 contains Branch Technical Position CSB 6-4 and item II.3.f (renumbered to II.6.f in revision 2) as referenced by NUREG-0737. SRP section 6.2.4, Item II.6.f states:

6. *...The General Design Criteria identified above established requirements for the design, testing, and functional performance of isolation barriers in lines penetrating the primary containment boundary and, in general, required that two isolation* [valves] *in series be used to assure that the isolation function is maintained assuming any single active failure in the containment isolation provisions. However, containment isolation provisions that differ from the explicit requirements of General Design Criteria 55 and 56 are acceptable if the basis for the difference is justified.*

Specific criteria necessary to meet the relevant requirements of the regulations identified above and guidelines for acceptable alternate containment isolation provisions for certain classes of lines are as follows: ...

f. Sealed closed barriers may be used in place of automatic isolation valves. Sealed closed barriers include blind flanges and sealed closed isolation valves which may be closed manual valves, closed remote-manual valves, and closed automatic valves which remain closed after a loss-of-coolant accident. Sealed closed isolation valves should be under administrative control to assure that they cannot be inadvertently opened. Administrative control includes mechanical devices to seal or lock the valve closed, or to prevent power from being supplied to the valve operator.

Subsection n specifically addresses containment purge and vent valves:

n. ... Containment isolation valve closure times should be selected to assure rapid isolation of the containment following postulated accidents. ... For lines which provide an open path from the containment to the environs; e.g., the containment purge and vent lines, isolation valve closure times on the order of 5 seconds or less may be necessary. The closure times of these valves should be established on the basis of minimizing the release of containment atmosphere to the environs, to mitigate the offsite radiological consequences, and assure that emergency core cooling system (ECCS) effectiveness is not degraded by a reduction in the containment backpressure. ... Additional guidance on the design and use of containment purge systems which may be used during the normal plant operating modes (i.e., startup, power operation, hot standby and hot shutdown) is provided in Branch Technical Position CSB 6-4. ...Item II.E.4.2 of NUREG-0737 and NUREG-0718 requires that containment purge valves that do not satisfy the operability criteria set forth in Branch Technical Position CSB 6-4 or the Staff Interim Position of October 23, 1979 must be sealed closed as defined in SRP Section 6.2.4, Item II.3.f during operational conditions 1, 2, 3 and 4. Furthermore, these valves must be verified to be closed at least every 31 days. (A copy of the Staff Interim Position appears as Attachment 1 to Item II.E.4.2 in NUREG-0737.)

10 CFR 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors," requires primary reactor containments meet the containment leakage test requirements set forth in this appendix. These test requirements provide for preoperational and periodic verification by tests of the leak-tight integrity of the primary reactor containment, and systems and components that penetrate containment of water-cooled power reactors, and establish the acceptance criteria for these tests. The purposes of the tests are to assure that; (a) leakage through the primary reactor containment and systems and components penetrating primary containment shall not exceed allowable leakage rate values as specified in the technical specifications or associated bases; and (b) periodic surveillance of reactor containment penetrations and isolation valves is performed so that proper maintenance and repairs are made during the service life of the containment, and systems and components penetrating primary

containment. Local leak tests of containment isolation valves are performed, as required during periods of reactor shutdown, in accordance with 10 CFR 50, Appendix J.

No changes are proposed in this amendment request regarding the frequency of leak-rate testing or the methods used for testing the containment purge supply and exhaust isolation valves.

3.3 KPS TS Requirements

The current KPS TS requirements for operability and surveillance testing of the containment purge supply and exhaust isolation valves come from the following NRC correspondence:

By letter dated March 7, 1983 (reference 4), the KPS staff committed to seal close the 36-inch containment purge and vent valves when the reactor is at greater than Hot Shutdown conditions and verify the valves are sealed closed by monthly surveillance of control board indication. The KPS staff identified this as an interim measure until a further analysis of the containment purge and vent valves could be performed.

The NRC acknowledged this commitment by letter dated April 22, 1983 (reference 5). The NRC staff responded, *"We have received your letter dated March 7, 1983 which committed to maintain the vent and purge valves sealed shut while above hot shutdown pending further investigation. This completes the action regarding the subject venting and purging for the Kewaunee Nuclear Power Plant."* The requirement to verify purge valves are sealed closed on a 31-day frequency when the reactor is critical was subsequently added to the KPS TS in Amendment 155 (reference 3).

When these requirements were transferred into the KPS TS, a mismatch occurred between the surveillance requirement (SR) mode of applicability *("when the reactor is critical")* and the Limiting Condition for Operability (LCO) mode of applicability (required above Cold Shutdown) associated with Containment System Integrity. The term "*greater than Cold Shutdown condition*" (as specified in TS 3.6.b.1) equates to the following operating modes: Intermediate Shutdown, Hot Shutdown, Hot Standby and Operating. Whereas, the term *"when the reactor is critical"* in TS 4.4.f.1 equates only to operating modes: Hot Standby and Operating. DEK evaluated the LCO and SR mode of applicability mismatch and determined that delaying performance of this SR until the reactor is critical is not warranted. A basis (justification) for not verifying that the containment purge supply and exhaust isolation valves are sealed closed during periods when the reactor is in intermediate shutdown or hot shutdown conditions has not been identified.

4.0 TECHNICAL ANALYSIS

The proposed amendment would revise KPS TS 4.4.f.1. The revised TS 4.4.f.1 would require verification that the containment purge and vent isolation valves are sealed closed every 31-days when the reactor is at greater than Cold Shutdown conditions. The revised TS 4.4.f.1 is more restrictive than the current TS 4.4.f.1 and is consistent with current industry standards.

4.1 System and Functional Evaluation

The proposed change would not modify how the containment purge and vent isolation valves function. The valves would continue to function as described in section 3.1 above and would not impact any of the design basis accidents requiring their safety function. The proposed amendment to verify the 36-inch containment purge and vent isolation valves are sealed closed when the reactor is at greater than Cold Shutdown conditions would not adversely affect the safe operation of the plant. The proposed amendment would align the surveillance requirements for the containment purge and vent isolation valves with the associated operability requirements, such that when the valves are required to be operable, they are verified to be sealed closed. The proposed amendment would ensure the valves are in their required DBA post-accident position prior to the reactor exceeding Cold Shutdown conditions.

Current plant practice is to seal closed the containment purge supply and exhaust isolation valves before the RCS is heated above 200°F. Therefore, DEK maintains KPS in a safe condition when above Cold Shutdown condition. This is verified by procedure.

The proposed change does not adversely impact containment integrity requirements, but increases the safety (enhances reliability) of the plant by ensuring that the valves are verified sealed closed when they are required to be operable. Therefore, the proposed change is considered satisfactory.

4.2 Regulatory Evaluation

The proposed amendment would revise KPS TS 4.4.f.1 to require the containment purge and vent isolation valves are verified sealed closed when the reactor is at greater than Cold Shutdown conditions. The current TS 4.4.f.1 requires that the containment purge and vent isolation valves are verified sealed closed at Hot Shutdown conditions and above. The proposed amendment does not affect the reliability of the containment purge and vent isolation valves. It does not change the current requirement to test these valves to assure they meet their Appendix J leak rate limits. The containment vent and purge valves will continue to meet their postulated post-accident leakage limits and no increase to the radiological consequences of an accident will result from the proposed amendment.

The KPS containment purge supply and exhaust valves will continue to meet the requirements of NUREG-0737, Item II.E.4.2, positions 6 and 7 (reference 1) as follows:

- The valves are required to be sealed closed[+] and verified sealed closed per TS 4.4.f.1 every 31 days.
- The valves close if a high radiation condition is detected in the containment.

However, NUREG-0737 also restricts the opening of these valves to plant conditions where containment integrity is not required. Containment integrity is required at KPS when the reactor is greater than Cold Shutdown conditions. NUREG-0737 specifies that these valves must be maintained closed when not in either the Cold Shutdown or Refueling modes of operation. The current KPS TS do not require these valves to be sealed closed while the plant is in the Intermediate Shutdown or Hot Shutdown condition; conditions when they are required to be operable per KPS TS 3.6.b.1. The proposed amendment is consistent with this portion of NUREG-0737, because it would require verification of closure of the containment purge and vent valves in all modes greater than Cold Shutdown.

The KPS containment purge supply and exhaust valves will continue to meet the requirements of NUREG-0800, Section 6.2.4.II.6 (reference 2) as follows:

f. The containment purge and vent isolation valves use sealed closed barriers over the control switches to prevent power from being supplied to the valve operators.

n. The containment purge and vent isolation valves are tested to verify they will close in 2.0 seconds or less, which meets the suggested timeframe of 5 seconds or less. The valves are sealed closed as described in section f. above and are verified closed per TS 4.4.f.1 every 31 days.

NUREG-0800, section 6.2.4 also prohibits the opening of these valves in operational conditions 1 – 4.[#] However, the current KPS TS 4.4.f.1 only requires these valves to be sealed closed when the reactor is critical, which corresponds to operational conditions 1 and 2. The proposed amendment would bring KPS into alignment with this portion of NUREG-0800 by requiring verification that the containment purge and vent isolation valves are closed when the reactor is at greater than Cold Shutdown conditions (operational conditions 1 – 4).

[+] In this application, the term "sealed" has no connotation of leak tightness. A containment purge and vent isolation valve that is sealed closed must be closed with its control switch sealed in the close position or under administrative control to assure that the valve cannot be inadvertently opened.

[#] Operational conditions correspond to the operational modes as described in the Standard Technical Specifications (e.g. NUREG-1431). Operational modes 1 – 4 correspond to Power Operation, Startup, Hot Standby and Hot Shutdown, respectively. The remaining operational modes are 5 and 6, which correspond to Cold Shutdown and Refueling, respectively.

Requiring the containment purge and vent isolation valves to be verified sealed closed when the reactor is at greater than Cold Shutdown conditions ensures that control and testing of these valves is consistent with NUREG-0737, Item II.E.4.2, provisions 6 and 7, and NUREG-0800, Section 6.2.4.II.6.f. Therefore, the proposed change is considered satisfactory.

4.3 Technical Specification Evaluation

The proposed change would revise TS 4.4.f.1 so that this SR mode of applicability for the containment purge and vent isolation valves is consistent with the corresponding LCO mode of applicability. As discussed in section 3.3 above, a TS SR mode of applicability should be consistent with the corresponding LCO mode of applicability unless otherwise justified. DEK cannot provide justification for the currently different mode of applicability for TS 4.4.f.1 versus the mode of applicability for the LCO. Furthermore, the applicable industry guidance regarding these valves (see section 3.2) does not specify a different mode of applicability. Therefore, the SR mode of applicability should be modified to align with the LCO mode of applicability, and the proposed change is considered satisfactory.

Conclusions

Currently, KPS TS 4.4.f.1 requires verification that the containment purge and vent isolation valves are sealed closed every 31 days when the reactor is critical. The proposed amendment would change TS 4.4.f.1 to require verification that the 36-inch containment purge and vent isolation valves are sealed closed when the reactor is at greater than Cold Shutdown conditions.

The proposed amendment would not adversely affect the safe operation of the plant. The proposed amendment would not adversely impact containment integrity requirements, but increases the safety of the plant by ensuring that when the containment purge and vent isolation valves are required to be operable they are also required to be verified as sealed closed. Requiring the containment purge and vent isolation valves to be verified sealed closed when the reactor is at greater than Cold Shutdown conditions ensures that operation and testing of these valves is in alignment with NUREG-0737, Item II.E.4.2, provisions 6 and 7, and NUREG-0800, Section 6.2.4.II.6.f. The proposed amendment would also align TS 4.4.f.1 with the mode of applicability for TS 3.6.b.1, the LCO requirements for the containment purge and vent isolation valves. Therefore, the proposed change is considered acceptable.

5.0 REGULATORY SAFETY ANALYSIS

5.1. No Significant Hazards Consideration

The proposed amendment would change KPS TS 4.4.f.1, "Containment Isolation Device Verification," to require verification that the 36-inch containment purge and vent isolation valves are sealed closed when the reactor is at greater than Cold Shutdown conditions.

Dominion Energy Kewaunee has evaluated the proposed amendment to determine if a significant hazards consideration is involved by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

   Response: No.

   The Design Bases Accidents (DBA) that result in a release of radioactive material within containment are a steam line break, rupture of a rod cluster control assembly, and loss-of-coolant accident (LOCA). In the analyses for each of these accidents, it is assumed that containment isolation valves are either closed or function to close within the required isolation time following accident initiation. This ensures that potential leakage paths to the environment through containment isolation valves (including containment purge and vent isolation valves) are minimized. The safety analyses assume that the containment purge and vent isolation valves are closed at accident initiation.

   The safety function of the containment purge and vent isolation valves is to support the Containment Isolation system by confining fission products within the Primary Containment system boundary during a DBA. The proposed amendment would require verification that the containment purge and vent isolation valves are sealed closed when the reactor is at greater than Cold Shutdown conditions. This requirement ensures the valves are in their required DBA post-accident position when the reactor is at greater than Cold Shutdown conditions.

   Verifying the containment purge and vent isolation valves are sealed closed at 31-day intervals does not add, delete, or modify any KPS system, structure, or component (SSC). Verifying that the containment purge and vent isolation valves are sealed closed when the reactor is at greater than Cold Shutdown conditions has no adverse effect on the ability of the plant to mitigate the effects of DBAs. The subject surveillance requirement constitutes a verification of isolation valve position and has no effect on equipment. Verification of valve closure only ensures the previous assumptions made in evaluating the consequences of DBAs remain valid. Therefore, there is no increase in the probability of an accident by performing the surveillance in additional modes of plant operation.

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

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

Response: No.

Verifying the containment purge and vent isolation valves are sealed closed when the reactor is at greater than Cold Shutdown conditions at 31-day intervals ensures these valves are in their required DBA post-accident position when the design function is required. The proposed amendment does not change the manner in which these valves are operated when the reactor is at or below Cold Shutdown or their design function. The proposed amendment does not create any new failure mechanisms or malfunctions for plant equipment or the nuclear fuel.

In addition, the containment purge and vent isolation valves are not accident initiators. Their function is only for mitigation of accidents.

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

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

Response: No.

Verifying the containment purge and vent isolation valves are sealed closed when the reactor is at greater than Cold Shutdown conditions at 31-day intervals ensures these valves are in their required DBA post-accident position when the design function is required. The proposed amendment does not change the manner in which these valves are operated when the reactor is at or below Cold Shutdown condition.

The proposed amendment would align the KPS TS with applicable NRC requirements stated in NUREG-0800, Section 6.2.4 and NUREG-0737, Item II.E.4.2. The proposed amendment does not result in altering or exceeding a design basis or safety limit for the plant. The safety analysis of record, including evaluations of the radiological consequences of design basis accidents, will remain applicable and unchanged.

Therefore, the proposed amendment does not involve a significant reduction in a margin of safety.

Based on the above, Dominion Energy Kewaunee, Inc. concludes that the proposed amendment presents 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/Criteria

The US Atomic Energy Commission (AEC) issued their Safety Evaluation (SE) for the Kewaunee Power Station (KPS) on July 24, 1972 with supplements dated December 18, 1972, and May 10, 1973. The SE, Section 3.1, "Conformance with AEC General Design Criteria," described the conclusions the AEC reached associated with the General Design Criteria in effect at the time. The AEC stated:

> *The Kewaunee plant was designed and constructed to meet the intent of the AEC's General Design Criteria, as originally proposed in July 1967. Construction of the plant was about 50% complete and the Final Safety Analysis Report (Amendment No. 7) had been filed with the Commission before publication of the revised General Design Criteria in February 1971 and the present version of the criteria in July 1971. As a result, we did not require the applicant to reanalyze the plant or resubmit the FSAR. However, our technical review did assess the plant against the General Design Criteria now in effect and we are satisfied that the plant design generally conforms to the intent of these criteria.*

The safety function of the containment purge and vent isolation valves is to support the Containment Isolation system by confining fission products within the Primary Containment system boundary during a DBA. The proposed change is consistent with the applicable requirements in NUREG-0737, Item II.E.4.2, provisions six and seven, and NUREG-0800, Section 6.2.4.

Based on the considerations discussed above:

1. There is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner;
2. Such activities will be conducted in compliance with the Commission's regulations, and;
3. The issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 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 criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

1. NUREG-0737, "Clarification of TMI Action Plan Requirements," Item II.E.4.2, "Containment Isolation Dependability," dated November 1980.
2. NUREG-0800, "Standard Review Plan," Section 6.2.4, "Containment Isolation System," Revision 2, dated July 1981.
3. Letter from John G. Lamb (NRC) to Mark Reddemann (NMC), "Subject: Kewaunee Nuclear Power Plant - Issuance of Amendment (TAC NO. MA8017)," dated June 8, 2001. [ADAMS Accession No. ML011590319]
4. Letter from C.W. Giesler (WPSC) to Director of NRR (NRC), "Operability of Large Pratt Butterfly Valves Used for Containment Isolation," dated March 7, 1983.
5. Letter from Steven A. Varga (NRC) to C. W. Giesler (WPSC), "Completion of the Review of Venting and Purging Containment While at Full Power and Effect on LOCA (MPA B-24)," dated April 22, 1983.

ATTACHMENT 2

LICENSE AMENDMENT REQUEST 229

CHANGE TECHNICAL SPECIFICATIONS TO REQUIRE TESTING CONTAINMENT PURGE AND VENT ISOLATION VALVES WHEN THE REACTOR IS ABOVE COLD SHUTDOWN

MARKED-UP TECHNICAL SPECIFICATIONS PAGE

KEWAUNEE POWER STATION

MARKED-UP TS PAGE:
TS 4.4-3

DOMINION ENERGY KEWAUNEE, INC.

d. Auxiliary Building Special Ventilation System

1. Periodic tests of the Auxiliary Building Special Ventilation System, including the door interlocks, shall be performed in accordance with TS 4.4.c.1 through TS 4.4.c.3, except for TS 4.4.c.2.d.

2. Each train of Auxiliary Building Special Ventilation System shall be operated with the heaters on at least 15 minutes every month.

3. Each system shall be determined to be operable at the time of periodic test if it starts with coincident isolation of the normal ventilation ducts and produces a measurable vacuum throughout the special ventilation zone with respect to the outside atmosphere.

e. Containment Vacuum Breaker System

The power-operated valve in each vent line shall be tested during each refueling outage to demonstrate that a simulated containment vacuum of 0.5 psig will open the valve and a simulated accident signal will close the valve. The check and butterfly valves will be leak tested in accordance with TS 4.4.b during each refueling, except that the pressure will be applied in a direction opposite to that which would occur post-LOCA.

f. Containment Isolation Device Position Verification

1. When the reactor is ~~critical~~greater than Cold Shutdown condition, verify each 36 inch containment purge and vent isolation valve is sealed closed every 31 days.

2. When the reactor is critical, verify each 2 inch containment vent isolation valve is closed every 31 days, except when the 2 inch containment vent isolation valves are open for pressure control, ALARA, or air quality considerations for personnel entry, or Surveillances that require the valves to be open.

3. Containment isolation manual valves and blind flanges shall be verified closed as specified in TS 4.4.f.3.a and TS 4.4.f.3.b, except as allowed by TS 4.4.f.3.c.

   a. When greater than COLD SHUTDOWN, verify each containment isolation manual valve and blind flange that is located outside containment and required to be closed during accident conditions is closed every 31 days, except for containment isolation valves that are locked, sealed, or otherwise secured closed or open as allowed by TS 3.6.b.2.

ATTACHMENT 3

LICENSE AMENDMENT REQUEST 229

**CHANGE TECHNICAL SPECIFICATIONS TO
REQUIRE TESTING CONTAINMENT PURGE AND VENT ISOLATION VALVES
WHEN THE REACTOR IS ABOVE COLD SHUTDOWN**

MARKED UP TECHNICAL SPECIFICATIONS BASES PAGE

KEWAUNEE POWER STATION

**TS B3.6-1 – B3.6-3
TS B4.4-4**

DOMINION ENERGY KEWAUNEE, INC.

BASIS

Containment System Integrity (TS 3.6.a)

The COLD SHUTDOWN condition precludes any energy releases or buildup of containment pressure from flashing of reactor coolant in the event of a system break. The restriction to fuel that has been irradiated during power operation allows initial testing with an open containment when negligible activity exists. The shutdown margin for the COLD SHUTDOWN condition assures subcriticality with the vessel closed even if the most reactive RCC assembly were inadvertently withdrawn. Therefore, the two parts of TS 3.6.a allow CONTAINMENT SYSTEM INTEGRITY to be violated when a fission product inventory is present only under circumstances that preclude both criticality and release of stored energy.

When the reactor vessel head is removed with the CONTAINMENT SYSTEM INTEGRITY violated, the reactor must not only be in the COLD SHUTDOWN condition, but also in the REFUELING shutdown condition. A 5% shutdown margin is specified for REFUELING conditions to prevent the occurrence of criticality under any circumstances, even when fuel is being moved during REFUELING operations.

This specification also prevents positive insertion of reactivity whenever Containment System integrity is not maintained if such addition would violate the respective shutdown margins. Effectively, the boron concentration must be maintained at a predicted concentration of 2,200 ppm[1] or more if the Containment System is to be disabled with the reactor pressure vessel open.

Containment Isolation Valves (TS 3.6.b)

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

To be considered operable, automatic containment isolation valves are required to close within prescribed time limits and to actuate on an automatic isolation signal. Check valves are considered operable when they have satisfactorily completed their required surveillance testing. Manual isolation components are considered operable when manual valves are closed, blind flanges are in place, and closed systems are intact.

Penetration flow path(s) may be unisolated intermittently under administrative controls except for the containment purge and vent isolation valves. These administrative controls consist of stationing a dedicated operator at the valve controls, who is in continuous communication with the control room. In this way, the penetration can be rapidly isolated when a need for containment isolation is indicated. Due to the size of the containment purge line penetration and the fact that those penetrations exhaust directly from the containment atmosphere to the environment, the penetration flow path containing these valves may not be opened under administrative controls. Specification TS 3.6.b.2 pertains to inoperable valves described in TS 3.6.b.3, manual valves assumed to be closed, and normally closed valves that are not assumed, by the USAR, to automatically close. This allows opening of containment isolation valves without entering the LCO or to open containment isolation valves closed as required by TS, provided the administrative controls are in place to ensure valve closure, if needed.

[1] USAR Table 3.2-1

~~continuous communication with the control room. In this way, the penetration can be rapidly isolated when a need for containment isolation is indicated. Specification TS 3.6.b.2 pertains to inoperable valves described in TS 3.6.b.3, manual valves assumed to be closed, and normally closed valves that are not assumed, by the USAR, to automatically close. This allows opening of containment isolation valves without entering the LCO or to open containment isolation valves closed as required by TS, provided the administrative controls are in place to ensure valve closure, if needed.~~

Containment Purge and Vent Isolation Valves (36 inch purge valves)

The Containment Purge System operates to supply outside air into the containment for ventilation and cooling or heating and may also be used to reduce the concentration of noble gases within containment prior to and during personnel access. The supply and exhaust lines each contain two isolation valves. Because of their large size, the 36 inch purge valves are not qualified for automatic closure from their open position under DBA conditions. Therefore, each of the purge valves is required to remain sealed closed when the reactor is greater than Cold Shutdown condition. In this case, the single failure criterion remains applicable to the containment purge valves due to failure in the control circuit associated with each valve. The purge system valve design precludes a single failure from compromising the containment boundary as long as the system is operated in accordance with the Technical Specifications.

For ~~these LCO(s),~~TS 3.6.b.3 separate condition entry is allowed for each penetration flow path. This is acceptable, since the required actions for each condition provide appropriate compensatory actions for each inoperable containment isolation valve. Complying with the required actions may allow for continued operation, and subsequent inoperable containment isolation valves are governed by subsequent condition entry and application of associated required actions.

In the event a containment isolation valve in one or more penetration flow paths is inoperable, the affected penetration flow path must be isolated within the specified time constraints. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are 1) a closed and de-activated automatic containment isolation valve, 2) a closed manual valve, 3) a blind flange, and 4) a check valve with flow through the valve secured. For a penetration flow path isolated, the device used to isolate the penetration should be the closest available one to containment. The 24-hour completion time is reasonable, considering the time required to isolate the penetration, perform maintenance, and the relative importance of supporting containment OPERABILITY.

For affected containment penetration flow paths that cannot be restored to operable status within the required completion time and that have been isolated, the affected penetration flow paths must be verified to be isolated on a periodic basis. This is necessary to ensure containment penetrations, requiring isolation following an accident and no longer capable of being automatically isolated, will be in that isolated position should an event occur. This required action does not require any testing or device manipulation. Rather, it involves verification, through a system walkdown, that those isolation devices outside containment and capable of being mispositioned are in the correct position. For the isolation devices inside containment, the time period is specified as "prior to entering intermediate shutdown from cold shutdown if not performed within the previous 92 days." This is based on engineering judgment and is considered reasonable in view of the inaccessibility of the isolation devices and other administrative controls that will ensure that isolation device misalignment is an unlikely possibility.

With two containment isolation valves in one or more penetration flow paths inoperable, the affected penetration flow path must be isolated within 1 hour. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic valve, a closed manual valve, and a blind flange. The 1-hour Completion Time is consistent with the ACTIONS of LCO 3.0.c. In the event the affected penetration is isolated, the affected penetration must be verified to be isolated on a periodic basis which remains in effect. This periodic verification is necessary to assure leak tightness of containment and that penetrations requiring isolation following an accident are isolated. The Completion Time of "once per 31 days for verifying each affected penetration flow path is isolated" is appropriate considering the fact that the valves are operated under administrative control and the probability of their misalignment is low.

For those penetrations where one of the isolation devices is a closed system, either inside containment or outside containment, a longer outage time is allowed. This condition is only applicable to those penetration flow paths with a single containment isolation valve and a closed system. This longer outage time is due to a closed system subjected to leakage testing, missile protected, and seismic category I piping. Also, a closed system typically has flow through it during normal operation such that any loss of integrity could be observed through leakage detection system inside containment and system walkdowns outside containment. Thus, a 72-hour completion time is considered appropriate given that certain valves may be located inside containment and the reliability of the closed system.

Isolation devices located in high radiation areas shall be verified closed by use of administrative means. Verification by administrative means is considered acceptable, since access to these areas is typically restricted. Therefore, the probability of misalignment of these devices once they have been verified to be in the proper position is small.

By removing or interrupting the valves motive force, ~~D~~activation of an automatic containment isolation valve is precluded.~~accomplished by removing or interrupting the valves motive force, thus, preventing a change in the valve position by a single active failure. De-a~~ Activation may be prevented~~accomplished~~ by opening the supply breaker for a motor operated valve, isolating air to an air operated valve, removing the supply fuse for a solenoid operated valve, or any other means for ensuring the isolation barrier cannot be affected by a single active failure.

Isolation Device Positions (TS 4.4.f)

TS 4.4.f.1 ensures each 36 inch containment purge valve is verified sealed closed at 31-day intervals.[6] This Surveillance is designed to ensure that an inadvertent or spurious opening of a containment purge valve does not cause a gross breach of containment. Detailed analysis of the purge valves failed to conclusively demonstrate their ability to close during a LOCA in time to limit off-site doses. Therefore, these valves are required to be in the sealed closed position when the reactor is greater than Cold Shutdown condition~~critical~~. A containment purge valve that is sealed closed must be closed with its control switch sealed in the close position. In this application, the term "sealed" has no connotation of leak tightness. The frequency is a result of a NRC initiative, Generic Issue B-24, related to containment purge valve use during plant operations.

TS 4.4.f.2 ensures the 2-inch vent/purge valves are closed as required or, if open, open for an allowable reason. If a 2-inch vent/purge valve is open in violation of this TS, the valve is considered inoperable. If the inoperable valve is not otherwise known to have excessive leakage when closed, it is not considered to have leakage outside of limits. The TS is not required to be met when the 2-inch vent/purge valves are open for the reasons stated. The valves may be opened for pressure control, ALARA, or air quality considerations for personnel entry, or for Surveillances that require the valves to be open. The 2-inch vent/purge valves are capable of closing in the environment following a LOCA. Therefore, these valves are allowed to be open for limited periods of time. The 31 day frequency is consistent with other containment isolation valve requirements discussed.

TS 4.4.f.3.A requires verification that each containment isolation manual valve and blind flange located outside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed. The TS helps to ensure that post-accident leakage of radioactive fluids or gases outside of the containment boundary are within design limits. This TS does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those containment isolation valves outside containment and capable of being mispositioned are in the correct position. Since verification of valve position for containment isolation valves outside containment is relatively easy, the 31day frequency is based on engineering judgment and was chosen to provide added assurance of the correct positions. The TS specifies that containment isolation valves that are open under administrative controls are not required to meet the TS during the time the valves are open. This TS does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing.

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[6] Letter from Steven A. Varga (NRC) to C.W. Giesler (WPSC) dated April 22, 1983