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**Constellation Energy Group**

Nine Mile Point
Nuclear Station

August 22, 2003
NMP2L 2098

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

SUBJECT: Nine Mile Point Unit 2
Docket No. 50-410

License Amendment Request Pursuant to 10 CFR 50.90:
Revision of Ultimate Heat Sink Temperature Limit –
Technical Specification 3.7.1

Gentlemen:

Pursuant to 10 CFR 50.90, Nine Mile Point Nuclear Station, LLC, (NMPNS) hereby requests an amendment to Nine Mile Point Unit 2 (NMP2) Operating License NPF-69. The proposed change to the Technical Specifications (TSs) contained herein would revise TS 3.7.1, "Service Water (SW) System and Ultimate Heat Sink (UHS)," to allow continued operation with short-term elevated UHS temperatures. The proposed change is based on NRC-approved Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, "Allowed Outage Time - Ultimate Heat Sink," TSTF-330, Rev. 3, dated October 16, 2000.

In August 2002, UHS temperatures approached the currently analyzed maximum temperature limit. If the UHS temperature were to exceed this limit, a plant shutdown would have been initiated in accordance with TS 3.7.1. Adoption of TSTF-330 would allow continued plant operation with UHS temperatures that temporarily exceed the current limit by completing certain Required Actions. Therefore, NMPNS requests approval of this license amendment application by April 1, 2004 (prior to next summer), with an implementation period of sixty days. The NRC previously approved similar TS changes for Peach Bottom Atomic Power Station, Units 2 and 3, by TS Amendment Nos. 244 and 248, respectively, and for Millstone Unit No. 2, by TS Amendment No. 257.

This letter contains no new commitments as reflected in Section 5.3 of Attachment 1.

Pursuant to 10CFR50.91(b)(1), NMPNS has provided a copy of this license amendment request and the associated analyses regarding no significant hazards considerations to the appropriate state representative.

A001

I declare under penalty of perjury that the foregoing is true and correct. Executed on August 22, 2003.

Sincerely,

Peter E. Katz
Vice President Nine Mile Point

PEK/JJD/bjh

Attachments:
1. Evaluation of Proposed Technical Specification Change
2. Proposed Technical Specification Changes (Mark-up)
3. Proposed Technical Specification Bases Changes (Mark-up)

cc: Mr. H. J. Miller, NRC Regional Administrator, Region I
Mr. G. K. Hunegs, NRC Senior Resident Inspector
Mr. P. S. Tam, Senior Project Manager, NRR (2 copies)
Mr. John P. Spath, NYSERDA

ATTACHMENT 1

## EVALUATION OF PROPOSED TECHNICAL SPECIFICATION CHANGE

Subject: License Amendment Request Pursuant to 10 CFR 50.90: Revision of Ultimate Heat Sink Temperature Limit – Technical Specification 3.7.1

## 1.0 DESCRIPTION

This letter is a request to amend Operating License NPF-69 for Nine Mile Point Unit 2 (NMP2).

The proposed change would amend the Operating License to revise Technical Specification (TS) 3.7.1, "Service Water (SW) System and Ultimate Heat Sink (UHS)," to allow continued operation with short-term elevated UHS temperatures. The proposed change is based on NRC-approved Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, "Allowed Outage Time - Ultimate Heat Sink," TSTF-330, Rev. 3, dated October 16, 2000.

In August 2002, UHS temperatures approached the currently analyzed maximum temperature of 82°F. If the UHS temperature were to exceed this limit, a plant shutdown would have been initiated in accordance with TS 3.7.1. Adoption of TSTF-330 would allow continued plant operation with UHS temperatures that temporarily exceed the 82°F limit by completing certain Required Actions.

## 2.0 PROPOSED CHANGE

The proposed change to TS 3.7.1, "Service Water (SW) System and Ultimate Heat Sink (UHS)," adds new actions associated with an inoperable UHS. Specifically, a new Condition G is added along with associated Required Actions and Completion Times. Condition G would be entered when the water temperature of one or both service water system supply headers (the temperature measurement points for the UHS) is > 82°F and ≤ 84°F. If the Condition is entered, verification that the water temperature of the SW supply headers is ≤ 82°F averaged over the previous 24 hour period is required once per hour. Additionally, a fifth SW pump is to be placed in operation within one hour.

The proposed change to the TSs is indicated in the mark-up page provided in Attachment 2. Corresponding TS Bases changes are marked-up in Attachment 3. The proposed Bases changes are provided for information only and will be processed in accordance with NMP2 TS 5.5.10, "Technical Specifications (TS) Bases Control Program," upon approval of the TS amendment.

## 3.0 BACKGROUND

The SW system is a once-through system that supplies water from Lake Ontario to various essential and non-essential components, as required, during normal plant operation and shutdown conditions. The SW system is designed with suitable redundancy to provide a reliable source of cooling water for the removal of residual heat from the following components:

Safety Related Components

1. Residual heat removal (RHR) heat exchangers
2. Emergency diesel generators (EDGs)
3. Control building area coolers and chillers
4. RHR pump seal coolers
5. Hydrogen recombiners
6. Safety-related area coolers
7. Spent fuel pool heat exchangers

Non-Safety Related Components

1. Main condenser steam jet air ejector system pre-coolers
2. Turbine building closed loop cooling (CCS) system heat exchangers
3. Reactor building closed loop cooling (CCP) system heat exchangers
4. Turbine building area coolers and chillers
5. Reactor building normal air supply cooler

The SW system is described in Section 9.2.1 of the Updated Safety Analysis Report (USAR) and consists of the UHS, two essential cooling water headers (Loops A and B), and their associated pumps, piping, valves, and instrumentation. Any three SW pumps will provide sufficient cooling capacity to support the required essential components following the limiting loss of coolant accident (LOCA). Loops A and B are configured to provide cooling water to essential equipment in Divisions 1 and 2, respectively.

In addition to the SW system, the UHS supplies cooling and process fluid for the fire protection water (FPW) system pumps. The FPW system is described in Section 9.5.1 of the USAR and consists of one electric driven main fire pump, one diesel engine driven main fire pump, two pressure maintenance pumps with associated fire mains, hydrants, standpipes, hose stations, sprinklers, water spray and deluge systems.

The UHS is described in Section 9.2.5 of the USAR and consists of Lake Ontario (the UHS) and the SW intake and discharge systems. The intake system includes two intake structures, an intake deicing heater system, two intake tunnels, and a pump intake bay. The discharge system includes an onshore discharge bay, a portion of one intake tunnel, a discharge tunnel, and a two-port discharge diffuser. The UHS is capable of providing sufficient cooling to meet all of the SW system post-LOCA cooling requirements for a 30-day period.

Lake Ontario water enters the two offshore intake structures through vertical bar racks that prevent large debris from entering the intake system. The bar racks are electrically heated by the intake deicing heater system to minimize ice formation in the flow passages. From the intake structures, the water flows through two intake tunnels (one tunnel per intake structure), then passes through trash racks and traveling water screens, and enters the onshore SW intake bay. Cooling water from the pump intake bay is then pumped by the SW pumps through strainers to a common header. Two normally open divisional cross-connect valves in the header separate (when closed) the SW system into two redundant headers (Loops A and B) which supply the essential (safety-related) components. Three pumps are available for each of the two loops (six pumps total). During normal plant operation, SW is supplied to non-essential components from taps off the Loop A side of the common header. Each of the non-essential supply and return lines is provided with two isolation valves located in series.

After removing heat from the essential and non-essential components, the SW discharge is directed to the SW discharge bay via two redundant and separate discharge headers. From the discharge bay, the discharge water flows by gravity through the discharge portion of one intake tunnel. The water then enters the discharge tunnel and continues to gravity flow to the discharge diffuser, where it is discharged to Lake Ontario through the diffuser nozzles.

During a loss of offsite power (LOOP) or a LOCA coincident with a LOOP, the SW supply header (divisional) cross-connect and isolation valves close automatically such that the non-essential components (required for normal operation) are isolated from the SW system, and cooling is directed only to essential components. However, if a partial LOOP occurs (i.e., one offsite power circuit is lost, resulting in de-energization of either the Division 1 or Division 2 4.16 kV emergency bus), the non-essential components will still isolate, but the SW supply header cross-connect valves will not close automatically. In addition, during the LOOP or LOCA coincident with a LOOP, one pump in each loop is restarted automatically in a timed sequence (provided the associated pump discharge valve has automatically closed). During a LOCA (without a coincident LOOP), the SW pumps that are operating remain in operation (no SW pumps are automatically started on a LOCA signal), the SW supply headers remain cross-connected (the SW supply header cross-connect valves are not automatically closed), and the non-essential components are not automatically isolated from the SW system.

NMP2 TS Limiting Condition for Operation (LCO) 3.7.1 currently requires both the Division 1 and Division 2 SW subsystems (loops) and the UHS to be operable and four of the six SW pumps to be operable and in operation. In order to support a LOCA without a coincident LOOP, a minimum of three operating SW pumps is required. The LCO requirement of four operable and operating SW pumps provides assurance that there will be no loss of the SW heat removal safety function assuming a single failure of one of the pumps. Operability of the UHS is based on a maximum water temperature of 82°F, a minimum SW pump intake bay water level of 233.1 ft above mean sea level, and 14 intake deicer heaters being operable and in operation per division when the intake tunnel water temperature is < 38°F.

In August 2002, UHS temperatures closely approached the currently analyzed maximum temperature of 82°F. If the UHS temperature were to exceed this limit, a plant shutdown would have been initiated in accordance with TS 3.7.1. Adoption of TSTF-330 would allow continued plant operation with UHS temperatures that temporarily exceed the 82°F limit by completing certain Required Actions. Because the UHS temperature cycles on a daily basis, the temperature averaging allowed by the proposed change should provide sufficient allowance for NMP2 to safely remain in Mode 1 for the short time periods the UHS temperature may exceed 82°F while avoiding unnecessary challenges to plant systems caused by plant shutdown.

The proposed change is based on NRC-approved TSTF Standard Technical Specification Change Traveler, "Allowed Outage Time - Ultimate Heat Sink," TSTF-330, Rev. 3, dated October 16, 2000. Adoption of the changes proposed by this TSTF have been previously approved by the NRC for Peach Bottom Atomic Power Station, Units 2 and 3, by TS Amendment Nos. 244 and 248, respectively, and for Millstone Unit No. 2, by TS Amendment No. 257. The changes proposed for the NMP2 TSs include an additional plant-specific Required Action for application of TSTF-330, in that a fifth SW pump must be placed in operation when the UHS temperature is > 82°F. The justification for this plant-specific variation of the TSTF is discussed in the next section.

## 4.0 TECHNICAL ANALYSIS

TSTF-330, Rev. 3 credits the inherent daily fluctuations of the UHS to allow the continued operation of the plant with short-term elevated service water temperatures. Adoption of the TSTF will allow continued plant operation, provided the UHS temperature, averaged over the previous 24 hours, does not exceed the current limit of 82°F. Use of the TSTF will also require establishment of a new maximum UHS temperature, above which the plant must shutdown.

The current UHS design temperature limit is 82°F (analytical limit). This corresponds to an operating UHS temperature limit of approximately 80°F due to instrument uncertainties. In August 2002, the measured UHS temperature exceeded 79°F. A 2°F increase in UHS temperature would provide sufficient assurance against the risk of plant shutdown. Therefore, a maximum UHS temperature of 84°F (analytical limit) has been used and is evaluated below.

TSTF-330 requires confirmation that the temperature averaging approach continues to satisfy the accident analysis assumptions for heat removal over time. Therefore, to adopt this strategy, the following four conditions must be satisfied, since they form the basis for acceptance of the UHS temperature averaging approach.

1) The UHS is not relied upon for immediate heat removal (such as to prevent containment over-pressurization), but is relied upon for longer-term cooling such that the temperature averaging approach continues to satisfy the accident analysis assumptions for heat removal over time.

2) When the UHS is at the proposed maximum allowed value of 84°F, equipment that is relied upon for accident mitigation, anticipated operational occurrences, or safe shutdown, will not be adversely affected, placed in alarm condition, nor limited in any way at this higher temperature.

3) Plant-specific assumptions, such as those that were credited in addressing station blackout and Generic Letter 96-06, have been adjusted (as necessary) to be consistent with the maximum allowed UHS temperature of 84°F that is proposed.

4) Cooling water that is being discharged from the plant (either during normal plant operation, or during accident conditions), does not affect the UHS intake water temperature (typical of an infinite heat sink, but location of the intake and discharge connections, and characteristics of the UHS can have an impact).

The following addresses the four conditions that are to be satisfied to adopt the temperature averaging approach. The evaluation considers an occurrence of UHS temperature at 84°F as an unplanned event, not a normal/upset plant condition, therefore, a design change is not required.

### 4.1 TSTF-330 Condition 1, Immediate Heat Removal/ Accident Analysis Assumptions

Accident analyses have been evaluated to determine those structures, systems, and components (SSCs) that have an immediate reliance on the UHS to provide cooling. SSCs that rely on UHS for heat removal and are required immediately after the accident have been evaluated to ensure that they will be capable of fulfilling their design function at a maximum UHS temperature of 84°F.

Primary Containment

The UHS is not immediately relied upon to provide post-accident primary containment heat removal. The suppression pool serves that function and its initial temperature is independent of UHS temperature. Long-term heat removal is achieved through the use of the containment spray and/or suppression pool cooling modes of the RHR system. The drywell coolers are non-safety related, and therefore, are not relied upon in the plant safety analysis for post-accident heat removal. The design basis heat removal capability of the RHR heat exchangers, assumed in accident analyses, has been evaluated and deemed to have margin that would compensate for a proposed increase in UHS temperature to 84°F, as discussed in Section 4.2.

Emergency Diesel Generators, Division I and II

The Division I and II EDGs receive an auto-start signal on a LOCA, LOOP, or LOCA/LOOP. With offsite power maintained (i.e., LOCA without LOOP), the EDGs run unloaded until manually secured. The jacket water cooling system has a 3% heat removal margin at an 82°F UHS temperature, at 110% of generator output, at 10% tube plugging, and at design basis fouling. During a LOCA, the generator is loaded to no more than 100%. Therefore, 13% margin would exist even with 10% of the cooler tubes plugged. The effect of a 2°F UHS temperature rise on the heat removal is approximately a 2% reduction in margin. Therefore, the existing 13% margin is ample for ensuring operability at 84°F without impacting shell side (i.e., engine system) temperatures.

Emergency Diesel Generator, Division III

The Division III EDG starts on a LOCA, LOOP and/or LOCA/LOOP. With offsite power maintained (i.e., LOCA without LOOP), the EDG runs unloaded until manually secured. The jacket water cooling system has a 2% heat removal margin at an 82°F UHS temperature, at 110% of generator output, at 5% tube plugging, and at design basis fouling. During the accident condition, the generator is loaded to no more than 100%. Therefore, a 12% margin would exist even with 5% tube plugging. The effect of a 2°F UHS temperature rise on the heat removal is approximately a 2% reduction in margin. Therefore, the existing 12% margin is ample for ensuring operability at 84°F, without impacting shell side (i.e., engine system) temperatures.

Control Building (CB) Chillers

The CB chillers were evaluated for operation at a maximum 84°F UHS temperature. The evaluation concluded that operation at 84°F would require 4 SW pumps in operation to ensure that the chiller flow requirement is met. Placing a 5th SW pump in service ensures adequate water flow is available under the LOCA condition with a trip of one SW pump (single failure) without a concurrent LOOP (non-essential loads do not isolate). At the proposed maximum 84°F UHS temperature, the design basis temperatures can be met for all operating and postulated accident conditions.

Operation of a fifth SW pump is included as a Required Action to utilize the temperature averaging strategy of TSTF-330. This Required Action is a plant-specific variation of the TS changes proposed by TSTF-330.

EDG Building Heating, Ventilation, and Air Conditioning (HVAC)

Each of the three EDG rooms is cooled by a once through ventilation system that does not utilize UHS for cooling. The cooling medium is outside air. As such, the EDG rooms are not impacted by the UHS temperature increase.

The diesel engine control rooms are cooled by the UHS. The unit coolers have more than 20% excess capacity with an 82°F UHS temperature. This margin is sufficient to offset the proposed 2°F increase in the UHS temperature.

It is therefore, concluded that a 2°F increase in the UHS temperature would not prevent any of the components in the EDG building from performing their required functions.

SW Pump Bay HVAC

Each SW pump bay has two unit coolers. Normally, each pump bay has two SW pumps running with one unit cooler in service. When three SW pumps in a bay are running, both unit coolers are needed at elevated UHS temperatures. These unit coolers function to maintain the SW pump bays below the area design temperature of 104°F.

In two pump operation with a UHS temperature of 84°F, one operating unit cooler has > 20% more heat removal capability than required to meet the area design temperature limit. In three pump operation with a UHS temperature of 84°F, the two operating unit coolers also have > 20% more heat removal capability than required to meet the area design temperature limit. Therefore, the unit coolers have sufficient margin for operation with the proposed increase in UHS temperature.

Emergency Core Cooling System (ECCS) Equipment HVAC

The predicted ECCS room temperature at an 84°F UHS temperature is 135°F. The equipment in the ECCS rooms has been evaluated and determined acceptable for temperatures in excess of 135°F. Therefore, it is concluded that the ECCS equipment will remain functional, following an accident, when exposed to the proposed UHS temperature of 84°F.

CB Safety-related Area Coolers

With a UHS temperature of 82°F, the required CB safety-related area coolers are capable of removing over 30% more heat than is required to maintain area temperatures below their design limits. This margin is sufficient to offset a 2°F rise in UHS temperature. Therefore, operation with the UHS temperature at the proposed maximum of 84°F will not adversely impact the performance of the equipment in the CB.

Service Water Pumps

The available net positive suction head (NPSH) for the SW pumps exceeds the required NPSH for a UHS temperature of 84°F by > 20%. Therefore, SW pump operability would not be adversely affected by a 2°F increase in UHS temperature to 84°F.

TSTF-330 Condition 1 Conclusion

With the exception of the CB chillers, existing margins offset the impact of the proposed increase in maximum UHS temperature to 84°F. For the CB chillers, operation of a fifth SW pump is included as a Required Action to ensure that CB design basis temperatures can be met for all operating and postulated accident conditions at a UHS temperature of 84°F. Condition 1 of TSTF-330 is therefore, satisfied in that the immediate heat removal requirements and accident analysis assumptions are unaffected by an allowable maximum UHS temperature of 84°F.

## 4.2 TSTF-330 Condition 2, Accident Mitigation, Anticipated Operational Occurrences, and Safe Shutdown

The following evaluations of equipment that are relied upon for accident mitigation, anticipated operational occurrences, or safe shutdown were performed at a UHS temperature of 84°F. Some of the equipment included under Condition 2 were also evaluated under Condition 1 and are therefore, not discussed below.

### 4.2.1 Accident Mitigation

#### 4.2.1.1 Containment Response

Primary Containment Response

The UHS is not immediately relied upon to provide post-accident primary containment heat removal. Peak drywell pressure and suppression chamber pressures are reached within a few minutes of the onset of a large LOCA and prior to containment spray actuation at 30 minutes into the accident. The suppression pool initially provides the post-accident containment heat removal function and its initial temperature is independent of UHS temperature. Long-term heat removal to control primary containment pressure is achieved through the use of the containment spray and/or suppression pool cooling modes of the RHR system. Therefore, an allowable maximum UHS temperature of 84°F will have no effect on the peak primary containment pressure.

The suppression pool is cooled by the UHS. The maximum post-LOCA peak suppression pool temperature for an 82°F UHS temperature is 4°F below the design limit of 212°F. This margin more than offsets the proposed 2°F UHS temperature increase.

The peak drywell temperature conditions are established by the steam line break in the early part of the accident (within a minute for the large break, to a few hours for the small break). The peak temperature is determined by the enthalpy of the steam in the reactor vessel. Therefore, the post-LOCA peak drywell temperature is not affected by the UHS temperature increase. The drywell temperature during normal plant operation is controlled by TS 3.6.1.5. The TS LCO is not affected by the UHS temperature increase.

The suppression chamber is in thermodynamic equilibrium with the suppression pool in the absence of steam bypass (explained below). Since the suppression pool temperature is essentially unaffected by the proposed increase in the UHS temperature to 84°F (see peak suppression pool temperature discussion above), the suppression chamber temperature is also unaffected by the change.

Primary containment integrity could be challenged by leakage paths that bypass the suppression pool. TS 3.6.1.1 limits the leakage area of these paths. The maximum allowed leakage area is primarily determined by the time delay to initiate the containment sprays and the spray flow rates.

The suppression pool steam bypass analysis uses containment spray at 30 minutes into the accident. The pressure reduction following the initiation of the containment spray is dependent upon the spray flow rate and droplet size, and is essentially independent of the spray water temperature that would be expected during a LOCA. This is because the bulk of the heat transfer is due to the steam condensation on the water droplets in the spray.

Therefore, it is concluded that the primary containment integrity remains unaffected by the proposed increase in maximum UHS temperature.

Peak Clad Temperature

The peak clad temperature is established within approximately 2 minutes of a large break LOCA (> 1 $ft^2$ break) and within approximately 10 minutes of a small break LOCA. The injection water used for core cooling is not cooled by the UHS until at least 10 minutes after the LOCA. Therefore, the proposed increase in UHS temperature to 84°F does not impact the peak clad temperature analysis.

Secondary Containment (SC) Integrity

Following a LOCA, the SC is maintained under a vacuum to limit off-site exposure to within the limits of 10 CFR 100. The limiting conditions for establishing and maintaining SC vacuum following a LOCA are associated with the coldest outside air temperature. Greater inleakage occurs during the colder seasons because of a larger differential pressure across the leakage paths at grade level and a greater air expansion effect as the cold air enters the SC. The peak UHS temperature occurs in summer, which is a less limiting condition for drawdown since the outside air temperature is relatively high. Therefore, the proposed 2°F increase in UHS temperature to 84°F will be offset by the warmer outside temperatures, and as such, will have no adverse effect on establishing or maintaining SC vacuum post-LOCA.

Impact on Accident Analysis Initial Conditions

*Suppression Pool Initial Temperature:*
The RHR system is used to maintain the suppression pool temperature within its TS limit of 90°F. The TS limit and associated LCO Actions are not being changed. Therefore, the accident analysis initial condition is not affected.

*Drywell Initial Temperature:*
The UHS temperature indirectly establishes the drywell initial temperature condition. The drywell temperature is established by the CCP system, which is cooled by the SW system. The proposed maximum UHS temperature of 84°F will have no effect on the peak drywell temperature since the intermediary cooling system (CCP) outlet temperature will continue to be maintained within its design limit by existing procedural guidance. The existing drywell temperature limit of TS 3.6.1.5 is not affected by the proposed change. Therefore, the accident analysis initial condition is not affected.

#### 4.2.1.2 Post-LOCA Supporting Equipment Operability

The proposed change allows a maximum 84°F UHS temperature while maintaining the average ≤ 82°F over the previous 24 hour period. The equipment necessary for operation post-LOCA has been evaluated. Specifically, the equipment with short thermal response times is evaluated in this section.

Reactor Building General Areas

The reactor building general areas are cooled by the UHS. The post-LOCA reactor building temperature increase due to the proposed 84°F UHS temperature (while maintaining the average ≤ 82°F) is expected to be negligible because of the large heat capacity of the reactor building and daily outdoor air temperature variations. In addition, the equipment within the reactor building general areas has been evaluated and determined acceptable for a higher post-LOCA area temperature. It is therefore, concluded that the equipment necessary for accident mitigation would continue to function as originally designed with the proposed maximum UHS temperature of 84°F.

Motor Control Center (MCC) Room and Standby Gas Treatment System (GTS) Room Unit Coolers

The MCC and GTS room unit coolers utilize water from the UHS as the cooling medium. The unit coolers performance has been evaluated, and it is concluded that the unit coolers will maintain the post-LOCA room temperatures at or below the design temperature with the proposed increase in UHS temperature to 84°F. Each MCC and GTS room unit cooler has excess capacity with an 84°F UHS temperature. Therefore, sufficient margin exists in each area to compensate for the proposed maximum 84°F UHS temperature.

Hydrogen Recombiners

The hydrogen recombiners utilize the UHS for cooling the recombiner exhaust gasses. The recombiner cooler is sized for SW temperatures ≤ 180°F. Therefore, recombiner performance will be unaffected by the 84°F maximum UHS temperature.

RHR Pump Seal Coolers

The RHR pump seal coolers are normally supplied from the CCP system. Should the normal supply be lost, UHS water can provide a back-up supply. The RHR pump seal coolers are designed for a maximum cooling water temperature of 105°F. Therefore, the proposed increase in UHS temperature to 84°F would have no impact on the operation of the RHR pumps during the accident condition.

Spent Fuel Pool Cooling System – Post-LOCA Temperature

Following a LOCA, UHS water is used to remove the decay heat from the spent fuel bundles stored in the spent fuel pool. With a UHS temperature of 84°F, the spent fuel pool temperature would remain below the operating temperature limit. Therefore adequate margin exists to support the proposed increase in UHS temperature to 84°F.

4.2.2 Anticipated Operational Occurrences (AOO)

Several systems and components have been credited for AOO mitigation. This section describes the impact of the proposed 84°F UHS temperature on these systems and components.

Suppression Pool Temperature Response

UHS water is used as cooling water to the RHR heat exchanger, which removes heat from the suppression pool. The anticipated transient without a scram (ATWS) analysis initial suppression pool temperature is not affected by the proposed increase in the UHS temperature to 84°F. A 2°F increase in UHS temperature would cause a corresponding increase in the peak suppression pool temperature, resulting in a peak calculated suppression pool temperature < 190°F, the ATWS pool temperature limit. Therefore, adequate margin exists to support the proposed increase in UHS temperature to 84°F.

The peak suppression pool temperature following a main steam line isolation transient from 100% reactor power coincident with a LOOP (worst case transient event) is 211°F, which is 1°F below the design limit of 212°F. Additional margin in heat exchanger performance is available by limiting the number of tubes that can be plugged. The current analysis assumes 5% tube plugging. A 2% reduction (from 5% to 3%) in allowed tube plugging is equivalent to approximately a 2.6°F reduction in the calculated peak pool temperature more than offsetting the 2°F rise due to an 84°F UHS temperature. The tube plugging limit of the RHR heat exchangers is administratively controlled.

Reactor Building Closed Loop Cooling System

The non-safety related CCP system is cooled by the UHS. With the proposed maximum UHS temperature of 84°F, the current strategy of utilizing a load management scheme (placing an additional heat exchanger in service and/or reducing system loads to maintain CCP outlet temperature within design) can continue to be used. Management of the CCP heat loads has not historically been utilized and is not anticipated to be needed at the increased UHS temperature.

Spent Fuel Pool Cooling System – Emergency Full Core Offload

The spent fuel pool cooling system heat exchangers normally use CCP water as cooling water. When the CCP system is not available, UHS water is used as cooling water for the heat exchangers. Under worst case emergency full core offload conditions with an 84°F UHS temperature, the calculated peak spent fuel pool temperature will remain below the design limit. Therefore, adequate margin exists to support the proposed change.

SW Piping System

The SW piping system has been evaluated for a UHS peak temperature of 84°F. The results show that the piping will remain within its design basis allowable stress requirements. SW system nozzles will also meet allowable load requirements. Pipe supports will meet the functionality criteria of Section III, Appendix F of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. Therefore, the proposed increase in UHS temperature to 84°F will have no significant effect on SW piping, nozzles, and supports.

Turbine Building Closed Loop Cooling System

The CCS system is a non-safety related closed loop cooling system that services components in the turbine and radwaste buildings. The CCS system has three heat exchangers that are cooled by UHS. Normally, two CCS heat exchangers are in service with one in standby. In the event of increasing CCS supply temperature, the third heat exchanger is placed in service and/or heat loads are reduced as necessary. The present performance of the CCS system is better than the design requirements. The CCS supply water temperature is usually about 5°F above the UHS temperature at full power during the summer with 3 heat exchangers in service. Furthermore, the addition of discretionary heat loads can be postponed until more favorable conditions exist. Therefore, adequate margin exists to accommodate the proposed 84°F UHS temperature without having to manage heat loads.

Turbine Building Unit Coolers in Steam Tunnel

The main steam tunnel area within the turbine building uses local area coolers cooled by UHS water. The steam tunnel areas contain temperature sensors to detect steam leakage and upon reaching the setpoint, isolate the main steam lines.

As a result of the proposed 2°F increase in the UHS cooling water temperature, the steam tunnel operating temperature will increase by approximately 2°F. Evaluation of the existing margins between operating temperatures and instrument setpoints, approximately 8°F, indicates that there is sufficient margin to accommodate an allowable maximum UHS temperature of 84°F without causing a main steam line (MSL) isolation alarm/trip.

Steam Jet Air Ejector (SJAE) Pre-Coolers

The SJAE pre-coolers use UHS water as the cooling medium. The pre-coolers cool the non-condensable gases and condense vapor removed from the main condenser. A UHS temperature increase will slightly raise the inlet pressure at the SJAE causing a small decrease in the efficiency of the SJAEs. The decrease in efficiency will have an insignificant impact on main condenser vacuum. Therefore, the proposed increase in UHS temperature to 84°F is acceptable relative to the SJAEs and main condenser.

Reactor Building Supply Air Cooler

The reactor building supply air cooler uses UHS water to cool the outside supply air to the reactor building during normal plant operation and transients when off-site power is available.

The reactor building temperature increase due to a 2°F increase in UHS temperature is expected to have a negligible effect on area equipment. This is due to the large heat capacity of the reactor building and daily temperature variations. Based on the review of operating data, the reactor building general area temperature will not exceed the maximum allowable temperature limit. In addition, equipment within the reactor building general areas has been evaluated and determined acceptable for a higher post-LOCA temperature. Therefore, adequate margin exists to the reactor building general area temperature limit to support the proposed increase in UHS temperature to 84°F.

Reactor Core Isolation Cooling (RCIC) Room Unit Coolers

The UHS supplies cooling water to the RCIC room unit coolers. Currently, the RCIC room unit coolers have a large excess capacity. Therefore, adequate margin exists to support the proposed increase in UHS temperature.

4.2.3 Safe Shutdown

The UHS is used to remove decay heat from the reactor coolant system during shutdown via the RHR heat exchangers.

*Normal Shutdown:*
Regulatory Guide 1.139, "Guidance for Residual Heat Removal," requires that one shutdown cooling loop should be able to achieve cold shutdown within approximately 36 hours. In addition, TS Required Actions also require shutdown within 36 hours. The current capability of the equipment at a UHS temperature of 82°F is to achieve cold shutdown in approximately 10 hours. Operating with a maximum UHS temperature of 84°F, while still maintaining the 24 hour average ≤ 82°F will have minimal impact on the ability to achieve cold shutdown in 36 hours.

*Alternate Shutdown Cooling Mode:*
When the normal shutdown cooling path is unavailable, cold shutdown is achieved by an alternate shutdown cooling mode. With 82°F cooling water, the time to reach cold shutdown is < 35 hours. The reduction in heat removal with a maximum UHS temperature of 84°F is negligible, because the average UHS temperature for the 35 hour period remains ≤ 82°F. Therefore, the time to reach cold shutdown is essentially unaffected.

#### 4.2.4 Temperature-Related Equipment Alarm or Trip Functions

Equipment area and process water temperature-related alarms are expected at the current 82°F limit to alert operators. The CCP and CCS alarms can be minimized or eliminated by procedurally removing non-essential heat loads and/or placing additional heat exchangers in service as needed. Trip setpoints leading to a reactor trip will not be reached at a UHS temperature of 84°F.

#### 4.2.5 TSTF-330 Condition 2 Conclusion

Based on the above evaluation, equipment relied upon for accident mitigation, anticipated operational occurrences, or safe shutdown, will not be adversely affected, or limited in any way by a maximum UHS temperature of 84°F. Condition 2 of TSTF-330 is therefore, satisfied.

### 4.3 TSTF-330 Condition 3, Plant Specific Assumptions

Generic Letter 96-06, "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions"

Evaluations have previously been performed in response to Generic Letter (GL) 96-06 to demonstrate that primary containment integrity could not be compromised by cooling water systems susceptible to waterhammer or overpressurization following a design basis accident. A review of the GL 96-06 evaluations has determined that the evaluations are not impacted by the proposed 84°F UHS temperature limit. The initial CCP water temperature assumed in the evaluations was 85.5°F, which corresponds to the normal operating temperature. An assumed 2°F increase in the CCP temperature, resulting from the 2°F increase in UHS temperature to 84°F, would not result in any rise in thermal expansion rate, any change in two-phase relief valve flow rate, or the potential for water column separation. Therefore, the GL 96-06 evaluations are not adversely affected by the proposed increase in UHS temperature.

Station Blackout

The station blackout (SBO) study did not credit heat removal by the RHR heat exchangers or RHR room unit coolers during the 4 hour SBO coping duration. Therefore, the proposed increase in the UHS temperature does not affect the SBO results regarding the RHR system.

The area temperatures during normal plant operation, which are used as initial conditions for the SBO evaluation, are largely determined by the UHS temperature as discussed earlier. Since the proposed change involves an increase in the UHS temperature, the SBO initial temperature condition could be affected. The following provides area specific details:

The initial temperature used for the control room and relay room heatup analysis is 90°F, which is considerably higher than the normal operating temperature of approximately 75°F. Therefore, the SBO heatup analysis has about 15°F margin, which would more than offset any small increase in the control and relay room initial temperatures resulting from the proposed 2°F increase in UHS temperature. Therefore, the existing SBO analysis bounds the impact of the proposed 84°F maximum UHS temperature.

The initial temperature used for the battery room heatup analysis is 85°F. The predicted battery room temperature at the end of the 4 hour SBO coping duration with an 84°F UHS temperature would remain below the design room temperature limit. Therefore, adequate margin exists with the proposed change.

The switchgear room on elevation 237' of the normal switchgear building is cooled by a chiller that uses UHS water as the cooling medium. The SBO analysis assumes an initial temperature of 90°F. This provides approximately 10°F margin above the procedurally controlled normal temperature.

The SBO evaluation for the spent fuel pool conservatively assumed that the water temperature is initially at the alarm setpoint of 125°F. The final water temperature in the evaluation remains below the design temperature limit for the spent fuel pool. This margin is sufficient to offset the impact of the proposed 2°F UHS temperature increase.

Appendix R

Following a fire in the control or relay room and subsequent evacuation, the UHS water cools the equipment areas supporting safe shutdown. As a result of the proposed 2°F UHS temperature increase, the equipment area temperature will increase, which could affect equipment operability. The following provides area-specific details:

The RHR pump room temperature with the proposed maximum 84°F UHS temperature remains below the operability limit of 150°F. Therefore, the proposed increase in UHS temperature will not adversely affect operability of the required components within the RHR pump room for the Appendix R fire event.

Similar conclusions have been reached for other areas with unit coolers supplied by the UHS when either no cooler is in operation (motor control center rooms) or fewer coolers are in operation (reactor building general areas) during an Appendix R fire event. For the remainder of the areas with coolers in operation (RCIC room, RHR heat exchanger rooms, remote shutdown rooms, SW pump bays, EDG control rooms, battery rooms, switch gear rooms, electrical tunnel, and electric motor driven fire pump room), the predicted room temperatures will be less than the equipment temperature limits. Therefore, the small increase in the area temperatures will not affect the equipment that is required to function.

The fire protection system utilizes UHS water that is pumped through two fire protection water pumps. The available NPSH at a UHS temperature of 84°F exceeds the required NPSH for the fire protection water pumps. Therefore, adequate margin exists with respect to the fire protection water pump NPSH to support the proposed increase in UHS temperature.

TSTF-330 Condition 3 Conclusion

Based on the above evaluation, plant-specific assumptions, such as those that were credited in addressing SBO, Appendix R, and GL 96-06, are not adversely affected by the proposed maximum UHS temperature of 84°F. Condition 3 of TSTF-330 is therefore, satisfied.

4.4 TSTF-330 Condition 4, Commingling of Intake and Discharge

The UHS for NMP2 is Lake Ontario, which can be classified as an infinite heat sink. The water intake is at least 10 feet below the lake surface and is 480 feet away from the discharge diffuser. Considering the large body of water (infinite heat sink) and large degree of intake and discharge separation, the discharge has an insignificant impact on the UHS intake water temperature.

Furthermore, the environmental impact of a 2°F rise in UHS temperature has been evaluated and will not violate the State Pollutant Discharge Elimination System (SPDES) permit. The maximum discharge temperature associated with an inlet temperature of 84°F is expected to be approximately 100°F, well below the maximum limit of 110°F specified in the SPDES permit.

TSTF-330 Condition 4 Conclusion

As discussed above, cooling water that is being discharged from the plant (either during normal plant operation, or during accident conditions) does not affect the UHS intake water temperature. Condition 4 of TSTF-330 is therefore, satisfied.

## 4.5 Results and Conclusions

With the exception of the CB chillers, existing margins offset the impact of the proposed increase in maximum UHS temperature to 84°F. For the CB chillers, operation of a fifth SW pump is included as a Required Action to ensure that CB design basis temperatures can be met for all operating and postulated accident conditions at a UHS temperature of 84°F. Condition 1 of TSTF-330 is therefore, satisfied in that the immediate heat removal requirements and accident analysis assumptions are unaffected by an allowable maximum UHS temperature of 84°F. Evaluation has also shown that equipment relied upon for accident mitigation, anticipated operational occurrences, or safe shutdown, will not be adversely affected, placed in alarm condition, or limited in any way by a maximum UHS temperature of 84°F. Plant-specific assumptions, such as those that were credited in addressing SBO, Appendix R, and GL 96-06, have been shown to not be adversely impacted by the proposed 2°F increase in UHS temperature. Additionally, cooling water that is being discharged from the plant does not affect the UHS intake water temperature.

Therefore, TSTF-330 Conditions 1 through 4 are satisfied.

# 5.0 REGULATORY SAFETY ANALYSIS

## 5.1 No Significant Hazards Consideration Analysis

Nine Mile Point Nuclear Station, LLC (NMPNS) is requesting a revision to the Nine Mile Point Unit 2 (NMP2) Technical Specification (TS) 3.7.1, "Service Water (SW) System and Ultimate Heat Sink (UHS)," to allow continued operation with short-term elevated UHS temperatures. The proposed change is based on NRC-approved Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, "Allowed Outage Time- Ultimate Heat Sink," TSTF-330, Rev. 3, dated October 16, 2000. In August 2002, UHS temperatures approached the currently analyzed maximum temperature of 82°F. If the UHS temperature were to exceed this limit, a plant shutdown would have been initiated in accordance with TS 3.7.1. Adoption of TSTF-330 would allow continued plant operation with UHS temperatures that temporarily exceed the 82°F limit.

NMPNS 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 change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

The proposed change allows plant operation to continue if the temperature of the UHS exceeds the TS limit of 82°F provided that (1) the water temperature, averaged over the previous 24 hour period, is at or below 82°F, and (2) the UHS temperature is less than or equal to 84°F. This increase in UHS temperature will not affect the normal operation of the plant to the extent that it would make any accident more likely to occur. The UHS is not an accident initiator. In addition, the proposed change assures adequate margin in the safety systems and safety-related heat exchangers to meet the design safety functions at the higher temperature. Thus, the proposed change will have no adverse effect on plant operation, or the availability or operation of any accident mitigation equipment. Furthermore, the proposed change cannot cause an accident, nor will the change significantly affect the plant response to any accidents. Therefore, there will be no increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No.

   The proposed change will not alter the current plant configuration (no new or different type of equipment will be installed) or require any new or unusual operator actions. The proposed change will not alter the way any structure, system, or component functions and will not cause an adverse effect on plant operation or accident mitigation equipment. The response of the plant and the operators following a design-basis accident is unaffected by the change. The proposed change does not introduce any new failure modes and the design basis heat removal capability of the affected safety-related components is maintained at the increased UHS temperature limit. Therefore, the proposed change will not create the possibility of a new or different kind of accident from any previously analyzed.

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

   Response: No.

   NMPNS has performed an evaluation of the safety systems to ensure their safety functions can be met with a UHS water temperature of 84°F. The higher UHS temperature represents a slight reduction in the margins of safety in terms of these systems' abilities to remove accident heat loads. As part of the evaluation, however, it was verified that these safety systems will still be capable of performing their design-basis functions. The proposed change will have no adverse effect on plant operation or equipment important to safety. The plant responses to accidents will not be significantly affected and the accident mitigation equipment will continue to function as assumed in the accident analysis. Therefore, there will be no significant reduction in a margin of safety.

Based on the above, NMPNS concludes that the proposed amendment presents no significant hazards considerations under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

## 5.2 Applicable Regulatory Requirements/Criteria

Based on the considerations discussed above evaluating the proposed change per the requirements of 10 CFR 50.91 and 50.92, (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.

## 5.3 Commitments

The following table identifies those actions committed to by NMPNS in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments.

| REGULATORY COMMITMENTS | Due Date/Event |
|---|---|
| None | None |

## 6.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment 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 amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment 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 amendment.

**ATTACHMENT 2**

**PROPOSED TECHNICAL SPECIFICATION CHANGES (MARK-UP)**

The current version of Technical Specification page 3.7.1-2 has been marked-up by hand to reflect the proposed change.

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| D. One division of intake deicer heaters inoperable. | D.1 | Restore intake deicer heater division to OPERABLE status. | 72 hours |
| E. One required SW pump not in operation. | E.1 | Restore required SW pump to operation. | 72 hours |
| F. Two or more required SW pumps not in operation. | F.1 | Restore all but one required SW pump to operation. | 1 hour |
| Insert 1 | | | |
| H. ~~G~~. Required Action and associated Completion Time of Condition A, B, C, D, E, F, or ~~F~~ G not met.<br><br>OR<br><br>Both SW subsystems inoperable for reasons other than Conditions A, B, and C.<br><br>OR<br><br>UHS inoperable for reasons other than Condition D, or G. | ------------NOTE------------<br>Enter applicable Conditions and Required Actions of LCO 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown," for RHR Shutdown Cooling subsystem(s) made inoperable by SW System or UHS.<br>---------------------------- | | |
| | H ~~G~~.1 | Be in MODE 3. | 12 hours |
| | AND | | |
| | H ~~G~~.2 | Be in MODE 4. | 36 hours |

INSERT 1

| | | | | |
|---|---|---|---|---|
| G. | Water temperature of one or two SW subsystem supply headers > 82°F and ≤ 84°F. | G.1 | Verify the water temperature of the SW supply headers is ≤ 82°F averaged over the previous 24 hour period. | Once per hour |
| | | <u>AND</u> | | |
| | | G.2 | Place a fifth SW pump in operation. | 1 hour |

## ATTACHMENT 3

## PROPOSED TECHNICAL SPECIFICATION BASES CHANGES (MARK-UP)

The current version of Technical Specification Bases page B 3.7.1-7 has been marked-up by hand to reflect the proposed change. This information is provided for information only.

BASES

ACTIONS

D.1 (continued)

remain free of ice blockage, thus ensuring the UHS is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE intake deicer heater division could result in loss of the UHS function during a DBA. The 72 hour Completion Time was developed taking into account the redundant capabilities afforded by the OPERABLE intake deicer heater division and the low probability of a DBA occurring during this period.

E.1

If one required SW pump is not in operation, it must be restored to operation within 72 hours. With the unit in this condition, the remaining operating SW pumps are adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure of a remaining operating pump could result in loss of the SW function during a DBA LOCA. The 72 hour Completion Time was developed taking into account the redundant capabilities afforded by the operating pumps and the low probability of a DBA LOCA occurring during this period.

F.1

If two or more required SW pumps are not in operation, three SW pumps must be in operation within 1 hour. The 1 hour Completion Time provides a period of time to correct the problem and is consistent with the 1 hour provided in LCO 3.0.3. This time period also takes into account the low probability of a DBA LOCA occurring during this time.

G.1 and G.2

If any Required Action and associated Completion Time of Condition A, B, C, D, E, or F are not met, or both SW subsystems are inoperable for reasons other than Conditions A, B, and C, or the UHS is inoperable for reasons other than Condition D, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4

(continued)

INSERT 2

G.1 and G.2

With the water temperature of the UHS (as measured at the SW subsystem supply headers) > 82°F and ≤ 84°F, the design basis assumptions associated with initial UHS temperature remain bounded, provided that the temperature of the UHS averaged over the previous 24 hour period is ≤ 82°F and five SW pumps are in operation. With the water temperature of the UHS > 82°F, long term cooling capability of the emergency core cooling system loads, DGs, and other components may be affected. Therefore, to ensure long term cooling capability is provided to these loads when water temperature of the UHS is > 82°F, Required Action G.1 is provided to more frequently monitor the water temperature of the UHS and verify the temperature is ≤ 82°F when averaged over the previous 24 hour period. The once per hour Completion Time takes into consideration UHS temperature variations and the increased monitoring frequency needed to ensure design basis assumptions and equipment limitations are not exceeded in this condition. If the water temperature of the UHS exceeds 82°F when averaged over the previous 24 hour period or the water temperature of the UHS exceeds 84°F, Condition H must be entered immediately.

To ensure sufficient SW flow to the control building chillers to meet accident analysis assumptions when the initial UHS temperature is > 82°F and ≤ 84°F, operation of four SW pumps is required. To meet the single failure criterion, Required Action G.2 is provided to place a fifth SW pump in operation. The Completion Time of 1 hour provides a period of time to place the required number of SW pumps in operation and is consistent with the one hour provided in LCO 3.0.3. This time period also takes into account the low probability of a DBA LOCA occurring during this time. If a fifth SW pump cannot be placed in service within the Completion Time, Condition H must be entered immediately.