GPU Nuclear

GPU Nuclear
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Parsippany, New Jersey 07054
201 263-6500
TELEX 136-482
Writer's Direct Dial Number:

March 11, 1986

Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Sir:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Technical Specification Change Request No. 145

Pursuant to 10CFR50.90, GPU Nuclear Corporation, operator of the Oyster Creek Nuclear Generating Station, Provisional Operating License No. DPR-16, requests a temporary change to Appendix A of that license.

The present Rod Worth Minimizer (RWM) hardware at Oyster Creek is original plant equipment. During the past several years, it has been increasingly difficult to maintain the RWM in an operable condition. This is due to the age of the equipment and lack of spare parts. In order to improve the reliability and availability of this system, a new RWM has been scheduled for installation during our upcoming Cycle 11R refueling outage. However, due to a delay in the projected delivery date for the new hardware, we will not be able to complete installation and testing prior to the current restart date in October of 1986. During the outage, as much preparatory work as is possible will be done so that upon arrival of the new RWM onsite the changeover from the old equipment to the new can be accomplished expeditiously.

In anticipation of future problems with the old RWM during operating Cycle 11 and the possibility of an unplanned shutdown and subsequent restart during Cycle 11 while the changeover to the new RWM is in progress with neither the old or new RWM operable, we are proposing a temporary change to the Technical Specifications, for Cycle 11 only, which will allow unlimited startups with an inoperable RWM. Every effort will continue to be made, however, to maintain the old RWM in an operable status.

This proposed change will affect Section 3.2 of the Appendix A Technical Specifications. Currently, specification 3.2.B.2.b allows one reactor startup per calendar year without the RWM. In addition to the added procedural controls presently required during a startup without the RWM, one more requirement would be instituted. This requirement will be the use of Control Rod Pattern Templates (CRPT). The CRPTs will further ensure that control rod

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sequence withdrawals are limited to those control rods within the specified group.

This change request has been reviewed in accordance with Section 6.5 of the Oyster Creek Technical Specifications. We have concluded that this proposed change does not constitute a significant hazard consideration.

Pursuant to 10CFR50.91(b)(1), a copy of this change request has been sent to the State of New Jersey Department of Environmental Protection. In addition, pursuant to 10CFR170.12, a check for $150.00, to cover the fee required for review of this application for license amendment, is enclosed.

Very truly yours,

Peter B. Fiedler
Vice President and Director
Oyster Creek

PBF:gpa
2848f
Attachment

cc: Dr. Thomas E. Murley, Administrator
Region 1
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Mr. Jack N. Donohew, Project Manager
U.S. Nuclear Regulatory Commission
Phillips Building, Mail Stop No. 314
7920 Norfolk Avenue
Bethesda, Maryland 20014

NRC Resident Inspector
Oyster Creek Nuclear Generating Station
Forked River, New Jersey 08731

GPU NUCLEAR CORPORATION
OYSTER CREEK NUCLEAR GENERATING STATION

Provisional Operating
License No. DPR-16

Technical Specification
Change Request No. 145
Docket No. 50-219

Applicant submits, by this Technical Specification Change Request No. 145 to the Oyster Creek Nuclear Generating Station Technical Specifications, a change to Section 3.2.

By [signature]
Peter B. Fiedler
Vice President and Director
Oyster Creek

Sworn and Subscribed to before me this 11 day of March 1986.

Diana A. Maldet
A Notary Public of NJ

DIANA A. MALDET
A Notary Public of New Jersey
My Commission Expires June 5, 1986

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of)
GPU Nuclear Corporation)

Docket No. 50-219

CERTIFICATE OF SERVICE

This is to certify that a copy of Technical Specification Change Request No. 145 for Oyster Creek Nuclear Generating Station Technical Specifications, filed with the U.S. Nuclear Regulatory Commission on March 11, 1986, has this day of March 11, 1986, 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

GPU Nuclear

GPU Nuclear Corporation
Post Office Box 388
Route 9 South
Forked River, New Jersey 08731-0388
609 971-4000
Writer's Direct Dial Number:

March 11, 1986

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. 145 for the Oyster Creek Nuclear Generating Station Operating License.

This document was filed with the United States Nuclear Regulatory Commission on March 11, 1986.

Very truly yours,

Peter B. Fiedler
Vice President and Director
Oyster Creek

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Attachment

OYSTER CREEK NUCLEAR GENERATING STATION

PROVISIONAL OPERATING LICENSE NO. DPR-16
DOCKET NO. 50-219
TECHNICAL SPECIFICATION CHANGE REQUEST NO. 145

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. <u>Section to be Changed</u>

   Section 3.2, subsection 3.2.B, paragraph 2.b.

2. <u>Extent of Change</u>

   This proposed change to Technical Specification 3.2.B.2.b will require the use of a Control Rod Pattern Template (CRPT) during control rod withdrawal with the reactor below 10% rated power and control rod insertion densities greater than 50% in a checkerboard withdrawal pattern when the Rod Worth Minimizer (RWM) is inoperable. This is in addition to the current Technical Specification requirement for a second licensed operator and a core engineer to be present to verify that the operator at the reactor control console is following the rod program.

   In addition, this proposed change will alter the operability requirements for the RWM by eliminating the restriction of allowing only one reactor startup during each calendar year without the RWM. This proposed change will allow for unlimited reactor startups without the RWM and will be in effect for Cycle 11 only.

   This proposed change will be effected by the addition of a note to Technical Specification 3.2.B.2.b.

3. <u>Change Requested</u>

   The requested change is shown on attached revised Technical Specification page 3.2-1.

4. <u>Discussion</u>

   The present Rod Worth Minimizer (RWM) hardware at Oyster Creek is original plant equipment. During the past several years, it has been increasingly difficult to maintain the RWM in an operable condition. This is due to the age of the equipment and lack of spare parts. In order to improve the reliability and availability of this system, a new RWM has been scheduled for installation during our upcoming Cycle 11R refueling outage. However, due to a delay in the projected delivery date for the new hardware, installation and startup testing will not be completed prior to the current restart date in October of 1986.

In anticipation of future problems with the old RWM during operating Cycle 11 and the possibility of an unplanned shutdown and subsequent restart during operating Cycle 11 while the changeover to the new RWM is in progress with neither the old or new RWM operable, we are proposing a temporary change to the Technical Specifications, for Cycle 11 only, which will allow unlimited startups with an inoperable RWM. Every effort will continue to be made, however, to maintain the old RWM in an operable status.

The design basis of the Rod Worth Minimizer is that it should serve as a backup for procedural control in limiting control rod worths so that, in the event of a control rod drop from the reactor core at a more rapid rate than can be achieved by the use of the control rod drive mechanism, the reactivity addition rate would not lead to damage of the Reactor Coolant System nor to significant fuel damage.

Good operating procedures are the primary defense against high worth control rod patterns. Normal plant operation results in control rod patterns which have sufficiently low individual rod worths. The RWM is not intended to replace operator selection of control patterns, but is intended simply to monitor and reinforce good procedures. In performing this function, it causes minimum interference with desired plant operation.

The reactivity control section of the Technical Specifications (Section 3.2) applies to core reactivity and the operating status of the reactivity control systems for the Oyster Creek reactor. Specifically, Technical Specification 3.2.B.2 addresses the RWM operability requirements during reactor startups. The specification reads as follows:

"The Rod Worth Minimizer (RWM) shall be operable during each reactor startup until reactor power reaches 10% of rated power except as follows:

(a) Should the RWM become inoperable after the first twelve rods have been withdrawn, the startup may continue provided that a second licensed operator verifies that the licensed operator at the reactor console is following the rod program.

(b) Should the RWM be inoperable before a startup is commenced or before the first twelve rods are withdrawn, one startup during each calendar year may be performed without the RWM provided that the second licensed operator verifies that the licensed operator at the reactor console is following the rod program and provided that a reactor engineer from the Core Engineering Group also verifies that the rod program is being followed. A startup without the RWM as described in this subsection shall be reported in a special report to the Nuclear Regulatory Commission (NRC) within 30 days of the startup stating the reason for the failure of the RWM, the action taken to repair it and the schedule for completion of the repairs.

Control rod withdrawal sequences shall be established with a banked position withdrawal sequence so that the rod drop accident design limit of 280 cal/gm is not exceeded. For control rod withdrawal sequences not in strict compliance to BPWS, the maximum in sequence rod worth shall be $\leq$ 1.0% K."

Of particular interest is subsection (b) of this specification which allows one reactor startup during each calendar year with an inoperable Rod Worth Minimizer. The basis in the Technical Specifications addresses this provision as follows:

"The Rod Worth Minimizer provides automatic supervision of conformance to the specified control rod patterns. It serves as a back-up to procedural control of control rod worth. In the event that the RWM is out of service when required, a licensed operator can manually fulfill the control rod pattern conformance functions of the RWM in which case the normal procedural controls are backed up by independent procedural controls to assure conformance during control rod withdrawal. This allowance to perform a startup without the RWM is limited to once each calendar year to assure a high operability of the RWM which is preferred over procedural controls."

The first barrier or line of defense in preventing the establishment of high worth control rods is the reactor operator and the control rod withdrawal sequence. By procedures, the reactor operator follows the rod-by-rod withdrawal sequence provided by the core engineer. This sequence, in addition to providing for an efficient startup, minimizes the reactivity worth of the control rods to be withdrawn. The RWM has been designed as a backup to the operator so that if procedures are violated, the RWM will block rod motion.

Given, however, that the RWM is out of service during operation at less than approximately 10 percent power, less favorable control rod patterns which contain high worth rods in the withdrawal sequence could be set up, but only if the reactor operator violates an operating procedure. If the reactor operator operates within the bounds established by procedures, whether the RWM is operational or not, the maximum control rod worths of in-sequence control rods are the same. There is nothing inherent in the RWM which, because it is operational, gives lower rod worths than when the operator is running the plant by the same rules without it.

If the RWM is out of service, normal startup procedure would still be followed but would not be automatically monitored. Additional personnel monitoring would be used instead, as discussed in paragraph 3.2.B.2.b of the Technical Specifications. If no operational errors were committed, rod worths and accident potential would be exactly the same as if the RWM were in operation. Rod grouping in startup sequences utilized in the RWM are exactly those that are the basis for the detailed sequence employed in a normal startup whether monitored by the RWM or not. The question then becomes one of evaluation of the probability of significant operational errors occurring in a startup unmonitored by the RWM.

It should be emphasized at this point that the mere existence in the core of a high worth rod presents no immediate safety problem. It is required that a drive-to-blade coupling failure and drive withdrawal occur before an excursion potential exists.

As stated earlier, the design basis of the Rod Worth Minimizer is to serve as a backup to procedural control in limiting control rod worths. The RWM ensures operator compliance with a predetermined rod withdrawal sequence. However, the functional intent of the RWM can be fulfilled using other methods. The method we propose is the requirement that Control Rod Pattern Templates (CRPT) be employed with a second licensed operator and core engineer being present to verify that the operator at the reactor control console is following the rod program. The control rod pattern templates are fabricated from plastic sheets. A set of templates is comprised of four sheets, which stack together atop the control rod selection switches. The topmost sheet contains cutouts which permit selection only of the group 1 control rods; the second sheet enables the selection of group 1 and 2 rods, etc., until the bottom sheet which enables the selection of any rod in the checkerboard or black-white pattern. Since the order of withdrawal of control rods within a group is unimportant, the CRPT performs one of the RWM functions by allowing withdrawal of only those rods which are members of the group being withdrawn.

Visual and mechanical features assure the proper stacking order of the various templates and correct orientation over the rod selection switches. First, each panel is clearly and conspicuously marked by group number order. In addition, adjacent sheets are keyed by uniquely positioned cutouts and raised areas, which by matching together, insure the correct stacking order. Finally, the proper orientation over the rod selection panel is guaranteed by asymmetrical pegs on the console which the templates fit.

There are two basic withdrawal sequences (A and B) which lead to a 50% control rod density or checkerboard pattern. Consequently, there is a set of templates for Sequence A and another set for Sequence B. Although there are several variations in the basic A and B sequences used to shape the core power distribution, these sequences remain the same in their approach to the 50% rod density. Thus, by the use of the CRPT, the probability of achieving a maximum out-of-sequence rod withdrawal error is effectively reduced to zero. This is because the maximum out-of-sequence control rod worth for a given withdrawal sequence (A or B) is always obtained by inadvertently withdrawing a control rod which is a member of the alternate sequence (B or A, respectively). For this reason only the proper set of templates are provided to the control room; the alternate set are stored in an area not readily accessible to the control room operators.

During those startups where 50% rod density is reached prior to 10% power, rod movement after 50% rod density must proceed without protection from the CRPT. However, protection from an additional operator and core engineer against withdrawal of an out-of-sequence

rod, in conjunction with relatively low rod worths after 50% rod density and the increase in required rod worths needed to exceed the 280 calories/gram design limit for the rod drop accident, is sufficient to warrant rod withdrawal in this region without the CRPT. Analysis shows that at a reactor power level as low as 2% with a single worst operator withdrawal error, the local energy deposition in the fuel is less than the 280 cal/gram design limit.

This Technical Specification Change Request to Section 3.2.B.2 is being made to allow for more than one reactor startup during each calendar year in Cycle 11 when the RWM is inoperable. This proposed change is an extension of an already existing Technical Specification provision. The function of the RWM is manually fulfilled with the addition of a second licensed operator, core engineer and the use of Control Rod Pattern Templates to ensure conformance to the control rod pattern sequence.

4. Determination

We have determined, based upon the above discussion, that this change request involves no significant hazards considerations in that operation of the Oyster Creek plant in accordance with the proposed amendment will not:

1. Involve a significant increase in the probability or consequences of any accident previously evaluated; or

2. Create the probability of a new or different kind of accident from any accident previously evaluated; or

3. Involve a significant reduction in margin of safety.

In summary, the basis for the above determination is twofold. Firstly, as an extension of an existent Technical Specification provision, this change request does not increase the probability or consequences of any accident previously evaluated nor does it create the probability of a new or different kind of accident from any accident previously evaluated. Secondly, the additional constraints, proposed for Cycle 11 only, enhance the margin of safety through the use of the CRPT and the second licensed operator and core engineer up to 50% control rod density or 10% power level, whichever occurs first.

3.2 REACTIVITY CONTROL

Applicability: Applies to core reactivity and the operating status of the reactivity control systems for the reactor.

Objective: To assure reactivity control capability of the reactor.

Specification:

A. Core Reactivity

The core reactivity shall be limited such that the core could be made subcritical at any time during the operating cycle, with the strongest operable control rod fully withdrawn and all other operable rods fully inserted.

B. Control Rod System

1. The control rod drive housing support shall be in place during power operation and when the reactor coolant system is pressurized above atmospheric pressure with fuel in the reactor vessel, unless all control rods are fully inserted and Specification 3.2.A is met.

2. The Rod Worth Minimizer (RWM) shall be operable during each reactor startup until reactor power reaches 10% of rated power except as follows:

(a) Should the RWM become inoperable after the first twelve rods have been withdrawn, the startup may continue provided that a second licensed operator verifies that the licensed operator at the reactor console is following the rod program.

(b) Should the RWM be inoperable before a startup (see NOTE below) is commenced or before the first twelve rods are withdrawn, one startup during each calendar year may be performed without the RWM provided that the second licensed operator verifies that the licensed operator at the reactor console is following the rod program and provided that a reactor engineer from the Core Engineering Group also verifies that

NOTE: During Cycle 11 only, unlimited reactor startups are permitted without the RWM. The Control Rod Pattern Templates must be used during Cycle 11 when the RWM is bypassed or inoperable until 50% control rod density (black and white pattern) is achieved or 10% power is reached whichever occurs first. All other provisions of specification 3.2.B.2.b remain in effect.