GPU NUCLEAR CORPORATION
OYSTER CREEK NUCLEAR GENERATING STATION

Provisional Operating
License No. DPR-16

Technical Specification
Change Request No. 164
Docket No. 50-219

Applicant submits, by this Technical Specification Change Request No. 164 to the Oyster Creek Nuclear Generating Station Technical Specifications, proposed changes to pages 2.1-1, 2.1-3, 3.3-3 and 3.3-8. Pages 3.3-3a and 3.3-8a are added as part of the proposed changes for pagination purposes.

By _____
Peter B. Fiedler
Vice President and Director
Oyster Creek

Sworn and Subscribed to before me this 31ST day of March, 1988.

Diana M. DeBlasio
A Notary Public of NJ

DIANA M. DeBLASIO
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires 6-5-91

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter)
GPU Nuclear Corporation)

Docket No. 50-219

CERTIFICATE OF SERVICE

This is to certify that a copy of Technical Specification Change Request No. 164 for Oyster Creek Nuclear Generating Station Technical Specifications, filed with the U.S. Nuclear Regulatory Commission on March 31, 1988, has this day of March 31, 1988, been served on the Mayor of Lacey Township, Ocean County, New Jersey by deposit in the United States mail, addressed as follows:

The Honorable Christopher Connors
Mayor of Lacey Township
818 West Lacey Road
Forked River, NJ 08731

By _____
Peter B. Fiedler
Vice President and Director
Oyster Creek

Nuclear

GPU Nuclear Corporation
One Upper Pond Road
Parsippany, New Jersey 07054
201-316-7000
TELEX 136-482
Writer's Direct Dial Number:

March 31, 1988

Mr. David M. Scott, Chief
Bureau of Nuclear Engineering
Department of Environmental Protection
CN 411
Trenton, NJ 08625

Dear Mr. Scott:

Subject: Oyster Creek Nuclear Generating Station
Provisional Operating License No. DPR-16
Technical Specification Change Request No. 164

Pursuant to 10CFR50.91(b)(1), please find enclosed a copy of the subject document which was filed with the United States Nuclear Regulatory Commission on March 31, 1988.

Very truly yours,

Peter B. Fiedler
Vice President and Director
Oyster Creek

PBF/PC/pa(5462g)
Attachment

Nuclear

GPU Nuclear Corporation
One Upper Pond Road
Parsippany, New Jersey 07054
201-316-7000
TELEX 136-482
Writer's Direct Dial Number:

March 31, 1988

The Honorable Christopher Connors
Mayor of Lacey Township
818 West Lacey Road
Forked River, New Jersey 08731

Dear Mayor Connors:

Enclosed herewith is one copy of Technical Specification Change Request No. 164 for the Oyster Creek Nuclear Generating Station Operating License.

This document was filed with the United States Nuclear Regulatory Commission on March 31, 1988.

Very truly yours,

Peter B. Fiedler
Vice President and Director
Oyster Creek

PBF/PC/pa(5462g)
Attachment

OYSTER CREEK NUCLEAR GENERATING STATION

PROVISIONAL OPERATING LICENSE NO. DPR-16
DOCKET NO. 50-219
TECHNICAL SPECIFICATION CHANGE REQUEST NO. 164

Applicant hereby requests the Commission to change Appendix A to the above captioned license as below, and pursuant to 10CFR50.91, an analysis concerning the determination of no significant hazards considerations is also presented:

1. Sections to be Changed

Section 2.1 and Section 3.3.

2. Extent of Change

Delete Technical Specification 2.1.E and associated basis. Add Technical Specifications 3.3.F.4, 3.3.F.5, 3.3.F.6 and associated basis. Revise Technical Specifications 3.3.F.1, 3.3.F.2 and 3.3.F.3 and provide a basis for these specifications. Correct a typographical error in the basis for specification 2.1.D.

3. Changes Requested

The requested changes are shown on attached Technical Specification pages 2.1-1, 2.1-3, 3.3-3, 3.3-3a, 3.3-8 and 3.3-8a. Pages 3.3-3a and 3.3-8a have been added for pagination purposes.

4. Discussion

The primary purpose of this Technical Specification Change Request is to properly classify the limitation imposed by safety limit 2.1.E as a limiting condition for operation and to revise this limitation so that it applies during appropriate plant conditions and reflects the results of analysis performed. This request also proposes changes to existing Technical Specifications 3.3.F.1, 3.3.F.2 and 3.3.F.3. These changes are intended to clarify the plant condition during which specifications 3.3.F.1 and 3.3.F.2 apply and revise the shutdown action requirement of specification 3.3.F.3 from cold shutdown to a hot shutdown condition. The changes proposed by this request will incorporate recirculation loop operability requirements into one Technical Specification section. The change to specification 3.3.F.3 has the potential to improve plant availability in the future.

Technical Specification safety limit 2.1.E was put into effect immediately following an event which occurred at Oyster Creek on May 2, 1979. After a reactor trip from 98% power all five recirculation loop discharge valves were closed, effectively isolating the downcomer region from the core region except for the five two-inch bypass lines. This, in conjunction with operating the Isolation Condenser System, caused the core region water level to go below the triple-low setpoint without actuation of the reactor double-low alarm. This situation results from the physical

arrangement of the level instrumentation at Oyster Creek. The annulus, core region and recirculation lines form a large U-tube when the recirculation pumps are not running, and the two levels should be very nearly the same. The low and double-low signals are generated from an instrument that is sensitive to water level in the annulus region. The triple-low instrument is sensitive to water level within the core region. Thus, isolating these two regions can have the result of having different water level readings from the two areas.

The requirement to have two recirculation loops fully open is classified a "Safety Limit" in the Oyster Creek license and Technical Specifications. Per 10CFR50.36(c)(1)(i)(A):

> "Safety limits for nuclear reactors are limits upon important process variables which are found to be necessary to reasonably protect the integrity of certain of the physical barriers which guard against the uncontrolled release of radioactivity."

The process variable which is indicative of a possible threat to a physical barrier (i.e., fuel clad integrity) is the core region water level. This "Safety Limit" is established separately (2.1.D) in the Oyster Creek Technical Specifications. The requirement regarding the open loops is more correctly defined as a "Limiting Condition for Operation". Per 10CFR50.36(c)(2):

> "Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility."

Since the requirement for having at least two of the recirculation loops fully open is intended to assure that other protective systems (e.g., the water level dependent actuation sequence for safety systems) perform correctly, rather than to actually protect the fission product barrier itself, it falls under the definition of a "Limiting Condition for Operation (LCO)."

A bounding loss of feedwater transient analysis was performed subsequent to the May 1979 event. This postulated transient event results in the largest loss of reactor coolant system inventory and in the most severe reduction in reactor vessel water levels during any anticipated operational occurrence. A hydraulic analysis of the recirculation lines was also performed to evaluate the effects of recirculation loop discharge valve position on steady-state water level in the core region. This analysis modeled recirculation line geometry with standard fluid mechanics methods. The methods included geometric pressure loss coefficients and a factor for a fixed rotor recirculation pump. The assumption of a fixed rotor is conservative and the pressure loss coefficient was based on in situ tests on a similar pump. The hydraulic model was used to calculate natural circulation flow from the annulus region to the core region. When taken together these analyses show that for the most severe loss of inventory transient core water level is maintained above the triple-low level safety limit and the natural

circulation flow from annulus to core is approximately five times the core boiloff rate with only one of the five recirculation loops unisolated. Adequate core cooling and water level indication is thus maintained.

The current safety limit requirement of maintaining two open recirculation loops was originally proposed in order to be conservative. However, changing this to a requirement of one unisolated loop still ensures adequate coolant communication. An LCO requirement for one unisolated recirculation loop, therefore, meets the LCO definition and is consistent with the transient and hydraulic analyses.

The conditions in the reactor vessel which provide adequate coolant communication between the annulus region and the core region and thus ensure proper core region water level indication are as follows:

1. A recirculation pump discharge valve and its associated suction valve in one recirculation loop are in the full open position; or

2. reactor water level is above 185 inches top of active fuel (TAF); or

3. when the steam separator and dryer are removed.

Condition 1 above can apply during all plant modes except power operation. Existing specifications 3.3.F.1, 3.3.F.2 and 3.3.F.3 establish recirculation loop operability requirements during power operation.

Condition 2 is applicable only when reactor coolant temperature is less than 212°F. With the reactor vessel flooded to a level above 185 inches TAF the water level is above the top of the steam separators. This provides a circulation path between the inside and the outside of the core shroud. Therefore, when the reactor vessel is flooded to a level above 185 inches TAF, coolant communication between the annulus region and the core region exists above the core in the steam separator/dryer area and water level indications will represent the level in the core region above the core without the need to maintain a recirculation loop unisolated . The requirement in this case for maintaining coolant temperature below 212°F results from Technical Specification (TS) 3.8.A. TS 3.8.A requires the Isolation Condenser System (ICS) to be operable whenever reactor coolant temperature is greater than 212°F. Flooding the reactor vessel above 185 inches TAF would flood the isolation condenser nozzles. This would result in rendering the steam condensing natural circulation ICS inoperable. When the isolation condenser nozzles are flooded ICS actuation would need to be prevented in order to avoid physical damage to the ICS due to water hammer. Therefore, condition 2 will not be applicable when reactor coolant temperature is greater than or equal to 212°F.

Condition 3 applies only when the steam separator and dryer are removed. In this case safety limit 2.1.D requires reactor vessel water level to be above the core shroud elevation. Coolant communication between the annulus region and the core region is achieved above the core, as in condition 2, but at a lower elevation due to the removal of the steam separator. The steam separator attaches to the core shroud

and effectively increases the elevation of the coolant separation between the annulus region and the core region. With the steam separator and dryer removed the coolant separation elevation is reduced and the minimum vessel level of 4 feet 8 inches required by safety limit 2.1.D provides coolant communication above the core between the annulus and core regions. This coolant communication path ensures water level indications are representative of core region water level without the need to maintain a recirculation loop unisolated. As in condition 2, condition 3 requires reactor coolant temperature to be less than 212°F. Although condition 3 allows reactor vessel water level to be lower than condition 2, condition 3 will usually apply during refueling operations when vessel level is significantly above 185 inches TAF. Fuel zone level instrumentation supplements other water level indication when water level is below 180 inches TAF and recirculation pumps are not operating.

Proposed specifications 3.3.F.4 and 3.3.F.6 account for the above plant conditions. Specification 3.3.F.4 applies when reactor coolant temperature is greater than or equal to 212°F. It requires one recirculation loop to be fully open. Specification 3.3.F.5 is a proposed action statement which requires one recirculation loop discharge valve and its associated suction valve to be opened immediately if specification 3.3.F.4 is not met. Immediate operator action can be achieved due to the provision for loop isolation detection and associated control room alarm for isolation of four or five loops. The most critical time for maintaining one recirculation loop fully open is during the early stages of the bounding loss of feedwater transient discussed earlier. If the fourth and/or fifth recirculation loops were isolated at this time, the control room alarm would alert the operator of the requirement to maintain at least one recirculation loop unisolated.

Specification 3.3.F.6 is proposed to allow isolation of all five recirculation loops when hydraulic communication between the annulus and core regions is achieved above the core. This specification requires that either condition 2 or condition 3 discussed above be met before isolation of all five recirculation loops is permitted. The reactor will be maintained in a cold shutdown (<212°F) with decay heat removal normally accomplished via the Shutdown Cooling System (SCS). When the SCS is in operation, hydraulic communication between annulus and core regions existing above the core as required by specification 3.3.F.6, is supplemented by forced flow through the SCS. Water level indication is supplemented by the fuel zone level instrumentation which has an upper range of 180 inches TAF.

Safety limit 2.1.E currently allows isolation of all five recirculation loops if the reactor is flooded to a level above the main steam nozzles and the reactor vessel head is removed. Proposed specification 3.3.F.6 does not require the head to be removed when conditions otherwise permit all recirculation loops to be isolated. There is nothing inherent in the removal of the vessel head which facilitates adequate vessel level monitoring. This current requirement is superfluous and does not provide any additional measure of safety. The GEMAC wide range level instrument provides vessel water level indication in the control room during cold conditions. This instrument has an effective range of 90-490 inches TAF and is available when the vessel head is in place.

Other vessel level instrumentation would be available when in the cold condition with the vessel head in place, but when level is above 185 inches TAF, these other indications would be pegged upscale. As a practical matter, the head would most likely be removed when the steam separator and dryer are removed since removal of the head would occur first.

The elevation of the centerline of the main steam nozzles is approximately 238 inches TAF. Proposed specification 3.3.F.6 would require vessel level to be above 185 inches TAF with the steam separator and dryer in place. Currently, in addition to requiring the reactor vessel head to be removed, safety limit 2.1.E requires vessel water level to be above the main steam nozzles in order to allow all recirculation loops to be isolated. As long as vessel level is above 185 inches TAF, hydraulic communication between the annulus and core regions is ensured above the core with the steam separator and dryer in place. The 212°F coolant temperature limitation prescribed by proposed specification 3.3.F.6 would necessitate operation of the Shutdown Cooling System. With the SCS in operation, hydraulic communication between the annulus and core regions which exists above the core is supplemented by forced coolant flow via the SCS. Upon removal of the steam separator and dryer, safety limit 2.1.D will ensure vessel water level is above the core shroud. Again, coolant communication between the annulus and core regions is achieved above the core and SCS operation provides an additional communication flow path.

If the reactor vessel is defueled, limitations on recirculation loop operation and vessel water level should not apply. Therefore, proposed specifications 3.3.F.4 and 3.3.F.6 stipulate that irradiated fuel is in the vessel.

Reactor power operation is currently not permitted with less than four operating recirculation loops. This limitation is established in specifications 3.3.F.1, 3.3.F.2 and 3.3.F.3. In addition to the proposed addition of technical specifications 3.3.F.4, 3.3.F.5 and 3.3.F.6 as discussed above, GPUN is proposing changes to existing specifications 3.3.F.1, 3.3.F.2 and 3.3.F.3. The changes to specifications 3.3.F.1 and 3.3.F.2 are editorial changes intended to provide greater clarity regarding the plant condition during which they apply. Specifically, these two specifications would be revised to incorporate the technical specification definitions of POWER OPERATION and OPERATING. The revision does not change current requirements.

Existing technical specification 3.3.F.3 is an action requirement which requires the reactor to be placed in the cold shutdown condition within 24 hours if less than four recirculation loops are operating during the power operation condition. The purpose of specification 3.3.F.3 is to place the reactor in a condition in which specifications 3.3.F.1 and 3.3.F.2 do not apply and to ensure that the reactor is maintained within analyzed and licensed limits. This is achieved by placing the reactor in a hot or cold shutdown subcritical condition. Currently, specification 3.3.F.3 requires the reactor to be placed in the cold shutdown condition within 24 hours if specifications 3.3.F.1 and 3.3.F.2 are not met. GPUN proposes that this requirement be changed to allow

the reactor to be maintained in a hot shutdown condition, i.e., the SHUTDOWN CONDITION or REFUEL MODE as defined in the Oyster Creek Technical Specifications with a further requirement to insert all operable control rods. This requirement would be required to be met within 12 hours. The reduction in time to reach a hot shutdown condition reflects the proposed change from the current cold shutdown requirement and is consistent with BWR Standard Technical Specification 3.4.1.1.a in NUREG 0123, Revision 3 for a similar condition. This proposed change to specificatin 3.3.F.3 has the potential to improve plant availability and minimize thermal cycling should a future shutdown be required to effect an easily accomplished short-term repair (e.g., recirculation pump motor-generator brush replacement when the fifth recirculation loop is unavailable for another reason).

Since there currently is no basis incorporated for specifications 3.3.F.1, 3.3.F.2 and 3.3.F.3, a basis is provided together with an appropriate basis for proposed specifications 3.3.F.4 and 3.3.F.6. This Technical Specification change request also corrects an inadvertant typographical error introduced by Amendment 75. This error is on page 2.1-3 of the bases section for Section 2.1. It is in what is currently the next to last paragraph. The first sentence should read as follows "...be monitored is 4'8" <u>above</u> the top of active fuel".

<u>Determination</u>

We have determined that the proposed Technical Specification changes involve no significant hazards considerations as discussed below.

1. The changes will not involve a significant increase in the probability or consequences of any accident previously evaluated. The reclassification of the requirement for unisolated recirculation loops from a safety limit to an LCO is an administrative change only. Reducing the requirement from two unisolated loops to one unisolated loop during applicable plant conditions has been analyzed. The loss of feedwater transient analysis when combined with the hydraulic analysis of the recirculation loops shows adequate hydraulic communication between the annulus and core regions. For this bounding anticipated operational occurrence water level indication is representative of the water level in the core with one unisolated recirculation loop. The primary concern regarding recirculation loop isolation is to maintain adequate hydraulic communication between the annulus and core regions. When conditions permit the reactor to be flooded to a water level above 185 inches TAF or when the steam separator and dryer are removed both regions are in hydraulic communication above the core and level readings are indicative of core region level, therefore, there is no need to keep recirculation loops unisolated. The proposed changes to specifications 3.3.F.1 and 3.3.F.2 are editorial and do not change these requirements. The proposed change to specification 3.3.F.3 ensures that the reactor is placed in a condition which does not necessitate operation of at least four recirculation loops, i.e., termination of power operation and subcritical.

   Since the proposed Technical Specifications do not alter any initial conditions assumed for design basis accidents previously evaluated nor do they change the operation of safety systems utilized to mitigate them, the probability or consequences of those accidents are unchanged.

2. The proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated. Adequate hydraulic communication between annulus and core regions is maintained during applicable plant conditions thus ensuring that water level indication is representative of the core region water level. Safety system actuation sequences dependent upon water level indication are not affected. The proposed changes to specifications 3.3.F.1 and 3.3.F.2 are editorial and do not change these requirements. The proposed change to specification 3.3.F.3 ensures that the reactor is placed in a condition which does not necessitate operation of at least four recirculation loops, i.e., termination of power operation and subcritical. The proposed Technical Specifications do not involve any physical plant change nor do they alter the operation of safety systems.

3. A significant reduction in margin of safety is not involved. The current Technical Specification basis for specification 2.1.E does not explicitly define a margin of safety. One unisolated recirculation loop provides a natural circulation coolant flow from the annulus to the core region which is approximately 5 times the boiloff rate expected during the bounding loss of coolant inventory transient. This is sufficient to prevent boiloff from significantly reducing core region water level relative to annulus level. Two unisolated loops would approximately double an already healthy margin. Since vessel water level does not fall below the water level safety limit as shown by the limiting transient analysis combined with the assumption of one unisolated recirculation loop, a reduction in the number of required unisolated loops from two to one is not considered significant.

   During conditions which permit isolating all five recirculation loops, limits are placed on reactor vessel water level which provide hydraulic communication above the core between the annulus and core regions. Although these levels are below what is currently required, they will continue to provide assurance that water level indication sensed in the annulus represent the water level in the core. The cold condition required would necessitate operation of the SCS. When the SCS is in operation, the forced recirculation path results in additional communication between annulus and core regions. Also, fuel zone level instrumentation is available when all recirculation loops are isolated and the recirculation pumps are not operating. This instrumentation senses vessel water level in the core region. Therefore, although the water level requirement is reduced representative core water level indication remains assured and so a significant reduction in margin of safety is not involved.

   A licensing basis has not yet been established at Oyster Creek for continued power operation with fewer than four operating recirculation loops. Therefore, specification 3.3.F.3 currently requires that power operation be terminated and that the reactor be placed in the cold shutdown condition if less than four recirculation loops are operating. The proposed change to allow the reactor to remain in a hot shutdown condition and subcritical achieves the same objective. Since power operation will still be terminated and the reactor maintained subcritical, there is no change in margin of safety.