Nebraska Public Power District
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50.90

NLS2022005
June 16, 2022

Attention: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Subject: Application to Revise Technical Specifications to Adopt TSTF-554, Revision 1, "Revise Reactor Coolant Leakage Requirements"
Cooper Nuclear Station, Docket No. 50-298, License No. DPR-46

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Nebraska Public Power District (NPPD) is submitting a request for an amendment to the Technical Specifications (TS) for Cooper Nuclear Station (CNS).

NPPD requests adoption of TSTF-554, Revision 1, "Revise Reactor Coolant Leakage Requirements," which is an approved change to the Standard Technical Specifications, into the CNS Technical Specifications (TS). The proposed amendment revises the TS definition of "Leakage," clarifies the requirements when pressure boundary leakage is detected, and adds a Required Action when pressure boundary leakage is identified. The change is requested as part of the Consolidated Line Item Improvement Process.

Attachment 1 provides a description and assessment of the proposed changes. Attachment 2 provides the existing TS pages marked to show the proposed changes. Attachment 3 provides revised (clean) TS pages. Attachment 4 provides existing TS Bases pages marked to show the proposed changes for information only.

Approval of the proposed amendment is requested by June 16, 2023. Once approved, the amendment shall be implemented within 60 days.

There are no regulatory commitments made in this submittal.

The proposed TS changes have been reviewed by the necessary safety review committees (Station Operations Review Committee and Safety Review and Audit Board). In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," a copy of this application, with attachments, is being provided to the designated State of Nebraska Official.

If you should have any questions regarding this submittal, please contact Linda Dewhirst, Regulatory Affairs and Compliance Manager, at (402) 825-5416.

I declare under penalty of perjury that the foregoing is true and correct.

Executed On: 6/16/2022
Date

Sincerely,

Khalil Dia
General Manager of Plant Operations

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Attachments:
1. Description and Assessment
2. Proposed Technical Specifications Changes (Mark-up)
3. Revised Technical Specifications Pages
4. Proposed Technical Specifications Bases Changes (Mark-up) - Information Only

cc: Regional Administrator w/ attachments
USNRC - Region IV

Cooper Project Manager w/ attachments
USNRC - NRR Plant Licensing Branch IV

Senior Resident Inspector w/ attachments
USNRC - CNS

Nebraska Health and Human Services w/ attachments
Department of Regulation and Licensure

NPG Distribution w/ attachments

CNS Records w/ attachments

Attachment 1

Description and Assessment

Cooper Nuclear Station, Docket No. 50-298, License No. DPR-46

1.0 DESCRIPTION

Nebraska Public Power District (NPPD) requests adoption of TSTF-554, Revision 1, "Revise Reactor Coolant Leakage Requirements," which is an approved change to the Standard Technical Specifications (STS), into the Cooper Nuclear Station (CNS) Technical Specifications (TS). The proposed amendment revises the TS definition of "Leakage" and the Reactor Coolant System (RCS) Operational Leakage TS to clarify the requirements.

2.0 ASSESSMENT

2.1 Applicability of Safety Evaluation

NPPD has reviewed the safety evaluation for TSTF-554, Revision 1, provided to the Technical Specifications Task Force (TSTF) in a letter dated December 18, 2020, Nuclear Regulatory Commission (NRC) ADAMS Accession No. ML20322A361. This review included a review of the NRC staff's evaluation, as well as the information provided in TSTF-554, Revision 1. NPPD has concluded that the justifications presented in TSTF-554, Revision 1, and the safety evaluation prepared by the NRC staff are applicable to CNS and justify this amendment for the incorporation of the changes into the CNS TS.

2.2 Variations

NPPD is proposing the following variations from the TS changes described in TSTF-554, Revision 1, or the applicable parts of the NRC staff's safety evaluation:

2.2.1 TSTF-554 makes editorial changes to the definition of LEAKAGE in STS Section 1.1 which have already been incorporated in the CNS TS and are not needed. Specifically, TSTF-554, Revision 1, changes commas to semi-colons in LEAKAGE paragraphs a.1, a.2 and c. These variations do not affect the applicability of TSTF-554, Revision 1, or the NRC staff's safety evaluation to the proposed license amendment.

2.2.2 TSTF-554 makes an editorial change to the definition of LEAKAGE paragraph b. to delete a comma at the end of the paragraph. CNS TS currently has a semi-colon in place of the comma, and the semi-colon will be deleted to make paragraph b. match TSTF-554, Revision 1. This variation does not affect the applicability of TSTF-554, Revision 1, or the NRC staff's safety evaluation to the proposed license amendment.

2.2.3 TSTF-554, Revision 1, contains the word "and" at the end of paragraph c. in the definition of LEAKAGE in STS Section 1.1. The CNS TS Section 1.1 definition of LEAKAGE is revised to add the word "and" at the end of paragraph c. This variation does not affect the applicability of TSTF-554, Revision 1, or the NRC staff's safety evaluation to the proposed license amendment.

2.2.4 The traveler and safety evaluation discuss the applicable regulatory requirement and guidance, including the 10 CFR 50, Appendix A, General Design Criteria (GDC). CNS

was not licensed to the 10 CFR 50, Appendix A, GDC. The CNS equivalents of the referenced GDC are located in Appendix F of the CNS Updated Safety Analysis Report (USAR). The USAR concludes that CNS meets the intent of the criteria contained in the 1971 10 CFR 50 Appendix A Final Rule. This difference does not alter the conclusion that the proposed change is applicable to CNS.

3.0 REGULATORY ANALYSIS

3.1 No Significant Hazards Consideration Analysis

Nebraska Public Power District (NPPD) requests adoption of TSTF-554, Revision 1, "Revise Reactor Coolant Leakage Requirements," that is an approved change to the Standard Technical Specifications, into the Cooper Nuclear Station Technical Specifications (TS). The proposed amendment revises the TS definition of "Leakage," clarifies the requirements when pressure boundary leakage is detected, and adds a Required Action when pressure boundary leakage is identified.

NPPD 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 proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   The proposed amendment revises the TS definition of "Leakage," clarifies the requirements when pressure boundary leakage is detected, and adds a Required Action when pressure boundary leakage is identified.

   The proposed change revises the definition of pressure boundary leakage. Pressure boundary leakage is a precursor to some accidents previously evaluated. The proposed change expands the definition of pressure boundary leakage by eliminating the qualification that pressure boundary leakage must be from a "nonisolable" flaw. A new TS Action is created which requires isolation of the pressure boundary flaw from the Reactor Coolant System (RCS). This new action provides assurance that the flaw will not result in any accident previously evaluated.

   Pressure boundary leakage, and the actions taken when pressure boundary leakage is detected, is not assumed in the mitigation of any accident previously evaluated. As a result, the consequences of any accident previously evaluated are unaffected.

   Therefore, the proposed change 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

   The proposed amendment revises the TS definition of "Leakage," clarifies the requirements when pressure boundary leakage is detected, and adds a Required Action when pressure boundary leakage is identified. The proposed change does not alter the design function or operation of the RCS. The proposed change does not alter the ability of the RCS to perform its design function. Since pressure boundary leakage is an evaluated accident, the proposed change does not create any new failure mechanisms, malfunctions, or accident initiators not considered in the design and licensing bases.

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

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

   Response: No

   The proposed amendment revises the TS definition of "Leakage," clarifies the requirements when pressure boundary leakage is detected, and adds a Required Action when pressure boundary leakage is identified. The proposed change does not affect the initial assumptions, margins, or controlling values used in any accident analysis. The amount of leakage allowed from the RCS is not increased. The proposed change does not affect any design basis or safety limit or any Limiting Condition for Operation.

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

Based on the above, NPPD concludes that the proposed change 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.

3.2 Conclusion

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

4.0 ENVIRONMENTAL CONSIDERATION

The proposed change would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change 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 change.

Attachment 2

Proposed Technical Specifications Changes (Mark-up)

Cooper Nuclear Station, Docket No. 50-298, License No. DPR-46

Revised Pages

1.1-4
3.4-8
3.4-9

1.1 Definitions

DRAIN TIME (continued)

c. The penetration flow paths required to be evaluated per paragraph b. are assumed to open instantaneously and are not subsequently isolated, and no water is assumed to be subsequently added to the RPV water inventory;

d. No additional draining events occur; and

e. Realistic cross-sectional areas and drain rates are used.

A bounding DRAIN TIME may be used in lieu of a calculated value.

INSERVICE TESTING PROGRAM

The INSERVICE TESTING PROGRAM is the licensee program that fulfills the requirements of 10 CFR 50.55a(f).

LEAKAGE

LEAKAGE shall be:

a. Identified LEAKAGE

1. LEAKAGE into the drywell, such as that from pump seals or valve packing, that is captured and conducted to a sump or collecting tank; or

2. LEAKAGE into the drywell atmosphere from sources that are both specifically located and known ~~either~~ to not ~~to~~ interfere with the operation of leakage detection systems ~~or not to be pressure boundary LEAKAGE~~;

b. Unidentified LEAKAGE

All LEAKAGE into the drywell that is not identified LEAKAGE;

c. Total LEAKAGE

Sum of the identified and unidentified LEAKAGE; and

d. Pressure Boundary LEAKAGE

LEAKAGE through a ~~nonisolable~~ fault in a Reactor Coolant System (RCS) component body, pipe wall, or vessel wall. LEAKAGE past seals, packing, and gaskets is not pressure boundary LEAKAGE.

(continued)

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 RCS Operational LEAKAGE

LCO 3.4.4 RCS operational LEAKAGE shall be limited to:

a. No pressure boundary LEAKAGE;

b. ≤ 5 gpm unidentified LEAKAGE;

c. ≤ 30 gpm total LEAKAGE averaged over the previous 24 hour period; and

d. ≤ 2 gpm increase in unidentified LEAKAGE within the previous 24 hour period in MODE 1.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Pressure boundary LEAKAGE exists.	A.1 Isolate affected component, pipe, or vessel from the RCS by use of a closed manual valve, closed and de-activated automatic valve, blind flange, or check valve.	4 hours
~~A~~B. Unidentified LEAKAGE not within limit. OR Total LEAKAGE not within limit.	~~A~~B.1 Reduce LEAKAGE to within limits.	4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
~~B~~C. Unidentified LEAKAGE increase not within limit.	~~B~~C.1	Reduce unidentified LEAKAGE increase to within limits.	4 hours
	OR		
	~~B~~C.2	Verify source of unidentified LEAKAGE increase is not service sensitive type 304 or type 316 austenitic stainless steel.	4 hours
~~C~~D. Required Action and associated Completion Time ~~of Condition A or B~~ not met.	~~C~~D.1	Be in MODE 3.	12 hours
	AND		
~~OR~~	~~C~~D.2	Be in MODE 4.	36 hours
~~Pressure boundary LEAKAGE exists.~~			

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify RCS unidentified and total LEAKAGE and unidentified LEAKAGE increase are within limits.	In accordance with the Surveillance Frequency Control Program

Attachment 3

Revised Technical Specifications Pages

Cooper Nuclear Station, Docket No. 50-298, License No. DPR-46

Revised Pages

1.1-4
3.4-8
3.4-9

1.1 Definitions

DRAIN TIME (continued)

c. The penetration flow paths required to be evaluated per paragraph b. are assumed to open instantaneously and are not subsequently isolated, and no water is assumed to be subsequently added to the RPV water inventory;

d. No additional draining events occur; and

e. Realistic cross-sectional areas and drain rates are used.

A bounding DRAIN TIME may be used in lieu of a calculated value.

INSERVICE TESTING PROGRAM

The INSERVICE TESTING PROGRAM is the licensee program that fulfills the requirements of 10 CFR 50.55a(f).

LEAKAGE

LEAKAGE shall be:

a. Identified LEAKAGE

1. LEAKAGE into the drywell, such as that from pump seals or valve packing, that is captured and conducted to a sump or collecting tank; or

2. LEAKAGE into the drywell atmosphere from sources that are both specifically located and known to not interfere with the operation of leakage detection systems;

b. Unidentified LEAKAGE

All LEAKAGE into the drywell that is not identified LEAKAGE

c. Total LEAKAGE

Sum of the identified and unidentified LEAKAGE; and

d. Pressure Boundary LEAKAGE

LEAKAGE through a fault in a Reactor Coolant System (RCS) component body, pipe wall, or vessel wall. LEAKAGE past seals, packing, and gaskets is not pressure boundary LEAKAGE.

(continued)

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 RCS Operational LEAKAGE

LCO 3.4.4 RCS operational LEAKAGE shall be limited to:

a. No pressure boundary LEAKAGE;

b. ≤ 5 gpm unidentified LEAKAGE;

c. ≤ 30 gpm total LEAKAGE averaged over the previous 24 hour period; and

d. ≤ 2 gpm increase in unidentified LEAKAGE within the previous 24 hour period in MODE 1.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Pressure boundary LEAKAGE exists.	A.1 Isolate affected component, pipe, or vessel from the RCS by use of a closed manual valve, closed and de-activated automatic valve, blind flange, or check valve.	4 hours
B. Unidentified LEAKAGE not within limit. OR Total LEAKAGE not within limit.	B.1 Reduce LEAKAGE to within limits.	4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Unidentified LEAKAGE increase not within limit.	C.1	Reduce unidentified LEAKAGE increase to within limits.	4 hours
	OR		
	C.2	Verify source of unidentified LEAKAGE increase is not service sensitive type 304 or type 316 austenitic stainless steel.	4 hours
D. Required Action and associated Completion Time not met.	D.1	Be in MODE 3.	12 hours
	AND		
	D.2	Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify RCS unidentified and total LEAKAGE and unidentified LEAKAGE increase are within limits.	In accordance with the Surveillance Frequency Control Program

Attachment 4

Proposed Technical Specifications Bases Changes (Mark-up) - Information Only

Cooper Nuclear Station, Docket No. 50-298, License No. DPR-46

Revised Pages

B 3.4-20
B 3.4-21
B 3.4-22
B 3.4-23

BASES

APPLICABLE SAFETY ANALYSES

The allowable RCS operational LEAKAGE limits are based on the predicted and experimentally observed behavior of pipe cracks. The normally expected background LEAKAGE due to equipment design and the detection capability of the instrumentation for determining system LEAKAGE were also considered. The evidence from experiments suggests that, for LEAKAGE even greater than the specified unidentified LEAKAGE limits, the probability is small that the imperfection or crack associated with such LEAKAGE would grow rapidly.

The unidentified LEAKAGE flow limit allows time for corrective action before the RCPB could be significantly compromised. The 5 gpm limit is a small fraction of the calculated flow from a critical crack in the primary system piping. Crack behavior from experimental programs (Refs. 4 and 5) shows that leakage rates of hundreds of gallons per minute will precede crack instability.

The low limit on increase in unidentified LEAKAGE assumes a failure mechanism of intergranular stress corrosion cracking (IGSCC) in service sensitive type 304 and type 316 austenitic stainless steel that produces tight cracks. This flow increase limit is capable of providing an early warning of such deterioration.

No applicable safety analysis assumes the total LEAKAGE limit. The total LEAKAGE limit considers RCS inventory makeup capability and drywell floor sump capacity.

RCS operational LEAKAGE satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii) (Ref. 6).

LCO

RCS operational LEAKAGE shall be limited to:

a. Pressure Boundary LEAKAGE

~~No p~~Pressure boundary LEAKAGE is prohibited ~~allowed, because it is indicative of material degradation. LEAKAGE of this type is unacceptable~~ as the leak itself could cause further RCPB deterioration, resulting in higher LEAKAGE. ~~Violation of this LCO could result in continued degradation of the RCPB. LEAKAGE past seals and gaskets is not pressure boundary LEAKAGE~~

BASES

LCO (continued)

b. Unidentified LEAKAGE

The 5 gpm of unidentified LEAKAGE is allowed as a reasonable minimum detectable amount that the drywell atmospheric monitoring and drywell floor drain sump monitoring equipment can detect within a reasonable time period. Separating the sources of leakage (i.e., leakage from an identified source versus leakage from an unidentified source) is necessary for prompt identification of potentially adverse conditions, assessment of the safety significance, and corrective action. ~~Violation of this LCO could result in continued degradation of the RCPB.~~

c. Total LEAKAGE

The total LEAKAGE limit is based on a reasonable minimum detectable amount. The limit also accounts for LEAKAGE from known sources (identified LEAKAGE). Violation of this LCO indicates an unexpected amount of LEAKAGE and, therefore, could indicate new or additional degradation in an RCPB component or system.

d. Unidentified LEAKAGE Increase

An unidentified LEAKAGE increase of > 2 gpm within the previous 24 hour period indicates a potential flaw in the RCPB and must be quickly evaluated to determine the source and extent of the LEAKAGE. The increase is measured relative to the steady state value; temporary changes in LEAKAGE rate as a result of transient conditions (e.g., startup) are not considered. As such, the 2 gpm increase limit is only applicable in MODE 1 when operating pressures and temperatures are established. ~~Violation of this LCO could result in continued degradation of the RCPB.~~

APPLICABILITY In MODES 1, 2, and 3, the RCS operational LEAKAGE LCO applies, because the potential for RCPB LEAKAGE is greatest when the reactor is pressurized.

In MODES 4 and 5, RCS operational LEAKAGE limits are not required since the reactor is not pressurized and stresses in the RCPB materials and potential for LEAKAGE are reduced.

BASES

ACTIONS

A.1

If pressure boundary LEAKAGE exists, the affected component, pipe, or vessel must be isolated from the RCS by a closed manual valve, closed and de-activated automatic valve, blind flange, or check valve within 4 hours. While in this condition, structural integrity of the system should be considered because the structural integrity of the part of the system within the isolation boundary must be maintained under all licensing basis conditions, including consideration of the potential for further degradation of the isolated location. Normal LEAKAGE past the isolation device is acceptable as it will limit RCS LEAKAGE and is included in identified or unidentified LEAKAGE. This action is necessary to prevent further deterioration of the RCPB.

B.1

With RCS unidentified or total LEAKAGE greater than the limits, actions must be taken to reduce the leak. Because the LEAKAGE limits are conservatively below the LEAKAGE that would constitute a critical crack size, 4 hours is allowed to reduce the LEAKAGE rates before the reactor must be shut down. If an unidentified LEAKAGE has been identified and quantified, it may be reclassified and considered as identified LEAKAGE; however, the total LEAKAGE limit would remain unchanged.

~~B~~C.1 and ~~B~~C.2

An unidentified LEAKAGE increase of > 2 gpm within a 24 hour period is an indication of a potential flaw in the RCPB and must be quickly evaluated. Although the increase does not necessarily violate the absolute unidentified LEAKAGE limit, certain susceptible components must be determined not to be the source of the LEAKAGE increase within the required Completion Time. For an unidentified LEAKAGE increase greater than required limits, an alternative to reducing LEAKAGE increase to within limits (i.e., reducing the LEAKAGE rate such that the current rate is less than the "2 gpm increase in the previous 24 hours" limit; either by isolating the source or other possible methods) is to evaluate service sensitive type 304 and type 316 austenitic stainless steel piping that is subject to high stress or that contains relatively stagnant or intermittent flow fluids and determine it is not the source of the increased LEAKAGE. This type piping is very susceptible to IGSCC.

The 4 hour Completion Time is reasonable to properly reduce the LEAKAGE increase or verify the source before the reactor must be shut down without unduly jeopardizing plant safety.

BASES

~~C~~D.1 and ~~C~~D.2

If any Required Action and associated Completion Time ~~of Condition A or B~~ is not met ~~or if pressure boundary LEAKAGE exists~~, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable,