

REQUEST FOR ADDITIONAL INFORMATION

AMENDMENT REQUEST TO ADD STEAM GENERATOR BLOWDOWN ISOLATION

REQUIREMENTS TO TECHNICAL SPECIFICATIONS (TAC NO. ME0596)

1. Provide the following information:

- a) The purpose and functional description of the steam generator blowdown system.
- b) Specific consequences, including impact on other Technical Specifications (TS), when isolating the system (immediate and long-term if done as a mitigating action for when equipment is inoperable).
- c) Any Updated Safety Analysis Report (USAR) references that may discuss (a) or (b) above.

Background: 10 CFR 50.36(c)(2)(i) requires that TS contain Limiting Conditions for Operation (LCO) which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met.

Omaha Public Power District (OPPD) is proposing to revise the USAR and TS to contain automatic isolation of the steam generator blowdown system on a reactor scram. However, no functional description of the steam generator blowdown system is included in the License Amendment Request (LAR). A precursory review of the USAR was done, and no information was found. The LAR does reference USAR section 7.2.7.1, however, no description of the system could be found in that section. Section 7.2.7.1, in USAR revision 15, is "Analog Portion of System," for Section 7.2.7, "Effects of Circuits and Components Failure." Section 7.2 is instrumentation and control for reactor protection systems.

In addition, under "Failure Mode Evaluation" of Section 3.0 of the LAR, OPPD states "A spurious de-energization of a relay will result in blowdown isolation. While this is undesirable, the consequences of a spurious blowdown isolation are minimal." However, no specific consequences are discussed.

The information requested by this RAI is needed to support review of the LAR. Specifically, the information is needed to ensure that proposed Function 4, "Steam Generator Blowdown Isolation," in TS Table 2-4, "Instrument Operating Conditions for Isolation Functions" ensures continued safe operation of the facility per 10 CFR 50.36(c)(2)(i). In addition, the supplemental information is needed in order to conclude that the proposed remedial actions, as permitted under 10 CFR 50.36(c)(2)(i), are acceptable.

2. Explain how the "Minimum Degree of Redundancy" column, in TS Table 2-4, effects operability requirements in the "Minimum Operable Channels" column.

Background: 10 CFR 50.36(c)(2)(i) requires that TS contain LCOs which are the lowest functional capability or performance levels of equipment required for safe operation of the facility.

OPPD is proposing to revise the TS to contain automatic isolation of the steam generator blowdown system on a reactor scram. Proposed Function 4, "Steam Generator Blowdown

Isolation,” in TS Table 2-4, “Instrument Operating Conditions for Isolation Functions,” contains a column labeled “Minimum Degree of Redundancy,” and lists values of “None” for the Steam Generator Blowdown Isolation. TS 2.15(3) and TS 2.15(4) discuss “Minimum Degree of Redundancy,” however, it is still unclear how this column impacts the requirements in the column labeled “Minimum Operable Channels.”

In order to ensure that 10 CFR 50.36(c)(2)(i) continues to be met, with regard to proposed Function 4, explain how the “Minimum Degree of Redundancy” column effects operability requirements in the “Minimum Operable Channels” column.

3. Are the existing SG blowdown valve isolation signals in the current TS? If so, where? If not, are the existing valve isolation signals discussed in the USAR?

Background: 10 CFR 50.36(c)(2)(i) requires that TS contain LCOs which are the lowest functional capability or performance levels of equipment required for safe operation of the facility.

OPPD is proposing to revise the TS to contain automatic isolation of the steam generator blowdown system on a reactor scram. Under “Existing Valve Isolation Signals” of Section 3.0 of the LAR, OPPD states “There are currently two signals that generate a SG blowdown isolation signal. The first is a SG Blowdown Hi Radiation level (indicative of a SG tube rupture event). The second is a Containment Isolation Actuation Signal (CIAS).” A precursory review of the TS was done, and no explicit TS requirement was found for the existing valve isolation signals. However, the TS may or may not implicitly require that the existing valve isolation signals be contained under broader isolation functions contained in TS 2.15.

The information requested by this RAI is needed to ensure that proposed Function 4, “Steam Generator Blowdown Isolation,” in TS Table 2-4, “Instrument Operating Conditions for Isolation Functions,” contains the appropriate isolation signals in order to ensure safe operation of the facility per 10 CFR 50.36(c)(2)(i).

4. Provide the following information:
 - a) A technical justification as to why Technical Specification (TS) 2.15(3), TS 2.15(4), and TS 2.01 (including all subparts of TS 2.01) are not applicable to the remedial action contained in Footnote (i).
 - b) A technical justification as to why TS 2.15(1) and TS 2.01 (including all subparts of TS 2.01) are not applicable to the remedial action contained in Footnote (j).

Background: 10 CFR 50.36(c)(2)(i) requires that TS contain LCOs which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met.

OPPD is proposing to revise the TS to contain automatic isolation of the steam generator blowdown system on a reactor scram. Proposed Function 4, “Steam Generator Blowdown Isolation,” in TS Table 2-4, “Instrument Operating Conditions for Isolation Functions,” contains remedial actions for when a steam generator blowdown isolation is inoperable. Footnote (i) states “If both trains become inoperable, power operation may continue

provided at least one SG blowdown isolation valve for each steam generator is closed or be in Mode 2 within 8 hours, and be in Mode 3 in the next 6 hours. Specifications 2.15(3) and (4) are not applicable; TS LCO 2.0.1 is not applicable.” Footnote (j) states “If one train becomes inoperable, that train may be placed in the bypassed condition. If the train is not returned to Operable status within 24 hours from time of discovery of loss of operability, operation may continue as long as one SG blowdown isolation valve to each steam generator is closed. If the train is not returned to Operable status within 24 hours from time of discovery, with blowdown not isolated to both SGs, be in Mode 2 in 6 hours, and in Mode 3 in the next 6 hours. Specification 2.15(1) is not applicable; TS LCO 2.0.1 is not applicable.” However, no technical justification is provided in the License Amendment Request (LAR) as to why TS 2.15(3), TS 2.15(4), and TS 2.01 are not applicable to remedial actions contained in Footnote (i), or why TS 2.15(1) and TS 2.0.1 are not applicable to remedial actions contained in Footnote (j). The LAR states “This proposed change is aligned with the current TS LCO 2.5(1)C for AFW operability,” however TS 2.5(1)C does not contain any exceptions and the associated TS 2.5 Basis does not provide any additional information that would seem to relate to the steam generator blowdown isolation.

The information requested by this RAI is needed to support review of the LAR. Specifically, the information is needed to ensure that the remedial actions for proposed Function 4, “Steam Generator Blowdown Isolation,” in TS Table 2-4, “Instrument Operating Conditions for Isolation Functions,” are appropriate, as permitted by 10 CFR 50.36(c)(2)(i).

5. Provide the following information:

- a) The plant conditions that require the SG blowdown isolation to be Operable in order to mitigate a Loss of Main Feedwater event as discussed in the USAR.
- b) Why proposed Function 4 would only be required to be Operable when the reactor is critical, regardless of reactor coolant temperature.
- c) If the “valve for each steam generator” in the Permissible Bypass Conditions column for proposed Function 4 is referring to the blowdown isolation valve.

Background: 10 CFR 50.36(c)(2)(i) requires that TS contain LCOs which are the lowest functional capability or performance levels of equipment required for safe operation of the facility.

OPPD is proposing to revise the TS to contain automatic isolation of the steam generator blowdown system on a reactor scram. Proposed Function 4, “Steam Generator Blowdown Isolation,” in TS Table 2-4, “Instrument Operating Conditions for Isolation Functions,” contains Permissible Bypass Conditions of “Operating Modes 3, 4, & 5 or if at least one valve for each steam generator is closed.” Mode 3 in the Fort Calhoun TS is defined as “The reactor is in a hot shutdown condition if the average temperature of the reactor coolant (T_{avg}) is greater than 515°F and the reactor is subcritical by at least the amount defined in Paragraph 2.10.2.” Mode 4 and Mode 5 are also based on subcritical conditions, but with lower reactor coolant temperatures. As a result, proposed Function 4 would only be required to be Operable when the reactor is critical, regardless of reactor coolant temperature. Under “Proposed TS Change - Mode Applicability,” in Section 3.0 of the LAR, OPPD states “While the new SG blowdown isolation interlock is being added to enhance the performance of the Auxiliary Feedwater (AFW) system, the proposed TS for the interlock will have the same mode dependencies as the automatic initiation for AFAS.” However, current TS 2.5, “Steam and Feedwater Systems,” contains different Operability requirements for the

AFW system. TS 2.5 states that “Two AFW trains shall be Operable when T_{cold} is above 300°F,” and that “The motor driven train is required to be Operable when T_{cold} is below 300°F and the steam generators are relied upon for heat removal.” There is a Note in TS 2.5 that states “When heating the reactor coolant above 300°F the steam driven auxiliary feedwater (AFW) pump is only required to be Operable prior to making the reactor critical,” however, the basis for this Note is unclear. As a result of the discrepancies, the uncertainty in the technical basis for the Note in TS 2.5, and the absence of a technical justification in the LAR with regards to the Loss of Main Feedwater event in the Updated Safety Analysis Report (USAR), it is unclear, from a technical consideration, what Modes of operation are required for proposed Function 4, in order to ensure safe operation of the facility per 10 CFR 50.36(c)(2)(i).

In addition, Proposed Function 4, in part, contains Permissible Bypass Conditions of “if at least one valve for each steam generator is closed.” It is unclear if this refers to the blowdown isolation valve.

For comparison purposes, NUREG-1432, Revision 3.0, “Standard Technical Specifications Combustion Engineering Plants,” has a TS 3.7.5, “Auxiliary Feedwater (AFW) System.” LCO 3.7.5 requires that the AFW trains be Operable in STS Modes 1, 2, and 3, as well as Mode 4 when the steam generator is relied upon for heat removal. STS Modes 1, 2, and 3 correspond to anytime the reactor is critical as well as anytime the reactor is subcritical with T_{avg} greater than or equal to 350°F. STS Mode 4 corresponds to anytime the reactor is subcritical with T_{avg} greater than 200°F but less than 350°F. The reasoning is found in the STS Bases, and states in “Modes 1, 2, and 3, the AFW System is required to be Operable and to function in the event that the MFW is lost. In addition, the AFW System is required to supply enough makeup water to replace steam generator secondary inventory, lost as the unit cools to Mode 4 conditions. In Mode 4, the AFW System may be used for heat removal via the steam generator. In Modes 5 and 6, the steam generators are not normally used for decay heat removal, and the AFW System is not required.”

The information requested by this RAI is needed to support review of the LAR. Specifically, the information is needed to ensure that proposed Function 4, “Steam Generator Blowdown Isolation,” in TS Table 2-4, “Instrument Operating Conditions for Isolation Functions” continues to ensure safe operation of the facility per 10 CFR 50.36(c)(2)(i).

6. Explain how the proposed TS address the use of an override switch and its effect on SG Blowdown Isolation Operability.

Background: 10 CFR 50.36(c)(2)(i) requires that TS contain LCOs which are the lowest functional capability or performance levels of equipment required for safe operation of the facility.

OPPD is proposing to revise the TS to contain automatic isolation of the steam generator blowdown system on a reactor scram. Under “Override Feature,” in Section 3.0 of the LAR, OPPD states “The SG blowdown actuation circuit will be equipped with an override switch that will allow operators to re-establish blowdown following a reactor trip.” However, no discussions or TS are included that address the use of the override switch and its effect on SG Blowdown Isolation Operability.

For comparison purposes, NUREG-1432, Revision 3.0, “Standard Technical Specifications Combustion Engineering Plants,” has LCO 3.0.2 which states, in part, “Upon discovery of a failure to meet an LCO, the Required Actions of the associated Conditions shall be met.”

The STS Bases provides amplifying information on LCO 3.0.2 and states “The Completion Times of the Required Actions are also applicable when a system or component is removed from service intentionally. The reasons for intentionally relying on the Actions include, but are not limited to, performance of Surveillances, preventive maintenance, corrective maintenance, or investigation of operational problems. Entering Actions for these reasons must be done in a manner that does not compromise safety. Intentional entry into Actions should not be made for operational convenience. Additionally, if intentional entry into Actions would result in redundant equipment being inoperable, alternatives should be used instead.” No similar TS could be found in the current Fort Calhoun TS that would address the use of the override switch and its effect on SG Blowdown Isolation Operability.

It is unclear how the use of an override switch and its effect on SG Blowdown Isolation Operability is addressed in the proposed TS in a manner that ensures safe operation of the facility per 10 CFR 50.36(c)(2)(i).

7. Provide the following information:

- a) A technical justification why 18 months is an appropriate frequency to perform a Channel Functional Test for the SG Blowdown Isolation instrumentation.
- b) A technical justification why a Channel Check, Channel Calibration, and a Response Time Test do not need to be performed on the SG Blowdown Isolation instrumentation.

Background: 10 CFR 50.36(c)(3) requires that TS include Surveillance Requirements (SR) which are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

OPPD is proposing to revise the TS to contain automatic isolation of the steam generator blowdown system on a reactor scram. The proposed SRs are listed in TS Table 3-2, “Minimum Frequencies for Checks, Calibrations and Testing of Engineered Safety Features, Instrumentation and Controls.” The proposed SR for Channel Description 25, “Manual Steam Generator Blowdown Isolation,” and Channel Description 26, “Automatic Steam Generator Blowdown Isolation,” consist of a Channel Functional Test being performed at least once every 18 months (Refueling). However, no technical justification for the proposed types of tests or frequency is included. The License Amendment Request (LAR) only states in Section 2.0 that “Testing (Channel Functional Test) to ensure operability of the interlock will be performed on a refueling outage frequency, consistent with the current testing frequency for other interlocks that perform similar type functions.”

For comparison purposes, NUREG-1432, Revision 3.0, “Standard Technical Specifications Combustion Engineering Plants,” contains SR for isolation instrumentation. Although there are variations among individual instruments, SR typically consist of a Channel Check performed on a shift (12 hour) frequency, a Channel Functional Test performed on a quarterly (92 days) frequency, a Channel Calibration Test performed every refueling cycle (18 months), and a Response Time Test performed every refueling cycle (18 months).

The information requested by this RAI is needed to support review of the LAR. Specifically, the information is needed to ensure that the proposed SR for Channel Description 25, “Manual Steam Generator Blowdown Isolation,” and Channel Description 26, “Automatic Steam Generator Blowdown Isolation,” will assure that the necessary quality of systems and

components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met per 10 CFR 50.36(c)(3).