



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NOS. 114 AND 76 TO FACILITY OPERATING
LICENSE NOS. NPF-39 AND NPF-85
PHILADELPHIA ELECTRIC COMPANY
LIMERICK GENERATING STATION, UNITS 1 AND 2
DOCKET NOS. 50-352 AND 50-353

1.0 INTRODUCTION

By letter dated August 1, 1995, the Philadelphia Electric Company (the licensee) submitted a request for changes to the Limerick Generating Station (LGS), Units 1 and 2, Technical Specifications (TSs). The requested changes will permit the continuation of core alterations during refueling operations with certain interlocks being inoperable, by providing alternate actions which will preserve the intended design-function(s) of the inoperable interlocks.

2.0 BACKGROUND

The proposed TS changes pertain only to the refueling interlocks associated with physical positions of Refueling and Service platforms, loaded/unloaded condition of fuel moving hoists and one-rod-out situation for control rods. These interlocks are designed to preclude inadvertent criticality of the reactor core during refueling operations by restricting control rod movement and the operation of fuel-loaded refueling equipment over the reactor core.

3.0 PROPOSED CHANGES AND EVALUATION

Existing TS Section 3/4.9.1, "Reactor Mode Switch," currently stipulates that when the switch is locked in the Refuel position, a control rod can not be withdrawn unless the Refuel position "one-rod-out" interlock is satisfied. Also, core alterations can not be performed using equipment associated with the Refuel-position-interlock unless the following four specific interlocks are operable:

1. All rods in,
2. Refuel platform position,
3. Refuel platform hoists fuel-loaded,
4. Service platform hoist fuel-loaded.

The above refueling interlocks, when operable, impose barriers to preclude an inadvertent criticality during refueling operations. Inadvertent criticality is precluded by preventing; (1) the operation of loaded refueling equipment (refueling platform, service platform, and associated hoists) over the core

when any control rod is withdrawn, or (2) withdrawal of any control rod when fuel-loaded equipment is operating over the core. In addition, when the reactor mode switch is in Refuel position, only one rod can be withdrawn, and selection of a second rod initiates a rod block.

The proposed modification adds TS operator-ACTIONS which are to be implemented in lieu of operable refueling-interlocks when these interlocks become inoperable. Since correct operation of the refueling-interlocks prevents undesirable events during refueling operations, it is necessary that the proposed TS operator-ACTIONS provide the intended design function(s) of these interlocks. The staff reviewed the licensee's justification for these proposed TS actions to verify that these ACTIONS when implemented will preserve the intended design function(s) of refueling-interlocks.

For LGS Units 1 and 2, the following specific TS changes are proposed:

3.1 Section 3/4.9.1 Limiting Condition for Operation

Proposed changes:

- 3.1.1 Revise LCO 3.9.1.a, which reads, "A control rod shall not be withdrawn unless the Refuel position one-rod-out interlock is OPERABLE," to read :
"The Refuel position one-rod-out interlock shall be OPERABLE."
- 3.1.2 Revise a sentence in LCO 3.9.1.b, which reads "CORE ALTERATIONS shall not be performed using equipment associated with a Refuel position interlock unless at least the following Refuel position interlocks associated with that equipment are OPERABLE," to read "The following Refuel position interlocks shall be OPERABLE."
- 3.1.3 Revise LCO 3.9.1.b.2, which reads, "Refuel platform position," to read "Refuel platform (over core) position."
- 3.1.4 Revise LCO 3.9.1.b.4, which reads, "Service platform hoist fuel-loaded," to read, "Service platform hoist fuel-loaded (with service platform installed)."

Evaluation:

All the above changes will make the TS format of this section consistent with other sections of the TSs, and will support and clarify alternate actions described in Section 3.2 of this safety evaluation. Using a standardized format and making the text consistent with other sections of the TSs is considered an editorial change and is acceptable to the staff.

3.2 Section 3/4.9.1, "Reactor Mode Switch"

3.2.1 Proposed change:

Revise ACTION b, which reads, "With the one-rod-out interlock inoperable, lock the reactor mode switch in the Shutdown position," to "With the one-rod-out interlock inoperable, verify all control rods are fully inserted and disable withdraw capabilities of all control rods***, or lock the reactor mode switch in the Shutdown position."

Evaluation:

The proposed change will add a verification that all control rods are fully inserted, and then are disabled from being withdrawn as a suitable alternative to placing the reactor mode switch in the SHUTDOWN position when the one-rod-out interlock is inoperable. By verifying all control rods are inserted, then disabling the withdraw capabilities of all rods, the potential for having more than one control rod out at a time, or having any control rod not fully inserted while fuel loaded refueling equipment is operating over the core, does not exist. The intended design functions of the refuel and one-rod-out interlocks are operationally preserved. Therefore, the proposed change is acceptable to the staff.

3.2.2 Proposed change:

Revise ACTION c, which reads, "With any of the above required Refuel position equipment interlocks inoperable, suspend CORE ALTERATIONS with equipment associated with the inoperable Refuel position equipment interlock." to read as follows:

"With any of the above required Refuel Platform Refuel position interlocks inoperable, take one of the ACTIONS listed below, or suspend CORE ALTERATIONS.

1. Verify all control rods are fully inserted and disable withdraw capabilities of all control rods***, or
2. Verify Refuel Platform is not over core (limit switches not reached) and disable Refuel Platform travel over core, or
3. Verify that no Refuel Platform hoist is loaded and disable all Refuel Platform hoists from picking up (grappling) a load."

Evaluation:

The existing TS Section 3/4.9.1 ACTION Statement c requires that core alterations be suspended in the event that a refueling interlock associated with the positions of equipment including the Refueling platform and the Service platform is not operable. The revised ACTION Statement c prescribes three alternate actions when interlocks associated with the refueling platform are inoperable. Any one or all three actions could be implemented, and as a

result there will be acceptable alternative back-ups for the refueling interlocks. The first and second proposed actions satisfy refueling interlock requirements that moving of the fuel-loaded refueling platform over the core be prevented if a control rod is already withdrawn or if a control rod is being withdrawn. The third action requires the operator to verify that no Refuel Platform hoist is loaded and to disable all Refuel Platform hoists from picking up (grappling) a load. An unloaded platform without grappling capabilities poses no threat to erroneous fuel bundle or control rod removal, and eliminates the potential for having any control rod not fully inserted while a fuel-loaded refueling platform is operating over the core. Therefore, the proposed actions meet the intent of the refueling position equipment interlocks, and are acceptable to the staff.

3.2.3 Proposed change:

Add a new ACTION "d" to read as follows:

"With the Service Platform installed over the vessel and any of the above required Service Platform Refuel position interlocks inoperable, take one of the ACTIONS listed below, or suspend CORE ALTERATIONS.

1. Verify all control rods are fully inserted and disable withdraw capabilities of all control rods^{***}, or
2. Verify Service Platform hoist is not loaded and disable Service Platform hoist from picking up (grappling) a load."

Evaluation:

The proposed new ACTION Statement d prescribes two ACTION-alternatives when the refueling interlocks relating to the position of the Service platform are inoperable. Any one or both ACTION-alternates could be implemented. These actions remove a potential for having any control rod not fully inserted while the service platform hoist is fuel-loaded over the core, and also satisfies the requirement of the interlock that control rod withdrawal be prevented when the service platform hoist over the core is being fuel-loaded. An unloaded platform without grappling capabilities poses no threat to erroneous fuel bundle or control rod removal, and eliminates the potential for having any control rod not fully inserted while a fuel-loaded Service platform is operating over the core. Therefore, the proposed actions are acceptable to the staff.

3.3 3/4.9 Refueling Operations, Page 3/4.9-1

Proposed change:

Add a footnote to read, "*** Except control rods removed per specification 3.9.10.1 or 3.9.10.2."

Evaluation:

As marked by *** in action statements for ACTION c.1 and ACTION d.1, this new footnote allows an exception to verifying all control rods to be in and disabling their withdraw capabilities per TS 3.9.10.1 and 3.9.10.2. These TS sections have specific requirements for removing surrounding fuel prior to control rod removal. In this situation, control rods are no longer required to carry out any safety function in a defueled cell and inadvertent criticality concerns are not applicable. Therefore the proposed change is acceptable to the staff.

The staff believes that preserving the intended design function(s) of the hardwired-refueling-interlocks depends on a clear understanding and proper implementation of the proposed TS ACTIONS by the plant operators. In a November 8, 1995 conference call, the licensee informed the staff that the plant operators will be trained for the proposed TS ACTIONS prior to the implementation of this TS modification. This is acceptable to the staff.

3.4 Summary

Based on the above review, the staff concludes that the alternate ACTIONS of the proposed TS modifications preserve the intended design function(s) of the inoperable refueling interlocks. Therefore, the proposed revisions to the TSs are acceptable to the staff.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (60 FR 49944). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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