



Commonwealth Edison  
1400 Opus Place  
Downers Grove, Illinois 60515

June 5, 1992

Dr. Thomas E. Murley, Director  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attn: Document Control Desk

Subject: La Salle Station Unit 1  
Application for Amendment to Facility Operating  
License NPF-11  
Attachment A, Technical Specifications  
Unit 1 Spent Fuel Pool Rerack  
NRC Docket No. 50-373

In accordance with 10CFR50.90, Commonwealth Edison (CECo) proposes to amend Appendix A, Technical Specifications, of Facility Operating License NPF-11. The proposed amendment requests changes to Technical Specification 5.0, "Design Features" to address the planned rerack of the Unit 1 spent fuel pool.

The current spent fuel racks have a capacity for storing 1080 fuel assemblies. The new storage racks have a capacity for storing 3982 assemblies, plus up to four defective fuel assemblies for a total of 3986 fuel assemblies. The reracking of the spent fuel pool is scheduled to begin in March 1993 and therefore, CECo requests NRC approval of this amendment by February 1, 1993.

This amendment request is subdivided as follows:

1. Attachment A provides a description of the proposed changes to the Technical Specifications, and a description and evaluation of the modification upon which the Technical Specification changes are based.
2. Attachment B is the document "Licensing Report for Capacity Expansion of the LaSalle County Station Unit 1".
3. Attachment C includes the marked-up Technical Specification page with the requested changes indicated.
4. Attachment D describes CECo's evaluation performed in accordance with 10CFR50.92, which confirms that no significant hazards consideration is involved.
5. Attachment E provides the Environmental Assessment.

This proposed amendment has been reviewed and approved by both CECo On-Site and Off-Site Review in accordance with Commonwealth Edison procedures.

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June 5, 1992

Commonwealth Edison is notifying the State of Illinois of this application for amendment by transmitting a copy of this letter and its attachments to the designated State Official.

To the best of my knowledge and belief, the statements contained above are true and correct. In some respects, these statements are not based on my personal knowledge, but upon information furnished by other Commonwealth Edison and contractee employees. Such information has been reviewed in accordance with company practice, and I believe it to be reliable.

Please direct any questions you may have concerning this amendment request to this office.

Respectfully,



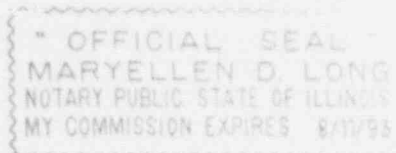
Jo Ann M. Shields  
Nuclear Licensing Administrator

Attachments: A. Description and Evaluation of the Proposed Changes  
B. LaSalle Station Unit 1 Spent Fuel Pool Licensing Report  
C. Marked-Up Technical Specification Pages  
D. Evaluation of Significant Hazards Consideration  
E. Environmental Assessment

cc: A.B. Davis, Regional Administrator - RIII  
D. Hills, Senior Resident Inspector - LSCS  
B.L. Siegel, Project Manager - NRR  
Office of Nuclear Facility Safety - IDNS

Subscribed and Sworn  
before me this 5 day  
of June, 1992

  
Notary Public



Description and Evaluation of Proposed Changes to Appendix A, Technical Specifications of Facility Operating License NPF-11

**Description of the Proposed Technical Specification Change**

There are two spent fuel storage pools (fuel pools) at LaSalle County Station. The existing Unit 1 fuel racks have 1080 fuel storage cells. The Unit 2 fuel pool has high density fuel storage racks, which has a total capacity of 4073 fuel assemblies and 43 special storage cells. LaSalle Station proposes to rerack the Unit 1 spent fuel pool to increase the storage capacity to 3986 spent fuel storage locations and 43 special storage cells. The addition of the new Unit 1 high density racks will provide for continued dual unit full-core discharge capability through the year 2013. The new racks are also designed to provide future flexibility to allow the safe storage of different fuel designs and higher fuel enrichments than presently used at LaSalle.

As a result of the proposed new racks, section 5.6 of the Design Features section of the LaSalle Unit 1 Technical Specifications requires changes to the spent fuel center-to-center distance and to the maximum storage capacity of the fuel pool. In addition, Specification 5.6.1.2, criticality for dry storage of the first core load of fuel, is being deleted as it no longer applies.

**Description of the New Racks**

The new spent fuel storage racks are free-standing and self supporting. The principal construction material for the racks is stainless steel, except for the neutron absorber material, which is a boron carbide aluminum compound with the brand name Boral™. Each rack consists of individual cells with a 6.05 inch (nominal) inside square dimension. Each cell accommodates a single Boiling Water Reactor (BWR) fuel assembly. The fuel assembly can be stored in the storage locations in channelled or unchannelled configuration. The design data is provided in Attachment B.

Specific information concerning the rack design and safety analysis is contained in Attachment B, and includes:

- Module Layout and Reracking Operation
- Rack Fabrication and Applicable Codes
- Criticality Safety Analyses
- Thermal-hydraulic Considerations
- Structural/Seismic Considerations
- Accident Analysis and Miscellaneous Structural Evaluations
- Analysis of Spent Fuel Pool Structure
- Radiological Evaluation
- Boral Surveillance Program
- Environmental Cost/Benefit Evaluation

These topics thoroughly cover the safety design requirements and evaluation of the design.

There will be no fuel (new or spent) stored in the Unit 1 fuel pool during the time of the rerack work. All spent fuel will be moved to the Unit 2 fuel pool prior to the start of work and will remain there for the duration of the work. Administrative procedures and controls are used to prevent movement of heavy objects over the Unit 2 spent fuel storage pool to protect the stored fuel from potential damage. Additional Administrative procedures and controls provide direction for the removal of the old spent fuel racks and the installation of the new racks. The removal and installation work requirements provide for continued safe operation of both LaSalle Unit 1 and 2 during the work.

#### Evaluation of the Proposed Changes

Attachment B, Licensing Report for Capacity Expansion of the LaSalle County Station Unit 1, (Licensing Report), documents that the design and analyses performed satisfy all governing requirements of the applicable codes and standards, in particular, USNRC "OT Position for Review and Acceptance of Spent Fuel Storage and Handling Applications."

#### Technical Specification Changes

The design features for spent fuel storage and new fuel storage are contained in the Unit 1 Technical Specification section 5.6., Fuel Storage. Sections 5.6.1.b and 5.6.3 require changes as a result of the proposed modification to the Unit 1 fuel pool.

The current spent fuel storage racks maintain a design basis requirement of a  $k_{eff}$  less than or equal to 0.95 by specifying a nominal 7 inch center-to-center distance between fuel assemblies placed in the storage racks. The proposed storage racks meet the same design requirement with a nominal 6.26 inch center-to-center distance between fuel assemblies placed in the storage racks. The criticality safety analysis to support this change is provided in Attachment B of section 4.0. The design will maintain a subcritical array under all specified design conditions, including a fuel drop accident. Therefore, it is proposed that Technical Specification 5.6.1.b be amended to read as follows:

5.6.1 The spent fuel storage racks are designed and shall be maintained with:

b. A nominal 6.26 inch center-to-center distance between fuel assemblies placed in the storage racks.

The current spent fuel racks have a capacity for storing 1080 fuel assemblies. The new storage racks have a capacity for storing 3982 assemblies, plus up to four defective fuel assemblies for a total of 3986 fuel assemblies. Therefore, it is proposed that Technical Specification 5.6.3 be amended to read:

5.6.3 The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 3986 fuel assemblies.

In addition, it is requested that Technical Specification 5.6.1.2 be deleted, for it was applicable only at the time prior to initial core loading and thus no longer applies.

#### Criticality Safety Analysis: Licensing Report Section 4.0

The design basis fuel for the storage racks is an 8x8 BWR fuel rod assembly with a bundle average enrichment of 3.5 wt% U-235 (uniform enrichment of 3.75% in the 138 inch enriched zone), with no credit taken for gadolinium burnable poison.

Criticality analyses are performed for both normal and abnormal (or accident) conditions, and include all significant manufacturing and calculational uncertainties.

The Criticality Safety Analysis presented concluded that the neutron multiplication factor of the Unit 1 racks will be less than the Technical Specification limit of 0.95 with 95% probability and 95% confidence, with the racks fully loaded with fuel of the highest anticipated reactivity and the pool flooded with water at a temperature corresponding to the highest reactivity (4 °C).

Current and future reload fuel bundles will be verified to be bounded by the design basis criticality evaluation by use of the verification methodology provided in Section 4.6. The use of both an in-core K-infinity and an enrichment limit is a refinement of the methodology approved for the LaSalle Unit 2 high density fuel racks. The in-core K-infinity limit is based upon a 4.60-8G2 bounding bundle design, which is less reactive than the LaSalle Unit 1 design basis bundle.

#### Thermal-hydraulic Analyses: Licensing Report Section 5.0

The Fuel Pool Cooling and Cleanup System and the B Residual Heat Removal System design heat removal capabilities presented in the LaSalle UFSAR were used as the basis for the analyses.

The analyses performed were:

- Evaluation of pool decay heat and pool bulk temperature variation with time.
- Determination of the maximum pool local temperature at the instant the bulk temperature reaches its maximum value.
- Evaluation of the maximum fuel cladding temperature which established that bulk nucleate boiling at any location resulting in two phase conditions around the fuel is not possible.
- Evaluation of the time-to-boil if all heat rejection paths from the pool are lost.
- Determination of the effect of a blocked fuel cell opening on the local water temperature and maximum cladding temperature.

The thermal-hydraulic analyses demonstrate the compliance of the reracked LaSalle Unit 1 spent fuel pool with the provisions of Section III of the USNRC "OT Position Paper for Review and Acceptance of Spent Fuel Storage and Handling Applications."

#### Structural/Seismic Considerations; Licensing Report Section 6.0

The new racks are free standing, not anchored to the fuel pool slab or the pool walls, and are not interconnected.

The structural and seismic analyses of the high density spent fuel rack under the seismic loadings postulated for the plant fuel pool are presented as are the details of the method of analysis, modeling assumptions, numerical convergence studies, and parametric evaluations performed to establish the required margins of safety. The seismic analyses are performed per a three dimensional (3-D) whole pool multi-rack dynamic model and a single rack 3-D dynamic model, both using the DYNARACK computer code. The analyses demonstrate the structural adequacy of the high density spent fuel racks as Seismic Category I structures capable of withstanding a safe shutdown earthquake (SSE) with no resultant damage to stored fuel.

#### Accident Analysis and Miscellaneous Structural Evaluations; Licensing Report Section 7.0

Accident analyses and miscellaneous evaluations were performed to demonstrate regulatory compliance of the new spent fuel racks. The following limiting accidents and miscellaneous structural evaluations are considered:

- Refueling accidents - drop of a fuel assembly from 30" above the rack to the top of the rack or through a cell to the baseplate.
- Analyses of tool drops from the elevated worktable.
- Uplift load of 1200 lbs. (UFSAR condition)
- Local cell wall buckling.
- Analysis of welded joints due to an isolated hot cell.

In all cases, the results of the analyses comply with the regulatory requirements.

#### Analysis of Spent Fuel Pool Structure; Licensing Report Section 8.0

The finite element analysis, performed to provide a structural assessment, demonstrated that the spent fuel pool for LaSalle Unit 1 can safely support the new loads associated with the installation of the new high density spent fuel racks. The stresses in the pool have been shown to be within the LaSalle UFSAR.

#### Radiological Evaluation; Licensing Report Section 9.0

The radiological consequences of the following aspects of the spent fuel rack modification were evaluated:

- Fuel handling accident over the spent fuel racks
- Gaseous releases due to the storage of the additional fuel
- Solid radwaste due to the storage of the additional fuel
- Personnel exposure as a result of the increase in the amount of stored fuel
- Anticipated radiation exposure during the reracking

#### Boral Surveillance Program; Licensing Report Section 10.0

In order to assure the neutron absorption characteristics of the Boral<sup>TM</sup> panels, a Boral<sup>TM</sup> surveillance program is presented. This program will be supplemented by administrative procedures. A coupon removal and testing program will be incorporated into the LaSalle surveillance program.

#### Environmental Cost/Benefit Evaluation; Licensing Report Section 11.0

An evaluation of the environmental cost/benefit of the LaSalle rerack modification determined that the modification and Technical Specification changes will have no environmental impact beyond that which has been predicted and described in the NRC's Final Environmental Statement related to the operation of LaSalle Station.

In conclusion, it is requested that this amendment be approved. The reracking of the fuel pool is scheduled to begin in March 1992 and therefore, CECO requests NRC approval of this amendment by February 1, 1993.

Attachment B

LaSalle Station Spent Fuel Pool  
Modification Licensing Report  
for Proposed Changes to  
Facility Operating License NPF-11