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SUBJECT: Forwards response to NRC 990310 RAI re proposed TS amend for svc water sys,submitted on 981016 by licensee.

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NMP2L 1865

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

Nine Mile Point Unit 2
Docket No. 50-410
NPF-69

Subject: *Request for Additional Information Regarding Proposed Technical Specification Amendment for Service Water System, Nine Mile Point Nuclear Station, Unit No. 2 (TAC No. MA3895)*

Gentlemen:

By a letter dated October 16, 1998, Niagara Mohawk Power Corporation (NMPC) requested a license amendment to the Nine Mile Point Unit 2 (NMP2) Technical Specifications (TS) regarding the service water system. The Nuclear Regulatory Commission (NRC) requested additional information regarding the TS amendment by a letter dated March 10, 1999. Attached is NMPC's response to that request.

Sincerely,

John H. Mueller
Senior Vice President and
Chief Nuclear Officer

JHM/TWP/kap
Attachment

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REQUEST FOR ADDITIONAL INFORMATION

REGARDING PROPOSED TECHNICAL SPECIFICATION CHANGE

FOR SERVICE WATER SYSTEM

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION, UNIT NO. 2

DOCKET NO. 50-410

Request for Information from Plant Systems Branch

1. *Currently, TS Section 3.7.1.2 requires two independent SWS loops, each with two pumps, to be operable, and one loop to be in operation, for Modes 4 and 5. You state that the heat load during Modes 4 or 5 can vary significantly with time after shutdown. As a result, the number of SWS pumps required to be operable or in operation can vary. Therefore, you propose to revise the TS to require only those portions of the SWS needed to support equipment to be operable during Modes 4 or 5. With required portions of the SWS inoperable, the associated equipment would be declared inoperable and action statements required by the applicable specification would be followed.*

   The NRC staff finds the proposed TS for the SWS for Modes 4 and 5 to be somewhat ambiguous and subject to various interpretations. Please clarify how the proposed TS would be applied by describing the methods (e.g., administrative controls and/or procedures) that would be used to ensure compliance with the proposed TS. Discuss how heat loads during shutdown would be determined and how the required equipment would be identified. Also, identify how required actions would be controlled when required equipment is inoperable.

Response:

This question consists of three parts:

1a. *Please clarify how the proposed TS would be applied by describing the methods (e.g., administrative controls and/or procedures) that would be used to ensure compliance with the proposed TS.*

Compliance with the proposed shutdown Technical Specifications (TS) will be controlled by means of plant operating procedures. Operating Procedure N2-OP-11, "Service Water System," controls operation during normal plant operation, shutdown, and off-normal conditions.

N2-OP-11 administratively controls system lineups and pump operating parameters during shutdown conditions. Changes in the normal system lineups are controlled in accordance with formal plant procedures that require consideration of the operability of any isolated loads. The required actions associated with the isolated equipment are implemented using the process described in the response to Items 1b and 1c below.

N2-OP-11 contains restrictions on minimum and maximum pump flow conditions to prevent prolonged operation in undesirable regions of the pump curve (i.e., near shutoff or at runout conditions). Header pressure criteria are provided in N2-OP-11 to ensure adequate flow to the applied loads and sufficient reserve capacity to accommodate flow requirements associated with all automatically initiated equipment (i.e., emergency diesel generators, recirculation unit cooler, etc.), should this equipment be required.

The operating procedures for the systems being supported by service water administratively control the lineups to, and the operation of, the interfacing equipment (i.e., heat exchangers, unit coolers, etc.). Guidance is provided to control pump operating conditions during major service water flow rate changes (i.e., starting or securing a residual heat removal heat exchanger, etc.).

1b. *Discuss how heat loads during shutdown would be determined and how the required equipment would be identified.*

The "minimum equipment" required during shutdown is addressed from two perspectives: 1) the minimum plant systems and equipment requiring direct or indirect service water support for operability and 2) the minimum service water equipment necessary to support this load and perform automatic equipment actuation functions within the service water system.

Operability requirements for service water supported systems and equipment are defined in their associated TS and in system operating procedures. Work activities to be performed during plant refueling outages are scheduled and sequenced to ensure TS compliance and the availability of key non-essential equipment and components. The work is normally separated into divisional outages (i.e., Division 1 and Division 2) and coordinated with disruptions in divisional power, when required. The outage windows are reviewed by System Engineering and Operations for TS compliance and implemented via the outage work control process.

Service water outage windows are coordinated with the divisional work windows and are planned to ensure continued support for the necessary systems and components. Service water planning considers both pump capacity and automatic equipment actuation requirements. Planned operations affecting automatically actuated service water equipment (i.e., bypassing or defeating an automatic valve), or the application of special valve lineups are reviewed by Engineering for design basis impact and 10 CFR 50.59 implications. Requirements, limitations, or restrictions resulting from this review are incorporated into plant operating procedures using the procedure change process.

Service water load management during forced outages is controlled using the same procedures and practices described in 1a and 1c. Operating Procedure N2-OP-11 administratively controls system lineups and operating parameters during shutdown conditions. N2-OP-11 maintains the availability of service water to all safety related loads, except during administratively controlled operations (i.e., divisional outages, etc.). Changes in the normal system lineups are controlled in accordance with formal plant procedures that require consideration of the operability of any isolated loads. Required Action a in the proposed shutdown specification will be entered when any TS required equipment is isolated or in any way rendered inoperable as a result of a service water interface. The equipment will be declared inoperable and the action required by the associated TS will be taken.

1c. Identify how required actions would be controlled when required equipment is inoperable.

The term "equipment required to be OPERABLE," as identified in proposed TS 3.7.1.2.a, refers to the safety related equipment requiring direct or indirect service water support for its operability. The required actions in the current TS default to declaring this safety related equipment inoperable and taking the actions required by TS 3.5.2, "ECCS - Shutdown," and TS 3.8.1.2, "AC Sources - Shutdown." The impact of service water system conditions on equipment operability is evaluated and controlled using the process outlined in the response to Item 1b above.

The required actions for the proposed TS will be controlled in the same manner. The proposed TS acknowledges the interrelationship between service water and the supported loads in the Limiting Condition for Operation (LCO) and defaults directly to the operability requirements for the supported systems. Required Action a in the proposed service water TS 3.7.1.2.a will be entered when equipment is isolated or in any way rendered inoperable as the result of a service water interface. The equipment will be declared inoperable and the action required by the associated TS will be taken, as is the practice in the current TS. The TS for the supported systems are not affected by the proposed change to the service water TS. Similar to the current TS, the requirements relating to the service water supply header discharge temperature and the requirements relating to the operability/operation of the intake deicing heater system were maintained as distinct and independent items in the proposed change.

__Request for Information from Instrumentation and Controls Branch__

2. *In TS Section 3/4.7.1, you propose to revise LCO 3.7.1.1, including its associated action and surveillance requirements, to change the Analytical Limit (AL) for the SWS supply header discharge water temperature from 81 °F to 82 °F.*

   You state that (1) the essential components cooled by the SWS are designed for a maximum inlet temperature of 82 °F; (2) the current TS limit is 81 °F; (3) the one degree difference accounts for uncertainty of the measuring instrumentation loop; (4) the proposed change to use an AL of 82 °F will make this TS consistent with other NMP2 TS; and (5) the SWS supply header discharge water temperature surveillance procedures include appropriate allowances to reflect measurement uncertainty. Provide the following additional information:

a. *Regarding your statement that the one degree difference in temperature accounts for the uncertainty of the measuring instrumentation loop, is this one degree an assumption or a value calculated using error-components of devices of the temperature instrument loop? Please provide details.*

b. *To prevent the SWS header discharge water temperature from exceeding 82 °F, the surveillance test measured temperature should be sufficiently low to provide appropriate allowances for measurement uncertainty. Provide a copy of your calculation to determine such allowances and the value of the acceptable measured temperature during a surveillance test. Alternatively, explain your in-house setpoint calculation methodology and confirm that the methodology used for uncertainty calculations was based upon guidance provided in the ISA 67-04, 1982 standard as endorsed by Regulatory Guide 1.105, Revision 2.*

Response:

RAI Question 2.a.

The one degree difference is an assumed value. During the original plant licensing process, the temperature limit was 77°F and the NRC imposed a TS limit of 76°F. The one degree difference is identified in Section 2.4.11.2 of the Nine Mile Point Unit 2 (NMP2) Safety Evaluation Report, NUREG-1047. The one degree difference was also applied to the service water system design basis temperature when the temperature was increased from 77 °F to 82 °F (see NMPC letter NMP2L 1094, dated November 24, 1987). The current TS limit of 81°F maintains the same one degree difference with the design basis limit of 82 °F.

RAI Question 2.b.

A calculation was performed to determine the instrument loop uncertainty for the service water supply header temperature indication loop. The instrument loop uncertainty is 1.63°F. The surveillance test measured temperature will be adjusted to account for this uncertainty.

The methodology used in the service water temperature indication loop uncertainty calculation is based on the methodology recommended in ISA-S67.04-1994, Setpoints for Nuclear Safety-Related Instrumentation. ISA-S67.04-1994 is endorsed by the proposed Revision 3 to Regulatory Guide 1.105. Also, the methodology in ISA-S67.04-1994 is consistent with the methodology in S67.04-1982.

Request for Information from Instrumentation and Controls Branch

3. *In TS Table 3.3.9-1, "Plant Systems Actuation Instrumentation," you propose to change LCO 3.7.1.1, including its associated action and surveillance requirements, to require the intake heaters of the Deicing Heater System to be placed in service once the Lake Ontario water temperature reaches 38 °F.*

You state that the deicing heaters are designed to minimize ice formation on the Ultimate Heat Sink system and that specifications for the intake deicing ensure that adequate intake flow area is available for the SWS. TS Table 3.3.9-2, "Plant Systems Actuation Instrumentation Setpoints," currently specifies a setpoint for actuating deicing heaters at a lake temperature ≥39 °F, which is well above freezing. The TS allowable value is ≥38 °F and the AL for this parameter is 34 °F, thus, the proposed change is consistent with the Allowable Value. Operability of the deicing heater system is based upon separate instrumentation that operates in parallel with the instrumentation that automatically actuates the deicing heaters. You further state that since the uncertainty associated with the instrumentation used to determine operability is lower than the instrumentation that actually switches the heaters, you believe adequate margin exists for reducing the limiting temperature to establish heater operability from 39 °F to 38 °F. Please provide the following additional information regarding these aspects of the proposed change.

a. *Provide a copy of the related calculation. Alternatively, explain your in-house setpoint calculation methodology and confirm that the methodology used for uncertainty calculations was based upon the guidance of the ISA 67-07, 1982 standard as endorsed by Regulatory Guide 1.105, Revision 2.*

b. *Explain how the operability of the "deicing heater actuation temperature loop" is verified using separate temperature instruments that are neither connected to the heater nor part of the deicing heater actuation temperature loop.*

Response:

RAI Question 3.a

The setpoint calculation methodology specified in ISA-S67.04-1982, as endorsed by Regulatory Guide 1.105, Revision 2, was used to determine the setpoint for the service water bar rack heaters temperature control. Included in the calculation are allowances for accuracies, drift, environmental effects, etc., as specified in ISA-S67.04-1982. The setpoint for the bar rack heaters temperature control is 40.4° F.

The calculation for the instrument channel uncertainty associated with the service water intake temperature indication uses the same methodology as the setpoint calculation for the service water bar rack heaters. The calculated total loop uncertainty for the service water intake temperature indication loop is 2.8° F. Subtracting this loop uncertainty from the 38° F allowable value used in the calculations yields 35.2° F, which is above the analytical limit of 34°F. Thus, there is adequate margin to reduce the TS allowable value from ≥39° F to ≥38 °F.

RAI Question 3.b

Each of the two service water intake structures has two divisions of bar rack heaters. Thus, there are four sets of bar rack heaters and temperature controls. These circuits are calibrated every eighteen months. The configuration of a single heater and temperature loop is described below.

A temperature element in the service water intake shaft feeds a temperature transmitter. The output of the temperature transmitter feeds an alarm switch and an optical isolator. On low temperature, the alarm switch actuates the heater contactor via an auxiliary relay. The auxiliary relay is normally energized and de-energizes to actuate the heater contactor. Indicating lights on a control panel in the control room provide on-off indication for the bar rack heater.

The output of the optical isolator goes to an analog input of the process computer, which provides service water intake temperature indication. In addition, the process computer actuates an annunciator on service water intake tunnel water low temperature.

Operability of the heaters is determined during each shift by verifying the service water intake temperature and the on-off position indication of the bar rack heaters. When the service water temperature is less than the allowable value (38° F), the heater on-off position indication must show that the heaters are on.