



May 31, 2012

Stephen E. Hedges
Site Vice President

WO 12-0047

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

Subject: Docket No. 50-482: Request for Interpretation of Technical Specification 3.4.12, "Low Temperature Overpressure Protection (LTOP) System"

Gentlemen:

Wolf Creek Nuclear Operating Corporation (WCNOC) is requesting Nuclear Regulatory Commission (NRC) concurrence with the following position regarding the intent of the Technical Specification (TS) Limiting Condition for Operation (LCO) 3.4.12, "Low Temperature Overpressure Protection (LTOP) System." This request is based on the guidance in Nuclear Regulatory Commission (NRC) Information Notice 97-80, "Licensee Technical Specification Interpretations," as supported by NRC Inspection Manual, Part 9900: Technical Guidance, Chapter STSINTR, "Licensee Technical Specification Interpretations."

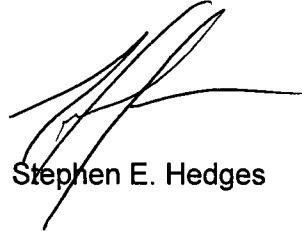
LCO 3.4.12 requires, in part, an LTOP System shall be OPERABLE with a maximum of zero safety injection pumps and one centrifugal charging pump capable of injecting into the Reactor Coolant System (RCS). The LCO is applicable in MODE 3 with any RCS cold leg temperature ≤ 368 °F, MODE 4, MODE 5, and MODE 6 when the reactor vessel head is on. At the Wolf Creek Generating Station (WCGS), the LCO is met when both safety injection pumps and one centrifugal charging pump are not capable of injecting into the RCS with the second centrifugal charging pump and the normal charging pump capable of injecting into the RCS.

WCNOC considers this position on LCO 3.4.12 to be consistent with the WCGS licensing basis and the NRC safety evaluations related to License Amendment Nos. 123 and 130. The basis for this position is provided in the Attachment.

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Your response is requested by November 1, 2012. This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4190, or Mr. Gautam Sen at (620) 364-4175.

Sincerely,

A handwritten signature in black ink, consisting of several overlapping, fluid strokes that form a stylized representation of the name Stephen E. Hedges.

Stephen E. Hedges

SEH/rlt

Attachment

cc: E. E. Collins (NRC), w/a
J. R. Hall (NRC), w/a
N. F. O'Keefe (NRC), w/a
Senior Resident Inspector (NRC), w/a

Request for Interpretation of Technical Specification 3.4.12, "Low Temperature Overpressure Protection (LTOP) System"

Wolf Creek Nuclear Operating Corporation (WCNOC) Position Regarding Technical Specification 3.4.12, "Low Temperature Overpressure Protection (LTOP) System"

The Limiting Condition for Operation (LCO) for Technical Specification (TS) 3.4.12 requires, in part, an LTOP System shall be OPERABLE with a maximum of zero safety injection (SI) pumps and one centrifugal charging pump (CCP) capable of injecting into the Reactor Coolant System (RCS). The LCO is applicable in MODE 3 with any RCS cold leg temperature ≤ 368 °F, MODE 4, MODE 5, and MODE 6 when the reactor vessel head is on. At the Wolf Creek Generating Station (WCGS), the LCO is met when both SI pumps and one CCP are not capable of injecting into the RCS with the second CCP and the normal charging pump (NCP) capable of injecting into the RCS.

Basis for WCNOC Position

By letter dated May 27, 1993 (Reference 1), WCNOC submitted a license amendment request proposing changes, in part, to TS Figure 3.4.4, "Maximum Allowed PORV Setpoint for the Cold Overpressure Mitigation System." The license amendment request (Attachment I, page 3 of 4) indicated that an allowance of 100 gpm was assumed in the design basis mass input transient to envelop the maximum flow possible by the operational configuration that uses the positive displacement pump (PDP) for charging with one CCP remaining OPERABLE during shutdown modes. The license amendment request was submitted as required by Surveillance Requirement 4.4.9.1.2 based on the analysis results of surveillance capsule Y. The license amendment request did not propose changes to 3/4.1.2, "Boration Systems – Charging Pump Shutdown" (LCO 3.1.2.3) or 3/4.5.4, "ECCS Subsystems – $T_{avg} \leq 200$ °F." Surveillance Requirement 4.1.2.3.2 required all CCPs, excluding the above required (one CCP in the boron injection flow path) OPERABLE pump, shall be demonstrated inoperable at least once per 31 days. TS 3/4.5.4, "ECCS Subsystems – $T_{avg} \leq 200$ °F" (LCO 3.5.4) required all SI pumps be inoperable. License Amendment No. 71 (Reference 2) was issued on February 10, 1994 approving the Cold Overpressure Mitigation System (COMS) power operated relief valve (PORV) relief valve setpoints in Figure 3.4.4. The NRC safety evaluation for this amendment did not include any specific discussion concerning the operational configuration of the PDP and one CCP being OPERABLE during shutdown modes.

By letter dated May 24, 1994 (Reference 3), WCNOC submitted a license amendment request to revise the TS to implement the improvements endorsed in the NRC's Final Policy Statement on Technical Specification Improvements for Nuclear Power Reactors, 58 FR 39132, July 22, 1993 (the Policy Statement). These improvements involved focusing the TS on those requirements that are of controlling importance to operational safety by screening each TS in Sections 3/4.1 through 3/4.11 using the criteria provided in the Policy Statement. Those criteria are intended to identify requirements derived from the analyses and evaluations included in the Updated Safety Analysis Report (USAR) that are of immediate concern to the health and safety of the public. TS that meet one or more of the criteria must be retained. Those that meet none of the criteria may be removed from the TS and relocated to a licensee controlled document. The request proposed the deletion of TS 3/4.1.2, Boration Systems – Charging Pump Shutdown (LCO 3.2.1.3) and the Surveillance Requirement 4.1.2.3.2 for one CCP inoperable for overpressure protection was incorporated into 3/4.5.4, "ECCS Subsystems – $T_{avg} \leq 200$ °F." License Amendment No. 89 (Reference 4) was issued on October 2, 1995 that included a

revised LCO 3.5.4 that required all SI pumps and one CCP inoperable in MODE 5 and MODE 6 with the reactor vessel head on.

In October 1996, a design change was implemented that replaced the PDP with the NCP. The NCP is a non-safety related single speed, horizontal, centrifugal type pump and is powered from a non-Class 1E source. At the time of implementation, the design documentation specified that the NCP must be incapable of injecting into the RCS during plant modes requiring low temperature overpressure protection.

By letter dated May 15, 1997 (Reference 5), WCNOB submitted a license amendment request that proposed converting the current TSs to the improved TSs based on NUREG-1431, Revision 1, "Standard Technical Specifications Westinghouse Plants." The amendment request combined current TS 3/4.5.4, "ECCS Subsystems – $T_{avg} \leq 200$ °F" and 3/4.4.9, "Pressure/Temperature Limits" into improved TS 3.4.12, "Low Temperature Overpressure Protection (LTOP) System." The wording in the LCO for current TS 3/4.5.4 was revised from:

"All safety injection pumps and one Centrifugal Charging Pump shall be inoperable."

to:

"An LTOP System shall be OPERABLE with a maximum of zero safety injection pumps and one centrifugal charging pump capable of injecting into the RCS and the accumulators isolated and of the following pressure relief capabilities:"

The Discussion of Change (DOC 3-02 LS-4 and 4-01 LS-4) indicated that the Surveillance Requirement and LCO requirements to satisfy cold overpressure analysis assumptions on Emergency Core Cooling System (ECCS) injection sources by rendering pumps inoperable has been revised to preclude those pumps from injecting into the RCS. The change was considered a less restrictive change on the configuration of the ECCS pumps but did not result in a less conservative operational position as flow to the RCS is still precluded. The improved TS 3.4.12 Bases, Background Section, included the following wording:

The normal charging pump (NCP) is rendered incapable of injecting into the RCS under administrative controls, when any RCS cold leg temperature is ≤ 368 °F. This ensures that the current LTOP analysis remains bounding.

At the time of submittal of Reference 5, the COMS PORV setpoint limit curve (TS Figure 3.4-4) had not incorporated the increased flow from the NCP.

The wording for the improved TS 3.4.12 LCO was based on NUREG-1431, Revision 1:

"An LTOP System shall be OPERABLE with a maximum of [one] [high pressure injection (HPI)] pump [and one charging pump] capable of injecting into the RCS and the accumulators isolated and either a or b below."

The brackets in NUREG-1431 indicate that plant specific wording can be used. Therefore, in the amendment request, WCNOB maintained the current TS wording of SI pumps and CCP while staying consistent with NUREG-1431, Revision 1.

By letter dated December 29, 1998 (Reference 6), WCNOC submitted a license amendment request to revise the TSs to incorporate revised RCS heatup and cooldown limit curves, and a revised COMS PORV setpoint limit curve, as required by 10 CFR 50 Appendix H and current TS Surveillance Requirement 4.4.9.1.2. Attachment II (page 4) of the amendment request provided the following:

The revised PORV setpoint limits for the COMS were derived using the same methodology employed in the development of the current COMS PORV setpoints. The COMS PORV setpoint limit curve (Technical Specification Figure 3.4-4) is determined based on the revised heatup and cooldown limit curves, and the analysis results of limiting Low Temperature Over-Pressure (LTOP) transients. The limiting LTOP mechanisms analyzed for WCGS under water solid conditions were:

a. FOR LIMITING MASS ADDITION LTOP MECHANISM

Operation of one Centrifugal Charging (CCP) and the Normal Charging Pump (NCP) with instrument air failure resulting in the flow control valve in the letdown line failing closed (letdown isolation) and the flow control valve in the charging line failing open (maximum charging flow), and

b. FOR LIMITING HEAT ADDITION LTOP MECHANISM

Inadvertent start-up of a reactor coolant pump with a maximum 50 °F temperature mismatch between the RCS and the hotter steam generators.

These analyses, using the LOFTRAN computer code, take into consideration pressure overshoot and undershoot beyond the PORV open and close setpoints, which can occur as a result of time delays in signal processing and valve stroke times. The maximum expected pressure overshoot and undershoot calculated from the limiting mass input and heat input transients, in conjunction with the 10 CFR 50, Appendix G, pressure limits and reactor coolant pump No. 1 seal pressure limit, are utilized in the selection of the pressure setpoints for the PORV. The mass injection rate assumed in the design basis mass input transient is based on 100%; flow capacity of the NCP and one CCP. The maximum combined pump flow has been assumed in order to envelop the maximum flow possible by the operational configuration that uses the NCP for charging with one CCP remaining operable, or the use of one CCP for charging with the NCP remaining operable during shutdown modes.

The amendment request did not propose changes to the current TS 3/4.5.4 and the LCO wording remained "All safety injection pumps and one Centrifugal Charging Pump shall be inoperable." The amendment request included proposed changes to the current TS Bases indicating that the TSs require lockout of both SI pumps and all but one CCP and the NCP while in the mode of applicability. At the time of submitting Reference 6, the amendment request (Reference 5) to convert from current TSs to the improved TSs had not been approved. Therefore, Reference 6 included any proposed changes to the improved TSs (no changes were proposed to the TSs themselves) and associated improved TS Bases. Changes to the improved TS Bases were provided consistent with the changes to the current TS Bases and indicated that the NCP in addition to one CCP has been included in the analysis of design basis mass input overpressure transient and the term CCP refers to the safety related ECCS pumps only.

License Amendment No. 123 (Reference 7) approved the conversion from current TSs to the improved TSs on March 31, 1999 and implemented on December 18, 1999. Amendment No. 123 approved the current wording in LCO 3.4.12. The safety evaluation associated with this amendment indicates the following:

LS-4 (CN 3-02 LS-4) The proposed change revises the CTS prescriptive wording related to pump inoperability, in footnote to SR 4.5.3.2, to specifically address the emergency core cooling system (ECCS) pump capability to inject into the RCS. This change involves the configuration of the centrifugal charging and safety injection pumps. The LTOP limitations on ECCS pumps, and related surveillances, are relocated to ITS 3.4.12. The requirement for having the charging pumps/safety injection pumps 'inoperable' has been revised to preclude injection into the RCS. This change is consistent with the cold overpressure analysis requirements. The intent of specifying that the required number of centrifugal charging pump/safety injection pumps be inoperable is to preclude the possibility of injecting flow into the RCS in excess of that analyzed for the LTOP system. This change results in the operability statements being revised and allows deletion of the notes which were in place for testing or accumulator filling. Because the change does not result in a less conservative operational position as flow to the RCS is still precluded, the proposed change is acceptable.

LS-4 (CN 4-01 LS-4) The proposed change will (1) revise the CTS LCO 3.5.4 Action b and SR 4.5.4.2 (the footnote) to satisfy LTOP analysis assumptions on ECCS injection sources by rendering pumps inoperable to preclude those pumps from injecting into the RCS, and (2) delete the note dealing with testing and accumulator filling. The LCO requirement to satisfy cold overpressure analysis assumptions on ECCS injection sources by rendering pumps inoperable has been revised to preclude those pumps from injecting into the RCS. The change does not result in a less conservative operational position as flow to the RCS is still precluded. The intent of specifying that the required number of centrifugal charging pumps/safety injection pumps be inoperable is to preclude the possibility of injecting flow into the RCS in excess of that analyzed for the LTOP system. Because the intent of precluding the possibility of excess flow injection continues to be met by the proposed change, the proposed change is acceptable.

The safety evaluation for the conversion from current TSs to the improved TSs indicates that the requirements associated with LCO 3.4.12 is specific to ECCS pump capability to inject into the RCS. The NCP is not an ECCS pump.

The issuance of License Amendment No. 130 (Reference 8) on December 7, 1999, revised (1) the RCS heatup and cooldown limit curves in Figures 3.4-2 and 3.4-3, and COMS PORV setpoint limit curve in Figure 3.4-4 of the current TSs, and (2) the list of references in Section 5.6.6 on the RCS pressure and temperature limits report in the improved TSs. The safety evaluation for Amendment No. 130 states, in part:

The operability of two PORVs or two RHR suction relief valves or an RCS vent opening of at least 2 square inches ensure adequate flow capacity to protect the RCS from overpressurization from either (1) the start of a centrifugal charging pump and/or the normal charging pump injecting into the RCS, or (2) the start of the idle RCP with the secondary water temperature of the steam generator less than or equal to 50 °F above the RCS cold leg temperature.

During the review and approval of the license amendment request of December 29, 1998 (Reference 6), the acceptability of the LCO wording in current TS 3/4.5.4 and improved TS 3.4.12 was not questioned with respect to one CCP and the NCP being capable of injecting into the RCS.

Conclusion

The mass input transient analysis assumes simultaneous injection of both a CCP and the NCP into the water-solid RCS while the Residual Heat Removal (RHR) System and the letdown line are isolated. This assumption is consistent with the TS LCO, which requires all safety injection pumps and one of the two ECCS CCPs be made incapable of injecting into the RCS and therefore, allows a CCP to be OPERABLE (CCP)/ and the NCP to be FUNCTIONAL (NCP) under these modes of operation. The safety evaluation in Amendment No. 123 for the conversion from current TSs to the improved TSs indicates that the requirements associated with LCO 3.4.12 is specific to ECCS pump capability to inject into the RCS. The NCP is not an ECCS pump. The safety evaluation for Amendment No. 130 specified that the OPERABILITY of two PORVs or two RHR suction relief valves or an RCS vent opening of at least 2 square inches ensures adequate flow capacity to protect the RCS from overpressurization from the start of a CCP and/or the NCP injecting into the RCS.

References

1. WCNOC Letter NA 93-0131, "Docket Number 50-482: Revision to Technical Specifications 3/4.4.9.1 – Pressure/Temperature Limits Reactor Coolant System and 3/4.4.9.3 – Overpressure Protection System," May 27, 1993.
2. Letter from W. D. Reckley, USNRC, to N. S. Carns, WCNOC, "Wolf Creek Generating Station – Amendment No. 71 to Facility Operating License No. NPF-42 (TAC NO. M86642)," February 10, 1994.
3. WCNOC Letter NA 94-0089, "Docket Number 50-482: Revisions to Technical Specifications Based on NRC Final Policy Statement on Technical Specifications Improvements," May 24, 1994.
4. Letter from J. C. Stone, USNRC, to N. S. Carns, WCNOC, "Wolf Creek Generating Station – Amendment No. 89 to Facility Operating License No. NPF-42 (TAC NO. M89578)," October 2, 1995.
5. WCNOC Letter ET 97-0050, "Docket Number 50-482: Technical Specification Conversion Application," May 15, 1997.
6. WCNOC Letter WO 98-0104, " Docket Number 50-482: Application for Amendment To The Technical Specifications To Incorporate Revised Heatup and Cooldown Limit Curves, And A Revised Cold Overpressure Mitigation System (COMS) Power-Operated Relief Valve (PORV) Setpoint Limit Curve," December 29, 1998.
7. Letter from J. N. Donohew, USNRC, to O. L. Maynard, WCNOC, "Conversion to Improved Technical Specification for Wolf Creek Generating Station – Amendment No. 123 to Facility Operating License No. NPF-42 (TAC NO. M98738)," March 31, 1999.

8. Letter from J. N. Donohew, USNRC, to O. L. Maynard, WCNOG, "Wolf Creek Generating Station – Amendment No. 130 to Facility Operating License No. NPF-42 (TAC NO. MA4572," December 7, 1999.