GPU Nuclear

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July 8, 1994
C321-94-2089

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

Gentlemen:

Subject: Oyster Creek Nuclear Generating Station (OCNGS)
Docket No. 50-219
Technical Specification Change Request (TSCR) No. 219

Pursuant to 10 CFR 50.90, GPU Nuclear Corporation, operator of the Oyster Creek Nuclear Generating Station (OCNGS), Facility Operating License No. DPR-16, requests a change to that license.

The attached Technical Specification Change Request proposes to revise the Technical Specifications to provide improved protection to safety related electrical equipment from loss of capability in the event of a sustained degraded voltage condition on the offsite electrical grid system.

This change request has been reviewed in accordance with Section 6.5 of the OCNGS Technical Specifications, and using the standards in 10 CFR 50.92 we have concluded that this proposed change does not constitute a significant hazards consideration.

Pursuant to 10 CFR 50.91(b)(1), a copy of this change request has been sent to the State of New Jersey Department of Environmental Protection.

Very truly yours,

J. J. Barton
Vice President and Director
Oyster Creek

Attachments
JJB/DJD/plp

cc: Administrator, Region I
NRC Resident Inspector
Oyster Creek NRC Project Manager

A001
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GPU NUCLEAR CORPORATION
OYSTER CREEK NUCLEAR GENERATING STATION

Facility Operating
License No. DPR-16

Technical Specification Change Request No. 219
Docket No. 50-219

Applicant submits, by this Technical Specification Change Request No. 219 to the Oyster Creek Nuclear Generating Station Operating License, a change to page 2.3-3.

BY _____
J. J. Barton
Vice President and Director
Oyster Creek

Sworn and Subscribed to before me this 8th day of July 1994.

_____
Judith M. Crowe
A Notary Public of NJ

JUDITH M. CROWE
Notary Public of New Jersey
My Commission Expires 1/25/95

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
) Docket No. 50-219
GPU Nuclear Corporation)

CERTIFICATE OF SERVICE

This is to certify that a copy of Technical Specification Change Request No. 219 for Oyster Creek Nuclear Generating Station Operating License, filed with the U.S. Nuclear Regulatory Commission on July 8 1994 has this day of July 8 1994, been served on the Mayor of Lacey Township, Ocean County, New Jersey by deposit in the United States mail, addressed as follows:

The Honorable Theodore J. Hutler
Mayor of Lacey Township
818 West Lacey Road
Forked River, NJ 08731

By J. J. Barton
J. J. Barton
Vice President and Director
Oyster Creek

OYSTER CREEK NUCLEAR GENERATING STATION
OPERATING LICENSE NO. DPR-16
DOCKET NO. 50-219
TECHNICAL SPECIFICATION CHANGE REQUEST NO. 219

Applicant hereby requests the Commission to change Facility Operating License No. DPR-16 as discussed below, and pursuant to 10 CFR 50.91, an analysis concerning the determination of no significant hazards consideration is also presented:

1.0 SECTION TO BE CHANGED

Technical Specification Section 2.3.P(2).

2.0 EXTENT OF CHANGE

Technical Specification Section 2.3.P(2) is revised to raise the degraded voltage setpoint from 3671 volts to 3840 volts, and to revise the allowable setpoint range from ± 1% to +20V, -40V. The revised setpoint tolerance values in volts represents a range of +0.5%, -1.0% compared to the existing setpoint tolerance range of ±1%. The current Technical Specification degraded voltage time delay setting of 10 ± 10% seconds is not changed.

3.0 CHANGES REQUESTED

The requested change is shown on the attached Technical Specification Page 2.3-3.

4.0 DISCUSSION

This Technical Specification change provides improved undervoltage protection for safety related electrical equipment for the maximum expected loading of the safety related buses. This change results from the reevaluation of the electrical distribution system which identified lower than expected voltages at various safety related equipment under worst case design basis accident loading conditions. This condition and the need to change the degraded voltage protection setpoint was previously described in GPU Nuclear's letter to NRC dated March 24, 1994 (C321-94-2039). The revised degraded voltage setpoint will adequately protect required engineered safety features equipment from adverse affects due to sustained degraded grid voltages, as clarified below. The revised setpoint will slightly increase the probability of separation from offsite power for worst case loading conditions; however, this probability is extremely low and is considered to be acceptable to

meet GDC-17. The calculated voltage for which separation could occur is slightly higher than previously calculated; however, the increased protection for safety related loads is considered an overall improvement in safety.

OC is supplied with offsite power from a 230KV and 34.5KV transmission network. The 34.5KV OC substation has two (2) parallel buses with tie breakers in between. The tie breakers connecting the buses will open automatically if either bus is faulted. Each of the buses can be supplied by a separate line from other JCP&L substations following different rights of way. The 34.5KV substation provides power to Startup Transformer Banks 5 and 6 which are the preferred sources of offsite power to OC for normal startup and shutdown, and emergency safe shutdown. The 230KV OC substation incorporates a breaker-and-a-half arrangement for high reliability and is connected to the transmission network by two (2) independent 230KV transmission lines and an interconnection to a 69KV system through a 230/69KV transformer. The 230KV substation also provides power to the 34.5KV substation via Transformer Banks 7 and 8 and therefore provides an additional source of independent offsite power to the station. A fault occurring on a single 230KV or 34.5KV line, bus or circuit breaker will not interrupt the remaining sources of offsite power to the plant. Voltage regulators upstream of the Startup Transformers will automatically accommodate voltage fluctuations in the subtransmission networks over a 20% range which is more than adequate for the maximum predicted voltage swing. These voltage regulators are highly reliable and normally in service when the plant is operating.

Two (2) levels of undervoltage relay protection exist on the 4.16KV safety buses. The first level of automatic undervoltage protection relays trip and transfer safety related loads to the emergency diesel generators on total loss of voltage, but does not trip due to transient conditions such as starting large motors. The second level of undervoltage protection relays is provided for the 4.16KV emergency switchgear Buses 1C and 1D to trip and transfer safety related loads to the emergency diesel generators on a persistent degraded grid voltage. This second level of undervoltage relays provide automatic protection of safety related equipment from the potential adverse thermal effects of degraded grid voltage.

Offsite power system analyses were updated based on historical data, including the voltage brownout conditions experienced in January 1994 due to heavy grid loading with reduced generation capacity available, and recent upgrades to the transmission system. These analyses are based on single contingency events considering various system load flow cases and a trip of the OC plant. The minimum predicted voltages at the 230KV and 34.5KV substations are 223KV and 32.4KV, respectively. Historically,

plant generation voltages have remained close to nominal for normal plant operations, and the minimum grid voltage experienced between January 1989 and January 1994 was 227KV (98.7%) and 34.4KV (99.7%) on the 230KV and 34.5KV systems, respectively. The probability of the grid voltages dropping below these predicted minimum values was determined to be less than 1×10^{-5}. Therefore, the likelihood of a degraded grid condition is extremely low.

The OC electrical distribution system has been reevaluated to determine the voltage available at the terminals of required nuclear safety related AC electrical equipment. These analyses included determining the running and starting voltages for 4160V and 480V equipment, voltages for motor starter pickup and dropout, and available voltages at the terminals of 120V equipment. Minimum voltages were determined based on lowest expected grid voltage, worst case loading conditions for the design basis LOCA, plus a single failure of one of the redundant electrical distribution system safety trains. This evaluation utilized updated power and control cable lengths for 480V and 120V ESF equipment, and reflects the current electrical configuration of the plant including consideration of the impact of planned modifications in the upcoming 15R outage. These analyses also confirm that the existing degraded voltage setpoint time delay value remains acceptable.

Voltage analyses for the auxiliary electrical system were performed using the DAPPER computer program. The base model for this program was verified against field measurements. The revised setpoint selected for the degraded voltage relay considers relay drift, potential transformer inaccuracy, and calibration tolerances, plus an additional safety margin.

As stated above, the revised degraded voltage setpoint will significantly improve the level of protection of safety related electrical equipment from loss of capability in the event of a sustained degraded voltage condition on the offsite electrical grid system. However, the voltage studies indicate that the improved protection provided by the increased setpoint will not sufficiently protect some electrical equipment on the 480V and 120V system under the extremely low probability of occurrence of the following postulated design basis conditions: degraded grid voltage, loss of the voltage regulators, LOCA, and a single failure of one safety related electrical distribution train. The following equipment may not be completely protected assuming the simultaneous occurrence of the above conditions:

480V System*

Standby Gas Treatment System (SBGTS) Emerg. Fan Motor Starters (EF-1-8, EF-1-9)
Battery "C" Chargers C1, C2
Starter for Main Battery Charger MG - Set B
Starters for Isolation Condenser Isolation Valves V-14-32, V-14-37
Starters for Shutdown Cooling Isolation Valves V-17-19, V-17-54
Starter for Liquid Poison Tank Heater T-19-001

*Based on vendor data that motor starters are rated for a pickup voltage of 85% of nominal. This is conservative since actual testing of typical starters has shown that NEMA Size 2 starters will typically pickup at 75-78% voltage.

120V System - Twenty-six (26) circuits have marginal calculated minimum voltages and will be subject to further testing to verify actual voltage drops.

The revised degraded voltage setpoint will increase the voltage margin between the electrical distribution and control system equipment minimum design rated voltage limits and the worst case available bus voltages under the postulated design basis conditions. In addition, interim administrative controls have been established to monitor the 4.16KV bus voltages and ensure that bus voltage is 4100V or greater, and to take corrective actions as necessary to improve voltage and ensure 120V vital systems are powered from regulated sources. These actions combined with the historical evidence of very infrequent low grid voltage, analysis that predicts a very low probability of low grid voltage, historical evidence of high voltage regulator availability, the use of conservatisms in the analysis that predicted plant low voltages for worst case conditions, and the historical setpoint stability of the second level undervoltage relays, will provide the necessary assurance that the 480V and 120V equipment listed above will have adequate voltage to perform their safety function. Additional analysis and field measurements of actual current and voltages will be performed to determine the appropriate long-term resolution for each of these components. Any plant modifications identified as a result of this effort will be scheduled in accordance with the Long Range Planning Program.

The revised undervoltage protection setpoint will result in a slight increase in the probability of separation from the offsite power system during a combined occurrence of a degraded grid condition, loss of the voltage regulators, a postulated design basis accident, and a single failure of one safety related electrical distribution train. The simultaneous occurrence of

these unrelated events is a very low probability, and the intent of requiring an adequate level of undervoltage protection is maintained by the revised degraded voltage setpoint. This slight increase in the probability of separation from the offsite power system is insignificant when compared to the additional protection of safety related equipment provided by the revised degraded voltage setpoint.

5.0 DETERMINATION

GPU Nuclear has determined that this Technical Specification Change Request involves no significant hazards consideration as defined by NRC in 10 CFR 50.92.

1. Operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability of occurrence or the consequences of an accident previously evaluated. Loss of Auxiliary Power is the only previously evaluated design basis accident that is affected by the proposed amendment. This event may be caused by separation of the unit from the transmission system. The revised degraded voltage protection setpoint will result in a slight increase in the probability of a loss of offsite power during a postulated design basis accident coincident with a degraded grid condition and loss of the voltage regulators. This slight increase is not considered significant since the postulated scenario involves the simultaneous occurrence of these unrelated events. The remaining accident analyses consider loss of offsite power subsequent to the postulated accident; therefore, these accident analyses are not affected by the proposed change. The revised setpoint increases the voltage margin between the electrical distribution and control system equipment minimum design rated voltage limits and the worst case postulated available bus voltages, which provides improved protection of safety related electrical equipment. Therefore, the proposed amendment does not significantly increase the probability of occurrence or the consequences of an accident previously evaluated.

2. Operation of the facility in accordance with the proposed amendment would not create the possibility of a new or different kind of accident from any accident previously evaluated. The revised setpoint provides improved protection of safety related electrical equipment from loss of capability in the event of a sustained degraded voltage condition on the offsite electrical grid system. Therefore, this change has no effect on the possibility of creating a new or different kind of accident from any accident

previously evaluated.

3. Operation of the facility in accordance with the proposed amendment would not involve a significant reduction in a margin of safety. The revised setpoint increases the voltage margin between the electrical distribution and control system equipment minimum design rated voltage limits and the worst case postulated available bus voltages, and thus provides improved protection of safety related electrical equipment. Therefore, it is concluded that operation of the facility in accordance with the proposed amendment does not involve a reduction in a margin of safety.

6.0 IMPLEMENTATION

It is requested that the amendment authorizing this change become effective 30 days after issuance to allow resetting of the degraded voltage setpoint and implementation of the associated procedure changes.