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10 CFR 50.90

2130-04-20072
May 20, 2004

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Oyster Creek Generating Station
Facility Operating License No. DPR-16
NRC Docket Nos. 50-219

Subject: Technical Specification Change Request No. 326 - Clarification of Control Rod Operability Requirements

Pursuant to 10 CFR 50.90, "Application for amendment of license or construction permit," AmerGen Energy Company, LLC (AmerGen), hereby requests the following amendment to the Technical Specifications (TS), Appendix A of Operating License No. DPR-16 for Oyster Creek Generating Station (OCGS).

The proposed changes will revise the control rod operability requirements in OCGS TS 3.2.B.4, and the associated Bases section, to clarify the application of the action requirements for inoperable control rods. The changes are consistent with the intent of the current TS operability requirements, and with the improved standard TS presented in the NRC document titled: "Standard Technical Specifications – General Electric Plants, BWR/4," NUREG-1433, Rev. 2. Additionally, a typographical correction is proposed for Table 3.1.1.

AmerGen requests approval of the proposed amendment by May 17, 2005. Once approved, the amendment shall be implemented within 30 days of issuance.

These proposed changes have been reviewed by the OCGS Plant Operations Review Committee, and approved by the Nuclear Safety Review Board in accordance with Section 6.5 of the Oyster Creek Technical Specifications.

AmerGen has concluded that the proposed changes present no significant hazards consideration under the standards set forth in 10 CFR 50.92.

No new regulatory commitments are established by this submittal.

A001

Pursuant to 10 CFR 50.91(b)(1), "Notice for public comment; State consultation," paragraph (b), AmerGen Energy Company, LLC is notifying the State of New Jersey of this application for changes to the TS by transmitting a copy of this letter and its attachments to the designated State Official.

If you have any questions or require additional information, please contact Dave Robillard at (610) 765-5952.

I declare under penalty of perjury that the foregoing is true and correct.

Respectfully,

May 20, 2004
Executed on

Keith R. Jury
Director, Licensing & Regulatory Affairs
AmerGen Energy Company, LLC

Enclosures:
1) Oyster Creek Technical Specification Change Request No. 326, Evaluation of Proposed Changes
2) Oyster Creek Technical Specification Change Request No. 326, Proposed Technical Specification Changes (Mark-up)
3) Oyster Creek Technical Specification Change Request No. 326, Retyped Technical Specification Changes

cc: H. J. Miller, Administrator, Region I, USNRC
R. J. Summers, USNRC Senior Resident Inspector, Oyster Creek
P. S. Tam, USNRC Senior Project Manager, Oyster Creek
K. Tosch, Director, Bureau of Nuclear Engineering, New Jersey Department of Environmental Protection
File No. 04032

Enclosure 1

Oyster Creek Technical Specification Change Request No. 326

Evaluation of Proposed Changes

1.0 INTRODUCTION

The proposed changes to the Facility Operating License No. DPR-16 for Oyster Creek Generating Station would revise Technical Specification (TS) 3.2.B.4, Control Rod System, and the associated Bases section, to clarify the intent of the control rod (CR) operability requirement. Additionally, a typographical correction is proposed to Table 3.1.1.

Specification 3.2.B.4 states that a control rod which cannot be moved with CR drive pressure (stuck) must be considered inoperable. A literal interpretation of this specification infers that, in addition to a stuck control rod, operable control rods, valved out-of-service to accommodate on-line maintenance of their associated controls, rendering them unresponsive to control rod drive pressure, are also designated as "inoperable" for the purpose of implementing the TS action statements. This interpretation triggers the accelerated control rod exercise requirement of surveillance requirement (SR) 4.2.D, since normal maintenance practice results in more than one operable control rod being fully inserted and valved out-of-service. SR 4.2.D requires each partially or fully withdrawn control rod be exercised within 24 hours in event power operation is continuing with two or more inoperable control rods. Normal exercise frequency for control rods is weekly. This results in unnecessary exercising that may shorten the operable lifespan of the control rod hydraulic controls.

Specification 3.2.B.4 also requires a plant shutdown with more than six control rods valved out-of-service. Using the literal interpretation of this TS as discussed above, operable control rods, valved out-of-service for maintenance, are included in this six control rod limit. This interpretation may result in an unnecessary plant shutdown. The changes proposed by this license amendment request would clarify that the intent of these operability requirements does not include operable control rods valved out-of-service in their fully inserted position for maintenance.

2.0 DESCRIPTION OF PROPOSED CHANGE

TS 3.2.B.4, page 3.2-3, currently reads as follows:

"Control rods, which cannot be moved with control rod drive pressure, shall be considered inoperable. If a partially or fully withdrawn control rod drive cannot be moved with drive or scram pressure, the reactor shall be brought to a shutdown condition within 48 hours unless investigation demonstrates that the cause of the failure is not due to a failed control rod drive mechanism collet housing. Inoperable control rods shall be valved out of service, in such positions that Specification 3.2.A is met. In no case shall the number of rods valved out of service be greater than six during the power operation. If this specification is not met, the reactor shall be placed in the shutdown condition."

Proposed Change 1: Revise the first sentence by adding the phrase "In service" in front of "control rods".

Proposed Change 2: Revise the fourth sentence by adding the phrase " inoperable control" in front of "rods".

Accordingly, proposed TS 3.2.B.4 would read as follows:

"In-service control rods which cannot be moved with control rod drive pressure shall be considered inoperable. If a partially or fully withdrawn control rod drive cannot be moved with drive or scram pressure, the reactor shall be brought to a shutdown condition within 48 hours unless investigation demonstrates that the cause of the failure is not due to a failed control rod drive mechanism collet housing. Inoperable control rods shall be valved out of service, in such positions that Specification 3.2.A is met. In no case shall the number of inoperable control rods valved out of service be greater than six during power operation. If this specification is not met, the reactor shall be placed in the shutdown condition."

Proposed Change 3: Revise the first sentence of the third paragraph on page 3.2-8 of the Bases by adding "inoperable control" in front of "rods".

Proposed Change 4: Add a new sentence to the third paragraph on page 3.2-8 Bases. "Operable rods that have been taken out of service at the fully inserted position to perform HCU maintenance are not to be counted as inoperable control rods." Accordingly, the first two sentences of the third paragraph would read:

"The number of inoperable control rods permitted to be valved out of service could be many more than the six allowed by specification, particularly late in the operating cycle; however, the occurrence of more than six could be indicative of a generic problem and the reactor will be shut down. Operable rods that have been taken out of service at the fully inserted position to perform HCU maintenance are not to be counted as inoperable control rods.

Proposed Change 5: Correct a typographical error in Table 3.1.1 that was inadvertently introduced by Oyster Creek License Amendment 208, approved by the NRC on June 2, 1999. A note applicable to TS Table 3.1.1, "Protective Instrumentation Requirements" item G.3, "Actions Required*" on TS page 3.1-12, was inadvertently changed from "See note i" to "See note I". Table 3.1.1 does not have a "note I".

Implementation of the amendment will be performed within 30 days of NRC issuance of the amendment.

3.0 BACKGROUND

Each control rod drive (CRD) has an associated hydraulic control unit (HCU) located in the reactor building that is accessible during reactor power operations. Remote signals to the HCU perform two separate functions: First is to provide normal rod positioning for reactivity control during startups, shutdowns, flux shaping and load follow. Second is to actuate a scram (rapid insertion of the rod) when a rapid plant shut down is required. The

HCU provides rod positioning by directing drive and exhaust water from the CRD hydraulic system for one rod at a time. The scram function is performed on all CRDs for reactor protection and on a single CRD for testing purposes. For a scram the HCU provides a volume of water with stored nitrogen gas pressure, and scram valves that quickly open to align the water volume and exhaust path to cause rapid insertion of the rod.

Over time the HCU components require both preventative and corrective maintenance to ensure complete HCU functioning capability. Degradation of one or more HCU component(s) can impact the positioning function performance of the control rod drive. Slow, fast, or improper single notch operation can occur during the operating cycle and be corrected by performing on-line HCU maintenance.

The scram function is normally unaffected by degradation of components utilized for rod positioning. HCU components that affect scram performance are designed so they normally fail to the scram position and cause a rod to insert. Proactive on-line maintenance is performed on scram equipment to assure rods reliably scram only upon a scram signal. Scram speeds are required to be verified after any maintenance on the HCU that could affect scram performance. Scram speeds are also monitored in accordance with Technical Specifications to ensure performance meets required speeds.

For control rods that exhibit less than optimum positioning performance, corrective maintenance on their HCUs is scheduled. Additionally, other components will be scheduled for proactive maintenance based on vendor and industry experience. For the past several years, HCU maintenance has been performed with the plant on-line during scheduled power reductions. On-line maintenance results in more timely implementation of corrective and preventative maintenance, enhancing the reliability of the CRD system. Considering the limited duration of the scheduled power reductions, normally more than one control rod is removed from service at the same time to perform HCU maintenance.

4.0 TECHNICAL ANALYSIS

Proposed Change 1:

Specification 3.2.B.4 defines an inoperable control rod as one that cannot be moved with control rod drive pressure. However, there is a situation where operable control rods are valved out-of-service, and as a consequence, "cannot be moved with control rod pressure." This involves operable control rods that have been fully inserted and valved out-of-service to perform maintenance on the control rod's hydraulic control unit (HCU), or other control features external to the control rod drive. The intent of the Specification was directed only at stuck control rods; not operable control rods removed from service for maintenance. The proposed change would clarify that the intent of the Control Rod System operability requirements of TS 3.2.B.4 is directed only at inoperable control rods. This clarification would be accomplished by adding the qualification of "in service" control rods.

Changing this sentence does not eliminate any operability requirements for an inoperable control rod. The remaining portions of the current TS 3.2.B.4 specify the required actions for all inoperable control rods, and additional requirements for stuck control rods not in the fully inserted position. Stuck control rods in the fully inserted position are considered inoperable, and accordingly, the requirements for inoperable control rods apply. The second sentence of the current TS 3.2.B.4 specifies the required action if a partially or fully withdrawn control rod cannot be moved with drive or scram pressure; i.e., a stuck control rod. The third sentence requires all inoperable control rods to be valved out of service, and verification that the shutdown margin requirements of TS 3.2.A are met. The fourth sentence of the current TS 3.2.B.4 prohibits power operation if the number of inoperable control rods exceeds six. The last sentence requires the reactor to be shutdown if the specified control rod operability requirements are not met. These sentences will remain in the TS unchanged, except for proposed clarification change 2. Accordingly, the requirements needed to assure the operability of control rods will remain unchanged by this proposed change.

The Standard Technical Specifications-General Electric Plants (STS), BWR/4, NUREG-1433, Rev. 2, applies the control rod operability requirements explicitly to "inoperable control rods" and "withdrawn stuck control rods." Accordingly, the STS excludes operable control rods, valved out of service for on-line maintenance, from consideration as inoperable control rods. The proposed clarification change is therefore consistent with the content of the STS.

A literal interpretation of the current TS would require designating an operable control rod that has been inserted and valved out-of-service, as an inoperable control rod. Since on-line maintenance is normally performed on more than one control rod at the same time, this will trigger the accelerated control rod exercise requirement of TS 4.2.D. This specification requires all partially or fully withdrawn control rods to be exercised within the next 24 hours, with two or more inoperable control rods. This unnecessary exercise testing may shorten the operable lifespan of HCU components.

Proposed Change 2:

The third sentence of the current TS 3.2.B.4 identifies as a "required action" for inoperable control rods, the requirement to valve the control rod out-of-service. The fourth sentence uses the "valved out-of-service" phrase not as a "required action", but as a condition requiring a plant shutdown if the limit of six is exceeded. The proposed change would limit the application of "valved out-of-service" to inoperable control rods. Accordingly, proposed change 2 would add the phrase "inoperable control" in front of "rods" in the fourth sentence.

The STS, NUREG-1433, applies the control rod operability requirements explicitly to "inoperable control rods" and "withdrawn stuck control rods". Accordingly, the STS excludes operable control rods, valved out of service for on-line maintenance, from consideration as inoperable control rods. These proposed changes are consistent with the STS, and do not remove the requirements needed to assure control rod operability.

A literal interpretation of the current TS would include operable control rods that have been inserted and valved out-of-service for corrective maintenance, to be counted in the six control rod limit of TS 3.2.B.4. This may result in unnecessary accelerated testing of other control rods, plant shutdowns and thermal cycles, or reduce the amount of HCU maintenance that can be performed on-line to maintain the reliability of the CRD system.

Performing such corrective maintenance on HCU components is an effective means of optimizing their performance. Before maintenance is performed, the control rod is disarmed electrically and/or hydraulically by closing the drive water and exhaust water isolation valves. A control rod that has been fully inserted, and disarmed for such maintenance satisfies the safety function of that control rod since it is in a position of maximum contribution to shutdown reactivity.

Proposed Changes 3 and 4:

Proposed changes 3 and 4 will establish consistency in the Bases section with proposed change 2. Inoperable control rods must be "valved out-of-service" in accordance with the third sentence of TS 3.2.B.4. The intent of using this phrase in the fourth sentence, regarding the six control rod limit, was to apply it only to inoperable control rods. The proposed changes would clarify that the six control rod limit of TS 3.2.B.4 does not apply to operable control rods that have been fully inserted and valved out-of-service for maintenance.

Proposed Change 5:

The change corrects a typographical error inadvertently introduced by a previous license amendment. The change is purely editorial in nature and has no impact on the technical content of TS 3.1.

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

AmerGen Energy Company, LLC, 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 amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   The proposed changes involve clarifications that do not change the intent of the control rod operability requirements and the correction of a typographical error in Table 3.1.1. The changes will not alter the physical design or operational procedures associated with the reactor control rods, or any other plant structure, system, or component. The requirements needed to assure the operability of the reactor shutdown system remain unchanged.

Therefore, this proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

Response: No.

The proposed changes involve clarifications that do not change the intent of the control rod operability requirements and the correction of a typographical error in Table 3.1.1. The changes do not alter the physical design, safety limits, or safety analysis assumptions, associated with the operation of the plant. Accordingly, the changes do not introduce any new accident initiators, nor do they reduce or adversely affect the capabilities of any plant structure, system, or component to perform their safety function.

Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any previously evaluated.

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

Response: No.

The intent of Technical Specification (TS) 3.2.B.4 is to identify the action requirements for inoperable control rods. A literal interpretation of the current TS would apply these requirements to operable control rods that have been fully inserted and disarmed and/or valved out-of-service to perform on-line corrective maintenance. This interpretation for operable control rods may result in unnecessary accelerated exercising of other control rods and/or a plant shutdown, or reduce the amount of HCU maintenance that can be performed on-line to maintain the reliability of the CRD system.

The proposed changes would clarify that control rods that have been fully inserted and disarmed are not considered inoperable control rods. Control rods that have been fully inserted, and disarmed, fulfill the safety function of the control rod since it is in a position of maximum contribution to shutdown reactivity. The change is consistent with the regulatory guidance of the Standard Technical Specification, NUREG-1433. The requirements applicable to inoperable control rods are unchanged, maintaining the existing margin to safety.

Correction of the typographical error in Table 3.1.1 is editorial in nature and has no impact on the technical content of the license.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

5.2 Applicable Regulatory Requirements/Criteria

The nuclear steam supply owners groups and the NRC staff developed improved standard technical specifications (ISTS) that established models of the Commission's policy for technical specifications, and improved the format and clarity of the specifications. The "Standard Technical Specifications – General Electric Plants, BWR/4," NUREG-1433, Revision 2, was approved and issued for use by the NRC. Control rod operability requirements in the ISTS (Section 3.1.3) apply to "inoperable control rods" and "stuck control rods". The ISTS does not define control rods valved out of service" as inoperable. The clarification changes proposed by this license amendment application are consistent with the nomenclature used in the ISTS for control rod operability.

In conclusion, based on the considerations discussed above, (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.

6.0 ENVIRONMENTAL CONSIDERATION

The proposed amendment is confined to changes that clarify the intent of existing requirements, and is therefore administrative in nature. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(10). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 PRECEDENT

The proposed change is specific to Oyster Creek Technical Specifications, therefore, no precedent exists.

8.0 REFERENCES

1. NUREG-1433, Revision 2, "Standard Technical Specifications-General Electric Plants. BWR/4," June 2001.

Enclosure 2

Oyster Creek Technical Specification Change Request No. 326

Proposed Technical Specification Changes (Mark-up)

The pages included in this enclosure are:

PAGES

3.1-12
3.2-3
3.2-8

TABLE 3.1.1 PROTECTIVE INSTRUMENTATION REQUIREMENTS
Sheet 4 of 13

Function	Trip Setting	Reactor Modes in which Function Must Be OPERABLE: Shutdown	Refuel	Startup	Run	Minimum Number of OPERABLE or OPERATING [tripped] Trip Systems		Minimum Number of Instrument Channels Per OPERABLE Trip System	Action Required*
E. Containment Spray									
Comply with Technical Specification 3.4									
F. Primary Containment Isolation									
1. High Drywell Pressure	≤ 3.5 psig	X(u)	X(u)	X(u)		X	2(k)	2(k)(oo)	Isolate containment or PLACE IN COLD SHUTDOWN CONDITION
2. Low-Low Reactor Water Level	≥ 7'2" above TOP of ACTIVE FUEL	X(u)	X(u)	X(u)		X	2	2(oo)	
G. Automatic Depressurization									
1. High Drywell Pressure	≤ 3.5 psig	X(v)	X(v)	X(v)		X	2(k)	2(k)	See note h
2. Low-Low-Low Reactor Water Level	≥4'8" above TOP of ACTIVE FUEL	X(v)	X(v)	X(v)		X	2	2	See note h
3. Core Spray Booster Pump d/p Permissive	>21.2 psid	X(v)	X(v)	X(v)		X	Note i	Note i	See note i
H. Isolation Condenser Isolation (See Note hh)									
1. High Flow Steam Line	≤ 20 psig P	X(s)	X(s)	X		X	2	2(oo)	Isolate affected Isolation Condenser comply with Spec 3.8. See note dd
2. High Flow Condensate Line	≤ 27" P H_2O	X(s)	X(s)	X		X	2	2(oo)	

The average of the scram insertion times for the three fastest control rods of all groups of four control rods in a two-by-two array shall be no greater than:

Rod Length Inserted (%)	Insertion Time (Seconds)
5	0.398
20	0.954
50	2.120
90	5.300

Any four rod group may contain a control rod which is valved out of service provided the above requirements and Specification 3.2.A are met. Time zero shall be taken as the de-energization of the pilot scram valve solenoids.

4. Control rods which cannot be moved with control rod drive pressure shall be considered inoperable. If a partially or fully withdrawn control rod drive cannot be moved with drive or scram pressure, the reactor shall be brought to a shutdown condition within 48 hours unless investigation demonstrates that the cause of the failure is not due to a failed control rod drive mechanism collet housing. Inoperable control rods shall be valved out of service, in such positions that Specification 3.2.A is met. In no case shall the number of rods valved out of service be greater than six during the power operation. If this specification is not met, the reactor shall be placed in the shutdown condition.

In service

inoperable control

5. Control Rods shall not be withdrawn for approach to criticality unless at least two source range channels have an observed count rate equal to or greater than 3 counts per second.

C. Standby Liquid Control System

1. The standby liquid control system shall be operable at all times when the reactor is not shut down by the control rods such that Specification 3.2.A is met and except as provided in Specification 3.2.C.3.

2. The standby liquid control solution shall have a Boron-10 isotopic enrichment equal to or greater than 35 atom %, be maintained within the cross-hatched volume-concentration requirement area in Figure 3.2-1 and at a temperature not less than the temperature presented in Figure 3.2-2 at all times when the standby liquid control system is required to be operable.

3. (a) If one standby liquid control system pumping circuit becomes inoperable during the RUN mode and Specification 3.2.A is met, the reactor may remain in operation for a period not to exceed 7 days, provided the pump in the other circuit is verified daily to be operable, otherwise be in the Shutdown condition within 24 hours.

However, 200 milliseconds is conservatively assumed for this time interval in the transient analyses and this is also included in the allowable scram insertion times of Specification 3.2.B.3. The specified limits provide sufficient scram capability to accommodate failure to scram of any one operable rod. This failure is in addition to any inoperable rods that exist in the core, provided that those inoperable rods met the core reactivity Specification 3.2.A.

Control rods (6) which cannot be moved with control rod drive pressure are clearly indicative of an abnormal operating condition on the affected rods and are, therefore, considered to be inoperable. Inoperable rods are valved out of service to fix their position in the core and assure predictable behavior. If the rod is fully inserted and then valved out of service, it is in a safe position of maximum contribution to shutdown reactivity. If it is valved out of service in a non-fully inserted position, that position is required to be consistent with the shutdown reactivity limitation stated in Specification 3.2.A, which assures the core can be shutdown at all times with control rods. Before a rod is valved out of service in a non-fully inserted position, an analysis is performed to insure Specification 3.2.A is met.

Σ inoperable control

The number of rods permitted to be valved out of service could be many more than six allowed by the specification, particularly late in the operating cycle; however, the occurrence of more than six could be indicative of a generic problem and the reactor will be shut down. Also, if damage within the control rod drive mechanism and in particular, cracks in drive internal housings, cannot be ruled out, then a generic problem affecting a number of drives cannot be ruled out. Circumferential cracks resulting from stress assisted intergranular corrosion have occurred in the collet housing of drives at several BWRs. This type of cracking could occur in a number of drives and if the cracks propagated until severance of the collet housing occurred, scram could be prevented in the affected rods. Limiting the period of operation with a potentially severed collet housing and requiring increased surveillance after detecting one stuck rod will assure that the reactor will not be operated with a large number of rods with failed collet housings. Placing the reactor in the shutdown condition inserts the control rods and accomplishes the objective of the specifications on control rod operability. This operation is normally expected to be accomplished within eight hours.

Operable rods that have been taken out of service at the fully inserted position to perform HCU maintenance are not to be counted as inoperable control rods.

The source range monitor (SRM) system (7) performs no automatic safety function. It does provide the operator with a visual indication of neutron level which is needed for knowledgeable and efficient reactor startup at low neutron levels. The results of the reactivity accidents are functions of the neutron flux. The requirement of at least 3 cps assures that any transient begins at or above the initial value of 10^{-8} of rated power used in the analyses of transients from cold conditions. One operable SRM channel would be adequate to monitor the approach to critical using homogeneous patterns of scattered control rods.

ENCLOSURE 3

Oyster Creek Technical Specification Change Request No. 326

Retyped Technical Specification Changes

The pages included in this enclosure are:

PAGES

3.1-12
3.2-3
3.2-8

TABLE 3.1.1 PROTECTIVE INSTRUMENTATION REQUIREMENTS
Sheet 4 of 13

Function	Trip Setting	Reactor Modes in which Function Must Be OPERABLE				Minimum Number of OPERABLE or OPERATING [tripped] Trip Systems	Minimum Number of Instrument Channels Per OPERABLE Trip System	Action Required*
		Shutdown	Refuel	Startup	Run			
E. Containment Spray								
Comply with Technical Specification 3.4								
F. Primary Containment Isolation								
1. High Drywell Pressure	≤ 3.5 psig	X(u)	X(u)	X(u)	X	2(k)	2(k)(oo)	Isolate containment or PLACE IN COLD SHUTDOWN CONDITION
2. Low-Low Reactor Water Level	≥ 7'2" above TOP of ACTIVE FUEL	X(u)	X(u)	X(u)	X	2	2(oo)	
G. Automatic Depressurization								
1. High Drywell Pressure	≤ 3.5 psig	X(v)	X(v)	X(v)	X	2(k)	2(k)	See note h
2. Low-Low-Low Reactor Water Level	≥ 4'8" above TOP of ACTIVE FUEL	X(v)	X(v)	X(v)	X	2	2	See note h
3. Core Spray Booster Pump d/p Permissive	> 21.2 psid	X(v)	X(v)	X(v)	X	Note i	Note i	See note i
H. Isolation Condenser Isolation (See Note hh)								
1. High Flow Steam Line	≤ 20 psig P	X(s)	X(s)	X	X	2	2(oo)	Isolate affected Isolation Condenser comply with Spec 3.8. See note dd
2. High Flow Condensate Line	≤ 27" P H_2O	X(s)	X(s)	X	X	2	2(oo)	

The average of the scram insertion times for the three fastest control rods of all groups of four control rods in a two-by-two array shall be no greater than:

Rod Length Inserted (%)	Insertion Time (Seconds)
5	0.398
20	0.954
50	2.120
90	5.300

Any four rod group may contain a control rod which is valved out of service provided the above requirements and Specification 3.2.A are met. Time zero shall be taken as the de-energization of the pilot scram valve solenoids.

4. In service control rods which cannot be moved with control rod drive pressure shall be considered inoperable. If a partially or fully withdrawn control rod drive cannot be moved with drive or scram pressure, the reactor shall be brought to a shutdown condition within 48 hours unless investigation demonstrates that the cause of the failure is not due to a failed control rod drive mechanism collet housing. Inoperable control rods shall be valved out of service, in such positions that Specification 3.2.A is met. In no case shall the number of inoperable control rods valved out of service be greater than six during the power operation. If this specification is not met, the reactor shall be placed in the shutdown condition.

5. Control Rods shall not be withdrawn for approach to criticality unless at least two source range channels have an observed count rate equal to or greater than 3 counts per second.

C. Standby Liquid Control System

1. The standby liquid control system shall be operable at all times when the reactor is not shut down by the control rods such that Specification 3.2.A is met and except as provided in Specification 3.2.C.3.

2. The standby liquid control solution shall have a Boron-10 isotopic enrichment equal to or greater than 35 atom %, be maintained within the cross-hatched volume-concentration requirement area in Figure 3.2-1 and at a temperature not less than the temperature presented in Figure 3.2-2 at all times when the standby liquid control system is required to be operable.

3. (a) If one standby liquid control system pumping circuit becomes inoperable during the RUN mode and Specification 3.2.A is met, the reactor may remain in operation for a period not to exceed 7 days, provided the pump in the other circuit is verified daily to be operable, otherwise be in the Shutdown condition within 24 hours.

However, 200 milliseconds is conservatively assumed for this time interval in the transient analyses and this is also included in the allowable scram insertion times of Specification 3.2.B.3. The specified limits provide sufficient scram capability to accommodate failure to scram of any one operable rod. This failure is in addition to any inoperable rods that exist in the core, provided that those inoperable rods met the core reactivity Specification 3.2.A.

Control rods (6) which cannot be moved with control rod drive pressure are clearly indicative of an abnormal operating condition on the affected rods and are, therefore, considered to be inoperable. Inoperable rods are valved out of service to fix their position in the core and assure predictable behavior. If the rod is fully inserted and then valved out of service, it is in a safe position of maximum contribution to shutdown reactivity. If it is valved out of service in a non-fully inserted position, that position is required to be consistent with the shutdown reactivity limitation stated in Specification 3.2.A, which assures the core can be shutdown at all times with control rods. Before a rod is valved out of service in a non-fully inserted position, an analysis is performed to insure Specification 3.2.A is met.

The number of inoperable control rods permitted to be valved out of service could be many more than six allowed by the specification, particularly late in the operating cycle; however, the occurrence of more than six could be indicative of a generic problem and the reactor will be shut down. Operable rods that have been taken out of service at the fully inserted position to perform HCU maintenance are not to be counted as inoperable control rods. Also, if damage within the control rod drive mechanism and in particular, cracks in drive internal housings, cannot be ruled out, then a generic problem affecting a number of drives cannot be ruled out. Circumferential cracks resulting from stress assisted intergranular corrosion have occurred in the collet housing of drives at several BWRs. This type of cracking could occur in a number of drives and if the cracks propagated until severance of the collet housing occurred, scram could be prevented in the affected rods. Limiting the period of operation with a potentially severed collet housing and requiring increased surveillance after detecting one stuck rod will assure that the reactor will not be operated with a large number of rods with failed collet housings. Placing the reactor in the shutdown condition inserts the control rods and accomplishes the objective of the specifications on control rod operability. This operation is normally expected to be accomplished within eight hours.

The source range monitor (SRM) system (7) performs no automatic safety function. It does provide the operator with a visual indication of neutron level which is needed for knowledgeable and efficient reactor startup at low neutron levels. The results of the reactivity accidents are functions of the neutron flux. The requirement of at least 3 cps assures that any transient begins at or above the initial value of 10^{-8} of rated power used in the analyses of transients from cold conditions. One operable SRM channel would be adequate to monitor the approach to critical using homogeneous patterns of scattered control rods.