



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 136 TO FACILITY OPERATING LICENSE NO. NPF-11
AND AMENDMENT NO. 121 TO FACILITY OPERATING LICENSE NO. NPF-18
COMMONWEALTH EDISON COMPANY
LASALLE COUNTY STATION, UNITS 1 AND 2
DOCKET NOS. 50-373 AND 50-374

1.0 INTRODUCTION

By letter dated August 13, 1999, as supplemented on August 27, 1999, Commonwealth Edison Company (ComEd, the licensee) requested changes to the Technical Specifications (TSs) for LaSalle County Station, Units 1 and 2. The proposed change would revise TS Section 1.0, "Definitions", Item 1.7, "Core Alteration" to eliminate neutron monitors and control rod movement from the definition of core alteration under certain special conditions. The proposed definition is consistent with the definition in the improved standard technical specifications (iSTS), NUREG-1433, Revision 1.

2.0 EVALUATION

2.1 Proposed Changes

Table 1.0 (below) presents the definition of core alterations as specified in the current LaSalle TS and the proposed definition (which is consistent with the iSTS definition). The current LaSalle TSs define core alteration to include the addition, relocation, or movement of fuel, sources, incore instrumentation, or reactivity controls within the pressure vessel with the vessel head removed. The proposed TS exempts neutron instrumentation and control rods from the definition of core alteration under certain conditions.

TABLE 1.0
Core Alteration Definition

TS	CURRENT	ISTS (NUREG-1433/1434)
<p>1.1 DEFINITION</p> <p>CORE ALTERATION:</p>	<p>CORE ALTERATION shall be the addition, removal, relocation or movement of fuel, sources, incore instruments or reactivity controls within the reactor pressure vessel with the vessel head removed and fuel in the vessel.</p> <p>Suspension of CORE ALTERATIONS shall not preclude completion of the movement of a component to a safe conservative position.</p>	<p>CORE ALTERATION shall be the movement of any fuel, sources, or reactivity control components, within the reactor vessel with the vessel head removed and fuel in the vessel. The following exceptions are not considered to be CORE ALTERATIONS:</p> <p>a. Movement of source range monitors, local power range monitors, intermediate range monitors, traversing incore probes, or special movable detectors (including undervessel replacement); and</p> <p>b. Control rod movement, provided there are no fuel assemblies in the associated core cell.</p> <p>Suspension of CORE ALTERATIONS shall not preclude completion of the movement of a component to a safe conservative position.</p>

The current TSs contain footnotes that exempt the movement of neutron monitoring and control rod movement using the normal control rod drive systems. The proposed definition of core alteration formalizes the qualifying comments and the footnotes are no longer needed. The licensee proposes that the following footnotes be revised or deleted:

- Delete the footnote in Limiting Condition for Operation (LCO) 3.1.1, "Shutdown Margin." The footnote qualifies core alteration stating, "except movement of IRMs, SRMs or special movable detectors."

- Modify LCO 3.1.3.2, "Control Rod Maximum Scram Insertion Times." The footnote currently states in reference to core alteration, "except movement of SRM, IRM or special movable detectors or normal control rod movement." The licensee proposes to revise the footnote to state, "except normal control rod movement."
- Delete the footnote at the bottom of page 3/4 3-4, which states "except movement of IRM, SRM, or special movable detectors, or replacement of LPRM strings provided SRM instrumentation is OPERABLE per Specification 3.8.2..." The footnote refers to Action 9 of Table 3.3.1-1, "Reactor Protection System Instrumentation."
- LCO 3.9.2, "Instrumentation," suspends core alteration in its action statement. The licensee proposes to delete the associated footnote, which states, "except movement of IRMs, SRMs or special movable detectors."
- The licensee proposes to delete the footnote that refers to the action statement in LCO 3.9.5, "Communication." The footnote states, "except movement of incore instrumentation and control rods with their normal drive system."

2.2 Licensee's Justification

ComEd stated in its August 13, 1999, letter that the purpose of the proposed changes is to allow the maintenance and replacement of control rod drive systems and nuclear instrumentation without these activities being designated as core alterations during Operational Condition 5 (refueling), while fuel is in the vessel. Under the current TS definition, the maintenance of the control rod drives or the nuclear instrumentation activities would be considered core alteration, when fuel is in the reactor vessel. The proposed definition of core alteration will exclude the movement of the nuclear instrumentations from the definition of the core alterations. It will also exclude the performance of maintenance of control rod drives (CRDs) from the definition if all fuel assemblies are removed from the control cell selected for maintenance.

The licensee pointed out that the proposed core alteration definition is identical to the improved standard technical specification (iSTS) as documented in NUREG-1433, Revision 1. The proposed definition limits core alterations to the movement of only those components that can affect core reactivity, primarily fuel assemblies and control rods adjacent to loaded fuel assemblies. The licensee outlined the TS LCOs that will remain in effect and will provide the necessary reactivity controls and monitoring. These are:

- TS Section 3/4.1.1, "Shutdown Margin," requires the shutdown margin (SDM) to be maintained, and core alteration to be suspended if the SDM requirement can not be met.
- Neutron monitoring and manual scram functions must be maintained at all times as required by TS Section 3/4.3.1, "Reactor Protection System Instrumentation." Otherwise, core alteration must be suspended except for movement of source range monitors.
- TS Section 3.9.1, "Reactor Mode Switch," requires the reactor mode switch to be operable and locked in the shutdown or the refuel position. If the mode switch is in the refuel

position, core alteration should not be performed unless the refuel position interlocks are operable. Core alteration must be suspended if the mode switch conditions can not be met or the refueling interlocks are inoperable.

- Section 3.9.2, "Instrumentation," requires two SRMS to be operable. One SRM must be located in the quadrant in which core alteration is taking place, and another one must be located in an adjacent quadrant.
- TS Section 3.9.3, "Control Rod Position," requires all control rods to be inserted during core alteration, except for control rods removed in accordance with TS 3.9.10.1, "Single Control Rod Removal," and TS 3.9.10.2, "Control Rod Removal."
- TS Section 3.9.5, "Communication," requires that direct communication be maintained between the control room and the refueling platform personnel during core alterations, except for movement of incore instrumentation and normal drive system control rod movements.
- TS Section 3.9.10.1 and TS Section 3.9.10.2 require operable source range monitors (SRMs) and reactor mode switch. The SDM must also be maintained and the special LCO places additional restrictions on fuel control cells preceding removal of the control rods.

The licensee stated that the TS Sections listed above will ensure that maintenance or repair of the control rods or control rod drive systems is performed under conditions that limit the probability of inadvertent criticality. The movement of the neutron monitoring fission chambers does not significantly affect core reactivity. Movement or removal of a control rod in a defueled cell will not be considered core alteration, since the movement or removal does not impact core reactivity. Direct communication will be maintained between the control room and the refueling platform; therefore, the command and control associated with refueling will not change. The licensee concluded that the proposed change will not affect the shutdown margin, the core monitoring, or the reactor protection system operability.

In the past, ComEd has generally performed full core offloads. However, the licensee intends to perform core shuffles in future refuelings. In the August 27, 1999, supplement to the amendment request, the licensee outlined the refueling process. The licensee stated that it will initially conduct fuel shuffle to align the core to support the open reactor pressure vessel (RPV) work window. All the control rod blade replacement and swaps, control rod drive maintenance and nuclear instrumentation will be done during the open RPV work window. After the maintenance work is completed, all the control rods are inserted to the full-in position, and all the instrumentation is restored, the licensee will initiate the final phase of the fuel shuffle. The supplement reiterated that with multiple control rods removed or withdrawn, ComEd will not conduct or perform any fuel movements.

2.3 Staff's Review

The definition of core alteration in the iSTS does provide the flexibility to perform neutron instrumentation and control rod blade or drive maintenance. In addition, the TSs for both units

of LaSalle currently contain footnotes that exclude movement of neutron monitors from the core alteration definition, and the proposed changes will formalizes the array of footnotes now available in the TSs of both units.

Neutron monitoring does not directly affect reactivity of the core; however, it provides the necessary monitoring that mitigates reactivity changes while in the refueling mode. LCO 3.9.2 of the LaSalle TSs requires two neutron monitors to be operable during core alteration when fuel is in the core. The LCO also requires removal of the Reactor Protection System (RPS) "shorting links" preceding and during any control rod withdrawal. The removal of the RPS "shorting links" allows scram to occur from the source range monitor (SRM) readings. Therefore, in accordance with the revised definition of core alteration, neutron monitoring and RPS functions are adequate.

In the proposed definition, movements of control rods in cells containing fuel assemblies will be considered core alterations. The proposed definition will, however, exclude movement of control rods in defueled cells because, with the removal of the fuel bundles, the fuel cell itself does not contribute to the core reactivity and can be considered as a "water hole." Therefore, the exclusion of the control rod (CR) withdrawal/removal from a defueled cell in the definition of core alteration is acceptable.

LCO 3.1.1 requires the shutdown margin (SDM) to be maintained at all times. ComEd has the capability to determine the SDM for all of the intermediate steps and this will provide the ability to ensure that the SDM is not reduced in a more reactive intermediate configuration. The SDM, however, is based on the assumption that a single control rod of the highest worth is withdrawn. The SDM, thus, implicitly assumes that the refueling equipment interlocks are operable and prevents the withdrawal of a second control rod or the loading of an uncontrolled fuel cell.

The refueling equipment interlocks receive signals from the (1) all-rods-in position indication (for full insertion of all CRs); (2) the loading of the main hoist (indicative of fuel bundle); and (3) the position of the refueling platform (over the core or not). If a CR is not in its full-in position, the refueling interlocks disarm the refueling equipment when loading a fuel assembly. If the main hoist is loaded with fuel and located over the core, the equipment refueling interlocks insert a CR withdrawal block to prevent inadvertent withdrawal during fuel loading. However, under the multiple CR LCO, the refueling equipment interlocks are defeated in order to allow multiple CR withdrawal for maintenance. The LCO places a number of restrictions, including removal of fuel from the control cell prior to CR withdrawal or removal. If fuel is loaded while multiple control rods are withdrawn or removed for maintenance, the potential increases for loading an uncontrolled fuel cell or an inadvertent CR withdrawal. Procedures provide the necessary controls instead of the built-in refueling equipment interlocks.

If a second CR is withdrawn inadvertently or loading of uncontrolled fuel cells occurs, then maintaining the SDM does not guarantee adequate protection against criticality.

The proposed definition of core alteration is identical to the iSTS definition; however, the requirements in the LaSalle, Units 1 and 2, TSs do not necessarily parallel the requirements in the iSTS. Specifically, the special operation LCO 3.10.6 for the iSTS and LCO 3.9.10.2 for LaSalle, Units 1 and 2, differ significantly.

LCO 3.10.6 of the iSTS permits maintenance of multiple control rods or the associated control rod drives provided that: (1) the four fuel assemblies are removed from the fuel cell selected for maintenance; (2) all other core cells containing one or more fuel assemblies are fully inserted; and (3) the fuel assemblies are loaded in an approved spiral reload scheme. In order to withdraw/remove more than one CR with fuel in the core, the special LCO suspends the following: (1) LCO 3.9.3, "Control Rod Position"; (2) LCO 3.9.4, "Control Rod Position Indication"; and (3) LCO 3.9.5, "Control Rod OPERABILITY-Refueling." For the iSTS, LCO 3.9.3 requires all CRs to be fully inserted when loading fuel into the core. LCO 3.9.4 requires, in part, that the one control rod "full-in" position indication channel for each CR be operable or that fuel movement be suspended. The full-in indications provide the input signal for the all-rods-in refueling interlocks in LCO 3.9.1. "Control Rod Operability," LCO 3.9.5, requires each withdrawn CR to be operable.

The LaSalle multiple CR LCO 3.9.10.2 bypasses the one-rod-out interlock LCO 3.9.1. LCO 3.9.3 requires all CRs except for one to be inserted, and a footnote suspends this LCO when CRs are removed in accordance with LCO 3.9.10.1 and LCO 3.9.10.2. Note that the corresponding iSTS LCO requires all CRs to be inserted.

Therefore, the iSTS and the LaSalle TSs all suspend the built-in, refueling, one-rod-out interlocks and the requirement to have all CRs inserted before loading fuel. During the development of the iSTS, only approved spiral reload schemes were authorized under the multiple CR withdrawal LCO. The objective of the spiral reload sequence is to minimize the reactivity addition. In addition, reactor vessel work can be conducted with all fuel removed from the core, including multiple CR maintenance.

The LaSalle TSs though, permit both fuel shuffle and spiral reload under the multiple CR LCO 3.9.10.2. Fuel shuffle while multiple CRs or their associated drives are withdrawn/removed or disarmed has not been evaluated to determine if it represents increased risk for inadvertent criticality.

In discussions with the staff, the licensee indicated that fuel shuffle will not be conducted while multiple control rods are withdrawn or removed for maintenance. The August 27, 1999, supplement states that "during both the initial and final shuffles, all rods will be in compliance with the TS for control rod position (i.e., TS Section 3.9.3, "Control Rod Position") that requires all control rods to be fully inserted, with the exception that one rod is permitted to be withdrawn as permitted by the Mode Switch Refueling interlock." However, there is a footnote in LCO 3.9.3, "Control Rod Position," which states, "except control rods removed per specification 3.9.10.1 or 3.9.10.2." The licensee, therefore, committed to perform the fuel shuffle while operating under LCO 3.9.10.2, without complying with or invoking the footnote. The supplement also states that "during the open vessel work window with multiple control rods removed or withdrawn, ComEd will not perform any fuel movement within the RPV."

The staff reviewed the licensee's proposal to adopt the iSTS definition of core alteration for LaSalle, Units 1 and 2. However, the staff finds the multiple control rod LCO of the iSTS and the TSs for LaSalle differ significantly. ComEd has stated that the plant procedures prohibit fuel movement unless all CRs except one are inserted. The staff is formalizing the licensee's commitment in the following license condition:

The licensee is prohibited from moving any fuel assemblies within the reactor pressure vessel unless all control rods except one are fully inserted during refueling in Mode 5.

The staff also reviewed the LCOs the licensee proposed to modify. The staff finds the proposed changes in LCOs 3.1.1, 3.1.3.2, 3.8.2, 3.9.2, and 3.9.5 acceptable. The footnotes are no longer applicable and the iSTS definition formalizes the content of these footnotes.

2.4 Summary

The staff reviewed the licensee's request to amend the LaSalle County Station, Units 1 and 2, facility licenses to adopt the iSTS core alteration definition. The TSs for LaSalle differ significantly from the iSTS, "Special Operation, Multiple Control Rod," LCO 3.10.6. The iSTS restricts fuel loading sequence under the multiple CR LCO to an approved spiral reload in order to minimize core reactivity with multiple CRs withdrawn. The multiple CR withdrawal LCO requires that all the fuel assemblies be removed before withdrawing or removing the CR. The staff has determined that the request is acceptable with the following license condition: The licensee is prohibited from moving any fuel assemblies within the reactor pressure vessel unless all control rods except one are inserted during refueling in Mode 5.

On the basis of its review, the staff approves the amendment request as stated and conditioned above.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Illinois 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 the 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 (64 FR 48860). 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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