Entergy

Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
600 Rocky Hill Road
Plymouth, MA 02360

Mike Bellamy
Site Vice President

February 24, 2003

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

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

Request for Enforcement Discretion to Allow Extended Single Recirculation Loop Operation

LETTER NUMBER: 2.03.030

Dear Sir or Madam:

On February 20, 2003 at 1500 hours Entergy Nuclear Operations, Inc. (Entergy) in teleconference discussions with the NRC Staff requested NRC approval of a request for enforcement discretion. The request was to allow Pilgrim Nuclear Power Station (Pilgrim) an additional seven days of operation with a recirculation loop out of service.

The discussions included Pilgrim's basis for the acceptability of enforcement discretion using the criteria provided in NRC Regulatory Issue Summary 2001-20, "Revisions to Staff Guidance for Implementing NRC Policy on Notices of Enforcement Discretion." This letter documents these discussions.

The reason for the request was to avoid an unnecessary plant shutdown transient while repairs were ongoing on the recirculation system loop 'A' motor-generator (MG) set/pump that tripped earlier in the day. At approximately 1800 hours on February 20, 2003 the NRC officially notified Pilgrim that this request was denied. Although Pilgrim believes sufficient justification existed for the acceptability of the requested enforcement discretion, we respect the NRC's decision to deny this request.

After extensive troubleshooting activities, Pilgrim determined that the loop would not be returned to service in the timeframe available without the requested enforcement discretion and commenced a normal shutdown to the hot shutdown condition at 0025 hours on February 21, 2003. At 0425 hours on February 21, 2003, the plant was manually scrammed and entered hot shutdown.

Should you have any questions or comments concerning this submittal, please contact Bryan Ford at (508) 830-8403.

Sincerely,

Robert M. Bellamy

Attachment: Evaluation of the Eleven Criteria Provided in NRC Regulatory Issue Summary 2001-03

cc: Mr. Travis Tate, Project Manager
Office of Nuclear Reactor Regulation
Mail Stop: 0-8B-1
U.S. Nuclear Regulatory Commission
1 White Flint North
11555 Rockville Pike
Rockville, MD 20852

U.S. Nuclear Regulatory Commission
Region 1
475 Allendale Road
King of Prussia, PA 19406

Senior Resident Inspector
Pilgrim Nuclear Power Station

Mr. Robert Walker
Radiation Control Program
Commonwealth of Massachusetts
Exec Offices of Health & Human Services
174 Portland Street
Boston, MA 02114

Mr. Steve McGrail, Director
Mass. Emergency Management Agency
400 Worcester Road
P.O. Box 1496
Framingham, MA 01702

Evaluation of the Eleven Criteria Provided in NRC Regulatory Issue Summary 2001-03

1. The TS or other license conditions that will be violated

The Technical Specifications (TS) and Operating License Conditions from which relief is requested are the following:

A. Facility Operating License Condition 3.E

The License Condition requires that if one recirculation loop is out of service, the plant shall be placed in a hot shutdown condition within 24 hours unless the loop is sooner returned to service.

B. TS Table 3.1.1, "Reactor Protection System," APRM High Flux Trip Level Settings

This specification requires the APRM High Flux Trip Level Settings for the reactor protection system be as specified in the Core Operating Limits Report (COLR). The COLR states that with one recirculation loop out of service operation is restricted in accordance with License Condition 3.E.

C. TS 3.2.C.1, "Control Rod Block Actuation," APRM Upscale Trip Setpoints

This specification requires the APRM Upscale Trip Setpoints to provide control rod blocks be as specified in the COLR. The COLR states that with one recirculation loop out of service operation is restricted in accordance with License Condition 3.E.

D. TS 4.6.E, "Jet Pumps"

This specification requires that certain surveillances be performed daily to confirm jet pump integrity. At low flows and with a recirculation loop out of service, these surveillances may not provide meaningful and repeatable data concerning jet pump integrity.

2. The circumstances surrounding the situation, including apparent root causes, the need for prompt action and identification of any relevant historical events.

A. Circumstances surrounding the situation

At approximately 0525 hours on February 20, 2003, an unplanned trip and lockout of the recirculation system loop 'A' motor-generator (MG) set/pump tripped occurred due to a loss of field. The plant continued to operate with only one recirculation loop in service.

B. Apparent Root Cause

Initial investigation determined the electrical lead from the recirculation system loop 'A' MG set generator field to collector ring had failed. This failure is thought to be due to fatigue. Investigations and troubleshooting are ongoing.

C. Need for prompt action

With one recirculation system loop out of service the plant will be required to be in hot shutdown by 0525 hours on February 21, 2003. The timeframe for completion of the current repair plan is estimated to be three to four days past that date.

D. Relevant historical events

This is the first failure of this type of a recirculation system MG set at Pilgrim.

Pilgrim in the past has requested NRC approval for unlimited operation with only one recirculation loop in service. The most recent of these requests ended with the withdrawal of the request by Pilgrim (reference TAC No. 10825). Pilgrim has reviewed these previous requests and related NRC reviews and has not identified any technical issues that are not addressed in this enforcement discretion request.

Pilgrim has a pending request with the NRC that would remove the need of the requested relief from the requirements of Technical Specification 4.6.E. That request was submitted January 30, 2003.

3. The safety basis for the request, including an evaluation of the safety significance and potential consequences of the proposed course of action. This evaluation should include at least a qualitative risk assessment using both risk insights and informed judgements, as appropriate.

The granting of the request for enforcement discretion would require extending the time in the Facility Operating License Condition 3.E an additional 7 days. For Pilgrim, single recirculation system loop operation has been analyzed, stability issues are addressed by the proposed operating restrictions and the requested condition is "risk neutral" as explained below.

a. Operation of Pilgrim with only one recirculation pump in operation (single-loop) has been analyzed to determine the core operating limits using the analytical methods previously reviewed and approved by the NRC in Technical Specification 5.6.5.b.1 and specifically described in General Electric (GE) report NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel". These analyses are documented in the following GE reports (Note: Specific report references were not provided during the conference call):

(i) Pilgrim Nuclear Power Station, Single-Loop Operation, NEDO-24268, June 1980

(ii) Pilgrim Nuclear Power Station, Single-Loop Operation, GENE-187-10-0591, DRF-A00-03984, October 1991

(iii) Supplemental Reload Licensing Report for Pilgrim Nuclear Power Station, Reload 13 Cycle 14, J11-03808-10 SRLR, September 2001

(iv) Compliance with NRC SER Condition for SLMCPR Methodology. GE letter GAW-2001-01, dated January 22, 2001

The above GE analyses for single-loop operation have confirmed that single loop operation is permitted for the requested condition. No additional analysis is required to operate Pilgrim during the time frame of the requested enforcement discretion considering the imposed operating restrictions. Application of the MAPLHGR, SLMCPR and OLMCPR limits described in the compensatory actions section will ensure that the validity of the accident and transient analysis will be maintained during operation in accordance with the request for enforcement discretion.

b. All safety systems are currently operable.

c. Protection from reactor core instabilities will be maintained during operation in accordance with the request for enforcement discretion. This protection will be provided by the compensatory actions to limit operation during the time frame provided by the requested enforcement discretion to ≤ the 67% rod load line and ≤ 50% of rated thermal power. This restriction in operation ensures that transient reactor conditions (i.e., power and flow) would not enter the "Exclusion Region" or the "Restricted Region" of operation as defined by the Pilgrim E-1A Stability solution without any operator or safety system intervention.

Additionally, the Period Based Detection System (PBDS) is operable and independent of the APRM flow-biased scram and rod block functions. The PBDS functions to alert operators of any transients where the plant could approach instability. Operator training and procedures require the initiation of a manual scram for this condition.

d. Except to address stability issues, the transient and accident analysis do not rely upon the functioning of the APRM flow bias scram or control rod block function. The APRM high clamped function is not affected by the current condition.

e. Pilgrim has reviewed General Electric SIL No. 517, "Single Loop Operation – GE BWR/3, 4, 5 and 6 Plants," and determined that the issues identified are addressed by this request for enforcement discretion.

f. Pilgrim has evaluated issues related to stresses on the jet pumps during this condition and determined that operation in this condition is acceptable. This conclusion is consistent with GE SIL 517.

g. As described in the following, there is no appreciable change in core damage frequency due to Pilgrim being in single loop operation for eight days. This, coupled with the proposed compensatory actions would make this condition "risk neutral."

The recirculation pumps are not included in the Pilgrim PRA model, since the function of providing forced circulation to the core is not one of the critical functions assessed by the PRA model in its quantification of core damage frequency.

In order for the trip of a recirculation pump to have an effect on core damage frequency, this condition must affect either the PRA initiating event frequency or the probability of failure of one of the critical functions that affect the probability of core damage. The critical function that affect the probability of core damage include:

- Reactivity Control
- Reactor Vessel Pressure Control
- AC Power
- Core Standby Cooling
- Early and Late Containment Pressure Control

The Reactor Protection and Control Rod drive systems perform the primary reactivity control function. If the plant fails to scram, there are two backup systems that can be used to ensure that the proper amount of negative reactivity is inserted into the core even though the primary systems have failed (ATWS).

The backup systems are the ATWS Alternate Rod Insertion (ARI) system and the Standby Liquid Control (SLC) system. The ATWS Recirculation Pump Trip (RPT) system and Feedwater Pump Trip (FPT) system enhance the effectiveness of these systems. Primary system pressure control is also augmented during failure to scram events by an automatic reactor feed pump trip on high primary system pressure. The condition of having one recirculation pump tripped actually lowers the probability of failure of the Recirculation Pump Trip system, but the dynamic nature of the ATWS scenario makes this difficult to assess.

The recirculation pumps are not included in the PRA model as contributing to the other critical PRA functions of AC power, Core Standby Cooling, or Early and Late Containment Pressure Control. Therefore, operation with a single recirculation pump would not have an effect on these functions.

The effect of operation with a single recirculation pump on the initiating event frequency for manual scram is negligible. The only effect that single loop operation could have is an increase in the initiating event frequency for an automatic scram due to loss of the remaining operating recirculation pump. The probability that the remaining recirculation pump will trip in the eight days in question is negligible, due to the short time interval and the low probability of recirculation pump trip.

To offset the possibility for a slight increase in core damage frequency due to the unlikely trip of the operating recirculation pump, the plant will have in place the following compensatory measures:

- Activities will be limited that might cause the operating recirculation system loop 'B' pump to trip, increase the probability of a plant transient, or adversely affect mitigative functions.

- Simulator training will be provided to all operating crews prior to assuming their watch to prepare them to deal with transients they might see in single loop operations.

Therefore, due to the very small possibility of a positive contribution to CDF, and due to the compensatory measures described above, operation for eight days in single loop operation is risk neutral.

Based on the information the safety significance and potential consequences of the proposed request is judged to be low.

4. The justification for the duration of the noncompliance.

Initial investigation determined the electrical lead from the recirculation system loop 'A' MG set generator field to collector ring had failed. The timeframe for completion of the repair plan is estimated to be three to four days.

Seven days is requested to allow for emergent work identified during the ongoing investigations.

5. The basis for the licensee's conclusion that the noncompliance will not be of potential detriment to the public health and safety and that no significant hazard consideration is involved.

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

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

   Response: No

   Pilgrim has been analyzed for single-loop operation and operation of the plant will be limited such that the assumptions of the accident analysis will be protected. Therefore, operation of Pilgrim in accordance with the requested enforcement discretion will 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 for any accident previously evaluated?

   Response: No

   Pilgrim has been analyzed for single-loop operation and operation of the plant will be limited such that the possibility of a new or different kind accident analysis will be prevented. Therefore, the requested enforcement discretion does not create the possibility of a new or different kind of accident from any previously evaluated.

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

   Response: No

   Pilgrim has been analyzed for single-loop operation. Pilgrim will enforce more restrictive operating limits applicable to single-loop operation. Therefore, the requested enforcement discretion does not involve a significant reduction in a margin of safety.

Based on the above, Entergy concludes that the proposed enforcement discretion presents no significant hazards consideration under the standards set forth in 10CFR50.92(c). This request is limited to activities within the restricted area as defined in 10 CFR Part 20, and there is no significant increase in individual or cumulative occupational radiation exposure resulting from the implementation of this request.

6. The basis for the licensee's conclusion that the noncompliance will not involve adverse consequences to the environment.

Pilgrim has determined the implementation of this request involves no increase in the amounts and no significant change in the types of any effluents that may be released offsite.

7. Any proposed compensatory measure(s).

1. Pilgrim will operate the reactor at ≤ 67% load line and ≤ 50% rated thermal power.

2. Pilgrim will apply a maximum planar linear heat generation rate multiplier for single loop operation.

3. Pilgrim will set the operating limit minimum core power ratio at 1.08, which is greater than the safety limit minimum core power ratio of greater than or equal to 1.06 for two loop operation. The OLMCPR will also be adjusted for the appropriate single loop multiplier.

4. The recirculation loop 'B' MG set/pump will be operated in local manual control mode.

5. Activities will be limited that might cause the operating recirculation system loop 'B' pump to trip, increase the probability of a plant transient, or adversely affect mitigative functions.

6. Pilgrim will evaluate jet pump readings to determine if there are jet pump integrity issues every 24 hours.

7. PBDS will be maintained operable.

8. Pilgrim will monitor the temperature of the idle recirculation loop.

9. Pilgrim operating crews will be provided Just-In-Time training on the current conditions and applicable activities.

8. A statement that the request has been approved by the facility organization that normally reviews safety issues.

The request was reviewed by Pilgrim's Onsite Review Committee, which approved the request.

9. The request must specifically address which of the NOED criteria for appropriate plant conditions specified in Section B is satisfied and how it is satisfied.

Inspection Manual Part 9900 Section B.2.1 Criterion 1, states that for an operating plant, the NOED is intended to (a) avoid unnecessary transients as a result of forcing compliance with the license condition and, thus, minimize potential safety consequences and operational risks, or (b) eliminate testing, inspection, or system realignment that is inappropriate for the particular plant conditions.

This request for enforcement discretion meets Criterion 1(a) in that License Condition 3.E limits operation with one operating recirculation system loop to 24 hours. The timeframe to complete the repair plan has been estimated to be three to four days, which is greater than 24 hours; therefore, it is expected to that to complete the repair without the requested enforcement discretion will result in a plant shutdown.

10. If a follow-up license amendment is required, both the written NOED request and the licensee amendment request must be submitted within 2 working days. The licensee's amendment request must describe and justify the exigent circumstances (see 10 CFR 50.91(a)(6)).

This request for enforcement discretion did not require a follow-up license amendment.

11. Question is applicable to requests related to severe weather or other natural phenomena.

This request is not related to severe weather or other natural phenomena.