Attachment
Proposed Change to Control Rod Drive
Weekly Surveillance Technical Specifications

Proposed Change

The proposed change involves Pilgrim Nuclear Power Station Technical Specifications, Appendix A, Section 4.3, Reactivity Control and its associated bases. Specifically, the proposed change is shown on attached Technical Specification Pages 80, 88, and 89 and is described below.

1. Technical Specification 4.3.A.2 currently states, in part, "Each partially or fully withdrawn operable control rod shall be exercised one notch at least once each week."

   It is proposed that this sentence be changed to read "Each partially or fully withdrawn operable control rod shall be exercised at least once each week."

2. The bases for Technical Specification 4.3.A.2 currently state the following, in part.

   > Also if damage within the control rod drive mechanism and in particular, cracks in drive internal housings, cannot be ruled out, then generic problem affecting a number of drives cannot be ruled out. Circumferential cracks resulting from stress assisted intergranular corrosion have occurred in the collet housing of drives at several BWRs. This type of cracking could occur in a number of drives and if the cracks propagated until severance of the collet housing occurred, scram could be prevented in the affected rods. Limiting the period of operation with a potentially severed collet housing and requiring increased surveillance after detecting one stuck rod will assure that the reactor will not be operated with a large number of rods with failed collet housings.

   It is proposed that the above section be deleted and replaced with the following.

   > Each partially or fully withdrawn operable control rod shall be exercised at least once each week based on the following requirements:
   >
   > a) The control rod drive mechanisms shall be monitored for potential circumferential cracking of the collet housing resulting from intergranular stress corrosion cracking. This is a potential generic problem that could affect a number of control rod drives, resulting in a loss of scram capability in the affected rods.
   >
   > b) The control rod drive mechanisms shall be monitored to demonstrate both the movement of the control rod under control rod drive water pressure and the mechanical integrity of the collet fingers.
   >
   > c) The crevices under the control rod drive piston seals shall be flushed weekly to minimize the corrosion of the nitrided surfaces.

These requirements are satisfied by a weekly control rod exercise consisting of a one notch insertion, or, as a minimum, a partial insert to an intermediate position indication (e.g., Position 46 to 45) and a settle back to the original notch. This partial insert exercise cannot begin at control rod Position 48 because the control rod does not latch at this position.

As additional protection against operating the reactor with a large number of control rods with failed collet housings, control rod surveillance is increased with a potentially severed collet housing and the period of operation is limited to 48 hours.

Reason for Change

Several control rod drive mechanisms at Pilgrim have recently had some degradation of the stop piston and collet piston seals. This degradation affects the ability to withdraw these control rods, but does not affect their scram capability. Although it is not a safety concern, this seal degradation has created difficulty in returning these few problem control rods to their original position after the successful completion of the weekly surveillance test required by Technical Specification 4.3.A.2. Often, power reductions have been necessary to complete the control rod manipulations needed to return a control rod to its original position. This technical specification change would decrease the number of power reductions needed by allowing weekly control rod exercise to be performed without requiring a full notch insertion.

Safety Considerations

This change does not present an unreviewed safety question as defined in 10CFR 50.59. It has been reviewed and approved by the Operations Review Committee and reviewed by the Nuclear Safety Review and Audit Committee.

Significant Hazards Considerations

It has been determined that the amendment request involves no significant hazards consideration. Under the NRC's regulations in 10CFR50.92, this means that operation of the Pilgrim Nuclear Power Station in accordance with the proposed amendment would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

The NRC has provided guidance concerning the application of standards for determining whether license amendments involve significant hazards considerations by providing certain examples (48 FR 14870). One example of an amendment that is considered not likely to involve a significant hazards consideration is "...(iv) A relief granted upon demonstration of acceptable operation from an operating restriction that was imposed because acceptable operation was not yet demonstrated." Although the proposed partial insert surveillance test for control rod drives is not in itself an operating restriction, the present full notch insert surveillance test can create operating restrictions in the form of power reductions to restore the control rod to its original position. It has been determined

that the proposed partial insert surveillance test is an acceptable alternative to the present test because it fulfills the requirements of the present weekly test:

(a) The control rod drive mechanisms shall be monitored for potential circumferential cracking of the collet housing resulting from intergranular stress corrosion cracking.

(b) The control rod drive mechanisms shall be monitored to demonstrate both the movement of the control rod under control rod drive water pressure and the mechanical integrity of the collet fingers.

(c) The crevices under the control rod drive piston seals shall be flushed weekly to minimize the corrosion of the nitrided surfaces.

Boston Edison has received concurrence from the vendor that the proposed partial insert surveillance test is an acceptable alternative to the present full notch insert surveillance test. Because the test requirements are fulfilled, the proposed change does not increase the probability or consequences of an accident previously evaluated and does not significantly reduce the existing safety margin. In addition, the proposed change only reduces the extent of control rod movement from the present full notch insertion and thus does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Schedule of Change

This change will be put into effect upon Boston Edison's receipt of approval by the Commission.

Fee Determination

Pursuant to 10CFR170.12, Boston Edisor proposes that this is a Class III change.

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
3.3 REACTIVITY CONTROL	4.3 REACTIVITY CONTROL
Applicability:	Applicability:
Applies to the operational status of the control rod system.	Applies to the surveillance requirements of the control rod system.
Objective:	Objective:
To assure the ability of the control rod system to control reactivity.	To verify the ability of the control rod system to control reactivity.
Specification:	Specification:
A. Reactivity Limitations	A. Reactivity Limitations
1. Reactivity margin - core loading	1. Reactivity margin - core loading
The core loading shall be limited to that which can be made subcritical in the most reactive condition during the operating cycle with the strongest operable control rod in its full out position and all other operable rods fully inserted.	Sufficient control rods shall be withdrawn following a refueling outage when core alterations were performed to demonstrate with a margin of 0.25 percent Δk that the core can be made subcritical at any time in the subsequent fuel cycle with the strongest operable control rod fully withdrawn and all other operable rods fully inserted.
2. Reactivity margin - inoperable control rods	2. Reactivity margin - inoperable control rods
a. Control rod drives which cannot be moved with control rod drive pressure shall be considered inoperable. If a partially or fully withdrawn control rod drive cannot be moved with drive or scram pressure the reactor shall be brought to a shutdown condition within 48 hours unless investigation demonstrates that the cause of the failure is not due to a failed control rod drive mechanism collet housing.	Each partially or fully withdrawn operable control rod shall be exercised at least once each week. This test shall be performed at least once per 24 hours in the event power operation is continuing with three or more inoperable control rods or in the event power operation is continuing with one fully or partially withdrawn rod which cannot be moved and for which control rod drive mechanism damage has not been ruled out. The surveillance need not be completed within 24 hours if the number of inoperable rods has

BASES:

2. Reactivity margin - inoperable control rods.

Specification 3.3.A.2 requires that a rod be taken out of service if it cannot be moved with drive pressure. If the rod is fully inserted and then disarmed electrically*, it is in a safe position of maximum contribution to shutdown reactivity. If it is disarmed electrically in a non-fully inserted position, that position shall be consistent with the shutdown reactivity limitation stated in Specification 3.3.A.1. This assures that the core can be shutdown at all times with the remaining control rods assuming the strongest operable control rod does not insert. An allowable pattern for control rods valved out of service, which shall meet this Specification, will be determined and made available to the operator. The number of rods permitted to be inoperable could be many more than the eight allowed by the Specification, particularly late in the operation cycle; however, the occurrence of more than eight could be indicative of a generic control rod drive problem and the reactor will be shut down.

Each partially or fully withdrawn operable control rod shall be exercised at least once each week based on the following requirements:

a) The control rod drive mechanisms shall be monitored for potential circumferential cracking of the collet housing resulting from intergranular stress corrosion cracking. This is a potential generic problem that could affect a number of control rod drives, resulting in a loss of scram capability in the affected rods.

b) The control rod drive mechanisms shall be monitored to demonstrate both the movement of the control rod under control rod drive water pressure and the mechanical integrity of the collet fingers.

c) The crevices under the control rod drive piston seals shall be flushed weekly to minimize the corrosion on the nitrided surfaces.

These requirements are satisfied by a weekly control rod exercise consisting of a one notch insertion, or, as a minimum, a partial insert to an intermediate position indication (e.g., Position 46 to 45) and a settle back to the original notch. This partial insert exercise cannot begin at control rod Position 48 because the control rod does not latch at this position.

As additional protection against operating the reactor with a large number of control rods with failed collet housings, control rod surveillance is increased with a potentially severed collet housing and the period of operation is limited to 48 hours.

* To disarm the drive electrically, four amphenol type plug connectors are removed from the drive insert and withdrawal solenoids rendering the rod incapable of withdrawal. This procedure is equivalent to valving out of the drive and is preferred because, in this condition, drive water cools and minimizes crud accumulation in the drive. Electrical disarming does not eliminate position indication.

B. Control Rod Withdrawal

1. Control rod dropout accidents as discussed in the FSAR can lead to significant core damage. If coupling integrity is maintained, the possibility of a rod dropout accident is eliminated. The overtravel position feature provides a positive check as only uncoupled drives may reach this position. Neutron instrumentation response to rod movement provides a verification that the rod is following its drive. Absence of such response to drive movement could indicate an uncoupled condition.

2. The control rod housing support restricts the outward movement of a control rod to less than 3 inches in the extremely remote event of a housing failure. The amount of reactivity which could be added by this small amount of rod withdrawal, which is less than a normal single withdrawal increment, will not contribute to any damage to the primary coolant system. The design