

Docket File



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

June 23, 1993

Docket Nos. 50-352
and 50-353

Mr. George A. Hunger, Jr.
Director-Licensing, MC 52A-5
Philadelphia Electric Company
Nuclear Group Headquarters
Correspondence Control Desk
P.O. Box No. 195
Wayne, Pennsylvania 19087-0195

Dear Mr. Hunger:

SUBJECT: LICENSE AMENDMENT TO RECEIVE, POSSESS, AND USE SHOREHAM FUEL,
LIMERICK GENERATING STATION, UNITS 1 AND 2 (TAC NOS. M85941 AND
M85942)

The Commission has issued the enclosed Amendment No. 62 to Facility Operating License No. NPF-39 and Amendment No. 27 to Facility Operating License No. NPF-85 for the Limerick Generating Station (LGS), Units 1 and 2. These amendments consist of changes to the Operating License for each unit in response to your application dated March 8, 1993, as supplemented by letter dated June 2, 1993.

These amendments would revise paragraph 2.B.(5) to the Operating License Nos. NPF-39 and NPF-85 for the Limerick Generating Station, Units 1 and 2, respectively, to allow the licensee to receive, possess, and use, but not separate, such source, byproduct, and special nuclear materials as contained in the fuel assemblies and fuel channels from the Shoreham Nuclear Power Station.

9306290271 930623
PDR ADDCK 05000352
P PDR

RECEIVED
JUN 23 1993

CP-1

DFOI

A copy of our Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,
 /s/
 Frank Rinaldi, Project Manager
 Project Directorate I-2
 Division of Reactor Projects - I/II
 Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 62 to License No. NPF-39
 Amendment No. 27 to License No. NPF-85
2. Safety Evaluation

cc w/enclosures:
 See next page

DISTRIBUTION

Docket File	MO'Brien(2)	CMcCracken	OC/LFDCB
NRC & Local PDRs	FRinaldi/JShea	NWagner	Ewenzinger, RGN-I
PDI-2 Reading	DNash	IDinitz	CAnderson, RGN-I
SVarga	JMoore	OGC	JJoiner, RGN-I
JCalvo	RJones	DHagan	
CMiller	EReis	GHill(4)	
RBenero	AHodgdon	Wanda Jones, P-370	
GArlotto	LPittiglio	LBell	
JRichardson	NOsgood	LPhillips	
FCongel	LKopp	MSlosson	
ATHadani	JHayes	CGrimes	
RCunningham	JAustin	ACRS(10)	
RBangart	CMacDonald	OPA	

*Previously Concurred

OFFICE	PDI-2/AA	PDI-2/PM	PRPB*	SRXB*	SLPB*
NAME	MO'Brien	FRinaldi:rb	LCunningham	RJones	CMcCracken
DATE	5/27/93	6/22/93	05/19/93	05/19/93	05/20/93
OFFICE	NRR/ILPB*	NMSS/IMTB*	NMSS/LLDR*	OGC*	PDI-2/D
NAME	MSlosson	CMacDonald	JAustin	APH	CMiller <i>cm</i>
DATE	05/21/93	05/21/93	05/24/93	05/27/93	6/23/93

Mr. George A. Hunger, Jr.

- 2 -

June 23, 1993

A copy of our Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,



Frank Rinaldi, Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 62 to
License No. NPF-39
Amendment No. 27 to
License No. NPF-85
2. Safety Evaluation

cc w/enclosures:
See next page

Mr. George A. Hunger, Jr.
Philadelphia Electric Company

Limerick Generating Station,
Units 1 & 2

cc:

J. W. Durham, Sr., Esquire
Sr. V.P. & General Counsel
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Mr. William P. Dornsife, Director
Bureau of Radiation Protection
PA Dept. of Environmental Resources
P. O. Box 8469
Harrisburg, Pennsylvania 17105-8469

Mr. Rod Krich 52A-5
Philadelphia Electric Company
955 Chesterbrook Boulevard
Wayne, Pennsylvania 19087-5691

Mr. James A. Muntz
Superintendent-Technical
Limerick Generating Station
P. O. Box A
Sanatoga, Pennsylvania 19464

Mr. David R. Helwig, Vice President
Limerick Generating Station
Post Office Box A
Sanatoga, Pennsylvania 19464

Mr. James L. Kantner
Regulatory Engineer
Limerick Generating Station
P. O. Box A
Sanatoga, Pennsylvania 19464

Mr. John Doering
Plant Manager
Limerick Generating Station
P.O. Box A
Sanatoga, Pennsylvania 19464

Library
US Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

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

Mr. Larry Hopkins
Superintendent-Operations
Limerick Generating Station
P. O. Box A
Sanatoga, Pennsylvania 19464

Mr. Neil S. Perry
Senior Resident Inspector
US Nuclear Regulatory Commission
P. O. Box 596
Pottstown, Pennsylvania 19464

Mr. Craig L. Adams
Superintendent - Services
Limerick Generating Station
P.O. Box A
Sanatoga, Pennsylvania 19464



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

PHILADELPHIA ELECTRIC COMPANY

DOCKET NO. 50-352

LIMERICK GENERATING STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 62
License No. NPF-39

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Philadelphia Electric Company (the licensee) dated March 8, 1993, as supplemented by letter dated June 2, 1993, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, paragraph 2.B.(5) on page 3 of Facility Operating License No. NPF-39 is hereby amended to read as follows:*

Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility, and to receive and possess, but not separate, such source, byproduct, and special nuclear materials as contained in the fuel assemblies and fuel channels from the Shoreham Nuclear Power Station.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Charles L. Miller

Charles L. Miller, Director
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Page 3 of Operating
License No. NPF-39

Date of Issuance: June 23, 1993

*Page 3 is attached, for convenience, for the composite license to reflect this change.

- (3) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
- (4) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
- (5) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility, and to receive and possess, but not separate, such source, byproduct, and special nuclear materials as contained in the fuel assemblies and fuel channels from the Shoreham Nuclear Power Station.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I (except as exempted from compliance in Section 2.D. below) and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The licensee is authorized to operate the facility at reactor core power levels not in excess of 3293 megawatts thermal (100% rated power) in accordance with the conditions specified herein and in Attachment 1 to this license. The items identified in Attachment 1 to this license shall be completed as specified. Attachment 1 is hereby incorporated into this license.

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 62, are hereby incorporated in the license. PECO shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.



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

PHILADELPHIA ELECTRIC COMPANY

DOCKET NO. 50-353

LIMERICK GENERATING STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 27
License No. NPF-85

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Philadelphia Electric Company (the licensee) dated March 8, 1993, as supplemented by letter dated June 2, 1993, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, paragraph 2.B.(5) on page 3 of Facility Operating License No. NPF-85 is hereby amended to read as follows:*

Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility, and to receive and possess, but not separate, such source, byproduct, and special nuclear materials as contained in the fuel assemblies and fuel channels from the Shoreham Nuclear Power Station.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Charles L. Miller

Charles L. Miller, Director
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Page 3 of Operating
License No. NPF-85

Date of Issuance: June 23, 1993

*Page 3 is attached, for convenience, for the composite license to reflect this change.

- (4) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
- (5) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility, and to receive and possess, but not separate, such source, byproduct, and special nuclear materials as contained in the fuel assemblies and fuel channels from the Shoreham Nuclear Power Station.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I (except as exempted from compliance in Section 2.D. below) and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

Philadelphia Electric Company is authorized to operate the facility at reactor core power levels of 3293 megawatts thermal (100 percent rated power) in accordance with the conditions specified herein.

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 27, are hereby incorporated into this license. Philadelphia Electric Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) Fire Protection (Section 9.5, SSER 2)*

The licensee shall maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report for the facility through Revision 58 and as approved in the SER through Supplement 9, and in the Fire Protection Evaluation Report through Revision 12, subject to the following provisions a and b below:

- a. The licensee shall make no change to features of the approved fire protection program which would decrease the level of fire protection in the plant without prior approval of the Commission. To make such a change the licensee must submit an application for license amendment pursuant to 10 CFR 50.90.

*The parenthetical notation following the title of license conditions denotes the section of the Safety Evaluation Report and/or its supplements wherein the license condition is discussed.



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 62 AND 27 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 March 8, 1993, as supplemented by letter dated June 2, 1993, the Philadelphia Electric Company (the licensee) submitted a request for changes to paragraph 2.B.(5) to the Operating License Nos. NPF-39 and NPF-85 for the Limerick Generating Station (LGS), Units 1 and 2. The requested changes would allow the receipt, possession and use of the fuel assemblies and fuel channels previously irradiated in the Shoreham Nuclear Power Station (SNPS). The fuel was fabricated by General Electric Company (GE) and consists of 560 GE6-(P8X8R) pressurized, C-lattice, non-barrier fuel assemblies. The 560 fuel assemblies include 340 enriched to 2.19 w/o U-235, 144 enriched to 1.76 w/o U-235, and the remaining 76 are natural uranium (i.e., 0.711 w/o U-235). These fuel assemblies are similar to those utilized in the LGS, Unit 1 initial core loading. The supplemental letter provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

The fuel was used at SNPS in a limited testing program at 5% power. It has been irradiated to a core average exposure of approximately 48 megawatt days per metric ton (MWD/MT). The estimated core fission inventory is less than 0.02% of the source term, and its decay heat rate is approximately 265 watts (i.e., 900 Btu/hr) as of June 1992. The fuel transport between the two sites will utilize the GE IF-300 Series spent fuel cask. The GE IF-300 has received an NRC Certificate of Compliance (No. 9001), that has been amended to address the specific payload to be utilized for the proposed transport of the SNPS fuel to the LGS site. The staff has confirmed that 1) a current amendment to the NRC Certificate of Compliance No. 9001 has been issued for the spent fuel cask; 2) a security plan has been established for the transport of the subject fuel; 3) an Environmental Assessment and Finding of No Significant Impact has been issued; and 4) a complete technical evaluation of all aspects affecting the receipt, possession and use of the subject fuel at the LGS site has been performed.

2.0 EVALUATION

The staff has addressed all pertinent issues associated with the proposed fuel transfer, as applicable to the loading and transport from the SNPS to the LGS, and the unloading, storage, and use of the fuel assemblies and the fuel channels at the LGS. The specific issues addressed by the staff in this

9306290286 930623
PDR ADOCK 05000352
P PDR

evaluation include the determination of the applicability of the Price-Anderson Rule; the evaluation of the criticality aspects of receiving, storing, and using the slightly irradiated fuel; the radiological assessment; and the handling of the heavy loads and cooling of the subject fuel and components.

2.1 Price-Anderson

There are no unresolved financial protection issues involved in the use of Shoreham spent fuel at Limerick. Price-Anderson coverage would cover the fuel from the SNPS to the LGS and would also extend to the fuel while it is being used at the LGS and to the natural uranium fuel assemblies that would be used to test for damage. See Section 170 of the Atomic Energy Act of 1954, as amended.

2.2 Storage and Use of the Irradiated Fuel

Storage of Irradiated Fuel

The criticality analysis for the LGS spent fuel pool, as described in the Updated Final Safety Analysis Report (UFSAR) Section 9.1.2.3.1, assumed fuel assemblies with a uniform 3.5 w/o U-235 enrichment. The analysis also assumed the presence of zircaloy channels. The resulting worst case k_{eff} was 0.933, which meets the NRC limiting criterion of k_{eff} no greater than 0.95. The highest average assembly enrichment of the SNPS fuel is 2.19 w/o U-235 and the maximum planar enrichment is 2.33 w/o U-235. Based on the lower enrichment, the reactivity of the storage array of the SNPS fuel in the LGS storage pool will result in a lower value of k_{eff} than was calculated for the LGS fuel.

The SNPS fuel will be packaged for transportation to the LGS with polyethylene spacers and a protective stainless steel channel. GE, therefore, evaluated the effect of these spacers and channels on the spent fuel storage pool k_{eff} . The stainless steel channels were found to lower the reactivity of the spent fuel pool k_{eff} in all cases. However, the increased neutron moderation due to the hydrogen in the polyethylene spacers tends to cause a reactivity increase. GE has determined that the lower enrichment of the SNPS fuel, compared to the enrichment used in the LGS criticality analysis, causes a much greater negative reactivity effect than the positive reactivity addition caused by the polyethylene spacers. Therefore, the storage of the SNPS fuel in the LGS spent fuel pool is acceptable since it results in a k_{eff} of less than 0.933, thus meeting the NRC limit of no greater than 0.95.

Use of the SNPS Fuel in the LGS Core

A detailed inspection of two of the irradiated SNPS fuel assemblies was performed by GE in August 1990. This inspection, which included eddy current testing of individual fuel and water rods as well as a visual inspection of the entire fuel assembly, verified that the SNPS fuel was suitable for future use. In addition, an evaluation of the water chemistry history of both the SNPS reactor and spent fuel pool determined that the fuel has not been exposed to an adverse environment that would preclude its future use.

PECo will ensure that the SNPS fuel assemblies arrive in a condition suitable for future use by inspecting a dummy test assembly after it has been subjected to accelerations and loadings at least as great as those expected during shipping and handling. The acceptance criteria will be the same as applied to the shipment of new fuel, as specified in NEDE-23542-P, "Fuel Assembly Evaluation of Shipping and Handling Loads," dated March 1977. In addition to disassembling and inspecting at least one fuel assembly from the first shipment, all assemblies shipped from the SNPS to the LGS will be visually inspected before and after packaging as well as upon arrival at LGS. Any assembly that does not meet the acceptance criteria used for the receipt inspection of new fuel will be excluded from future use in the LGS cores unless it is appropriately repaired. The staff finds the acceptance criteria as well as the tests and inspections used to determine the suitability of the SNPS fuel for future use at the LGS acceptable.

Before operation with the SNPS fuel, a cycle-specific core nuclear analysis will be performed based on the latest NRC-approved version of NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel GESTAR II." The effect of the SNPS fuel on the thermo-hydraulic stability of the core will also be evaluated based on NRC Generic Letter 88-07, Supplement 1, "Power Oscillations in Boiling Water Reactors (BWR)." These are the same evaluations performed for all the LGS reload cores and are acceptable. In addition, an evaluation was performed to determine if any analysis changes are required to account for the prior operating history, handling, and transportation of the SNPS fuel. The SNPS fuel was found to meet all the licensing bases documented in NEDE-24011-P-A and, therefore, no exceptions to GESTAR II will be needed when the SNPS fuel is analyzed for use in the LGS cores.

PECo has stated that only a limited number of the SNPS fuel assemblies will be used each cycle. These assemblies will only be placed in low duty core locations. The staff finds this limited use in low power locations acceptable.

Conclusion of Storage and Use of the SNPS Fuel

The staff has reviewed the criticality aspects of storage of the irradiated SNPS Fuel in the LGS spent fuel pools and the suitability of this fuel for future use in the LGS cores. The impact of the SNPS fuel and its packaging material on the LGS spent fuel pool criticality was found to be bounded by the fuel pool criticality analysis presented in Section 9.1.2.3.1 of the LGS UFSAR. In addition, before the SNPS fuel is used in an LGS core, a cycle-specific analysis, which will include the effect on the thermal-hydraulic stability, will be performed in accordance with NRC-approved methods to determine its acceptability.

2.3 Radiological Assessment

In the submittal from PECO, it was stated that SNPS fuel had been irradiated to a core average exposure of approximately 48-Megawatt-days-per-metric-ton and that the fuel had been removed from the reactor and placed in the SNPS spent fuel pool in August 1989. The submittal indicated that the slightly irradiated fuel contains 0.02% of the source term assumed in the design basis loss of coolant accident described in the LGS UFSAR. PECO also stated that the radiological consequences of a dropped fuel assembly involving the SNPS fuel are bounded by the fuel handling accident involving highly irradiated spent fuel described in the LGS UFSAR Section 15.7.4, "Fuel Handling Accident." They stated further that while handling the IF-300 cask, which weighs 85 tons including the basket, 17 fuel assemblies, and a redundant cask-lifting yoke, the requirements of NUREG-0554, "Single-Failure-Proof Cranes for Nuclear Power Plants" and NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," would be met by the use of a single-failure-proof redundant yoke and by restricting the critical load of the reactor enclosure main hoist to 110 tons. PECO also stated that restricting the reactor enclosure main hoist critical load to 110 tons and the use of single-failure-proof equipment precludes a cask drop due to single-failure. Therefore, an analysis of the spent fuel cask drop is not required.

The staff has assessed the consequences of a fuel handling accident involving the SNPS fuel. The staff is in agreement with PECO that existing analysis for fuel handling accident involving highly irradiated fuel at the LGS, which is described in the LGS UFSAR Section 15.7.4, bounds any potential fuel handling accident associated with the SNPS fuel. In addition, such a postulated accident is also bounded by the staff's analysis of the consequences of a fuel handling accident, which was presented in NUREG 0991, "Safety Evaluation Report Related to the Operation for the Limerick Generating Station, Units 1 and 2." The staff has also concluded that, as a result of the steps PECO is taking to meet the requirements of NUREG-0554 and NUREG-0612, an analysis of a spent fuel cask drop accident is not required for this licensing action.

2.4 Fuel Handling and Cooling

The licensee plans to move the fuel from the SNPS via barge to a PECO site along the Delaware River and then to the LGS by rail. The shipping container will be the GE IF-300 series spent fuel cask with a basket design that can hold 17 fuel assemblies. The railcar will be moved into the reactor building under the refueling hoist-way. The reactor enclosure crane will lift the cask from the railcar through the open hoist-way via the yoke designed for lifting the IF-300 cask. The cask will then be moved to the cask pool, located between the Unit 1 and Unit 2 spent fuel pools. The cask top will then be removed and individual fuel assemblies will be moved from the cask to the spent fuel pool for Unit 1 or Unit 2 through open slot B in either pool.

The licensee plans to inspect the shipped fuel sometime after it arrives once the cask is in the LGS cask pool. Note that this safety evaluation is only concerned with the movement of the fuel handling cask within the reactor building and cooling of the SNPS fuel after removal from the transfer cask.

This evaluation addresses two aspects considered in the licensee's submittal and does not address the transfer process from Shoreham to Limerick. The two issues considered in this evaluation are: (1) Heavy loads handling which involves the movement of cask containing the SNPS fuel within the confines of the LGS reactor building, and (2) The capability of the LGS spent fuel storage pool cooling system as regards cooling the SNPS fuel assemblies stored in the spent fuel pool.

Heavy Load Handling

The reactor enclosure crane, with which the licensee plans to move the IF-300 series cask, has been found acceptable for use as a single-failure-proof crane. The specified maximum critical crane load is 110 tons, while the IF-300-type cask with basket, 17 assemblies and yokes, weigh about 85 tons. The crane bridge and trolley have travel limit switches to prevent movement of the crane over spent fuel.

The special lifting device, or yoke, has 2 independent components; the standard lifting yoke and a redundant yoke. The standard yoke engages the cask trannions with the standard yoke's J-hooks; the yoke cross-members hold cables which are used to remove the cask head. The redundant yoke has a cradle into which the cask is lowered before moving. Each yoke is designed in accordance with the criteria of ANSI 14.6-1977; each is designed with a safety factor of 3 to minimum component yield stress and 5 to minimum component ultimate stress, thus complying with the criteria of a single-failure-proof lifting device.

The licensee will follow the same load path that would be encountered in moving highly irradiated fuel from the plant except in reverse, i.e., movement will be from hoist-way to cask pool instead of reverse.

The head of the cask containing the Shoreham fuel will not be removed until the cask is in the cask pit, under water. After the head is removed, the SNPS fuel may be moved into either the LGS, Units 1 or 2 spent fuel pool or may be removed for examination, at the licensee's discretion. Removal and subsequent examination is to be conducted in accordance with applicable safety requirements.

The load path from the hatch-way to the cask storage pit has been determined to be a safe load path, i.e., a path which avoids spent fuel and redundant safety shutdown equipment in the unlikely event of a load drop.

Cooling of the Fuel Assemblies

There are no thermal/hydraulic concerns because of the extremely low heat generation rate for the irradiated core, 900 BTU/HR. This value may be contrasted to the capability of one of the Limerick fuel pool cooling systems.

Each unit has 3 pumps and 3 heat exchangers. With 2 pumps and 2 heat exchangers operating and a pool filled with spent fuel assemblies generating up to 16,320,000 BTU/HR, the fuel pool water is maintained below 140°F.

Conclusion for Fuel Handling and Cooling

The staff finds that movement of the series IF-300 cask from its entrance into the reactor building to the cask pool to present no handling problems since the reactor enclosure crane and yoke constitute a single-failure-proof handling system, in accordance with the provisions of Section 5.1.6 of NUREG-0612, "Control of Heavy Loads." Such compliance assumes the possibility of a load drop to be negligibly low. In addition, the path of the cask, from entrance into the fuel handling building to the cask pool bypasses irradiated fuel and dual or redundant safe shutdown systems so that the cask, even were a load drop to occur, would have no effect upon spent fuel or the capability of the plant to shut down safely.

The movement of individual fuel elements into either spent fuel pool from the cask also presents no problem beyond that normally encountered, and provided for, when moving irradiated fuel from either pool into a cask when such fuel has been irradiated as part of an operational core.

As noted above, in Section 2.2, there are no thermal/hydraulic concerns because the Shoreham fuel elements are generating very little heat as compared to the capability of the spent fuel pool cooling system.

Therefore, the staff finds the movement of the Shoreham fuel inside the LGS and subsequent storage in the spent fuel storage pools to be acceptable in that such movement and storage will be in accordance with applicable criteria, from a heavy loads and fuel handling aspect and from a thermal/hydraulic aspect. All other concerns, including that of spent fuel pool storage criticality and movement of fuel from the SNPS to the LGS are addressed elsewhere.

3.0 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.

4.0 ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.21, 51.32, and 51.35, an environmental assessment and finding of no significant impact have been prepared and published (58 FR 29010) in the Federal Register on May 18, 1993. Accordingly, based upon the environmental assessment, the Commission has determined that the issuance of this amendment will not have a significant effect on the quality of the human environment.

5.0 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.

Principal Contributors: F. Rinaldi
L. Kopp
J. Hayes
N. Wagner
I. Dinitz

Date: June 23, 1993