Entergy

Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
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Michael A. Balduzzi
Site Vice President

October 18, 2005

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-0001

SUBJECT: Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
Docket No. 50-293
License No. DPR-35

Technical Specifications Amendment Request for Single Control Rod Withdrawal Allowances, TS 3/4.14 "Special Operations"

LETTER NUMBER: 2.05.072

Dear Sir or Madam:

Pursuant to 10CFR50.90, Entergy Nuclear Operations Inc. (Entergy) hereby proposes to amend its Facility Operating License, DPR-35. Entergy has reviewed the proposed amendment in accordance with 10CFR50.92 and concludes it does not involve a significant hazards consideration.

There are no commitments contained in this letter.

Entergy requests approval of the proposed amendment by November 1, 2006. Once approved, the amendment shall be implemented within 90 days.

If you have any questions or require additional information, please contact Bryan Ford at (508) 830-8403.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 18th day of OCTOBER 2005.

Sincerely,

Michael A Balduzzi

Michael A. Balduzzi

ES/dm
Enclosure: Evaluation of the proposed change – 9 pages
Attachments: 1. Proposed Technical Specification Changes (mark-up) – 25 pages

A001

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ENCLOSURE

EVALUATION OF THE PROPOSED CHANGE

ENCLOSURE

Evaluation of the Proposed Change

Subject: Technical Specifications Amendment Request for Single Control Rod Withdrawal Allowances

1. DESCRIPTION

Entergy Nuclear Operations, Inc. (Entergy) is requesting to amend Operating License DPR-35 for Pilgrim Nuclear Power Station (PNPS). The proposed changes would revise the Operating License Technical Specifications (TS) to provide allowances for single control rod withdrawal during Hot Shutdown and Cold Shutdown conditions. Existing PNPS allowances for single control rod withdrawal while the reactor vessel head is fully tensioned follow the requirements consistent with Startup and Run MODE operations. The proposed changes, are modeled after Special Operations allowances recommended in the Standard Technical Specifications, NUREG-1433, Revision 3 (Reference 1) and changes previously approved by the NRC for other boiling water reactors (e.g., Reference 2), which impose restrictions consistent with the allowances for single control rod withdrawal while the reactor vessel head is removed. Because of the format of Pilgrim's Custom Tech Specs, an exact adoption of the Standard Technical Specifications format in this case is not possible, although the requirements are consistent.

Additionally, existing TS 3/4.10.D, "Multiple Control Rod Removal," is being administratively relocated to Section 3/4.14, consistent with the intent and presentation of special operations in the Standard Technical Specifications.

2. PROPOSED CHANGES

2.1 New TS 3/4.14.C, "Single Control Rod Withdrawal – Hot Shutdown," is added, including Applicability, Actions, and Surveillance Requirements modeled after NUREG-1433, Specification 3.10.3 as detailed in Attachment 1. Proposed Bases drafts associated with these changes are also provided for information. This specification provides that:

> "The MODE definition specified in Specification 1.0 for Hot Shutdown may be changed to include the reactor mode switch in the refuel position, and operation considered not to be in Refuel MODE, to allow withdrawal of a single control rod, provided the following requirements are met:
>
> 1. Two Source Range Monitors (SRM) are OPERABLE per Specification 3.10.B.1 and 3.10.B.2,
>
> 2. The Refuel Position One-Rod-Out Interlock is OPERABLE,
>
> 3. The "full-in" control rod position indication for each control rod is OPERABLE, or the associated control rod drive is disarmed,
>
> 4. All other control rods are fully inserted, and
>
> 5.a The withdrawn control rod is OPERABLE, and Table 3.1.1, "Reactor Protection System (Scram) Instrumentation Requirement," channels for the following Trip Functions are OPERABLE as required for the Refuel MODE:
>
> - IRM – High Flux
> - IRM – Inoperative
> - SDIV High Water Level – East
> - SDIV High Water Level – West
> - Mode Switch in Shutdown
> - Manual Scram

OR

5.b All other control rods in a five by five array centered on the control rod being withdrawn are disarmed; at which time LCO 3.3.A.1, "Reactivity Margin – Core Loading," requirements may be changed to allow the single control rod withdrawn to be assumed to be the strongest control rod."

2.2 New TS 3/4.14.D, "Single Control Rod Withdrawal – Cold Shutdown," is added, including Applicability, Actions, and Surveillance Requirements modeled after NUREG-1433, Specification 3.10.4 as detailed in Attachment 1. Proposed Bases drafts associated with these changes are also provided for information. This specification provides that:

"The MODE definition specified in Specification 1.0 for Cold Shutdown may be changed to include the reactor mode switch in the refuel position, and operation considered not to be in Refuel MODE, to allow withdrawal of a single control rod, and subsequent removal of the associated control rod drive (CRD) if desired, provided the following requirements are met:

1. Two Source Range Monitors (SRM) are OPERABLE per Specification 3.10.B.1 and 3.10.B.2,

2.a The Refuel Position One-Rod-Out Interlock is OPERABLE, and the "full-in" control rod position indication for each control rod is OPERABLE or the associated control rod drive is disarmed,

OR

2.b A control rod withdrawal block is inserted,

3. All other control rods are fully inserted, and

4.a The withdrawn control rod is OPERABLE, and Table 3.1.1, "Reactor Protection System (Scram) Instrumentation Requirement," channels for the following Trip Functions are OPERABLE as required for the Refuel MODE:

- IRM – High Flux
- IRM – Inoperative
- SDIV High Water Level – East
- SDIV High Water Level – West
- Mode Switch in Shutdown
- Manual Scram

OR

4.b All other control rods in a five by five array centered on the control rod being withdrawn are disarmed; at which time LCO 3.3.A.1, "Reactivity Margin – Core Loading," requirements may be changed to allow the single control rod withdrawn to be assumed to be the strongest control rod."

2.3 Existing TS 3/4.10.D, "Multiple Control Rod Removal," is being relocated as TS 3/4.14.E and associated Bases changes are made. Additionally, the requirement specified in 3.10.D.1.b that invokes the SRM operability requirements of Specification 3.3.B.3 is revised to invoke the SRM

operability requirements of 3.10.B.1 and 3.10.B.2. Similarly, SR 4.10.D.1.b is revised to invoke the surveillance requirements of 4.10.B "Core Monitoring". These proposed changes are consistent with the SRM operability requirements presented in NUREG 1433, Revision 3 and they are more restrictive than the current requirements in that periodic verification is required. Finally, a typographical error in Surveillance Requirement 4.10.D.1.f is corrected i.e. the misspelled word "road" is changed to "rod".

2.4 The Table of Contents is updated to reflect the changes described above.

3. BACKGROUND

The refueling interlocks are designed to back up procedural core reactivity controls during refueling operations. Specifically, the interlocks prevent an inadvertent criticality during refueling operations. One safety design basis to meet this protection is to assure that no more than one control rod shall be withdrawn from its fully inserted position at any time when the reactor is in the refuel mode.

During a refueling operation, the reactor vessel head is removed, allowing direct access to the core. The refueling interlocks reinforce operational procedures that prohibit taking the reactor critical under certain situations encountered during refueling operations by restricting the movement of control rods and operation of refueling equipment. The refueling interlocks include circuitry that senses the condition of the refueling equipment and the control rods. Depending on the sensed condition, interlocks are actuated which prevent the movement of the refueling equipment or withdrawal of control rods (rod block).

The prevention of a control rod withdrawal is accomplished by opening contacts at two different points in the rod block circuitry. During refueling operations, no more than one control rod may be withdrawn; this is enforced by a redundant logic circuit that uses the "all rods in" signal and a rod selection to prevent the selection of a second rod for movement with any other rod not fully inserted. The simultaneous selection of two control rods is prevented by the interconnection arrangement of the select push buttons. With the mode switch in "Refuel," the circuitry prevents the withdrawal of more than one control rod and the movement of the loaded refueling platform over the core with any control rod withdrawn.

The nuclear characteristics of the core assure that the reactor is subcritical even when the highest worth control rod is fully withdrawn. Refueling procedures are written to avoid situations in which inadvertent criticality is possible by not allowing any more than one withdrawn control rod in a fueled cell.

4. TECHNICAL ANALYSIS

4.1 Specification 3/4.14.C, "Single Control Rod Withdrawal – Hot Shutdown," is proposed, including Applicability, Actions, and Surveillance Requirements modeled after NUREG-1433, Specification 3.10.3.

The proposed Specification will allow the reactor mode switch to be placed in the refuel position to allow a single control rod to be withdrawn, and still consider operation to be in Hot Shutdown MODE, provided certain Refuel MODE requirements are met. Hot Shutdown MODE is defined by the reactor mode switch being in "Shutdown," which imposes a control rod block, while Refuel MODE is defined by the mode switch being in "Refuel" without regard to whether the reactor vessel head is fully tensioned (i.e., a difference from the Standard Technical Specifications, NUREG-1433 definition for Refuel MODE).

Existing PNPS TS in subsection 3.3.B provide allowances for control rod withdrawal in Refuel MODE (i.e., mode switch in the "Refuel" position) with the reactor head fully tensioned. However, the requirements of the proposed special operations TS 3/4.14.C provides more appropriate presentation of the necessary allowances by ensuring that: 1) two source range monitors are OPERABLE, 2) only the one rod is withdrawn, 3) all other control rods are fully inserted, and 4) RPS and control rod operability requirements applicable to Refuel MODE are met, or all other rods in a 5 x 5 array centered on the withdrawn rod are disarmed. These requirements effectively compensate for the reactor mode switch not being in the shutdown position and adequately provide the necessary protection with a control rod withdrawn. The proposed LCO imposes the same types of requirements on the plant as if the plant were in Refuel MODE, with the differences from the TS 3.3.B requirements addressed in Section 4.3 of this Enclosure. The proposed 3/4.14.C requirements, coupled with reactivity margin requirements for the most reactive rod fully withdrawn, are adequate to prevent inadvertent criticality when a single rod is withdrawn for maintenance or testing.

NUREG 1433 specifies MODE-dependent SRM operability requirements in Section 3.3.1.2 and Table 3.3.1.2-1. In NUREG-1433, the Special Operations LCO 3.10.4 for Single Control Rod Withdrawal - Hot Shutdown does not take exception to these requirements, i.e. SRM requirements are invoked by LCO 3.3.1.2 concurrently with the other requirements in 3.10.4. Pilgrim CTS do not have a similar format to STS Table 3.3.1.2-1, therefore, the proposed Specification 3/4.14.C will also include LCO and surveillance requirements for SRMs. This ensures the proposed specifications are consistent with the requirements presented in NUREG-1433.

The alternate provision for single control rod withdrawal reflects an allowance recommended by Standard Technical Specifications, NUREG-1433, Revision 3, as well as similar allowances in the predecessor standard, NUREG-0123. This provision has also been added by amendment to existing operating facilities (e.g., Reference 2). As such, it has been previously shown that there is no adverse impact to the public health and safety as a result of this allowance.

4.2 Specification 3/4.14.D, "Single Control Rod Withdrawal – Cold Shutdown," is proposed, including Applicability, Actions, and Surveillance Requirements modeled after NUREG-1433, Specification 3.10.4.

The proposed Specification will allow the reactor mode switch to be placed in the refuel position to allow a single control rod to be withdrawn, and subsequent removal of the associated control rod drive (CRD) if desired, and still consider operation to be in Cold Shutdown MODE, provided certain Refuel MODE requirements are met. Currently, Cold Shutdown MODE is defined by the reactor mode switch being in "Shutdown," which imposes a control rod block, while Refuel MODE is defined by the mode switch being in "Refuel" without regard to whether the reactor vessel head is fully tensioned (i.e., a difference from the Standard Technical Specifications, NUREG-1433 definition for Refuel MODE).

Existing Specification 3.3.B provides allowances for control rod withdrawal in Refuel MODE (i.e., mode switch in the "Refuel" position) with the reactor head fully tensioned. The requirements of the proposed special operations TS 3/4.14.D provides more appropriate presentation of the necessary allowances by ensuring that: 1) two source range monitors are OPERABLE, 2) only the one rod is withdrawn, 3) all other control rods are fully inserted, and 4) RPS and control rod operability requirements applicable to Refuel MODE are met, or all other rods in a 5 x 5 array centered on the withdrawn rod are disarmed. These requirements effectively compensate for the reactor mode switch not being in the shutdown position and adequately provide the

necessary protection with a control rod withdrawn. The proposed LCO imposes the same types of requirements on the plant as if the plant were in Refuel MODE, with the differences from the TS 3.3.B requirements addressed in Section 4.3 of this Enclosure. These requirements, coupled with reactivity margin requirements for the most reactive rod fully withdrawn, are adequate to prevent inadvertent criticality when a single rod is withdrawn for maintenance or testing.

NUREG 1433 specifies MODE-dependent SRM operability requirements in Section 3.3.1.2 and Table 3.3.1.2-1. In NUREG-1433, the Special Operations LCO 3.10.4 for Single Control Rod Withdrawal - Cold Shutdown does not take exception to these requirements, i.e. SRM requirements are invoked by LCO 3.3.1.2 concurrently with the other requirements in 3.10.4. Pilgrim CTS do not have a similar format to STS Table 3.3.1.2-1, therefore, the proposed Specification 3/4.14.D will also include LCO and surveillance requirements for SRMs. This ensures the proposed specifications are consistent with the requirements presented in NUREG-1433.

The alternate provision for single control rod withdrawal reflects an allowance recommended by Standard Technical Specifications, NUREG-1433, Revision 3, as well as similar allowances in the predecessor standard, NUREG-0123. This provision has also been added by amendment to existing operating facilities (e.g., Reference 2). As such, it has been previously shown that there is no adverse impact to the public health and safety as a result of this allowance.

4.3 The proposed limitations differ from the existing requirements found in 3.3.B that provide allowances for single control rod withdrawal while the reactor vessel head is fully tensioned, which follow the requirements consistent with Startup and Run MODE operations. The differences when utilizing the proposed 3/4.14.C or 3/4.14.D for single control rod withdrawal while the reactor vessel head is fully tensioned will result in eliminating the following Surveillance Requirements (SRs) and Action allowances, with the stated justification:

1) LCO 3.3.B.1, Action A, and SRs 4.3.B.1.1 and 4.3.B.1.2 related to control rod sticking and exercising: This Action imposes various verifications and limitations related to interactions of a stuck control rod with other withdrawn control rods. Since only one control rod will be withdrawn at any time, the existing considerations for multiple withdrawn control rod interactions are unnecessary. The surveillances that periodically demonstrate that withdrawn control rod(s) are not "stuck" is not pertinent to control rods withdrawn under the proposed Specifications, since these control rods will be withdrawn for a very limited time. Completion of these testing or maintenance activities on these control rods would be expected within hours or shifts as opposed to days and weeks. Since only a single control rod will be withdrawn, there is adequate assurance that the reactor will remain subcritical even if this control rod should fail to insert.

   Furthermore, the associated testing or maintenance activities may involve rendering the control rod incapable of movement (i.e., "stuck"), and as such, the appropriate controls for the condition are enforced by the proposed special operations Specifications (specifically, 3.14.C Item 5.b and 3.14.D Item 4.b).

2) SR 4.3.B.1.3 related to coupling integrity: If the control rod is stuck at an inserted position and becomes decoupled from its drive, a control rod drop can possibly occur. However, during the proposed special operations, withdrawal of only a single control rod is attempted, and if it should be decoupled and drop, there would be no significant adverse consequences. The reactor would remain subcritical and no fuel damage would result.

Furthermore, the associated testing or maintenance activities may involve decoupling the control rod, and as such, the appropriate controls for that condition are enforced by the proposed special operations Specifications (specifically, 3.14.C Item 5.b and 3.14.D Item 4.b).

3) SR 4.3.B.1.4 and TS 3/4.3.C, "Scram Insertion Times": Since only one control rod is withdrawn during the proposed special operations, the reactor would remain subcritical. The conservative protection provided by maintaining the control rod and various reactor protection system trips OPERABLE is not dependent on a specific minimum scram time.

   Furthermore, the associated testing or maintenance activities may involve rendering the control rod incapable of scramming, and as such, the appropriate controls for the condition are enforced by the proposed special operations Specifications (specifically, 3.14.C Item 5.b and 3.14.D Item 4.b).

4) SR 4.3.B.1.5 requiring "Determine the position of each control rod once per 24 hours": The proposed special operations Specifications require only the "full-in" position of each control rod be OPERABLE. Since all rods remain fully inserted, except the one allowed withdrawn control rod, this is essentially equivalent to the SR being replaced. For the control rod being withdrawn, its actual position is not significant – only that it correctly indicate not full-in. The position of the withdrawn control rod is not limited by any analysis (assumed to be fully withdrawn) and is not an input to any analyses.

5) LCO 3.3.B.3 requiring that "control rods shall not be withdrawn for Startup unless at least two Source Range channels have an observed count rate equal to or greater than 3 counts per second." The proposed specifications invoke the SRM operability requirements of LCO 3.10.B.1 and 3.10.B.2 and SR 4.10.B "Core Monitoring" instead of LCO 3.3.B.3 and SR 4.3.B.3. The proposed SRM operability requirements are consistent with the SRM operability requirements presented in NUREG 1433, Revision 3 and they are more restrictive than the current requirements in that periodic verification is required.

6) TS 3/4.3.D, "Control Rod Accumulators": The requirements for OPERABLE withdrawn control rods to have OPERABLE accumulators when the reactor mode switch is in the "Refuel" position, is replaced with proposed SRs 4.14.C.5.a.2 and 4.14.D.4.a.2. The actions associated with failure to meet this requirement are more restrictive in proposed Specifications 3.14.C and 3.14.D. Therefore, this change is more restrictive; but consistent with the recommended allowances of the Standard Technical Specifications, NUREG-1433, Revision 3.

7) TS 3/4.3.G, "Scram Discharge Volume": Since only one control rod is withdrawn during the proposed special operations, the reactor would remain subcritical. Not imposing operability requirements on the scram discharge volume when a single control rod is withdrawn is acceptable since the potential impact on this single rod is not significant. The conservative protection provided by maintaining the control rod and various reactor protection system trips OPERABLE is adequate to assure the control rod can be returned to full-in condition even in the event the scram discharge volume were not OPERABLE.

4.4 Existing TS 3/4.10.D, "Multiple Control Rod Removal," is being relocated as TS 3/4.14.E. This is an administrative renumbering to facilitate common location for control rod withdrawal special operations. One change in technical requirements is proposed in this relocation; Specification 3.10.D.1.b is revised as proposed 3.14.E.1.b to invoke the SRM operability requirements of Specification 3.10.B.1 and 3.10.B.2 in place of the currently specified 3.3.B.3. Similarly, the

corresponding Surveillance Requirement 4.10.D.1.b is revised as proposed 4.14.E.1.b to invoke the requirements of Specification 4.10.B "Core Monitoring" in place of the currently specified 4.3.B.3. The proposed SRM operability requirements are consistent with the SRM operability requirements presented in NUREG 1433, Revision 3 as well as those specified for the new Special Operations being added to Pilgrim's Technical Specifications and they are more restrictive than the current requirements in that periodic verification is required.

5. REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

Entergy Nuclear Operations, Inc. (Entergy) is proposing to modify the Pilgrim Nuclear Power Station (PNPS) Technical Specifications (TS) to provide allowances for single control rod withdrawal during Hot Shutdown and Cold Shutdown conditions. Existing PNPS allowances for single control rod withdrawal while the reactor vessel head is fully tensioned follow the requirements consistent with Startup and Run MODE operations. The proposed changes, modeled after corresponding Special Operations allowances recommended in the Standard Technical Specifications, NUREG-1433, Revision 3, provide alternate allowances consistent with those provided for single control rod withdrawal while the reactor vessel head is removed. Additionally, existing TS 3/4.10.D, "Multiple Control Rod Removal," is being administratively relocated to Section 3/4.14, consistent with the intent and presentation of special operations in the Standard Technical Specifications.

Entergy has evaluated whether or not a significant hazards consideration is involved with the proposed amendment(s) by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No. The proposed special operation allowances do not involve the modification of any plant equipment or affect basic plant operation. The relevant design basis analyses are associated with refueling operations. The refueling interlocks are designed to back up procedural core reactivity controls during refueling operations to prevent an inadvertent criticality during refueling operations. The relaxations proposed in relocating and revising single control rod withdrawal allowances during the Refueling MODE with the reactor vessel head fully tensioned, to the proposed special operations allowances consistent with NUREG-1433 recommendations, will not increase the probability of an accident compared to a withdrawal of a rod while in Refueling MODE with the reactor vessel head removed. This is because the proposed special operations will allow the withdrawal of only one control rod at a time while requiring the one-rod-out interlock to be OPERABLE and other requirements imposed to ensure that all other rods remain fully inserted. This requirement coupled with the reactivity margin requirement for the most reactive rod fully withdrawn or removed, is adequate to prevent inadvertent criticality when a single rod is withdrawn for maintenance or testing. As such, there is no significant increase in the probability of an accident previously evaluated.

   Since no criticality is assumed to occur, the consequences of analyzed events are therefore not affected. Therefore, the proposed change does not involve a significant increase in the consequences of an accident previously evaluated.

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

   Response: No. The proposed change does not involve any physical alteration of existing plant equipment or the installation of new equipment. The basic operation of installed equipment is unchanged and no new accident initiators or failure modes are introduced as a result of these changes. The methods governing plant operation and testing remain consistent with current safety analysis assumptions. These changes do not adversely affect existing plant safety margins or the reliability of the equipment assumed to operate in the safety analysis. The requirements imposed during these Special Operations ensure the existing analyses and equipment operating conditions remain bounding. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   Response: No. The margin of safety is not reduced because the proposed requirements offer similar protection to those imposed during normal refueling activities. The proposed special operation allowances do not involve the modification of any plant equipment or affect basic plant operation. The proposed allowances limit the withdrawal of only one control rod at a time. This allowance is controlled by the reactor mode switch in the refuel position, or other precautions to prevent the withdrawal or removal of more than one rod and the requirement that adequate reactivity margin be maintained. These requirements are adequate to prevent an inadvertent criticality. These changes do not adversely affect existing plant safety margins or the reliability of the equipment assumed to operate in the safety analysis. As such, there are no changes being made to safety analysis assumptions, safety limits or safety system settings that would adversely affect plant safety as a result of the proposed change. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

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

5.2 Environmental Consideration

A review has determined that the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the proposed amendment.

6. PRECEDENTS

The NRC has approved similar changes for single control rod withdrawal allowances, including the proposed Special Operations allowances (e.g., Reference 2).

7. COORDINATION WITH OTHER PENDING TECHNICAL SPECIFICATION CHANGES

Entergy submitted a license amendment request for Pilgrim Station dated May 24, 2005 (TAC No. MC7055) that affects Technical Specification section 3/4.14 and associated Bases. Current Pilgrim Technical Specifications include section 3/4.14 along with subsection 3/4.14.A only. The May 24, 2005 request proposes new Technical Specification subsection 3/4.14.G, and inserts the placeholder "Not Used" for subsections 3/4.14.B through 3/4.14.F. The license amendment request contained in this letter proposes specifications for subsections 3/4.14.C through 3/4.14.E, leaving 3/4.14.B and 3/4.14.F as "Not Used". Therefore, the marked up Technical Specification and Bases pages for this license amendment request were developed using the retyped pages applicable to TAC No. MC7055 under the presumption that request will be approved.

8. REFERENCES

1. NUREG-1433, Rev. 3, "Standard Technical Specifications, General Electric Plants, BWR/4"

2. James A. FitzPatrick Nuclear Power Plant Amendment No. 274 dated July 3, 2002.

ATTACHMENT 1

PROPOSED TECHNICAL SPECIFICATION AND BASES CHANGES

(MARK-UP)

NOTE: the following marked-up pages were developed in consideration of pending license amendment request TAC MC7055, which also affects TS Section 3/4.14. This mark-up presumes the prior request will be approved.

Delete and replace with insert below

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.10 CORE ALTERATIONS (Cont)	4.10 CORE ALTERATIONS (Cont)
B. Core Monitoring (Cont)	B. Core Monitoring (Cont)
2. The SRM shall have a minimum of 3 cps except as specified in 3 and 4 below.	
3. Prior to spiral unloading, the SRM's shall have an initial count rate of ≥ 3 cps. During spiral unloading, the count rate on the SRM's may drop below 3 cps.	
4. During spiral reload, each control cell shall have at least one assembly with a minimum exposure of 1000 MWD/ST.	Spiral Reload During spiral reload, SRM operability will be verified by using a portable external source every 12 hours until the required amount of fuel is loaded to maintain 3 cps. As an alternative to the above, up to two fuel assemblies will be loaded in different cells containing control blades around each SRM to obtain the required 3 cps. Until these assemblies have loaded, the cps requirement is not necessary.
C. Spent Fuel Pool Water Level	C. Spent Fuel Pool Water Level
Whenever irradiated fuel is stored in the spent fuel pool, the pool water level shall be maintained at or above 33 feet.	Whenever irradiated fuel is stored in the spent fuel pool, the water level shall be recorded daily.
D. Multiple Control Rod Removal	D. Multiple Control Rod Removal
1. Any number of control rods and/or control rod drive mechanisms may be removed from the reactor pressure vessel provided that at least the following requirements are satisfied until all control rods and control rod drive mechanisms are reinstalled and all control rods are fully inserted in the core.	1. Within 4 hours prior to the start of removal of control rods and/or control rod drive mechanisms from the core and/or reactor pressure vessel and at least once per 24 hours thereafter until all control rods and control rod drive mechanisms are reinstalled and all control rods are fully inserted in the core, verify that:
a. The reactor mode switch is ~~operable~~ and locked in the Refuel position except that the position indication may be bypassed, as required, for those control rods and/or control rod drive mechanisms to be removed, after the fuel assemblies have been removed as specified below.	a. The reactor mode switch is ~~operable~~ and locked in the Refuel position.

OPERABLE

MOVE TO TS SECTION 3/4.14

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
14 3.~~10~~ CORE ALTERATIONS (Cont)	14 4.~~10~~ CORE ALTERATIONS (Cont)
~~D.~~ E Multiple Control Rod Removal (Cont)	~~D.~~ E Multiple Control Rod Removal (Cont)
b. The source range monitors (SRM) are operable per Specification 3.3.B.3.	b. The SRM channels are operable per Specification 3.3.B.3.
c. The Reactivity Margin requirements of Specifications 3.3.A.1 are satisfied.	c. The Reactivity Margin requirements of Specification 3.3.A.1 are satisfied.
d. No fuel is being loaded into the reactor core.	d. Deleted
e. All other control rods are fully inserted.	e. All other control rods are fully inserted.
f. The four fuel assemblies are removed from the core cell surrounding each control rod or control rod drive mechanism to be removed from the core and/or reactor vessel.	f. The four fuel assemblies surrounding each control ~~rod~~ and/or control rod drive mechanism that is to be removed from the reactor vessel at the same time are removed from the core and/or reactor vessel.

Replace with

b. Two source range monitors (SRM) are OPERABLE per specification 3.10.B.1 and 3.10.B.2	b. Two Source Range Monitors (SRM) are OPERABLE per Specification 4.10.B "Core Monitoring".

→ Relocate to TS Section 3/4.14

Delete this page

BASES:

3.10 CORE ALTERATIONS (Cont)

C. Spent Fuel Pool Water Level

To ensure there is adequate water to shield and cool the irradiated fuel assemblies stored in the pool, a minimum pool water level is established. The minimum water level of 33 feet is established because it would be a significant change from the normal level (-1 foot) and is well above the level to assure adequate cooling.

D. E. Multiple Control Rod Removal

These specifications ensure maintenance or repair of control rods or rod drives will be performed under conditions that limit the probability of inadvertent criticality. The requirement that the fuel assemblies in the cell controlled by the control rod be removed from the reactor core before the control rod position indication to the Refueling Interlocks can be bypassed ensures withdrawal of another control rod does not result in inadvertent criticality. Each control rod essentially provides reactivity control for the fuel assemblies in the cell associated with the control rod. Thus, removal of an entire cell (fuel assemblies plus control rod) results in a lower reactivity potential of the core.

4.10 CORE ALTERATIONS

Move to 3/4.14 Bases as B3/4.14.E

A. Refueling Interlocks

SPECIFICATION 4.10.A.1 REQUIREMENTS

Performance of a functional test demonstrates that each required refueling equipment interlock will function properly when a simulated or actual signal indicative of a required condition is injected into the logic. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable functional test of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

The function test may be performed by any series of sequential, overlapping, or total channel steps so that the entire channel is tested.

The weekly frequency is based on engineering judgment and is considered adequate in view of other indications of refueling interlocks and their associated input status that are available to unit operations personnel.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.14 SPECIAL OPERATIONS (continued)	4.14 SPECIAL OPERATIONS (continued)
B. (Not Used)	B. (Not Used)
C. (Not Used)	C. (Not Used)
D. (Not Used)	D. (Not Used)
E. (Not Used)	E. (Not Used)
F. (Not Used)	F. (Not Used)

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LIMITING CONDITIONS FOR OPERATION

3.14 SPECIAL OPERATIONS (continued)

C. Single Control Rod Withdrawal – Hot Shutdown

Specification

The MODE definition specified in Specification 1.0 for Hot Shutdown may be changed to include the reactor mode switch in the Refuel position, and operation considered not to be in Refuel MODE, to allow withdrawal of a single control rod, provided the following requirements are met:

1. Two Source Range Monitors (SRM) are OPERABLE per Specification 3.10.B.1 and 3.10.B.2,

2. The Refuel Position One-Rod-Out Interlock is OPERABLE,

3. The "full-in" control rod position indication for each control rod is OPERABLE or the associated control rod drive is disarmed,

4. All other control rods are fully inserted, and

5.a The withdrawn control rod is OPERABLE, and Table 3.1.1, "Reactor Protection System (Scram) Instrumentation Requirement," channels for the following Trip Functions are OPERABLE as required for the Refuel MODE:
- IRM – High Flux
- IRM – Inoperative
- SDIV High Water Level – East
- SDIV High Water Level – West
- Mode Switch in Shutdown
- Manual Scram

OR

5.b All other control rods in a five by five array centered on the control rod being withdrawn are disarmed; at which time LCO 3.3.A.1, "Reactivity Margin – Core Loading," requirements may be changed to allow the single control rod withdrawn to be assumed to be the strongest control rod.

SURVEILLANCE REQUIREMENTS

4.14 SPECIAL OPERATIONS (continued)

C. Single Control Rod Withdrawal – Hot Shutdown

1. Two Source Range Monitors (SRM) are OPERABLE per Specification 4.10.B "Core Monitoring".

2. Perform functional test of the one-rod-out interlock weekly.

3. Each time the control rod is withdrawn from the "full-in" position, verify the control rod position indication has no "full-in" indication.

4. Verify all control rods, other than the control rod being withdrawn, are fully inserted every 24 hours.

5.a.1 Verify the Surveillance Requirements of Tables 4.1.1 and 4.1.2 for channels required to be OPERABLE for the Refuel MODE are performed as required,

5.a.2 Verify withdrawn control rod accumulator pressure is greater than minimum required every 7 days, and

5.a.3 Insert each withdrawn control rod at least one notch within 7 days after control rod is withdrawn and every 7 days thereafter.

OR

5.b Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed every 24 hours.

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LIMITING CONDITIONS FOR OPERATION

3.14 SPECIAL OPERATIONS (continued)

C. Single Control Rod Withdrawal – Hot Shutdown (continued)

Applicability

Hot Shutdown MODE with the reactor mode switch in Refuel position.

Actions

A. One or more of the above requirements not met,

1. Immediately initiate action to fully insert all insertable control rods,

AND

2. Place the reactor mode switch in the Shutdown position within 1 hour.

SURVEILLANCE REQUIREMENTS

4.14 SPECIAL OPERATIONS (continued)

C. Single Control Rod Withdrawal – Hot Shutdown (continued)

INSERT NEW PAGE

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.14 SPECIAL OPERATIONS (continued)	4.14 SPECIAL OPERATIONS (continued)
D. Single Control Rod Withdrawal – Cold Shutdown	D. Single Control Rod Withdrawal – Cold Shutdown
Specification The MODE definition specified in Specification 1.0 for Cold Shutdown may be changed to include the reactor mode switch in the Refuel position, and operation considered not to be in Refuel MODE, to allow withdrawal of a single control rod, provided the following requirements are met:	
1. Two source range monitors (SRM) are OPERABLE per Specification 3.10.B.1 and 3.10.B.2,	1. Two Source Range Monitors (SRM) are OPERABLE per Specification 4.10.B "Core Monitoring".
2.a The Refuel Position One-Rod-Out Interlock is OPERABLE, and the "full-in" control rod position indication for each control rod is OPERABLE or the associated control rod drive is disarmed,	2.a Perform functional test of the one-rod-out interlock weekly. Additionally, each time the control rod is withdrawn from the "full-in" position, verify the control rod position indication has no "full-in" indication.
OR	OR
2.b A control rod withdrawal block is inserted,	2.b Verify a control rod block is inserted every 24 hours.
3. All other control rods are fully inserted, and	3. Verify all control rods, other than the control rod being withdrawn, are fully inserted every 24 hours.
4.a The withdrawn control rod is OPERABLE, and Table 3.1.1, "Reactor Protection System (Scram) Instrumentation Requirement," channels for the following Trip Functions are OPERABLE as required for the Refuel MODE: - IRM – High Flux - IRM – Inoperative - SDIV High Water Level – East - SDIV High Water Level – West - Mode Switch in Shutdown - Manual Scram	4.a.1 Verify the Surveillance Requirements of Tables 4.1.1 and 4.1.2 for channels required to be OPERABLE for the Refuel MODE are performed as required, and 4.a.2 Verify withdrawn control rod accumulator pressure is greater than minimum required every 7 days, and 4.a.3 Insert each withdrawn control rod at least one notch within 7 days after control rod is withdrawn and every 7 days thereafter.
OR	OR
4.b All other control rods in a five by five array centered on the control rod being withdrawn are disarmed; at which time LCO 3.3.A.1, "Reactivity Margin – Core Loading, "requirements may be changed to allow the single control rod withdrawn to be assumed to be the strongest control rod.	4.b Verify all control rods, other than the control rod being withdrawn, in a five by five array centered on the control rod being withdrawn, are disarmed every 24 hours.

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LIMITING CONDITIONS FOR OPERATION

3.14 SPECIAL OPERATIONS (continued)

D. Single Control Rod Withdrawal – Cold Shutdown (continued)

Applicability

Cold Shutdown MODE with the reactor mode switch in Refuel position.

Actions

A. With one or more of the above requirements not met with the affected control rod insertable,

1. Immediately initiate action to fully insert all insertable control rods,

AND

2. Place the reactor mode switch in the Shutdown position within 1 hour.

B. With one or more of the above requirements not met with the affected control rod not insertable,

1. Immediately suspend withdrawal of the control rod and removal of associated CRD,

AND

2.1 Immediately initiate action to fully insert all control rods.

OR

2.2 Immediately initiate action to satisfy the requirements of this LCO.

SURVEILLANCE REQUIREMENTS

4.14 SPECIAL OPERATIONS (continued)

D. Single Control Rod Withdrawal – Cold Shutdown (continued)

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LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.14 SPECIAL OPERATIONS (Continued)	4.14 SPECIAL OPERATIONS (Continued)
E. Multiple Control Rod Removal	E. Multiple Control Rod Removal
1. Any number of control rods and/or control rod drive mechanisms may be removed from the reactor pressure vessel provided that at least the following requirements are satisfied until all control rods and control rod drive mechanisms are reinstalled and all control rods are fully inserted in the core.	1. Within 4 hours prior to the start of removal of control rods and/or control rod drive mechanisms from the core and/or reactor pressure vessel and at least once per 24 hours thereafter until all control rods and control rod drive mechanisms are reinstalled and all control rods are fully inserted in the core, verify that:
a. The reactor mode switch is OPERABLE and locked in the Refuel position except that the position indication may be bypassed, as required, for those control rods and/or control rod drive mechanisms to be removed, after the fuel assemblies have been removed as specified below.	a. The reactor mode switch is OPERABLE and locked in the Refuel position.
b. Two source range monitors (SRM) are OPERABLE per Specification 3.10.B.1 and 3.10.B.2,	b. Two Source Range Monitors (SRM) are OPERABLE per Specification 4.10.B "Core Monitoring".
c. The Reactivity Margin requirements of Specifications 3.3.A.1 are satisfied.	c. The Reactivity Margin requirements of Specification 3.3.A.1 are satisfied.
d. No fuel is being loaded into the reactor core.	d. Deleted
e. All other control rods are fully inserted.	e. All other control rods are fully inserted.
f. The four fuel assemblies are removed from the core cell surrounding each control rod or control rod drive mechanism to be removed from the core and/or reactor vessel.	f. The four fuel assemblies surrounding each control rod and/or control rod drive mechanism that is to be removed from the reactor vessel at the same time are removed from the core and/or reactor vessel.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.14 SPECIAL OPERATIONS (continued)	4.14 SPECIAL OPERATIONS (continued)
B. (Not Used)	B. (Not Used)
C. (Not Used)	C. (Not Used)
D. (Not Used)	D. (Not Used)
E. (Not Used)	E. (Not Used)
F. (Not Used)	F. (Not Used)

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.14 SPECIAL OPERATIONS (continued)	4.14 SPECIAL OPERATIONS (continued)
G. Control Rod Testing - Operating	G. Control Rod Testing - Operating
Specification The requirements of LCO 3.3.H, "Rod Pattern Control," may be suspended to allow performance of reactivity margin demonstrations, control rod scram time testing, control rod friction testing, and the Startup Test Program, provided: 1. The banked position withdrawal sequence requirements of SR 4.3.F.3 are changed to require the control rod sequence to conform to the specified test sequence, OR 2. The RWM is bypassed; the requirements of LCO 3.3.F, "Rod Worth Minimizer," are suspended; and conformance to the approved control rod sequence for the specified test is verified by a second licensed operator or other qualified member of the technical staff.	1. Prior to control rod movement, verify control rod sequence input to the RWM is in conformance with the approved control rod sequence for the specified test, OR 2. During control rod movement, verify movement of control rods is in compliance with the approved control rod sequence for the specified test by a second licensed operator or other qualified member of the technical staff.
Applicability Run MODE and startup MODE with the requirements of LCO 3.3.H not met.	
Actions Above requirements not met immediately suspend performance of the test and exception to LCO 3.3.H.	

BASES:

3/4.14.B (Not Used)

3/4.14.C (Not Used)

3/4.14.D (Not Used)

3/4.14.E (Not Used)

3/4.14.F (Not Used)

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BASES:

3/4.14 C. SINGLE CONTROL ROD WITHDRAWAL – HOT SHUTDOWN

Background

The purpose of this Special Operations LCO is to permit the withdrawal of a single control rod for testing while in hot shutdown, by imposing certain restrictions. In Hot Shutdown MODE, the reactor mode switch is in the shutdown position, and all control rods are inserted and blocked from withdrawal. Many systems and functions are not required in these conditions, due to the other installed interlocks that are actuated when the reactor mode switch is in the shutdown position. However, circumstances may arise while in Hot Shutdown MODE that present the need to withdraw a single control rod for various tests (e.g., friction tests, scram timing, and coupling integrity checks). These single control rod withdrawals are normally accomplished by selecting the refuel position for the reactor mode switch. This Special Operations LCO provides the appropriate additional controls to allow a single control rod withdrawal and still consider the condition to be Hot Shutdown MODE.

Applicable Safety Analyses

With the reactor mode switch in the refuel position, the analyses for control rod withdrawal during refueling are applicable and, provided the assumptions of these analyses are satisfied in Hot Shutdown MODE, these analyses will bound the consequences of an accident. Explicit safety analyses in the FSAR (Ref. 1) demonstrate that the functioning of the refueling interlocks and adequate reactivity margin will preclude unacceptable reactivity excursions. Refueling interlocks restrict the movement of control rods to reinforce operational procedures that prevent the reactor from becoming critical. These interlocks prevent the withdrawal of more than one control rod. Under these conditions, since only one control rod can be withdrawn, the core will always be shut down even with the highest worth control rod withdrawn if adequate reactivity margin exists. The control rod scram function provides backup protection to normal refueling procedures and the refueling interlocks, which prevent inadvertent criticalities during refueling. Alternate backup protection can be obtained by ensuring that a five by five array of control rods, centered on the withdrawn control rod, are inserted and incapable of withdrawal. The SRMs have no safety function and are not assumed to function during any UFSAR design basis accident or transient analysis. However, the SRMs provide the only on-scale monitoring of neutron flux levels during this Special Operation.

As described in LCO 3.0.7, compliance with Special Operations LCOs is optional, and therefore, no criteria of 10 CFR 50.36(c)(2)(ii) apply. Special Operations LCOs provide flexibility to perform certain operations by appropriately modifying requirements of other LCOs.

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BASES:

3/4.14 C. SINGLE CONTROL ROD WITHDRAWAL – HOT SHUTDOWN (continued)

LCO

As described in LCO 3.0.7, compliance with this Special Operations LCO is optional. However, if a single control rod withdrawal is desired in Hot Shutdown MODE, controls consistent with those required during refueling must be implemented and this Special Operations LCO applied. "Withdrawal" in this application includes the actual withdrawal of the control rod as well as maintaining the control rod in a position other than the full-in position, and reinserting the control rod. As is required during CORE ALTERATIONS, the two SRMs required by this Special Operations LCO provide redundant monitoring of potential reactivity changes during control rod movement and provide the Operator with early indication of unexpected subcritical multiplication that could be indicative of an approach to criticality. For an SRM channel to be considered OPERABLE, it must be providing neutron flux indication. The one-rod-out refueling interlock required by this Special Operations LCO, will ensure that only one control rod can be withdrawn. To back up the refueling interlocks, the ability to scram the withdrawn control rod in the event of an inadvertent criticality is provided by this Special Operations LCO Item 5.a requirement. Alternately, provided a sufficient number of control rods in the vicinity of the withdrawn control rod are known to be inserted and incapable of withdrawal (Item 5.b), the possibility of criticality on withdrawal of this control rod is sufficiently precluded, so as not to require the scram capability of the withdrawn control rod. Also, once this alternate (Item 5.b) is completed, the reactivity margin requirement to account for both the withdrawn-untrippable control rod and the highest worth control rod may be changed to allow the withdrawn-untrippable control rod to be the single highest worth control rod.

Applicability

Control rod withdrawals are adequately controlled in Run, Startup, and Refueling MODES by existing LCOs. In Hot Shutdown and Cold Shutdown MODES, control rod withdrawal is only allowed if performed in accordance with this Special Operations LCO or Special Operations LCO 3.14.D, and if limited to one control rod. This allowance is only provided with the reactor mode switch in the refuel position. For these conditions, the two SRMs, one-rod-out interlock, control rod full-in position indication, full insertion requirements for all other control rods, control rod operability requirements, as well as scram functions or the added administrative controls in Item 5.b of this Special Operations LCO, monitor and minimize potential reactivity excursions. The SRM requirements applicable to control rod removal under CORE ALTERATIONS are also applicable to this Special Operations LCO.

Actions

With any of the LCO requirements not met, Actions are required to restore compliance with the normal Hot Shutdown MODE requirements, thereby exiting this Special Operations LCO Applicability. Actions must be initiated immediately to insert all insertable control rods. Actions must continue until all such control rods are fully inserted. Placing the reactor mode switch in the shutdown position will ensure all inserted rods remain inserted and restore operation in accordance with the Hot Shutdown MODE definition in Specification 1.0. The allowed Completion Time of 1 hour to place the reactor mode switch in the shutdown position provides sufficient time to normally insert the control rods.

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BASES:

3/4.14 C. SINGLE CONTROL ROD WITHDRAWAL – HOT SHUTDOWN (continued)

Surveillance Requirements (SR)

SR 4.14.C

The requirements of this Special Operations LCO are required to have Surveillances met to establish that this Special Operations LCO is being met. The SR 4.14.C.1 functional test demonstrates the associated SRM channel will function properly and the daily response check verifies that a gross failure of instrumentation has not occurred. If the local array of control rods is inserted and disarmed while the scram function for the withdrawn rod is not available, periodic verification in accordance with SR 4.14.C.5.b is required to preclude the possibility of criticality. SR 4.14.C.5.b is not required to be met if SR 4.14.C.5.a is satisfied for LCO 3.14.C.5.a requirements, since SR 4.14.C.5.a demonstrates that the alternative LCO 3.14.C.5.a requirements are satisfied. Also, SR 4.14.C.4 verifies that all control rods other than the control rod being withdrawn are fully inserted. The 24-hour Frequency is acceptable because of the administrative controls on control rod withdrawal, the protection afforded by the LCOs involved, and hardwire interlocks that preclude additional control rod withdrawals.

References: 1. FSAR, Section 7.6.

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BASES:

3/4.14 D. SINGLE CONTROL ROD WITHDRAWAL – COLD SHUTDOWN

Background

The purpose of this Special Operations LCO is to permit the withdrawal of a single control rod for testing or maintenance, while in cold shutdown, by imposing certain restrictions. In Cold Shutdown MODE, the reactor mode switch is in the shutdown position, and all control rods are inserted and blocked from withdrawal. Many systems and functions are not required in these conditions, due to the installed interlocks associated with the reactor mode switch in the shutdown position. Circumstances may arise while in Cold Shutdown MODE, however, that present the need to withdraw a single control rod for various tests (e.g., friction tests, scram time testing, and coupling integrity checks). Certain situations may also require the removal of the associated control rod drive (CRD). These single control rod withdrawals and possible subsequent removals are normally accomplished by selecting the refuel position for the reactor mode switch.

Applicable Safety Analyses

With the reactor mode switch in the refuel position, the analyses for control rod withdrawal during refueling are applicable and, provided the assumptions of these analyses are satisfied in Cold Shutdown MODE, these analyses will bound the consequences of an accident. Explicit safety analyses in the FSAR (Ref. 1) demonstrate that the functioning of the refueling interlocks and adequate reactivity margin will preclude unacceptable reactivity excursions.

The SRMs have no safety function and are not assumed to function during any UFSAR design basis accident or transient analysis. However, the SRMs provide the only on-scale monitoring of neutron flux levels during this Special Operation.

Refueling interlocks restrict the movement of control rods to reinforce operational procedures that prevent the reactor from becoming critical. These interlocks prevent the withdrawal of more than one control rod. Under these conditions, since only one control rod can be withdrawn, the core will always be shut down even with the highest worth control rod withdrawn if adequate reactivity margin exists.

The control rod scram function provides backup protection in the event normal refueling procedures and the refueling interlocks fail to prevent inadvertent criticalities during refueling. Alternate backup protection can be obtained by ensuring that a five by five array of control rods, centered on the withdrawn control rod, are inserted and incapable of withdrawal. This alternate backup protection is required when removing a CRD because this removal renders the withdrawn control rod incapable of being scrammed.

As described in LCO 3.0.7, compliance with Special Operations LCOs is optional, and therefore, no criteria of 10 CFR 50.36(c)(2)(ii) apply. Special Operations LCOs provide flexibility to perform certain operations by appropriately modifying requirements of other LCOs.

INSERT NEW PAGE

BASES:

3/4.14 D. SINGLE CONTROL ROD WITHDRAWAL – COLD SHUTDOWN (continued)

LCO

As described in LCO 3.0.7, compliance with this Special Operations LCO is optional. Operation in Cold Shutdown MODE with the reactor mode switch in the refuel position can be performed in accordance with other LCOs applicable in Refueling MODE without meeting this Special Operations LCO or its ACTIONS. If a single control rod withdrawal is desired in Cold Shutdown MODE, controls consistent with those required during refueling must be implemented and this Special Operations LCO applied. "Withdrawal" in this application includes the actual withdrawal of the control rod as well as maintaining the control rod in a position other than the full-in position, and reinserting the control rod.

As is required during CORE ALTERATIONS, the two SRMs required by this Special Operations LCO provide redundant monitoring of potential reactivity changes during control rod movement and provide the Operator with early indication of unexpected subcritical multiplication that could be indicative of an approach to criticality. For an SRM channel to be considered OPERABLE, it must be providing neutron flux indication. The one-rod-out refueling interlock required by this Special Operations LCO will ensure that only one control rod can be withdrawn. At the time CRD removal begins, the disconnection of the position indication probe will cause failure of the full-in position indication, which impacts the one-rod-out refueling interlock. Therefore, prior to commencing CRD removal, a control rod withdrawal block is required to be inserted to ensure that no additional control rods can be withdrawn and that compliance with this Special Operations LCO is maintained.

To back up the refueling interlocks or the control rod withdrawal block, the ability to scram the withdrawn control rod in the event of an inadvertent criticality is provided by the Special Operations LCO requirements in Item 4.a. Alternatively, when the scram function is not OPERABLE, or when the CRD is to be removed, a sufficient number of rods in the vicinity of the withdrawn control rod are required to be inserted and made incapable of withdrawal (Item 4.b). This precludes the possibility of criticality upon withdrawal of this control rod. Also, once this alternate (Item 4.b) is completed, the reactivity margin requirement to account for both the withdrawn-untrippable control rod and the highest worth control rod may be changed to allow the withdrawn-untrippable control rod to be the single highest worth control rod.

Applicability

Control rod withdrawals are adequately controlled in Run, Startup, and Refueling MODES by existing LCOs. In Hot Shutdown and Cold Shutdown MODES, control rod withdrawal is only allowed if performed in accordance with Special Operations LCO 3.14.C, or this Special Operations LCO, and if limited to one control rod. This allowance is only provided with the reactor mode switch in the refuel position.

During these conditions, the two SRMs, full insertion requirements for all other control rods, the one-rod-out interlock, control rod full-in position indication, and scram functions and control rod operability, or the added administrative controls in Item 2.b and Item 4.b of this Special Operations LCO, provide monitoring and mitigation of potential reactivity

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BASES:

3/4.14 D. SINGLE CONTROL ROD WITHDRAWAL – COLD SHUTDOWN (continued)

excursions. The SRM requirements applicable to control rod removal under CORE ALTERATIONS are also applicable to this Special Operations LCO.

Actions

If one or more of the requirements of this Special Operations LCO are not met with the affected control rod insertable, Actions must be initiated immediately to insert all insertable control rods. Actions must continue until all such control rods are fully inserted. Placing the reactor mode switch in the shutdown position will ensure all inserted rods remain inserted and restore operation in accordance with the COLD Shutdown MODE definition in Specification 1.0. The allowed Completion Time of 1 hour to place the reactor mode switch in the shutdown position provides sufficient time to normally insert the control rods.

If one or more of the requirements of this Special Operations LCO are not met with the affected control rod not insertable, withdrawal of the control rod and removal of the associated CRD must be immediately suspended. If the CRD has been removed, such that the control rod is not insertable, the Required Actions require the most expeditious action be taken to either initiate action to restore the CRD and insert its control rod, or initiate action to restore compliance with this Special Operations LCO.

Surveillance Requirements (SR)

SR 4.14.D

The requirements of this Special Operations LCO are required to have Surveillances met to establish that this Special Operations LCO is being met. The SR 4.14.D.1 functional test demonstrates the associated SRM channel will function properly and the daily response check verifies that a gross failure of instrumentation has not occurred. If the local array of control rods is inserted and disarmed while the scram function for the withdrawn rod is not available, periodic verification is required to ensure that the possibility of criticality remains precluded. Verification that all the other control rods are fully inserted is required to meet the reactivity margin requirements (SR 4.14.D.3). Verification that a control rod withdrawal block has been inserted ensures that no other control rods can be inadvertently withdrawn under conditions when position indication instrumentation is inoperable for the affected control rod (SR 4.14.D.2.b). The 24 hour Frequency is acceptable because of the administrative controls on control rod withdrawals, the protection afforded by the LCOs involved, and hardwire interlocks to preclude an additional control rod withdrawal.

References: 1. FSAR, Section 7.6.

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BASES:

3/4.14.E MULTIPLE CONTROL ROD REMOVAL

As described in LCO 3.0.7, compliance with Special Operations LCOs is optional, and therefore, no criteria of 10 CFR 50.36(c)(2)(ii) apply. Special Operations LCOs provide flexibility to perform certain operations by approximately modifying requirements of other LCOs.

These specifications ensure maintenance or repair of control rods or rod drives will be performed under conditions that limit the probability of inadvertent criticality. The requirement that the fuel assemblies in the cell controlled by the control rod be removed from the reactor core before the control rod position indication to the Refueling Interlocks can be bypassed ensures withdrawal of another control rod does not result in inadvertent criticality. Each control rod essentially provides reactivity control for the fuel assemblies in the cell associated with the control rod. Thus, removal of an entire cell (fuel assemblies plus control rod) results in a lower reactivity potential of the core.

INSERT NEW PAGE

BASES:

3/4.14.F (Not Used)

BASES:

3/4.14.G CONTROL ROD TESTING -- OPERATING

Background

The purpose of this Special Operations LCO is to permit control rod testing, while in Run MODE or Startup MODE, by imposing certain administrative controls. Control rod patterns during startup conditions are controlled by the operator and the rod worth minimizer (RWM) (LCO 3.3.F, " Rod Worth Minimizer"), such that only the specified control rod sequences and relative positions required by LCO 3.3.H, "Rod Pattern Control," are allowed over the operating range from all control rods inserted to the low power setpoint (LPSP) of the RWM. The sequences effectively limit the potential amount and rate of reactivity increase that could occur during a control rod drop accident (CRDA). During these conditions, control rod testing is sometimes required that may result in control rod patterns not in compliance with the prescribed sequences of LCO 3.3.H. These tests include reactivity margin demonstrations, control rod scram time testing, control rod friction testing, and testing performed during the Startup Test Program. This Special Operations LCO provides the necessary exemption to the requirements of LCO 3.3.H and provides additional administrative controls to allow the deviations in such tests from the prescribed sequences in LCO 3.3.H.

Applicable Safety Analyses

The analytical methods and assumptions used in evaluating the CRDA are summarized in References 1 and 2. CRDA analyses assume the reactor operator follows prescribed withdrawal sequences. These sequences define the potential initial conditions for the CRDA analyses. The RWM provides backup to operator control of the withdrawal sequences to ensure the initial conditions of the CRDA analyses are not violated. For special sequences developed for control rod testing, the initial control rod patterns assumed in the safety analysis of References 1 and 2 may not be preserved. Therefore special CRDA analyses are required to demonstrate that these special sequences will not result in unacceptable consequences, should a CRDA occur during the testing. These analyses, performed in accordance with an NRC approved methodology, are dependent on the specific test being performed.

As described in LCO 3.0.7, compliance with Special Operations LCOs is optional, and therefore, no criteria of 10 CFR 50.36(c)(2)(ii) apply. Special Operations LCOs provide flexibility to perform certain operations by appropriately modifying requirements of other

BASES:

3/4.14.G CONTROL ROD TESTING -- OPERATING (continued)

LCO

As described in LCO 3.0.7, compliance with this Special Operations LCO is optional. Control rod testing may be performed in compliance with the prescribed sequences of LCO 3.3.H, and during these tests, no exceptions to the requirements of LCO 3.3.H are necessary. For testing performed with a sequence not in compliance with LCO 3.3.H, the requirements of LCO 3.3.H may be suspended provided additional administrative controls are placed on the test to ensure that the assumptions of the special safety analysis for the test sequence are satisfied. Assurances that the test sequence is followed can be provided by either programming the test sequence into the RWM, with conformance verified as specified in SR 4.3.F.3 and allowing the RWM to monitor control rod withdrawal and provide appropriate control rod blocks if necessary, or by verifying conformance to the approved test sequence by a second licensed operator or other qualified member of the technical staff. These controls are consistent with those normally applied to operation in the startup range as defined in the ACTIONS of LCO 3.3.F, " Rod Worth Minimizer."

Applicability

Control rod testing, while in Run MODE or Startup MODE, with thermal power greater than the LPSP of the RWM, is adequately controlled by the existing LCOs on power distribution limits and control rod block instrumentation without being restricted to prescribed sequences. With thermal power less than or equal to the LPSP of the RWM, the provisions of this Special Operations LCO are necessary to perform special tests that are not in conformance with the prescribed sequences of LCO 3.3.H. ← INSERT

While in Shutdown MODES, control rod withdrawal is only allowed if performed in accordance with other Special Operations (LCO 3.14.C, "Single Control Rod Withdrawal - Hot Shutdown," or Special Operations LCO 3.14.D, "Single Control Rod Withdrawal - Cold Shutdown"), which provide adequate controls to ensure that the assumptions of the safety analyses of Reference 1 and 2 are satisfied. During these Special Operations and while in Refuel MODE, the one-rod-out interlock and scram functions (Table 3.1.1, "Reactor Protection System (Scram) Instrumentation Requirement," and control rod OPERABILITY requirements), or the added administrative controls prescribed in the applicable Special Operations LCOs, provide mitigation of potential reactivity excursions.

Actions

With the requirements of the LCO not met (e.g., the control rod pattern is not in compliance with the special test sequence, the sequence is improperly loaded in the RWM) the testing is required to be immediately suspended. Upon suspension of the special test, the provisions of LCO 3.3.H are no longer excepted, and appropriate actions are to be taken to restore the control rod sequence to the prescribed sequence of LCO 3.3.H, or to shut down the reactor, if required by LCO 3.3.H.

14

BASES:

3/4.14.G CONTROL ROD TESTING -- OPERATING (continued)

Surveillance Requirements (SR)

SR 4.14.G

When the RWM provides conformance to the special test sequence, the test sequence must be verified to be correctly loaded into the RWM prior to control rod movement. This Surveillance demonstrates compliance as would SR 4.3.F.3, thereby demonstrating that the RWM is OPERABLE.

With the special test sequence not programmed into the RWM, a second licensed operator or other qualified member of the technical staff is required to verify conformance with the approved sequence for the test. This verification must be performed during control rod movement to prevent deviations from the specified sequence.

References:
1. NEDE-24011-P-A-US, General Electric Standard Application for Reactor Fuel, Supplement for United States (as amended).
2. Letter from T. Pickens (BWROG) to G.C. Lainas (NRC) "Amendment 17 to General Electric Licensing Topical Report NEDE-24011-P-A," August 15, 1986.