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U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 22055

Subject: McGuire Nuclear Station, Units 1 and 2
Docket Nos. 50-369 and 50-370
Request for Additional Information
TAC Numbers M91901 and M91902

Dear Sir:

Please find enclosed the formal response to the request for additional information involving the proposed Low Temperature Overpressure Protection (LTOP) Technical Specification (TAC Nos. M91901/2) which was received on September 13, 1995.

Should you need additional information or if questions arise, please contact John M. Washam at (704) 875-4181.

Very truly yours,

T.C. McMeekin

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Response to Request for Additional Information for TAC NOS. M91901/2

1. What is the basis / justification for selecting the RCS temperature criteria when the charging and SI pump are in operation in TS 3.4.9.3?

Response: The provision in TS 3.4.9.3 which allows a second high head pump (NV or NI) to be capable of injection to the RCS is based on having at least two PORVs or a PORV and RHR suction relief (ND-3) available, after considering a single failure (i.e. the provision requires two PORVs and ND-3 to be OPERABLE). Assuming a single failure of one relief valve, at least two reliefs will remain available). Having any two of the three relief valves available assures adequate relief capacity for the two high head pumps. The limiting single failure is to assume a PORV does not operate, since the RHR suction relief has a slightly higher setpoint. The temperature limitation is due to the higher setpoint of ND-3, which results in a higher calculated peak pressure during an LTOP actuation. The peak pressure for ND-3 is calculated as follows: 450 psig setpoint + 10% relief valve accumulation + reactor coolant pump differential pressure + correction to RV beltline + pressure instrument uncertainty. At this peak pressure, the 10CFR50 Appendix G limitations for 60 F/hr heatup and 100 F/hr cooldown will not be exceeded, provided the RCS temperature is at least 155 °F. Instrumentation uncertainty of 12 °F has been included in the TS value, resulting in the referenced 167 °F. If the cooldown rate is limited to 20 °F/hr, the Appendix G limitations will not be exceeded if the RCS temperature is at least 95 °F (107 °F including temperature uncertainties).

2. TS 3.4.9. 3 indicates that the PORVs open to atmosphere. Do you have an evaluation of the radiological consequences?

Response: The Pressurizer PORVs and the RHR Suction Isolation valve ND-3 relieve to the Pressurizer Relief Tank (PRT) which is located inside containment. The PRT is a normally closed tank with a nitrogen cover gas with a negligible backpressure (normally 3-5 psig). The PRT has a rupture disk with a setpoint of 100 psig, which relieves to the containment atmosphere. In the unlikely event that the PRT rupture disc opened while RCS temperature was less than 200 °F and containment was not established (Modes 5 or 6), containment closure would be implemented by controlling procedure OP/1/A/6100/23. A radiological release by this path is considered to be bounded by other refueling mode analyses.

3. What is the size of the PORV? What is the justification for the decrease in vent size?

Response: The Pressurizer PORV is a CCI "Self Drag Element Relief Valve". The valve has the following characteristics:

Flow Coefficient: Cv = 55

	INLET	OUTLET
Rating	1500# ANSI	300# ANSI
Nominal Size	3"	4"
Schedule	XXS	Standard Wall
End Connection	Butt-Weld	Butt-Weld

The decrease in vent size is based on calculations which demonstrate the RCS will not exceed the 10CFR50 Appendix G limits with the proposed 2.75 sq. inch flow area. The methodology and calculations are described on pages 17-20 of Attachment 2 (Technical Justification) the TS submittal. The proposed change will provide consistency to the vent area requirement, by establishing the required vent area based on the required relief flowrate.

The PORV inlet area is 4.155 sq. inches, based on the 2.3" inlet bore for 3" schedule XXS pipe. This TS change, from 4.5 sq. inch to 2.75 sq. inch will allow removal of a PORV, which is a typical outage evolution, to serve as the vent path. This will allow outage flexibility by allowing an alternate vent location which is acceptable for LTOP relief protection.

4. The submittal indicates that the revision to TS 3.4.9.3 is acceptable because "... it has always been the practice at McGuire..." What is the plant specific analysis or evaluation that justifies the revision to TS 3.4.9.3? The staff does not accept the fact that the revision is consistent with NUREG 1431 as a plant specific justification.

Response: The intent of the TS 3.4.9.3 revision is to clarify the operability requirements of the LTOP system and the maximum number of *allowed* high head pumps capable of injection to the RCS. The change does not reduce the number of *required* OPERABLE pumps below that of existing Technical Specifications.

The wording of the existing Technical Specifications is not very concise. TS 3.5.3 requires "One OPERABLE centrifugal charging (NV) pump". There is no existing Technical Specification *requirement* for an operable Safety Injection pump in Mode 4. The footnote below TS 3.5.3 further states "A maximum of one centrifugal charging pump and one safety injection pump shall be operable ....". The surveillance requirement TS 4.5.3.2 states "All centrifugal charging and safety injection pumps except the above required OPERABLE pumps, shall be demonstrated inoperable...".

However, the LTOP Technical Specification (TS 3.4.9.3) which is applicable during Modes 4, 5 and 6 does not have any such limitation, potentially leading to the incorrect interpretation that no such limitation is required for LTOP. The proposed TS change adds the limitation of one high head pump in LTOP modes, consistent throughout the Technical Specifications. This limitation is necessary based on the capacity of a single Pressurizer PORV and the single failure assumption leading to only one of two PORVs functional for analysis purposes.

The requirement of accumulators being isolated is consistent with the Standard Technical Specifications, NUREG 1431. The Cold Leg Accumulators are not required by existing Technical Specifications below a RCS pressure of 1000 PSIG. Furthermore, the accumulators must be isolated prior to reaching LTOP conditions to prevent injecting the accumulators into the RCS, since RCS pressure is less than the accumulator pressure when LTOP is required. The A and B Cold Leg accumulators must also be isolated and pressurized to ensure they remain available as the nitrogen backup source for the actuators on the PORVs.

A plant specific analysis of the shutdown LOCA was evaluated and documented in the McGuire FSAR, section 6.3.3.2. A further evaluation has been made by the Westinghouse Owners Group and submitted in WCAP-12476 "Evaluation of LOCA During Mode 3 and Mode 4 Operation for Westinghouse NSSS". The minimum OPERABLE pump requirements within the proposed Technical Specification changes are consistent with these evaluations.

5. **With reference to the LTOP revision, do you currently have a TS restriction limiting the temperature difference between the steam generator and the rest of the RCS.**

Response: TS 3.4.1.3 (Mode 4) and TS 3.4.1.4.1 (Mode 5, Loops Filled) limit the steam generator - RCS temperature difference to a maximum of 50 ° for starting a reactor coolant pump.

6. **The submittal indicates that there will be controlled procedures for the heatup and cooldown rates. Briefly describe the procedures.**

Response: The controlling procedure for Unit shutdown (OP/1/A/6100/02 for Unit 1 and OP/2/A/6100/02 for Unit 2) contain Limits and Precautions at the beginning of the procedure which contain the acceptable cooldown rates for various RCS temperature ranges and reactor coolant pump combinations. This table is repeated in the procedure immediately prior to the steps which place the LTOP system in service. Specific procedure steps require reducing the number of running reactor coolant pumps and limiting the cooldown rate, prior to reaching specific reactor coolant temperatures, to ensure the LTOP analysis remains acceptable. Prior to entering Mode 5 (200 °F) the critical core parameters are monitored and logged per PT/1/A/4600/09 "Surveillance Requirements for Unit Shutdown, Enclosure 13.6, Cold Shutdown Critical Core Parameters Checklist"

The controlling procedure for Unit startup (OP/1/A/6100/01 for Unit 1 and OP/2/A/6100/01 for Unit 2) contain Limits and Precautions at the beginning of the procedure which contain the acceptable cooldown rates for various RCS temperature ranges and reactor coolant pump combinations. Additional procedure steps and cautions alert the operator to checking RCS- Steam generator temperature differences prior to starting reactor coolant pumps. The critical parameters of the RCS Heatup are logged and documented in PT/1/A/4600/08 "Precriticality Surveillance Requirements for Unit Startup". The procedure OP/1/A/6150/01 "Filling and Venting of the Reactor Coolant System" contains similar guidance to the operators for acceptable heatup and cooldown rates, steps for complete restoration of the LTOP system and specific LTOP controls for testing PORVs prior to restart.

7. **In the discussion of the revision to the P/T curves, the submittal indicated that the instrumentation margins will be administratively implemented by incorporating them into the controlling procedures. Describe the criteria used to determine the amount of instrument inaccuracy that will be incorporated in the controlling procedures.**

Response: The temperature and pressure instrument uncertainties discussed in the TS submittal, Attachment 2, page 24 and 25, are incorporated into the Operating Procedures. These instrument uncertainties have been developed in accordance with the Westinghouse Reactor Protection System and Engineered Safeguards Setpoint Methodology and IS SP67.15, Draft 10.

The temperature uncertainties are incorporated into the procedure steps by specifying acceptable cooldown rates within specific temperature ranges which have the temperature uncertainties incorporated. The pressure limits are controlled procedurally by the Unit Data Book (OP/1/A/6100/22) Pressure-Temperature curves, which have the pressure and temperature uncertainties included. The pressure uncertainties are also incorporated into the LTOP setpoints and peak pressure analysis.