



Entergy

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December 29, 2011

Robert G. Smith, P.E.
Site Vice President

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

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

**Cycle-Specific License Amendment Request for Rod Worth Minimizer
(RWM) Bypass Allowance to Allow Reactor Startup**

- REFERENCES:**
1. Oyster Creek Nuclear Generating Station, License Amendment No. 113, Rod Worth Minimizer (TSCR 145, TAC 61062), dated November 7, 1986
 2. Pilgrim Nuclear Power Station Amendment No. 186, Compliance with the Operating Requirements Derived from NEDO-21231, (Banked Position Withdrawal Sequence (BPWS), January 1977), dated October 16, 2000
 3. Pilgrim Nuclear Power Station Amendment No. 221, Revised Rod Worth Bypass Allowances, (TAC NO. MC7055), dated April 13, 2006

LETTER NUMBER: 2.11.070

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Entergy Nuclear Operations, Inc. (Entergy) hereby requests a cycle-specific license amendment to the Pilgrim Operating License Technical Specifications (TS). The proposed amendment would revise TS 3.3.F.A.2.1.2 as it pertains to operability of the Rod Worth Minimizer (RWM) and will allow additional reactor startups during Cycle 19 with an inoperable RWM provided that a 30-day special report is submitted to the NRC. The special report shall identify the reason why the RWM is or became inoperable, actions necessary to repair the RWM, and a schedule for restoring the RWM back to operable status.

The proposed TS change provides flexibility for plant restart with an inoperable RWM during Cycle 19. Flexibility is needed to address potential problems with newly installed equipment and software.

The proposed cycle specific RWM Bypass allowance with a follow up reporting requirement follows a previous allowance granted to Oyster Creek (Reference 1). This proposed change ensures that the operating requirements derived from NEDO-21231 for the Banked Position Withdrawal Sequence (BPWS), and implemented by Pilgrim License Amendment No. 186 (Reference 2) continue to be satisfied.

IE26
MRC

Entergy has reviewed the proposed amendment in accordance with the 10 CFR 50.92 and concludes it does not involve a significant hazards consideration.

Attachment 1 to this letter provides "Evaluation of Proposed TS Change" and Attachment 2 provides "Marked-up pages of the current TS".

This letter contains no new regulatory commitments.

If you have any questions regarding the subject matter, please contact Joseph R. Lynch at (508) 830-8403.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 29th day of DECEMBER, 2011.

Sincerely,



Robert G. Smith, P.E.
Site Vice President

Attachment 1: Evaluation of Proposed TS Change
Attachment 2: Marked-up Page of the Current TS

cc:

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Attachment 1 to Entergy Letter 2.11.070
Evaluation of Proposed TS Change

**Evaluation of Proposed TS Changes
(7 pages)**

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1.0 DESCRIPTION

Pursuant to 10 CFR 50.90, Entergy Nuclear Operations, Inc. (Entergy) hereby requests a cycle-specific license amendment to the Pilgrim Operating License Technical Specifications (TS). The proposed amendment would revise TS 3.3.F.A.2.1.2 as it pertains to plant startup with the Rod Worth Minimizer (RWM) inoperable during Cycle 19 (i.e. the current operating cycle). The proposed change will allow additional reactor startups in the same calendar year during Cycle 19 with an inoperable RWM provided that a 30-day special report is submitted to the NRC after each startup with an inoperable RWM. The special report shall identify the reason why the RWM is or became inoperable, actions necessary to repair the RWM, and a schedule for restoring the RWM to operable status.

The proposed TS change provides flexibility for plant restart with an inoperable RWM during Cycle 19. Flexibility is needed to address potential problems with newly installed equipment and software.

The proposed RWM Bypass allowance contains a follow up reporting requirement that is consistent with a previous allowance granted to Oyster Creek (Reference 1). In the case of Oyster Creek, a new RWM hardware and associated software was installed, which required work to resolve RWM operating uncertainties, thus Oyster Creek sought a multiple start-up allowance for Operating Cycle 11. Pilgrim similarly installed a new RWM hardware and software package. Implementation problems were encountered that affected operability for a recent startup. The Pilgrim proposed TS change follows the Oyster Creek precedent. The proposed TS change ensures that the operating requirements derived from Banked Position Withdrawal Sequence (BPWS), defined in NEDO-21231, as implemented by Pilgrim License Amendment No. 186 (Reference 2) continue to be satisfied. During the start-up BPWS sequence would be fully enforced through manual verification of control rod positions thereby ensuring the reactivity controls during power ascension below 20% RTP.

2.0 PROPOSED CHANGES

The proposed change would include the following footnote to Specification 3.3.F.A.2.1.2:

"If this Specification can not be met in Cycle 19 additional startups are allowed provided that a special report is submitted to the NRC within 30 days of the startup. The report shall identify the reason for RWM inoperability and the schedule for completion of the RWM repairs."

Attachment 2 to this letter provides a mark-up of current Pilgrim Technical Specification page.

3.0 BACKGROUND

The RWM consists of a computer system and associated hardware and software which receives information on rod positions, keeps track of desired and existing rod patterns, and provides rod blocks when the existing pattern departs significantly from the desired pattern inserted into the RWM computer to comply with BPWS.

The RWM assists and supplements the operator with an effective backup control rod monitoring routine that enforces adherence to established startup, shutdown, and low power level control rod movement procedures and sequences. The computer prevents

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the operator from establishing control rod patterns that are not consistent with prestored RWM sequences by initiating appropriate rod select block, rod withdrawal block, and rod insert block interlock signals to the reactor manual control systems rod block circuitry. The RWM sequences stored in the computer memory are based on control rod withdrawal procedures designed to limit and, thereby, minimize individual control rod worths to acceptable levels as determined by the design basis rod drop accident. The RWM function does not interfere with normal reactor operation, and in the event of a failure does not itself cause rod patterns to be established which would violate the above objective. The RWM function may be bypassed and its rod block function disabled only by specific procedural control initiated by the operator.

The established control rod sequences that are loaded into the RWM adhere to the requirements of the BPWS that mitigates the consequences of a Control Rod Drop Accident (exceed 280 calories/gram peak fuel enthalpy limit).

LCO 3.3.F requires RWM operability in RUN and STARTUP MODES with reactor thermal power $\leq 20\%$ RTP. If the RWM is not operable, then rod movement is allowed as provided by LCO 3.3.F Action A.2.1.2 and A.2.2. Startup with RWM inoperable condition is allowed provided that the RWM was not inoperable during startup in the last calendar year and control rod movement is in compliance with BPWS, as verified by a second licensed operator or other qualified member of the technical staff during control rod movement.

The RWM receives control rod identification number and position information from the Rod Position Information System (RPIS) and determines if the selected control rod is in compliance with the established sequence for control rod movement.

The setpoint $\leq 20\%$ RTP, also known as the Low Power Set Point (LPSP) is determined by the RWM from an external input. When this input is active, then the RWM automatically enforces the established sequence for control rod movement.

The RWM enforces the established control rod pull sequence by actuating error and rod block signal for the selected control rod compared to the established sequence.

The current RWM system was installed during Cycle 19. RWM system operation concerns were identified and the system was declared inoperable just prior to the November 2011 forced outage. The RWM was inoperable when the plant was restarted. Per TS 3.3.F.A.2.2 plant restart with an inoperable RWM is not allowed more than once in the same calendar year.

4.0 TECHNCIAL ANALYSIS

- 4.1 By Pilgrim License Amendment No. 186 (Reference 2), Entergy implemented, Banked Position Withdrawal Sequence (BPWS), in compliance with the operating requirements derived from NEDO-21231, dated January 1977. This amendment approved allowances for continued rod movement with RWM bypassed. In the associated Safety Evaluation, the NRC stated:

"LCO 3.3.F will continue to require operability of the RWM below 20% RTP (Rated Thermal Power), but it would allow movement once per 12 months if a second licensed operator or other qualified member of the technical staff verifies movements. The RWM is designed to aid the operator by not allowing rod patterns not considered as part of the BPWS analyses. This function can also be

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performed by a visual inspection by another qualified staff member. The reason for the once per year restriction is to ensure that the RWM is maintained operable as much as possible."

Based on the proposed TS change, during plant restart with the RWM inoperable, Entergy will use a second reactor operator or other qualified member of the technical staff to verify that movement of control rods is in compliance with BPWS as required per existing TS 3.3.F.A.2.2. In addition, Entergy will use "control rod pull sheets" developed using the BPWS to provide further assurance. The control rod pull sheets act similar to a RWM.

- 4.2 The once per calendar year restriction in the current TS was imposed to ensure that the RWM is maintained operable as much as possible. The proposed TS changes does not invalidate the restriction to maintain the operability of RWM, instead, it provides flexibility to start and continue to operate the reactor, while ensuring that the RWM problems are being resolved in an expeditious manner. The time period does not confer any safety significance, instead it imposes urgency to correct the problem associated with RWM as quickly as possible.
- 4.3 By Pilgrim License Amendment No. 221, the NRC approved "once per 12 months" to "once in the last calendar year" and included an alternative provision allowing verification that ≥ 12 control rods have been withdrawn, if RWM becomes inoperable during reactor startups. The calendar year restriction was revised but still provides reasonable assurance that required repairs would performed in an expeditious manner such that RWM would remain operable as much as possible.
- 4.4 The requested TS change does not bypass the BWPS requirement; instead it enforces compliance with the BWPS by having a second licensed operator or other qualified member of the technical staff dedicated for the verification of the control rod movement sequence to comply with "pull sheet" pattern developed for the BPWS.
- 4.5 This proposed TS revision does not make any changes to the RPIS inputs. Also, there are no changes to the method of loading and verifying the established sequence for control rod movement. The determination of the established sequence for control rod movement includes compliance with requirements of BPWS. The established sequence is determined by other engineering processes, and the RWM only enforces the sequence. Therefore, this TS change does not affect compliance with BPWS.
- 4.6 The proposed TS change does not change the value of the LPSP, and it remains as an input to the RWM for automatic sequence enforcement. The FSAR also discusses the Low Power Alarm Set Point (LPAP) that provides indication to the operator of proximity to the LPSP to ensure any error conditions can be corrected prior to automatic enforcement. There is no change to this feature.
- 4.7 TS 4.3.F defines the surveillance requirements for the RWM. This proposed TS change does not change surveillance scope or frequency requirements. The FSAR does not include any other explicit or implicit procedures for the RWM. The Control Rod Drop Accident (CRDA) analysis is not impacted by this change. The RWM input, outputs, or functions are not used in the CRDA analysis. One output of the CRDA is the BPWS sequence for control rod movement and is enforced by the RWM.

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

Entergy requests a cycle-specific license amendment to Pilgrim Operating License Technical Specifications to include the following footnote to Specification 3.3.F.A.2.1.2:

"If this Specification can not be met during Cycle 19, additional startups are allowed provided that a special report is submitted to the NRC within 30 days of the startup. The report shall identify the reason for RWM failure and the schedule for completion of the repairs."

Entergy has evaluated the proposed Pilgrim TS changes using the criteria in 10 CFR 50.92, and 10 CFR 50.91(a)(6), and has determined that the proposed changes do not involve a significant hazards consideration. The following information is provided to support a finding of no significant hazards consideration determination.

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

Response: No

The proposed footnote allowance for additional startups in Cycle 19 does not involve the modification of any plant equipment or affect basic plant operation. The proposed allowances provide additional time to correct problems associated with the Rod Worth Minimizer (RWM). In the event the RWM is inoperable during reactor startup, the technical specification ensures that a licensed operator or other qualified member of the technical staff enforce compliance with the control rod position sequence developed using the NRC approved Banked Position Withdrawal Sequence (BPWS) as defined in NEDO-21231. This is consistent with the current technical specification requirement.

The proposed TS change does not involve a change to the safety function of the RWM. The proposed TS change involves no significant changes to the operation of any systems or components in normal or accident operating conditions.

Therefore, the proposed change does not involve a significant increase in the probability or 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 RWM bypass allowance is not a precursor to any accident previously evaluated. The proposed change provides additional time to rectify RWM equipment issues to ensure that the system implements the control rod pattern developed using BPWS methodology. The proposed change is not required to mitigate the accident conditions. The proposed change does not change the safety function. There is no alteration to the parameters within which the plant is normally operated. The RWM bypass allowance for additional startups is not a precursor to new or different kind of accidents and do not initiate new or different kind of accidents. As a result, no new failure modes are being introduced.

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

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

Response: No

The margin of safety is established through the design of the plant structures, systems, and components, and administrative controls within which the plant is operated. The margin of safety to the consequences of a control rod drop accident is maintained through the use of additional administrative controls described within the current technical specification. The establishment for the control rod insertion and withdrawal during the startups is manually controlled with independent verification by a second licensed reactor operator or other qualified member of the technical staff to ensure compliance with BPWS, if RWM becomes inoperable for any reason. Therefore, the proposed change does not impact the design basis accidents. The proposed change increases the time to rectify RWM inoperability issues to comply with technical specification requirements and control rod pattern developed using NRC approved BPWS methodology. The proposed change does not change the requirements governing operation or availability of safety equipment assumed to operate to preserve the margin of safety.

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

Based upon 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 Applicable Regulatory Requirements and Criteria

10 CFR 50, Appendix A provides criteria for Emergency Core Cooling System (ECCS) performance and 10 CFR 50.36, Technical Specifications, requires safety system settings to ensure the integrity of the reactor pressure boundary during normal and abnormal operations and to mitigate transient and accident conditions. The proposed increase in the time allowance to rectify software issues to ensure operability of RWM follows the requirements cited above.

In conclusion, based on the considerations discussed above, (1) there is a 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 NRC'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

Entergy has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, "Standards for Protection Against Radiation." However, 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

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eligibility criterion for categorical exclusion set forth in 10 CFR 51.22, "Criterion for Categorical Exclusion; identification of licensing and regulatory actions eligible for categorical exclusion or otherwise not requiring environmental review", Paragraph (c)(9). Therefore, in accordance with 10 CFR 51.22, Paragraph (b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 COORDINATION WITH PENDING TS CHANGES

Entergy has filed a proposed License Amendment by Letter No. 2.11.040, dated October 26, 2011, to increase the setpoint for condensate tank water level. The proposed Technical Specification change does not impact the condensate storage tank setpoint technical specification change.

8.0 REFERENCES

1. Oyster Creek Nuclear Generating Station, License Amendment No. 113, Rod Worth Minimizer (TSCR 145, TAC 61062), dated November 7, 1986
2. Pilgrim Nuclear Power Station Amendment No 186, Compliance with the Operating Requirements Derived from NEDO-21231, (Banked Position Withdrawal Sequence (BPWS), dated January 1977), dated October 16, 2000
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Marked-Up TS Page
(1 Page)

LIMITING CONDITIONS FOR OPERATION

3.3 REACTIVITY CONTROL (Continued)

F. Rod Worth Minimizer (RWM)

LCO 3.3.F

The RWM shall be OPERABLE.

APPLICABILITY:

RUN and STARTUP MODES with reactor thermal power \leq 20% RTP.

ACTIONS:

A. RWM inoperable during reactor startup.

- 1 Immediately suspend control rod movement except by scram.

OR

- 2.1.1 Immediately verify \geq 12 rods withdrawn,

OR

- 2.1.2 Immediately verify by administrative methods that startup with RWM inoperable has not been performed in the last calendar year.

 See Footnote

AND

- 2.2 Verify movement of control rods is in compliance with BPWS by a second licensed operator or other qualified member of the technical staff during control rod movement.

B. RWM inoperable during reactor shutdown.

- 1 Verify movement of control rods is in accordance with BPWS by a second licensed operator or other qualified member of the technical staff during control rod movement.

SURVEILLANCE REQUIREMENT

4.3 REACTIVITY CONTROL (Continued)

F. Rod Worth Minimizer (RWM)

SR 4.3.F.1

Perform an INSTRUMENT FUNCTIONAL TEST of the RWM prior to control rod withdrawal for startup or insertion to reduce power below 20%.

SR 4.3.F.2

Verify the RWM automatic bypass setpoint to be \geq 20% RTP every 24 months.

SR 4.3.F.3

Verify control rod sequences input to the RWM are in conformance with BPWS prior to declaring RWM OPERABLE following loading of sequence into RWM.

Footnote- If this Specification can not be met during Cycle 19, additional startups are allowed provided that a special report is submitted to the NRC within 30 days of the startup. The report shall identify the reason for RWM failure and the schedule for completion of the repairs.