

DEC 1 1976

Docket No. 50-272

Public Service Electric & Gas Company  
ATTN: Mr. F. P. Librizzi  
General Manager - Electric Production  
Production Department  
80 Park Place, Room 7221  
Newark, New Jersey 07101

Gentlemen:

ISSUANCE OF AMENDMENT NO. 3 TO FACILITY OPERATING LICENSE NO. DPR-70  
FOR SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 3 to Facility Operating License No. DPR-70. Amendment No. 3 is effective as of the date of issuance. Facility Operating License No. DPR-70, as amended, shall expire at midnight, September 25, 2008.

In accordance with the Commission's Supplemental Statement of General Policy of November 5, 1976 (41 F.R. 49898, November 11, 1976), the staff has determined in the enclosed Environmental Assessment, that use of revised values for reprocessing and waste management would not tilt the cost-benefit balance for Salem Unit No. 1 against issuance of a full power operating license. Accordingly, Amendment No. 3 to License No. DPR-70 authorizes the Public Service Electric and Gas Company to operate the Salem Nuclear Generating Station, Unit No. 1 at a reactor core power level of 3338 megawatts thermal (one hundred percent of the rated core thermal power). However, in accordance with Amendment No. 3 and the revised Attachment 1 to License DPR-70, the amended license is conditioned to provide a sequential approach to full power which takes into account a series of incomplete construction items, preoperational tests, startup tests and other items, and provides for further Commission approval at various stages of these activities.

Other changes include (1) the requirement for a long-term means of providing overpressure protection; (2) the temporary limitation of power operation to twenty percent of rated core power until the ECCS performance is reevaluated by modeling the upper head temperature as the hot leg temperature; (3) the condition that Facility Operating License No. DPR-70 is subject to the outcome of the proceedings in Natural Resources Defense Council v. NRC (D. C. Circuit, July 21, 1976)

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Nos. 74-1385 and 74-1586, and (4) changes to the Appendix A Technical Specifications, in response to your request dated November 8, 1976. Facility Operating License No. DPR-70 initially contained several conditions relating to environmental matters. Since these conditions are included in the Appendix B Technical Specifications, they have been deleted from the license proper.

Copies of the related Safety Evaluation and the Federal Register Notice of Issuance of Amendment are also enclosed.

Sincerely,

Original signed by R. C. DeYoung

*[Signature]*  
 Roger S. Boyd, Director  
 Division of Project Management  
 Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 3 to License No. DPR-70
2. Environmental Assessment
3. Federal Register Notice
4. Safety Evaluation

cc: See page 3

DSE:AD/EP <i>[Signature]</i> VAMcGone	DSE:DIR <i>[Signature]</i> HRDenton	ELD MER M Riddle
11/23/76	11/30/76	11/30/76

SEE PREVIOUS CONCURRENCES.

OFFICE →	LWR 2	LWR 2	DPR	LWR 2	LWR:AD	DPM:DIR
SURNAME →	Hee:mt	IVillalva	JMcGough	KKniel	DBVassallo	<i>[Signature]</i>
DATE →	11/23/76	11/23/76	11/23/76	11/23/76	11/30/76	12/1/76

Public Service Electric &  
Gas Company

- 2 -

Nos. 74-1385 and 74-1586, and (4) changes to the Appendix A Technical Specifications, in response to your request dated November 8, 1976.

INSERT

Copies of the related Safety Evaluation and the Federal Register Notice of Issuance of Amendment are also enclosed.

Sincerely,

Roger S. Boyd, Director  
Division of Project Management  
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 3 to License No. DPR-70
2. Environmental Assessment
3. Federal Register Notice
4. Safety Evaluation

cc: See page 3

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JMcGough	
11/ /76	11/ /76

OFFICE >	LWR 2	LWR 2 <i>glo</i>	DSE:AD/EP	LWR:2	LWR:AD	DPM:DIR
SURNAME >	JLPS:mt	IVillalva	VAMoore	KKniel	DBVassallo	RSBoyd
DATE >	11/19/76	11/22/76	11/ /76	11/ /76	11/ /76	11/ /76

DEC 1 1976

cc: Fred Broadfoot, Esq.  
Public Service Electric & Gas Company  
80 Park Place  
Newark, New Jersey 07101

Joseph B. Knotts, Jr., Esq.  
Conner & Knotts  
Suite 1050  
1747 Pennsylvania Avenue, N. W.  
Washington, D. C. 20006

Philadelphia Electric Company  
2301 Market Street  
Philadelphia, Pennsylvania 19105

Delmarva Power & Light Company  
800 King Street  
Wilmington, Delaware 19899

Atlantic City Electric Company  
1600 Pacific Avenue  
Atlantic City, New Jersey 08401

State House Annex  
ATTN: Deputy Attorney General  
State of New Jersey  
36 West State Street  
Trenton, New Jersey 08625

Department of Natural Resources  
and Environmental Control  
ATTN: Director, Division of  
Environmental Control  
Tatnall Building  
Dover, Delaware 19901

Governor's Office of State Planning  
and Development  
ATTN: Coordinator, Pennsylvania  
State Clearinghouse  
P. O. Box 1323  
Harrisburg, Pennsylvania 17120  
(w/o enclosures)

Department of Environmental Resources  
ATTN: Director, Office of  
Radiological Health  
P. O. Box 2063  
Harrisburg, Pennsylvania 17105

Honorable David A. Fogg  
Mayor, Lower Alloways Creek Township  
Salem County, New Jersey 08079

Chief, Energy Systems  
Analysis Branch (AW-459)  
Office of Radiation Programs  
U. S. Environmental Protection Agency  
Room 645, East Tower  
401 M Street, S. W.  
Washington, D. C. 20460

U. S. Environmental Protection Agency  
Region II Office  
ATTN: EIS COORDINATOR  
26 Federal Plaza  
New York, New York 10007

Mr. Bruce Blanchard  
Environmental Projects Review  
U. S. Department of the Interior  
Room 5321  
18th and C Streets, N. W.  
Washington, D. C. 20240

Mr. Sheldon Myers  
ATTN: Mr. Jack Anderson  
Office of Federal Activities  
U. S. Environmental Protection Agency  
Room W-541, Waterside Mall  
401 M Street, S. W.  
Washington, D. C. 20460

ITT Grinnell Corporation  
ATTN: Charles McKenna  
Standards Engineer  
260 West Exchange Street  
Providence, Rhode Island 02901

Bechtel Power Corporation  
ATTN: R. L. Ashley  
P. O. Box 607  
Gaithersburg, Maryland 20760

Interdevelopment, Inc.  
ATTN: Micealae Delgado  
Rutherford B. Hayes Building  
Suite 104  
2361 South Jefferson-Davis Highway  
Arlington, Virginia 22202

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SURNAME >					
DATE >					

PUBLIC SERVICE ELECTRIC AND GAS COMPANY  
PHILADELPHIA ELECTRIC COMPANY  
DELMARVA POWER AND LIGHT COMPANY  
ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-272

SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

FACILITY OPERATING LICENSE

Amendment No. 3  
License No. DPR-70

1. The Nuclear Regulatory Commission (the Commission) having found that:
  - A. The application for license filed by the Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company, and Atlantic City Electric Company (the licensees) and the application for license amendment dated November 8, 1976, filed by Public Service Electric and Gas Company comply with the standards and requirements of the Atomic Energy Act (the Act) of 1954, as amended, and the Commission's rules and regulations set forth in 10 CFR Chapter I and all required notifications to other agencies or bodies have been duly made;
  - B. Construction of the Salem Nuclear Generating Station, Unit No. 1 (facility) has been substantially completed in conformity with Provisional Construction Permit No. CPPR-52 and the application, as amended, the provisions of the Act and the rules and regulations of the Commission;
  - C. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;
  - D. There is reasonable assurance: (i) that the activities authorized by this amended operating license can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the rules and regulations of the Commission;
  - E. Public Service Electric and Gas Company is technically qualified and the licensees are financially qualified to engage in the activities authorized by this amended operating license in accordance with the rules and regulations of the Commission;

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- F. The licensees have satisfied the applicable provisions of 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements," of the Commission's regulations;
- G. The issuance of this amended operating license will not be inimical to the common defense and security or to the health and safety of the public;
- H. After weighing the environmental, economic, technical, and other benefits of the facility against environmental and other costs and considering available alternatives, the issuance of Amendment No. 3 to Facility Operating License No. DPR-70 subject to the conditions for protection of the environment set forth in the Technical Specifications, Appendix B is in accordance with 10 CFR Part 51 (and with former Appendix D to 10 CFR Part 50) of the Commission's regulations and all applicable requirements have been satisfied; and
- I. The receipt, possession, and use of source, byproduct and special nuclear material as authorized by this amended license will be in accordance with the Commission's regulations in 10 CFR Parts 30, 40, and 70, including 10 CFR Sections 30.33, 40.32, and 70.23 and 70.31.

2. Facility Operating License No. DPR-70, issued to the Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company, and Atlantic City Electric Company, is hereby amended in its entirety, to read as follows:

- A. This amended license applies to the Salem Nuclear Generating Station, Unit No. 1, a pressurized water nuclear reactor and associated equipment (the facility), owned by the Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company, and Atlantic City Electric Company and operated by Public Service Electric and Gas Company. The facility is located on the applicants' site in Salem County, New Jersey, on the southern end of Artificial Island on the east bank of the Delaware River in Lower Alloways Creek Township, and is described in the "Final Safety Analysis Report" as supplemented and amended (Amendments 10 through 39) and the Environmental Report as supplemented and amended (Amendments 1 through 3).
- B. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses

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- (1) Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company, and Atlantic City Electric Company to possess the facility at the designated location in Salem County, New Jersey, in accordance with the procedures and limitations set forth in this amended license;
- (2) Public Service Electric and Gas Company, pursuant to Section 104b of the Act and 10 CFR Part 50, "Licensing of Production and Utilization Facilities," to possess, use and operate the facility;
- (3) Public Service Electric and Gas Company, pursuant to the Act and 10 CFR Part 70, to receive, possess and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;
- (4) Public Service Electric and Gas Company, 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;
- (5) Public Service Electric and Gas Company, 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
- (6) Public Service Electric and Gas Company, pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This amended license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; 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:

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(1) Maximum Power Level

Public Service Electric and Gas Company is authorized to operate the facility at a steady state reactor core power level not in excess of 3338 megawatts (one hundred percent of rated core power). Prior to attaining the one hundred percent power level, Public Service Electric and Gas Company shall complete the preoperational tests, startup tests and other items identified in Attachment 1 to this amended license in the sequence specified. Attachment 1 is an integral part of this amended license.

(2) Technical Specifications

The Technical Specifications contained in Appendix A issued on August 13, 1976, amended on September 29, 1976, and as revised in the attached pages, are incorporated in this amended license. The Technical Specifications contained in Appendix B issued on August 13, 1976, are incorporated in this license amendment. Public Service Electric and Gas Company shall operate the facility in accordance with the Technical Specifications.

(3) Steam Generator Water Rise Rate

Except for the purpose of performing secondary side flow stability tests, Public Service Electric and Gas Company shall, whenever the secondary side water level in a steam generator is below the level of the feedwater sparger, limit the secondary side water level rise rate in each steam generator to less than 1.2 inches per minute and shall reduce the rise rate to within this limit within two (2) minutes. This condition will be removed by amendment of this license when Public Service Electric and Gas Company demonstrates to the satisfaction of the Commission that secondary side flow instability (water hammer) does not result in unacceptable consequences.

D. The licensees shall maintain in effect and fully implement all provisions of the NRC Staff-approved physical security plan, including amendments and changes made pursuant to the authority of 10 CFR 50.54(p). The approved security plan consists of proprietary documents, collectively titled Salem Nuclear Generating Station "Industrial Security Plan" as follows:

Original, submitted with letter dated June 29, 1973

Revision 1, submitted with letter dated November 26, 1973

Revision 2, submitted with letter dated July 20, 1976

OFFICE	Division 2, submitted with letter dated July 20, 1976				
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- E. In accordance with the requirement imposed by the October 8, 1976, order of the United States Court of Appeals for the District of Columbia Circuit in Natural Resources Defense Council v. Nuclear Regulatory Commission, No. 74-1385 and 74-1586, that the Nuclear Regulatory Commission "shall make any licenses granted between July 21, 1976 and such time when the mandate is issued subject to the outcome of the proceedings herein," the license amendment issued herein shall be subject to the outcome of such proceedings.
- F. Prior to exceeding twenty percent of rated core power, Public Service Electric and Gas Company shall reanalyze, to the satisfaction of the Commission, the emergency core cooling system performance as delineated in Item F.1. of Attachment 1 of this amended license.
- G. Prior to startup following the first regularly scheduled refueling outage, Public Service Electric and Gas Company shall install, to the satisfaction of the Commission, a long-term means of protection against reactor coolant system over-pressurization when water-solid.
- H. This amended license is effective as of the date of its issuance. Facility Operating License No. DPR-70, as amended, shall expire at midnight, September 25, 2008.

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by R. C. DeYoung

*for* Roger S. Boyd, Director  
 Division of Project Management  
 Office of Nuclear Reactor Regulation

Attachments:

- 1. Incomplete Preoperational Tests, Startup Tests, and Other Items Which Must be Completed
- 2. Page Changes to Technical Specifications, Appendix A

Date of Issuance: December 1, 1976

ELD  
*M Riddle*  
 11/3/76

SEE PREVIOUS CONCURRENCES.

OFFICE ➤	LWR 2 <i>J.V.</i>	DSE:AD/EP	DSE:DIR	LWR 2 <i>KK</i>	LWR:AD	DEP:DIR
SURNAME ➤	<i>J.F.</i> :mt	<i>N.Moore</i>	HRDenton	KKniel	DBVassallo	<i>R.S. Boyd</i>
DATE ➤	11/23/76	11/23/76	11/23/76	11/28/76	11/30/76	12/1/76

F. The licensees have satisfied the applicable provisions of 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements," of the Commission's regulations;

G. The issuance of this amended operating license will not be inimical to the common defense and security or to the health and safety of the public;

H. After weighing the environmental, economic, technical, and other benefits of the facility, against environmental and other costs and considering available alternatives, the issuance of Amendment No. 3 to Facility Operating License No. DPR-70 ~~subject to the conditions for protection of the environment set forth herein~~ is in accordance with 10 CFR Part 51 (and with former Appendix D to 10 CFR Part 50) of the Commission's regulations and all applicable requirements have been satisfied; and

I. The receipt, possession, and use of source, byproduct and special nuclear material as authorized by this amended license will be in accordance with the Commission's regulations in 10 CFR Parts 30, 40, and 70, including 10 CFR Section 30.33, 40.32, and 70.23 and 70.31.

2. Facility Operating License No. DPR-70, issued to the Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company, and Atlantic City Electric Company, is hereby amended in its entirety, to read as follows:

A. This amended license applies to the Salem Nuclear Generating Station, Unit No. 1, a pressurized water nuclear reactor and associated equipment (the facility), owned by the Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company, and Atlantic City Electric Company and operated by Public Service Electric and Gas Company. The facility is located on the applicants' site in Salem County, New Jersey, on the southern end of Artificial Island on the east bank of the Delaware River in Lower Alloways Creek Township, and is described in the "Final Safety Analysis Report" as supplemented and amended (Amendments 10 through 39) and the Environmental Report as supplemented and amended (Amendments 1 through 3).

B. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses

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E. This amended license is subject to the following additional conditions for the protection of the environment:

- (1) The licensees shall establish a baseline study to determine the seasonal plankton densities in the region of the cooling water intake and, subsequently, the zooplankton losses due to passage through the cooling system, the impact of such losses on the aquatic ecosystem, and the need for corrective action to mitigate losses if they are significant (see Sections 5.4.2 and 6.2 of the Final Environmental Statement).
- (2) The licensees shall initiate a program to frequently monitor the water intake forebay and identify fish losses by number and species attributable to the intake screens during facility operations in order to determine the need, if any, for corrective action to protect aquatic life (see Sections 5.4.1 and 6.2 of the Final Environmental Statement).
- (3) The licensees shall develop a plan to continue monitoring the fish, macroinvertebrates, and zooplankton after facility startup to quantify the effects on aquatic life attributable to the discharge of heated effluents and chemicals. Concurrently, field measurements shall be made to define the time-temperature-area characteristics of the thermal plume. The results of this program would determine the need for possible corrective action (see Sections 5.4.3, 5.4.4 and 6.2 of the Final Environmental Statement).
- (4) The licensees shall undertake a program to measure actual residual chlorine concentrations at several sampling stations in the discharge conduit during facility operation. These measured concentrations will be used to determine what changes, if any, will be required in the facility's chlorination procedures (see Section 5.4.4 of the Final Environmental Statement).
- (5) The licensees shall incorporate into the operational radiological monitoring program of milk sampling a weekly, rather than quarterly, schedule to detect any short-term increases of radioiodine. Also, high-efficiency iodine samplers shall be used for the detection of both organic and inorganic radioiodines in gases released from the facility (see Section 6.3 of the Final Environmental Statement).

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- (6) Comprehensive environmental monitoring programs specified above (for the facility operation), which are acceptable to the staff for determining environmental effects which may occur as a result of the operation of the facility, are defined in the Technical Specifications, Appendix B.
- (7) If other harmful effects or evidence of irreversible damage are detected, the licensees will provide an analysis of the problem and a proposed course of action to alleviate the problem.

*E.F.* In accordance with the requirement imposed by the October 8, 1976, order of the United States Court of Appeals for the District of Columbia Circuit in Natural Resources Defense Council v. Nuclear Regulatory Commission, No. 74-1385 and 74-1586, that the Nuclear Regulatory Commission "shall make any licenses granted between July 21, 1976 and such time when the mandate is issued subject to the outcome of the proceedings herein," the license amendment issued herein shall be subject to the outcome of such proceedings.

*F.G.* Prior to exceeding twenty percent of rated core power, Public Service Electric and Gas Company shall reanalyze, to the satisfaction of the Commission, the emergency core cooling system performance as delineated in Item F.1. of Attachment 1 of this amended license.

*G.H.* Prior to startup following the first regularly scheduled refueling outage, Public Service Electric and Gas Company shall install, to the satisfaction of the Commission, a long-term means of protection against reactor coolant system over-pressurization when water-solid.

*H.I.* This amended license is effective as of the date of its issuance. Facility Operating License No. DPR-70, as amended, shall expire at midnight, September 25, 2003.

FOR THE NUCLEAR REGULATORY COMMISSION

Roger S. Boyd, Director  
 Division of Project Management  
 Office of Nuclear Reactor Regulation

Attachments:

- 1. Incomplete Preoperational Tests, Startup Tests, and Other Items Which Must be Completed ELD DSE:AD/EP DSE:DIR
  - 2. Page Changes to Technical Specifications, Appendix A VAMoore HRDertion
- 11/ /76 11/ /76 11/ /76

Date of Issuance:	LWR 2	LWR 2 <i>L.V.</i>	<i>DOR</i>	<del>LWR 2</del>	LWR:AD	DPM:DIR
OFFICE →						
SURNAME →	<i>JLeBant</i>	IVillalva	<i>JMcGough</i>	KKniel	DBVassallo	RSBoyd
DATE →	11/22/76	11/24/76	11/24/76	11/ /76	11/ /76	11/ /76

ATTACHMENT 1 TO LICENSE DPR-70

Incomplete Preoperational Tests, Startup Tests, and  
Other Items Which Must be Completed

This attachment identifies certain preoperational tests, startup tests, and other items which must be completed to the Commission's satisfaction prior to proceeding to certain specified Operational Modes. Public Service Electric and Gas Company shall not proceed beyond the authorized Operational Modes without prior written authorization from the Commission.

- A. Public Service Electric and Gas Company may at the license issue date proceed directly to Operational Mode 6 (initial fuel loading), and may subsequently proceed to Operational Mode 5 (cold shutdown).
- B. Prior to proceeding to Operational Mode 4 (hot shutdown), Public Service Electric and Gas Company shall test the response times of primary sensors in the reactor coolant system per SUP 20.1. Subsequent to the verification by the Office of Inspection and Enforcement of the acceptable completion of this item, and upon written authorization by the Commission, Public Service Electric and Gas Company may proceed to Operational Mode 4 (hot shutdown).
- C. Prior to proceeding to Operational Mode 3 (hot standby), Public Service Electric and Gas Company shall complete the following items:
  - 1. Testing operation of RHR pump recirculation valves 11RH29 and 12RH29 per SUP 50.0.
  - 2. Testing motor winding temperatures of RHR pump motors Nos. 11 and 12 per SUP 12.
  - 3. Testing the following snubbers per SUP 50.4:
    - RHRH 11-29A
    - RHRH 11-29B
    - RHRH 12-34B
    - RHRH 12-34C
  - 4. Testing the boron recycle system per SUP 10.5.
  - 5. Demonstrate beta dosimetry capability.
  - 6. Testing process radiation monitors, excluding those required for fuel loading, per SUP 21.
  - 7. Testing service water system per SUP 28.

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8. Testing chilled water portion of the control room air conditioning system per SUP 19.7.
9. Prepare the following radiochemistry procedures:
  - (a) PD 3.3.010 - procedure to determine the average energy of gamma emitting isotopes;
  - (b) PD 3.3.011 - procedure for detecting fission gases by gamma spectroscopy in the presence of other gases;
  - (c) PD 3.3.003 - procedure to determine the dose equivalent Iodine 131 in the primary coolant.
10. Replace the existing standby charcoal filters in the auxiliary building ventilation system with charcoal filters capable of removing 90 percent of the organic iodines.

Subsequent to verification by the Office of Inspection and Enforcement of the acceptable completion of the above listed items, and upon written authorization from the Commission, the Public Service Electric and Gas Company may proceed to Operational Mode 3 (hot standby).

D. Prior to proceeding to Operational Mode 2 (initial criticality), Public Service Electric and Gas Company shall complete the following items:

1. Testing high temperature alarm TE463A on pressurizer relief line per SUP 50.6.
2. Testing control of steam generator blowdown flow by valves GB8 and GB10 per SUP 50.13.
3. Testing upper motor bearing of reactor coolant pump No. 14 per SUP 50.0.
4. Testing pump seal of reactor coolant pump No. 11 per SUP 50.0.
5. Testing RTD's Nos. 423B, 431A, 433B and 440B in the reactor coolant system per SUP 50.7.
6. Testing the following snubbers per SUP 50.4:

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- |             |           |            |             |
|-------------|-----------|------------|-------------|
| 1 - PRA-146 | 1-PRSN-7  | 1-PRSN-28  | 1-PRSN-400  |
| 1 - PRA-150 | 1-PRSN-9  | 1-PRSN-29  | 1-PRSN-401  |
| 1 - PRA-154 | 1-PRSN-10 | 1-PRSN-30  | 1-PRSN-402  |
| 1 - PRA-158 | 1-PRSN-11 | 1-PRSN-32A | 1-PRSN-405  |
| 1 - PRA-162 | 1-PRSN-12 | 1-PRSN-32B | 1-PRSN-405A |
|             | 1-PRSN-13 | 1-PRSN-33  | 1-PRSN-406  |
| 1-PRSN-1    | 1-PRSN-16 | 1-PRSN-34  | 1-PRSN-406A |
| 1-PRSN-2    | 1-PRSN-17 | 1-PRSN-36  |             |
| 1-PRSN-3    | 1-PRSN-19 | 1-PRSN-37  |             |
| 1-PRSN-3A   | 1-PRSN-20 | 1-PRSN-38A |             |
| 1-PRSN-4    | 1-PRSN-23 | 1-PRSN-38B |             |
| 1-PRSN-5    | 1-PRSN-25 | 1-PRSN-39  |             |
| 1-PRSN 5A   | 1-PRSN-27 | 1-PRSN-42  |             |

Subsequent to verification by the Office of Inspection and Enforcement of the acceptable completion of the above items, and upon written authorization from the Commission, Public Service Electric and Gas Company may proceed to Operational Mode 2 (initial criticality).

E. Prior to proceeding to Operation Mode 1 (power operation), the following items shall be completed:

1. Reactor Vessel Overpressure Alarm - A reactor vessel overpressure alarm shall be installed in the control room. This alarm shall be operable whenever the system is in cold shutdown or hot shutdown, shall be actuated whenever the system pressure exceeds the technical specification limits, and shall not compromise safety related equipment.
2. Maintenance Procedures - The maintenance procedures delineated in Inspection and Enforcement Report 50-272/76-38 shall be completed.

Subsequent to verification by the Office of Inspection and Enforcement of the acceptable completion of the above items, and upon written authorization by the Commission, Public Service Electric and Gas Company may proceed in its power ascension program to Operational Mode 1, with the power level limited to twenty percent of rated core power.

F. Prior to exceeding the twenty percent power limit, the following items shall be completed.

(Revised December 1, 1976)

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1. ECCS Analysis - A reanalysis of the ECCS system in conformance with Appendix K of 10 CFR Part 50 shall be provided as soon as possible. Said reanalysis shall verify that the ECCS performs in accordance with the Commission's ECCS performance criteria by calculating the peak cladding temperature, for the worst case break, with the upper head temperature modeled as the hot leg temperature. The worst case break shall be identified by performing a break spectrum calculation with a minimum of three break sizes.
2. Snubber Tests - The following snubbers shall be tested at a power level between fifteen and twenty percent of rated core power per SUP 50.4:

11-FWSN-12A	12-FWSN-15	14-FWSN-13A
11-FWSN-12B	13-FWSN-15A	14-FWSN-13B
11-FWSN-16	13-FWSN-15B	14-FWSN-15A
12-FWSN-13A	13-FWSN-17A	14-FWSN-15B
12-FWSN-13B	13-FWSN-17B	

The acceptable completion of the above tests will be verified by the Office of Inspection and Enforcement.

Upon written acceptance by the Commission of the ECCS analysis and the snubber tests, Public Service Electric and Gas Company may proceed in its power ascension program to a power level not exceeding forty percent of rated core power.

- G. Prior to exceeding the forty percent power limit, the snubber tests delineated in Item F above shall be repeated at a power level between thirty and forty percent of rated core power. Upon written acceptance by the Commission of the above items, Public Service Electric and Gas Company may proceed in its power ascension program to a power level not exceeding ninety percent of rated core power.
- H. Prior to exceeding the ninety percent power limit, the snubber tests delineated in Item F above shall be repeated at a power level between eighty and ninety percent of rated. Upon written acceptance by the Commission of these tests, Public Service Electric and Gas Company may proceed in its power ascension program to full-power.

Upon attaining full-power, or as soon as possible thereafter, Public Service Electric and Gas Company shall perform a final verification test of these snubbers. The Office of Inspection and Enforcement will review the results of these verification tests, and absent any notification to the contrary, Public Service Electric and Gas Company may sustain full-power operation.

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ATTACHMENT TO LICENSE AMENDMENT NO. 3

FACILITY OPERATING LICENSE NO. DPR-70

DOCKET NO. 50-272

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

Pages

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PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- a. At least once per 31 days by initiating flow through the HEPA filter and charcoal adsorber train and verifying that the train operates for at least one hour and maintains the control room air temperature  $\leq 120^{\circ}\text{F}$  with each fan operating for at least 15 minutes.
- b. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system, by:
  1. Verifying that the charcoal adsorbers remove  $\geq 99\%$  of a halogenated hydrocarbon refrigerant test gas when they are tested in-place while operating the ventilation system at a flow rate of  $7410 \text{ cfm} \pm 10\%$ .
  2. Verifying that the HEPA filter banks remove  $\geq 99\%$  of the DOP when they are tested in-place while operating the ventilation system at a flow rate of  $7410 \text{ cfm} \pm 10\%$ .
  3. Verifying within 31 days after removal that a laboratory analysis of a carbon sample from either at least one test canister or at least two carbon samples removed from one of the charcoal adsorbers demonstrates a removal efficiency of  $\geq 90\%$  for radioactive methyl iodide when the sample is tested at  $130^{\circ}\text{C}$ , 95% R.H. The carbon samples not obtained from test canisters shall be prepared by either:
    - a) Emptying one entire bed from a removed adsorber tray, mixing the adsorbent thoroughly, and obtaining samples at least two inches in diameter and with a length equal to the thickness of the bed, or
    - b) Emptying a longitudinal sample from an adsorber tray, mixing the adsorbent thoroughly, and obtaining samples at least two inches in diameter and with a length equal to the thickness of the bed.
  4. Verifying a system flow rate of  $7410 \text{ cfm} \pm 10\%$  during system operation.

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

c. After every 720 hours of charcoal adsorber operation by either:

1. Verifying within 31 days after removal that a laboratory analysis of a carbon sample obtained from a test canister demonstrates a removal efficiency of  $\geq 90\%$  for radioactive methyl iodide when the sample is tested at  $130^{\circ}\text{C}$ , 95% R.H.; or
2. Verifying within 31 days after removal that a laboratory analysis of at least two carbon samples demonstrate a removal efficiency of  $\geq 90\%$  for radioactive methyl iodide when the samples are tested at  $130^{\circ}\text{C}$ , 95% R.H. and the samples are prepared by either:
  - a) Emptying one entire bed from a removed adsorber tray, mixing the adsorbent thoroughly, and obtaining samples at least two inches in diameter and with a length equal to the thickness of the bed, or
  - b) Emptying a longitudinal sample from an adsorber tray, mixing the adsorbent thoroughly, and obtaining samples at least two inches in diameter and with a length equal to the thickness of the bed.

Subsequent to reinstalling the adsorber tray used for obtaining the carbon sample, the system shall be demonstrated OPERABLE by also:

- a) Verifying that the charcoal adsorbers remove  $\geq 99\%$  of a halogenated hydrocarbon refrigerant test gas when they are tested in-place while operating the ventilation system at a flow rate of  $7410 \text{ cfm} \pm 10\%$ , and
- b) Verifying that the HEPA filter banks remove  $> 99\%$  of the DOP when they are tested in-place while operating the ventilation system at a flow rate of  $7410 \text{ cfm} \pm 10\%$ .

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

---

- d. At least once per 18 months by:
  - 1. Verifying that the pressure drop across the combined HEPA filter and charcoal adsorber bank is  $< 4$  inches Water Gauge while operating the ventilation system at a flow rate of  $7410 \text{ cfm} \pm 10\%$ .
  - 2. Verifying that on a safety injection test signal or control room area high radiation test signal, the system automatically actuates in the recirculation mode by closing off the outside air supply and diverting air flow through the HEPA filter and charcoal adsorber bank.
- e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove  $\geq 99\%$  of the DOP when they are tested in-place while operating the filter system at a flow rate of  $7410 \text{ cfm} \pm 10\%$ .
- f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove  $\geq 99\%$  of a halogenated hydrocarbon refrigerant test gas when they are tested in-place while operating the filter system at a flow rate of  $7410 \text{ cfm} \pm 10\%$ .

## PLANT SYSTEMS

### 3/4.7.7 AUXILIARY BUILDING EXHAUST AIR FILTRATION SYSTEM

#### LIMITING CONDITION FOR OPERATION

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3.7.7.1 At least one Auxiliary Building exhaust air HEPA filter train, associated with the one charcoal adsorber bank, and at least two exhaust fans shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

#### ACTION:

- a. With the above required HEPA filter train inoperable, restore the HEPA filter train to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With the charcoal adsorber bank inoperable, restore the charcoal adsorber bank to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- c. With only one exhaust fan OPERABLE, restore at least two exhaust fans to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

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4.7.7.1 The above required Auxiliary Building exhaust air filtration system shall be demonstrated OPERABLE:

- a. At least once per 31 days by initiating, from the control room, flow through the HEPA filter and charcoal adsorber train and verifying that the filter train and each fan operate for at least 15 minutes.
- b. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system, by:

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

1. Verifying that with the system operating at a flow rate of 21,400 cfm  $\pm$  10 % and exhausting through the HEPA filters and charcoal adsorbers, the total bypass flow of the ventilation system to the facility vent, including leakage through the ventilation system diverting valves, is  $<$  1% when the system is tested by admitting cold DOP at the system intake.
  2. Verifying that the charcoal adsorbers remove  $>$  99% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place while operating the ventilation system at a flow rate of 21,400 cfm  $\pm$  10%.
  3. Verifying that the HEPA filter banks remove  $>$  99% of the DOP when they are tested in-place while operating the ventilation system at a flow rate of 21,400 cfm  $\pm$  10%.
  4. Verifying within 31 days after removal that a laboratory analysis of a carbon sample from either at least one test canister or at least two carbon samples removed from one of the charcoal adsorbers demonstrates a removal efficiency of  $\geq$  90% for radioactive methyl iodide when the sample is tested at 130°C, 95% R.H. The carbon samples not obtained from test canisters shall be prepared by either:
    - a) Emptying one entire bed from a removed adsorber tray, mixing the adsorbent thoroughly, and obtaining samples at least two inches in diameter and with a length equal to the thickness of the bed, or
    - b) Emptying a longitudinal sample from an adsorber tray, mixing the adsorbent thoroughly, and obtaining samples at least two inches in diameter and with a length equal to the thickness of the bed.
  5. Verifying a system flow rate of 21,400 cfm  $\pm$  10% during system operation.
- c. After every 720 hours of charcoal adsorber operation by either:

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

1. Verifying within 31 days after removal that a laboratory analysis of a carbon sample obtained from a test canister demonstrates a removal efficiency of  $\geq 90\%$  for radioactive methyl iodide when the sample is tested at  $130^{\circ}\text{C}$ , 95% R.H.; or
2. Verifying within 31 days after removal that a laboratory analysis of at least two carbon samples demonstrate a removal efficiency of  $\geq 90\%$  for radioactive methyl iodide when the samples are tested at  $130^{\circ}\text{C}$ , 95% R.H. and the samples are prepared by either:
  - a) Emptying one entire bed from a removed adsorber tray, mixing the adsorbent thoroughly, and obtaining samples at least two inches in diameter and with a length equal to the thickness of the bed, or
  - b) Emptying a longitudinal sample from an adsorber tray, mixing the adsorbent thoroughly, and obtaining samples at least two inches in diameter and with a length equal to the thickness of the bed.

Subsequent to reinstalling the adsorber tray used for obtaining the carbon sample, the system shall be demonstrated OPERABLE by also:

- a) Verifying that the charcoal adsorbers remove  $\geq 99\%$  of a halogenated hydrocarbon refrigerant test gas when they are tested in-place while operating the ventilation system at a flow rate of 21,400 cfm  $\pm 10\%$ , and
  - b) Verifying that the HEPA filter banks remove  $> 99\%$  of the DOP when they are tested in-place while operating the ventilation system at a flow rate of 21,400 cfm  $\pm 10\%$ .
- d. At least once per 18 months by:
1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is  $< 4$  inches Water Gauge while operating the ventilation system at a flow rate of 21,400 cfm  $\pm 10\%$ .

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

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2. Verifying that the air flow distribution is uniform within 20% across HEPA filters and charcoal adsorbers.
- e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove  $\geq 99\%$  of the DOP when they are tested in-place while operating the ventilation system at a flow rate of 21,400 cfm  $\pm 10\%$ .
- f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove  $\geq 99\%$  of a halogenated hydrocarbon refrigerant test gas when they are tested in-place while operating the ventilation system at a flow rate of 21,400 cfm  $\pm 10\%$ .

## PLANT SYSTEMS

### 3/4.7.8 SEALED SOURCE CONTAMINATION

#### LIMITING CONDITION FOR OPERATION

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3.7.8.1 Each sealed source containing radioactive material either in excess of 100 microcuries of beta and/or gamma emitting material or 5 microcuries of alpha emitting material shall be free of  $\geq 0.005$  microcuries of removable contamination.

APPLICABILITY: At all times.

#### ACTION:

- a. Each sealed source with removable contamination in excess of the above limits shall be immediately withdrawn from use and:
  1. Either decontaminated and repaired, or
  2. Disposed of in accordance with Commission Regulations.
- b. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

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4.7.8.1.1 Test Requirements - Each sealed source shall be tested for leakage and/or contamination by:

- a. The licensee, or
- b. Other persons specifically authorized by the Commission or an Agreement State.

The test method shall have a detection sensitivity of at least 0.005 microcuries per test sample.

4.7.8.1.2 Test Frequencies - Each category of sealed sources shall be tested at the frequency described below.

- a. Sources in use (excluding startup sources and fission detectors previously subjected to core flux) - At least once per six months for all sealed sources containing radioactive materials.

## REFUELING OPERATIONS

### SURVEILLANCE REQUIREMENTS (Continued)

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2. Verifying that the charcoal adsorbers remove  $\geq 99\%$  of a halogenated hydrocarbon refrigerant test gas when they are tested in-place while operating the ventilation system at a flow rate of 19,490 cfm  $\pm 10\%$ .
  3. Verifying that the HEPA filter banks remove  $\geq 99\%$  of the DOP when they are tested in-place while operating the ventilation system at a flow rate of 19,490 cfm  $\pm 10\%$ .
  4. Verifying within 31 days after removal that a laboratory analysis of a carbon sample from either at least one test canister or at least two carbon samples from one of the charcoal adsorbers demonstrates a removal efficiency of  $\geq 90\%$  for radioactive methyl iodide when the sample is tested at 130°C, 95% R. H. The carbon samples not obtained from test canisters shall be prepared by either:
    - (a) Emptying one entire bed from a removed adsorber tray, mixing the adsorbent thoroughly, and obtaining samples at least two inches in diameter and with a length equal to the thickness of the bed, or
    - (b) Emptying a longitudinal sample from an adsorber tray, mixing the adsorbent thoroughly, and obtaining samples at least two inches in diameter and with a length equal to thickness of the bed.
  5. Verifying a system flow rate of 19,490 cfm,  $\pm 10\%$  during system operation.
- c. After every 720 hours of charcoal adsorber operation by either:
1. Verifying within 31 days after removal that a laboratory analysis of a carbon sample obtained from a test canister demonstrates a removal efficiency of  $\geq 90\%$  for radioactive methyl iodide when the sample is tested at 130°C, 95% R.H.; or
  2. Verifying within 31 days after removal that a laboratory analysis of at least two carbon samples demonstrate a removal efficiency of  $\geq 90\%$  for radioactive methyl iodide when the samples are tested at 130°C, 95% R.H. and the samples are prepared by either:

REFUELING OPERATIONS

SURVEILLANCE REQUIREMENTS (Continued)

- a) Emptying one entire bed from a removed adsorber tray, mixing the adsorbent thoroughly, and obtaining samples at least two inches in diameter and with a length equal to the thickness of the bed, or
- b) Emptying a longitudinal sample from an adsorber tray, mixing the adsorbent thoroughly, and obtaining samples at least two inches in diameter and with a length equal to the thickness of the bed.

Subsequent to reinstalling the adsorber tray used for obtaining the carbon sample, the system shall be demonstrated OPERABLE by also:

- a) Verifying that the charcoal adsorbers remove  $\geq 99\%$  of a halogenated hydrocarbon refrigerant test gas when they are tested in-place while operating the ventilation system at a flow rate of  $19,490 \text{ cfm} \pm 10\%$ , and
  - b) Verifying that the HEPA filter banks remove  $> 99\%$  of the DOP when they are tested in-place while operating the ventilation system at a flow rate of  $19,490 \text{ cfm} \pm 10\%$ .
- d. At least once per 18 months by:
- 1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is  $\leq 4$  inches Water Gauge while operating the ventilation system at a flow rate of  $19,490 \text{ cfm} \pm 10\%$ .
  - 2. Verifying that the air flow distribution is uniform within 20% across HEPA filters and charcoal adsorbers.
  - 3. Verifying that on a high radiation test signal, the system automatically directs its exhaust flow through the HEPA filters and charcoal adsorber banks.
  - 4. Verifying that the ventilation system maintains the spent fuel storage pool area at a negative pressure of  $\geq 1/8$  inches Water Gauge relative to the outside atmosphere during system operation.

REFUELING OPERATIONS

SURVEILLANCE REQUIREMENTS (Continued)

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- e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove  $\geq 99\%$  of the DOP when they are tested in-place while operating the filter train at a flow rate of 19,490 cfm  $\pm 10\%$ .
  
- f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove  $\geq 99\%$  of a halogenated hydrocarbon refrigerant test gas when they are tested in-place while operating the filter train at a flow rate of 19,490 cfm  $\pm 10\%$ .

## PLANT SYSTEMS

### BASES

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#### 3/4.7.5 FLOOD PROTECTION

The limitation on flood protection ensures that facility protective actions will be taken and operation will be terminated in the event of flood conditions. The limit of elevation 10.5' Mean Sea Level is based on the elevation above which facility flood control measures are required to provide protection to safety related equipment.

#### 3/4.7.6 CONTROL ROOM EMERGENCY AIR CONDITIONING SYSTEM

The OPERABILITY of the control room emergency air conditioning system ensures that 1) the ambient air temperature does not exceed the allowable temperature for continuous duty rating for the equipment and instrumentation cooled by this system and 2) the control room will remain habitable for operations personnel during and following all credible accident conditions. The OPERABILITY of this system in conjunction with control room design provisions is based on limiting the radiation exposure to personnel occupying the control room to 5 rem or less whole body, or its equivalent. This limitation is consistent with the requirements of General Design Criterion 19 of Appendix "A", 10 CFR 50. ANSI N510-1975 should be used as a procedural guideline for surveillance testing.

#### 3/4.7.7 AUXILIARY BUILDING EXHAUST AIR FILTRATION SYSTEM

The OPERABILITY of the auxiliary building exhaust air filtration system ensures that radioactive materials leaking from the ECCS equipment following a LOCA are filtered prior to reaching the environment. The operation of this system and the resultant effect on offsite dosage calculations was assumed in the accident analyses. ANSI N510-1975 should be used as a procedural guideline for surveillance testing.

#### 3/4.7.8 SEALED SOURCE CONTAMINATION

The limitations on removable contamination for sources requiring leak testing, including alpha emitters, is based on 10 CFR 70.39(c) limits for plutonium. This limitation will ensure that leakage from byproduct, source, and special nuclear material sources will not exceed allowable intake values.

## PLANT SYSTEMS

### BASES

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#### 3/4.7.9 HYDRAULIC SNUBBERS

The hydraulic snubbers are required OPERABLE to ensure that the structural integrity of the reactor coolant system and all other safety related systems is maintained during and following a seismic or other event initiating dynamic loads. The only snubbers excluded from this inspection program are those installed on nonsafety related systems and then only if their failure or failure of the system on which they are installed, would have no adverse effect on any safety related system.

The inspection frequency applicable to snubbers containing seals fabricated from materials which have been demonstrated compatible with their operating environment (only ethylene propylene compounds to date) is based upon maintaining a constant level of snubber protection. Therefore, the required inspection interval varies inversely with the observed snubber failures. The number of inoperable snubbers found during an inspection of these snubbers determines the time interval for the next required inspection of these snubbers. Inspections performed before that interval has elapsed may be used as a new reference point to determine the next inspection. However, the results of such early inspections performed before the original required time interval has elapsed (nominal time less 25%) may not be used to lengthen the required inspection interval. Any inspection whose results require a shorter inspection interval will override the previous schedule.

To provide further assurance of snubber reliability, a representative sample of the installed snubbers will be functionally tested during plant shutdowns at 18 month intervals. These tests will include stroking of the snubbers to verify proper piston movement, lock-up and bleed. Observed failures of these sample snubbers will require functional testing of additional units. To minimize personnel exposures, snubbers installed in high radiation zones or in especially difficult to remove locations (as identified in Table 3.7-4) may be exempted from these functional testing requirements provided the OPERABILITY of these snubbers was demonstrated during functional testing at either the completion of their fabrication or at a subsequent date.

## REFUELING OPERATIONS

### BASES

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#### 3/4.9.10 and 3/4.9.11 WATER LEVEL - REACTOR VESSEL AND STORAGE POOL

The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed 10% iodine gas activity released from the rupture of an irradiated fuel assembly. The minimum water depth is consistent with the assumptions of the accident analysis.

#### 3/4.9.12 FUEL HANDLING AREA VENTILATION SYSTEM

The limitations on the fuel handling area ventilation system ensure that all radioactive material released from an irradiated fuel assembly will be filtered through the HEPA filters and charcoal adsorber prior to discharge to the atmosphere. The OPERABILITY of this system and the resulting iodine removal capacity are consistent with the assumptions of the accident analyses. ANSI N510-1975 should be used as a procedural guideline for surveillance testing.

## ADMINISTRATIVE CONTROLS

- f. Unless otherwise authorized by the Commission, the licensee shall not assign protection factors in excess of those specified in Table 6.12-1 in selecting and using respiratory protective equipment.

### REVOCATION

6.12.3 The specifications of Section 6.12 shall be revoked in their entirety upon adoption of the proposed change to 10 CFR 20, Section 20.103, which would make such provisions unnecessary.

### 6.13 HIGH RADIATION AREA

6.13.1 In lieu of the "control device" or "alarm signal" required by paragraph 20.203(c)(2) of 10 CFR 20:

- a. A High Radiation Area in which the intensity of radiation is greater than 100 mrem/hr but less than 1000 mrem/hr shall be barricaded and conspicuously posted as a High Radiation Area and entrance thereto shall be controlled by issuance of a Radiation Exposure Permit and any individual or group of individuals permitted to enter such areas shall be provided with a radiation monitoring device which continuously indicates the radiation dose rate in the area.
- b. A High Radiation Area in which the intensity of radiation is greater than 1000 mrem/hr shall be subject to the provisions of 6.13.1.a above, and in addition locked doors shall be provided to prevent unauthorized entry into such areas and the keys shall be maintained under the administrative control of the Shift Foreman on duty.

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-272

PUBLIC SERVICE ELECTRIC AND GAS COMPANY, ET AL.

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

Notice is hereby given that the U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 3 to Facility Operating License No. DPR-70, issued to Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company, and Atlantic City Electric Company for the Salem Nuclear Generating Station, Unit No. 1, located in Salem County, New Jersey. Amendment No. 3 authorizes Public Service Electric and Gas Company to operate the facility at full power. However, the amended license is conditioned to provide a sequential approach to full power which takes into account a series of incomplete construction items, preoperational tests, startup tests and other items, and provides for further Commission approval at various stages of these activities.

In accordance with the Commission's General Statement of Policy (41 F.R. 34707, August 16, 1976), Public Service Electric and Gas Company, et al. was issued Facility Operating License No. DPR-70 on August 13, 1976 authorizing operation of Salem Nuclear Generating Station, Unit No. 1, at a reactor core power level not to exceed 33.38 megawatts thermal (1%) for testing purposes, limited to a cumulative fuel exposure of 300 megawatt days. Subsequently, the Commission issued Supplemental General Statement of Policy (41 F.R. 49898, November 11, 1976) which concluded that full-power licensing of light water reactors may be resumed on a conditional basis

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using existing fuel cycle impact values (Table S-3) for reprocessing and waste management, provided the revised values presented in the Commission's notice of proposed rulemaking of October 18, 1976 (41 F.R. 45849) were also examined to determine the effect on the cost-benefit balance for operating the plant. This examination has been performed by the Commission staff and is set forth in the "Environmental Assessment, Salem Nuclear Generating Station, Unit No. 1, Fuel Cycle Considerations." The assessment concludes that use of such revised values would not tilt the cost-benefit balance against issuance of the operating license.

The amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. The Commission has also made appropriate findings which are set forth in the license amendment regarding the environmental impacts associated with operation of the facility. Amendment No. 3 also includes the condition that the license is subject to the outcome of the proceedings in Natural Resources Defense Council v. NRC (D. C. Circuit, July 21, 1976), Nos. 74-1385 and 74-1586.

In addition, Amendment No. 3 includes (1) the requirement for a long-term means of providing overpressure protection, (2) the temporary limitation of power operation to twenty percent of rated core power until the Emergency core Cooling System performance is reevaluated by modeling the upper head temperature as the hot leg temperature, and (3) changes

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to the Appendix A Technical Specifications concerning (a) the high efficiency particulate air filters in the auxiliary building exhaust air filtration system and (b) the surveillance requirements for the control room, auxiliary building, and fuel handling air filtration systems. These three items are discussed in the Safety Evaluation dated December 1, 1976. Facility Operating License No. DPR-70 initially contained several conditions relating to environmental matters. Since these conditions are included in the Appendix B Technical Specifications, they have been deleted from the license proper.

Amendment No. 3 is effective as of the date of issuance. Facility Operating License No. DPR-70, as amended, shall expire at midnight, September 25, 2008. This action is in furtherance of the licensing action encompassed in the "Notice of Consideration of Issuance of Facility Operating Licenses and Notice of Opportunity for Hearing," dated October 6, 1972.

For further details with respect to this action, see (1) the application for amendment dated November 8, 1976; (2) Amendment No. 3 to License No. DPR-70; (3) the Commission's related Safety Evaluation, dated December 1, 1976; (4) the "Environmental Assessment, Salem Nuclear Generating Station Unit No. 1, Fuel Cycle Considerations;" (5) the report on the Advisory Committee on Reactor Safeguards, dated February 14, 1975; (6) the Office of Nuclear Reactor Regulation's Safety Evaluation Report and Supplements Nos. 1 and 2 thereto, dated October 11, 1974, June 28, 1976 and August 13, 1976 respectively; (7) the Final Safety Analysis Report and amendments thereto; (8) the applicants' Environmental Report dated June 30, 1970 and

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supplements thereto; (9) the Draft Environmental Statement dated October 1972; and (10) the Final Environmental Statement dated April 1973. These items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Salem Free Public Library, 112 West Broadway, Salem, New Jersey.

Single copies of items (2), (3), (4), (5), (6) and (10) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Project Management.

Dated at Bethesda, Maryland, this 1st day of December, 1976.

FOR THE NUCLEAR REGULATORY COMMISSION



I. Villalva, Acting Chief  
Light Water Reactors  
Branch No. 2  
Division of Project Management

SEE PREVIOUS CONCURRENCES.

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supplements thereto; (9) the Draft Environmental Statement dated October 1972; and (10) the Final Environmental Statement dated April 1973. These items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Salem Free Public Library, 112 West Broadway, Salem, New Jersey.

Single copies of items (2), (3), (4), (5), (6) and (10) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Project Management.

Dated at Bethesda, Maryland, this            day of November, 1976.

FOR THE NUCLEAR REGULATORY COMMISSION

Karl Kniep, Chief  
Light Water Reactors  
Branch No. 2  
Division of Project Management

VILLALVA, AC

SEE PREVIOUS CONCURRENCES

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DATE	11/23/76	11/ /76	11/23/76
SURNAME	L. G. M. C.		K. Knitel
OFFICE	LWR 2	EPD	LWR 2

SEE PREVIOUS CONCURRENCE

Karl Knitel, Chief  
 Light Water Reactors  
 Branch No. 2  
 Division of Project Management  
 FOR THE NUCLEAR REGULATORY COMMISSION

Dated at Bethesda, Maryland, this day of November, 1976.

using existing fuel cycle impact values (Table S-3) for reprocessing and waste management, provided the revised values presented in the Commission's notice of proposed rulemaking of October 18, 1976 (41 F.R. 45849) were also examined to determine the effect on the cost-benefit balance for operating the plant. This examination has been performed by the Commission staff and is set forth in the "Environmental Assessment, Salem Nuclear Generating Station, Unit No. 1, Fuel Cycle Considerations." The assessment concludes that use of such revised values would not tilt the cost-benefit balance against issuance of the operating license.

The amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. The Commission has also made appropriate findings which are set forth in the license amendment regarding the environmental impacts associated with operation of the facility. Amendment No. 3 also includes the condition that the license is subject to the outcome of the proceedings in Natural Resources Defense Council v. NRC (D. C. Circuit, July 21, 1976), Nos. 74-1385 and 74-1586. *P* In addition, Amendment No. 3 includes (1) the requirement for a long-term means of providing overpressure protection, (2) the temporary limitation of power operation to twenty percent of rated core power until the Emergency core Cooling System performance is reevaluated by modeling the upper head temperature as the hot leg temperature, and (3) changes

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to the Appendix A Technical Specifications concerning (a) the high efficiency particulate air filters in the auxiliary building exhaust air filtration system and (b) the surveillance requirements for the control room, auxiliary building, and fuel handling air filtration systems.

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Amendment No. 3 is effective as of the date of issuance. Facility Operating License No. DPR-70, as amended, shall expire at midnight, September 25, 2008. This action is in furtherance of the licensing action encompassed in the "Notice of Consideration of Issuance of Facility Operating Licenses and Notice of Opportunity for Hearing," dated October 6, 1972.

For further details with respect to this action, see (1) the application for amendment dated November 3, 1976, (2) Amendment No. 3 to License No. DPR-70, (3) the Commission's related Safety Evaluation, dated November 1976, and (4) the "Environmental Assessment, Salem Nuclear Generating Station Unit No. 1, Fuel Cycle Considerations." These items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Salem Free Public Library, 112 West Broadway, Salem, New Jersey.

Single copies of items (2), (3) and (4) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Project Management.

Dated at Bethesda, Maryland, this            day of November, 1976.

FOR THE NUCLEAR REGULATORY COMMISSION

Karl Kniel, Chief

OFFICE	LWR 2	LWR 2	Light water reactors	OELD	LWR 2
SURNAME	J. DeMont	IV. Llalva	Branch No. 2		KKniel
DATE	11/19/76	11/22/76	Division of Project Management	11/ /76	11/ /76

SAFETY EVALUATION BY THE  
OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 3 TO  
FACILITY OPERATING LICENSE DPR-70

PUBLIC SERVICE ELECTRIC AND GAS COMPANY,  
PHILADELPHIA ELECTRIC COMPANY,  
DELMARVA POWER AND LIGHT COMPANY, AND  
ATLANTIC CITY ELECTRIC COMPANY

SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

DOCKET NO. 50-272

INTRODUCTION

This safety evaluation addresses three items amending Facility Operating License No. DPR-70: (1) reactor vessel overpressurization, (2) ECCS criteria, and (3) Appendix A technical specification changes.

Reactor Vessel Overpressurization

By letter dated August 27, 1976, we informed Public Service Electric and Gas Company of our concern regarding reactor vessel overpressurization, and requested information regarding steps being taken to minimize the likelihood of such events. By letters dated September 15, 1976 and October 25, 1976 Public Service Electric and Gas Company informed the Commission of its proposed program to preclude overpressurizing the reactor vessel.

ECCS Criteria

At a meeting on August 9, 1976, Westinghouse reported that the fluid temperature in the upper head region may be higher than assumed in the loss-of-coolant accident analysis for Salem Unit No. 1. Since the design bypass flow pattern is from the downcomer, through the upper head, and into the upper plenum via the control rod guide tubes, the upper head temperature was assumed to be at the cold leg temperature. Recent data, however, have indicated an upward flow into the upper head from the central guide tubes, and a return flow through the peripheral guide tubes. Consequently, the upper head temperature is hotter than the cold leg temperature. A thermocouple reading at Connecticut Yankee (Docket No. 50-213) has confirmed that the upper head is hotter than originally assumed. We will require that this matter be resolved prior to authorizing full power operation.

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Appendix A Technical Specification Changes

By letter dated November 8, 1976, Public Service Electric and Gas Company has proposed certain changes to the Appendix A Technical Specifications for Salem, Unit No. 1. These changes would (1) modify the testing requirements for the auxiliary building exhaust air filtration system, the control room emergency air conditioning system, and the fuel handling area ventilation system; (2) reduce from two to one the number of required high efficiency particulate air filter trains in the auxiliary building exhaust air filtration system.

DISCUSSION

Reactor Vessel Overpressurization

Our letter of August 27, 1976 requested that Public Service Electric and Gas company conduct an analysis of their system design to determine the susceptibility of Salem Unit No. 1 to reactor vessel overpressurization events. The letter provided information and conclusions reached by the staff regarding reactor vessel overpressurization, and identified criteria to be applied in determining the adequacy of protection against pressure transients. Should the results of their analysis show that design modifications are necessary to meet the acceptance criteria, they were advised to include the modifications in their analysis. Pending implementation of the design modifications identified, they were advised that short-term measures should be incorporated to reduce the likelihood of overpressurization events prior to implementing the long-term design modifications. The letter also requested that they notify the staff within 20 days of receipt of the letter as to whether they would provide the information requested within 60 days.

By letter dated September 15, 1976, (the 20 day letter), Public Service Electric and Gas Company indicated that they had joined a Task Group of utilities with Westinghouse designed plants to examine the complexity of the pressure transient events and to identify similarities between Westinghouse plants for determining a consistent solution to the issue. This letter also informed us that they would report the results of the Task Group meetings as applicable to Salem Unit No. 1 at the end of the 60 day period.

By letter dated October 25, 1976, (the 60 day letter), Public Service Electric and Gas Company informed us of the results of meetings held by the Task Group. This letter highlighted the course of action which will be pursued to analyze the pressure transients and stated that the proposed long-term corrective actions would be based on the results of transient analyses. These analyses will include consideration of mass input

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induced overpressurization and heat input induced overpressurization. The letter indicates that these transient analyses will be completed within approximately six months, after which time modification to the Salem plant will be initiated. This letter also addresses interim measures which have been taken to preclude overpressurization events. These measures include the modification of operating instructions I-3.6, Hot Standby to Cold Shutdown and II-1.3.4, Filling and Venting. These modifications are intended to reduce the time that the system is operated in a water solid condition. This letter also states that compliance with Appendix G to 10 CFR Part 50 will be verified by temperature and pressure recorders in the control room. The hot and cold leg temperatures on each of the four loops will be monitored in the control room by four temperature recorders while starting up, shutting down or during periods of cold shutdown. The hot leg pressure will be monitored in the control room by a pressure recorder and two pressure indicators during all modes of operation.

ECCS Criteria

On August 9, 1976, Westinghouse informed the staff that (1) the fluid temperature in the upper head region of the reactor vessel may be higher than assumed in the loss-of-coolant accident analysis for Salem Unit No. 1, and (2) results of analysis using the upper head temperature modeled as the hot leg temperature, rather than as the cold leg temperature, increased the peak cladding temperature by 80 degrees Fahrenheit in a 4-loop, 17 x 17 plant operating at full power. Since the fluid temperature in the upper head region of the reactor vessel may be higher than assumed for Salem Unit No. 1, we will require new calculations pursuant to Appendix K of 10 CFR Part 50 to verify that the criteria of Section 50.46 of 10 CFR Part 50 are not exceeded prior to authorizing full-power operation.

Appendix A Technical Specification Changes

By letter dated November 3, 1976, the licensee has proposed two basic changes to the Appendix A Technical Specification. One change would reduce the number of high efficiency particulate air filter banks required in the auxiliary building air exhaust system from two to one. The other change would delete the phrase "in accordance with ANSI N510-1975" from the surveillance requirements for the control room, auxiliary building, and fuel handling ventilation systems.

The design of the auxiliary building exhaust air filtration system ensures that radioactive materials that might possibly leak from the emergency core cooling equipment subsequent to a highly unlikely but postulated loss-of-coolant accident are effectively filtered prior to

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being exhausted to the atmosphere. The present design includes two banks of high efficiency particulate air filters for particulate removal, but only one bank of charcoal filter trays for radioiodine removal. The licensee therefore proposes that we consider only one bank of high efficiency particulate air filters in the Appendix A Technical Specification, as is the case for single bank filter systems.

The air filtration systems for the control room, auxiliary building, and fuel handling area were designed, reviewed and approved by the Commission, purchased and installed prior to the issuance of ANSI N510-1975; therefore, the licensee has proposed to delete the phrase "in accordance with ANSI N510-1975" as surveillance requirements for these systems. The licensee will, however, include ANSI N510-1975 as a procedural guideline document in the bases sections of the Appendix A Technical Specification for these systems.

EVALUATION

Reactor Vessel Overpressurization

A comprehensive evaluation of the generic matter of reactor vessel overpressurization is contained in a report prepared by an NRR Task Group entitled, "Technical Report on Reactor Vessel Pressure Transients" dated November 1, 1976. This report evaluated overpressurization events which exceeded the pressure-temperature limits of the Appendix A Technical Specifications. Each event was initiated by either an operator error or equipment malfunction. Two of the conclusions in this report are that (1) no event resulted in any release of radioactivity, and (2) all the pressure transients were such that fracture mechanics and fatigue calculations indicate that the reactor vessels were not damaged and that continued operation of these vessels was acceptable. This report also concludes that because of the very large safety margins to failure for unirradiated reactor vessels, new plants can be permitted to be licensed under existing safety criteria, but that administrative procedures and overpressure protection devices should be upgraded in an appropriate time frame to reduce the likelihood of future pressure transient events for new plants.

By letter dated October 25, 1976, Public Service Electric and Gas Company has described certain interim measures which have been taken to reduce the likelihood of reactor vessel overpressurization. We have reviewed these measures, which include modifying operating instructions to reduce the time that the system is in a water solid condition, and informing operators of the potential of overpressurization transients when the plant is in a water solid condition. This letter also describes the pressure and

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temperature recorders which are in the control room to verify that the limits of Appendix G to 10 CFR Part 50 are not exceeded. Based on our review of these interim measures, which are basically administrative, we have determined that although they are responsive to some of the interim measures delineated in our letter of August 27, 1976, they are lacking with regard to certain considerations, such as alarms and the disabling of injection pumps. For example, the method used for measuring and recording system pressures and temperatures does not provide sufficient assurance that overpressurization events will be detected on a timely basis. To ensure the timely detection of overpressurization events, we will require that the interim measures be augmented to include the installation of an acceptable over-pressure alarm in the control room. We will require this alarm to (1) be operable whenever the system is in cold shutdown (Mode 5) or hot shutdown (Mode 4); (2) be actuated whenever the system pressure exceeds the technical specification limits; (3) not compromise any safety related instrumentation; and (4) be installed prior to authorizing Mode 1 operation. Other measures are currently under staff consideration. The staff will call upon Public Service Electric and Gas Company to comply with any additional measures the staff deems appropriate as a result of the generic review of this matter.

The October 25 letter also reported on the progress to date regarding the long-term modifications and described the analyses required to determine the most appropriate course of action. Analyses yet to be performed include transient analysis of mass input induced overpressurization and heat input induced overpressurization events. Public Service Electric and Gas Company estimates that these analyses will be completed in approximately six months, at which time they will determine the most appropriate measures to be taken for the long-term modifications. Based on our review, we have determined that this matter is being resolved in a manner that is consistent with the conclusions contained in the aforementioned report entitled, "Transient Report on Reactor Vessel Pressure Transients" and that this matter will be resolved in accordance with Commission requirements.

We will review the results of the analyses and the proposed long-term modifications, when submitted, and will require that approved long-term modifications be implemented during or prior to the first refueling outage.

ECCS Criteria

We have evaluated the combined effect of reduced power operation and the allowable peaking factor on the peak linear heat generation rate for Salem Unit No. 1. The peaking factor allowed by the technical specification

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for power levels above fifty percent of rated core power is inversely proportional to the ratio of generated thermal power to rated thermal power. This inverse relationship limits the peak linear heat generation rate to the value assumed in the ECCS analysis and permits the plant to be operated at identical peak linear heat generation rates at power levels above fifty percent of rated. However, at power levels below fifty percent, the allowable peaking factor is constant. This constant peaking factor reduces the peak linear heat generation rate in direct proportion to the reduction in power below fifty percent power. The use of an incorrect value for upper head temperature in the previously submitted evaluation can affect the calculated peak clad temperature at high power operation. For lower power operation, the effect of a higher upper head temperature would not be sufficient to significantly affect the results of the ECCS performance evaluation. At twenty percent of rated core power the peak linear heat generation rate would be sixty percent lower than that at fifty percent.

We have evaluated the effect of such a reduction and have concluded that operation at twenty percent of rated core power would assure conformance with the Commission's ECCS criteria. At this power level the uncertainties associated with the effects of a higher than anticipated temperature at the upper head region would be completely offset. We will limit power operation to twenty percent of rated until loss-of-coolant accident analyses which fully account for the effect of higher upper head temperatures are performed for Salem Unit No. 1. Operation at full power will not be authorized until we have reviewed and approved these calculations.

Appendix A Technical Specification Changes

We have reviewed the two basic changes to the Appendix A Technical Specification proposed by the licensee. One change would reduce the number of required high efficiency particulate air filters in the auxiliary building exhaust air filtration system from two to one. Although the design of this system includes two banks of high efficiency particulate air filters, it only includes one bank of charcoal filters; therefore, the licensee has proposed that we consider this system as having only one high efficiency particulate air filter in the Appendix A Technical Specification.

During the course of preoperational testing, one bank of high efficiency particulate air (HEPA) filters did not satisfy all requirements to enable specific credit to be given to its performance. While this system will remain in place and will be available to backup the other HEPA bank, no credit is accorded to this capability. Consequently, the system must be treated as a single bank system and more stringent

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limitations are needed in the event that the satisfactory HEPA filter is inoperable. Public Service Electric and Gas Company proposed more restrictive specifications for this system requiring the reactor to be shutdown in the event that the required HEPA filter is inoperable. This is similar to requirements for the other single bank components in the system. We find the proposed change, deleting requirements for one bank of HEPA filters and increasing the requirements for operability of the other system, to be acceptable.

The other basic change would delete the phrase "in accordance with ANSI N510-1975" from the surveillance requirements for the control room, auxiliary building, and fuel handling air filtration systems. These systems were designed, reviewed and approved by the Commission, purchased and installed prior to issuance of ANSI N510-1975. We have determined that testing of these systems in strict accordance with ANSI N510-1975 is therefore not possible without major changes to the filter systems. Nevertheless, we have determined that the licensee will meet the intent of ANSI N510-1975 by including ANSI N510-1975 as a procedural guideline requirement in the bases sections of the Technical Specification for these systems. In addition, since the proposed changes are in accordance with Appendix A Technical Specifications, currently being issued, we find that the proposed change is acceptable.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

SEE PREVIOUS CONCURRENCES.

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DATE ➤	11/29/76	11/30/76	11/ /76	<i>JLV</i>	<i>JLV 11/29/76</i>

to the Appendix A Technical Specifications concerning (a) the high efficiency particulate air filters in the auxiliary building exhaust air filtration system and (b) the surveillance requirements for the control room, auxiliary building, and fuel handling air filtration systems.

Facility Operating License No. DPR-70 initially contained several conditions relating to environmental matters. Since these conditions are included in the Appendix B Technical Specifications, they have been deleted from the license proper.

Amendment No. 3 is effective as of the date of issuance. Facility Operating License No. DPR-70, as amended, shall expire at midnight, September 25, 2008. This action is in furtherance of the licensing action encompassed in the "Notice of Consideration of Issuance of Facility Operating Licenses and Notice of Opportunity for Hearing," dated October 6, 1972.

For further details with respect to this action, see (1) the application for amendment dated November 8, 1976, (2) Amendment No. 3 to License No. DPR-70, (3) the Commission's related Safety Evaluation, dated November 1976, and (4) the "Environmental Assessment, Salem Nuclear Generating Station Unit No. 1, Fuel Cycle Considerations." These items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Salem Free Public Library, 112 West Broadway, Salem, New Jersey.

Single copies of items (2), (3) and (4) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C.

20555, Attention: Director, Division of Project Management.

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SAFETY EVALUATION BY THE  
OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 3 TO  
FACILITY OPERATING LICENSE DPR-70

PUBLIC SERVICE ELECTRIC AND GAS COMPANY,  
PHILADELPHIA ELECTRIC COMPANY,  
DELMARVA POWER AND LIGHT COMPANY, AND  
ATLANTIC CITY ELECTRIC COMPANY

SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

DOCKET NO. 50-272

INTRODUCTION

This safety evaluation addresses three items amending Facility Operating License No. DPR-70: (1) reactor vessel overpressurization, (2) ECCS criteria, and (3) Appendix A technical specification changes.

Reactor Vessel Overpressurization

By letter dated August 27, 1976, we informed Public Service Electric and Gas Company of our concern regarding reactor vessel overpressurization, and requested information regarding steps being taken to minimize the likelihood of such events. By letters dated September 15, 1976 and October 25, 1976 Public Service Electric and Gas Company informed the Commission of its proposed program to preclude overpressurizing the reactor vessel.

ECCS Criteria

At a meeting on August 9, 1976, Westinghouse reported that the fluid temperature in the upper head region may be higher than assumed in the loss-of-coolant accident analysis for Salem Unit No. 1. Since the design bypass flow pattern is from the downcomer, through the upper head, and into the upper plenum via the control rod guide tubes, the upper head temperature was assumed to be at the cold leg temperature. Recent ~~tests~~ <sup>data</sup>, however, have indicated an upward flow into the upper head from the central guide tubes, and a return flow through the peripheral guide tubes. Consequently, the upper head temperature is hotter than the cold leg temperature. A thermocouple reading at Connecticut Yankee (Docket No. 50-213) has confirmed that the upper head is hotter than originally assumed. We will require that this matter be resolved prior to authorizing full power operation.

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are intended to reduce

induced overpressurization and heat input induced overpressurization. The letter indicates that these transient analyses will be completed within approximately six months, after which time modification to the Salem plant will be initiated. This letter also addresses interim measures which have been taken to preclude overpressurization events. These measures include the modification of operating instructions I-3.6, Hot Standby to Cold Shutdown and II-1.3.4, Filling and Venting. These modifications will minimize the time that the system is operated in a water solid condition. This letter also states that compliance with Appendix G to 10 CFR Part 50 will be verified by temperature and pressure recorders in the control room. The hot and cold leg temperatures on each of the four loops will be monitored in the control room by four temperature recorders while starting up, shutting down or during periods of cold shutdown. The hot leg pressure will be monitored in the control room by a pressure recorder and two pressure indicators during all modes of operation.

ECCS Criteria

On August 9, 1976, Westinghouse informed the staff that (1) the fluid temperature in the upper head region of the reactor vessel may be higher than assumed in the loss-of-coolant accident analysis for Salem Unit No. 1, and (2) results of analysis using the upper head temperature modeled as the hot leg temperature, rather than as the cold leg temperature, increased the peak cladding temperature by 80 degrees Fahrenheit in a 4-loop, 17 x 17 plant operating at full power. Application of this result to Trojan (Docket No. 50-344) indicated that with this modification of the upper head water temperature, the calculated peak cladding temperature for the worst case break would not exceed the Commission's emergency core cooling system performance criteria. Nevertheless, since the fluid temperature in the upper head region of the reactor vessel may be higher than assumed for Salem Unit No. 1, we will require new calculations pursuant to Appendix K of 10 CFR Part 50 to verify that the criteria of Section 50.46 of 10 CFR Part 50 are not exceeded prior to authorizing full-power operation.

Appendix A Technical Specification Changes

By letter dated November 3, 1976, the licensee has proposed two basic changes to the Appendix A Technical Specification. One change would reduce the number of high efficiency particulate air filter banks required in the auxiliary building air exhaust system from two to one. The other change would delete the phrase "in accordance with ANSI N510-1975" from the surveillance requirements for the control room, auxiliary building, and fuel handling ventilation systems.

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The design of the auxiliary building exhaust air filtration system ensures that radioactive materials that might possibly leak from the emergency core cooling equipment subsequent to a highly unlikely but postulated loss-of-coolant accident are effectively filtered prior to being exhausted to the atmosphere. The present design includes two banks of high efficiency particulate air filters for particulate removal, but only one bank of charcoal filter trays for radiiodine removal. The licensee therefore proposes that we consider only one bank of high efficiency particulate air filters in the Appendix A Technical Specification, as is the case for single bank filter systems.

The air filtration systems for the control room, auxiliary building, and fuel handling area were designed, reviewed and approved by the Commission, purchased and installed prior to the issuance of ANSI N510-1975; therefore, the licensee has proposed to delete the phrase "in accordance with ANSI N510-1975" as surveillance requirements for these systems. The licensee will, however, include ANSI N510-1975 as a procedural guideline document in the bases sections of the Appendix A Technical Specification for these systems.

EVALUATION

Reactor Vessel Overpressurization

A comprehensive evaluation of the <sup>generic</sup> matter of reactor vessel overpressurization is contained in a report prepared by an NRR Task Group entitled, "Technical Report on Reactor Vessel Pressure Transients" dated November 1, 1976. This report evaluated overpressurization events which exceeded the pressure-temperature limits of the Appendix A Technical Specifications. Each event was initiated by either an operator error or equipment malfunction. Two of the conclusions in this report are that (1) no event resulted in any release of radioactivity, and (2) all the pressure transients were such that fracture mechanics and fatigue calculations indicate that the reactor vessels were not damaged and that continued operation of these vessels was acceptable. This report also concludes that because of the very large safety margins to failure for unirradiated reactor vessels, new plants can be permitted to be licensed under existing safety criteria, but that administrative procedures and overpressure protection devices should be upgraded in an appropriate time frame to reduce the likelihood of future pressure transient events for new plants.

By letter dated October 25, 1976, Public Service Electric and Gas Company has described certain interim measures which have been taken to ~~practice~~ reduce the likelihood of reactor vessel overpressurization. We have reviewed these measures,

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To ensure the timely detection of overpressurization events,

are lacking with regard to certain considerations, such as alarms and the disabling of injection pumps. For example,

which include modifying operating instructions ~~so as to minimize~~ <sup>reduce</sup> the time that the system is in a water solid condition, and informing operators of the potential of overpressurization transients when the plant is in a water solid condition. This letter also describes the pressure and temperature recorders which are in the control room to verify compliance <sup>that the limits of</sup> with Appendix G to 10 CFR Part 50 <sup>are not exceeded.</sup> Based on our review of these interim measures, which are basically administrative, we have determined that although they are responsive to some of the interim measures delineated in our letter of August 27, 1976, they do not provide an acceptable degree of protection. We have determined that the method used for measuring and recording system pressures and temperatures does not provide sufficient assurance that overpressurization events will be detected on a timely basis. ~~Accordingly,~~ we will require that the interim measures be augmented to include the installation of an acceptable over-pressure alarm in the control room. We will require this alarm to (1) be operable whenever the system is in cold shutdown (Mode 5) or hot shutdown (Mode 4); (2) be actuated whenever the system pressure exceeds the technical specification limits; (3) not compromise any safety related instrumentation; and (4) be installed prior to authorizing Mode 1 operation. <sup>Other requirements are currently under staff considerations. The</sup> ~~licenses~~ <sup>will be required to comply with any additional measures the staff deems appropriate as a result of the generic review of this matter.</sup> The October 25 letter also reported on the progress to date regarding the long-term modifications and described the analyses required to determine the most appropriate course of action. Analyses yet to be performed include transient analysis of mass input induced overpressurization and heat input induced overpressurization events. Public Service Electric and Gas Company estimates that these analyses will be completed in approximately six months, at which time they will determine the most appropriate measures to be taken for the long-term modifications. Based on our review, we have determined that this matter is being resolved in a manner that is consistent with the conclusions contained in the aforementioned report entitled, "Transient Report on Reactor Vessel Pressure Transients" and that this matter will be resolved in accordance with Commission requirements.

Pub Ser Elec & Gas

We will review the results of the analyses and the proposed long-term modifications, when submitted, and will require that approved long-term modifications be implemented during or prior to the first refueling outage.

ECCS Criteria

We have evaluated the combined effect of reduced power operation and the allowable peaking factor on the peak linear heat generation rate for Salem Unit No. 1. The peaking factor allowed by the technical specification

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below fifty percent power. The use of an incorrect value for upper head temperature in the previously submitted evaluation can affect the calculated peak clad temperature at high power operation. For lower power operation, the effect of a higher upper head temperature would not be sufficient to significantly affect the results of the ECCS performance evaluation.

for power levels above fifty percent of rated core power is inversely proportional to the ratio of generated thermal power to rated thermal power. This inverse relationship limits the peak linear heat generation rate to the value assumed in the ECCS analysis and permits the plant to be operated at identical peak linear heat generation rates at power levels above fifty percent of rated. However, at power levels below fifty percent, the allowable peaking factor is constant. This constant peaking factor reduces the peak linear heat generation rate in direct proportion to the reduction in power. ~~that~~ At twenty percent of rated core power the peak linear heat generation rate would be sixty percent lower than that at fifty percent.

loss-of-coolant accident analyses

We have evaluated the effect of such a reduction and have concluded that operation at twenty percent of rated core power would assure conformance with the Commission's ECCS criteria. At this power level the uncertainties associated with the effects of a higher than anticipated temperature at the upper head region would be completely offset. We will limit power operation to twenty percent of rated ~~until ECCS performance calculations~~ which fully account for the effect of higher upper head temperatures are performed for Salem Unit No. 1. Operation at full power will not be authorized until we have reviewed and approved these ~~performance~~ calculations.

Appendix A Technical Specification Changes

We have reviewed the two basic changes to the Appendix A Technical Specification proposed by the licensee. One change would reduce the number of required high efficiency particulate air filters in the auxiliary building exhaust air filtration system from two to one. Although the design of this system includes two banks of high efficiency particulate air filters, it only includes one bank of charcoal filters; therefore, the licensee has proposed that we consider this system as having only one high efficiency particulate air filter in the Appendix A Technical Specification.

*Insert* Since there is only one bank of charcoal filters and since the licensee has committed to shutting down the reactor within twenty-four hours if the considered, and required, high efficiency particulate air filter bank is inoperable, we have determined that the proposed change would be identical to previously approved single bank filter system. We therefore find this change acceptable.

The other basic change would delete the phrase "in accordance with ANSI N510-1975" from the surveillance requirements for the control room, auxiliary building, and fuel handling air filtration systems. These

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systems were designed, reviewed and approved by the Commission, purchased and installed prior to issuance of ANSI N510-1975. We have determined that testing of these systems in strict accordance with ANSI N510-1975 is therefore not possible without major changes to the filter systems. Nevertheless, we have determined that the licensee will meet the intent of ANSI N510-1975 by including ANSI N510-1975 as a procedural guideline requirement in the bases sections of the Technical Specification for these systems. In addition, since the proposed changes are in accordance with Appendix A Technical Specifications currently being issued, we find that the proposed change is acceptable.

#### CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

During the course of preoperational testing, one bank of ~~HEPA~~ <sup>high efficiency / particulate air (HEPA)</sup> filters did not satisfy all requirements to enable specific credit to be given to its performance. While this system will remain in place and will be available to backup the other HEPA bank, no credit is accorded to this capability. Consequently, the system must be treated as a single <sup>N</sup> ~~bank~~ system and more stringent limitations are needed in the event that the satisfactory HEPA filter is inoperable. <sup>Public Service Electric and Gas Company</sup> ~~The licensee has~~ proposed more restrictive specifications for this system requirement <sup>ing</sup> ~~ing~~. The reactor to be shutdown in the event that the required HEPA filter is inoperable. This is similar to requirements for the other single bank components in the system. We find the proposed change, deleting requirements for one bank of HEPA filters and increasing the requirements for operability of the <sup>other</sup> system, to be acceptable.

Insert (A)

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

SEE PREVIOUS CONCURRENCES.

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SAFETY EVALUATION BY THE  
OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 3 TO  
FACILITY OPERATING LICENSE DPR-70

PUBLIC SERVICE ELECTRIC AND GAS COMPANY,  
PHILADELPHIA ELECTRIC COMPANY,  
DELMARVA POWER AND LIGHT COMPANY, AND  
ATLANTIC CITY ELECTRIC COMPANY

SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

DOCKET NO. 50-272

INTRODUCTION

This safety evaluation addresses <sup>three</sup> ~~four~~ items amending Facility Operating License No. DPR-70: (1) ~~Commission imposed limitations~~, (2) reactor vessel overpressurization, (3) ECCS criteria, and (4) Appendix A technical specification changes.

Commission Imposed Limitations

On August 13, 1976, the Commission issued its General Statement of Policy, [Docket RM-50-3], Environmental Effects of the Uranium Fuel Cycle (41 F.R. 34707, August 16, 1976). Pursuant to said policy, Facility Operating License No. DPR-70, as amended, authorizes the operation of Salem Unit No. 1 at one percent of rated core power for testing purposes only.

On October 13, 1976, the Commission issued its proposed interim rule dealing with environmental impacts of fuel reprocessing and waste management in licensing nuclear power plants [10 CFR Part 51] Licensing and Regulatory Policy and Procedures for Environmental Protection (41 F.R. 45849, October 18, 1976). In announcing its proposed rule, the Commission stated that the resolution of these questions, or some of them, may be affected by the October 8, 1976 order by the United States Court of Appeals for the District of Columbia Circuit in Natural Resources Defense Council v. Nuclear Regulatory Commission, Nos. 74-1385 and 74-1586.

On November 5, 1976, the Commission issued its Supplemental General Statement of Policy [Docket RM-50-3], Environmental Effects of the Uranium Fuel Cycle (41 F.R. 49898, November 11, 1976). This supplemental policy allows for the full power licensing of nuclear power plants appropriately conditioned as permitted by the October 8 Court order.

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Reactor Vessel Overpressurization

By letter dated August 27, 1976, we informed Public Service Electric and Gas Company of our concern regarding reactor vessel overpressurization, and requested information regarding steps being taken to minimize the likelihood of such events. By letters dated September 15, 1976 and October 25, 1976 Public Service Electric and Gas Company informed the Commission of its proposed program to preclude overpressurizing the reactor vessel.

NCCS Criteria

At a meeting on August 9, 1976, Westinghouse reported that the fluid temperature in the upper head region may be higher than assumed in the loss-of-coolant accident analysis for Salem Unit No. 1. Since the design bypass flow pattern is from the downcomer, through the upper head, and into the upper plenum via the control rod guide tubes, the upper head temperature was assumed to be at the cold leg temperature. Recent model tests, however, have indicated an upward flow into the upper head from the central guide tubes, and a return flow through the peripheral guide tubes. Consequently, the upper head temperature is hotter than the cold leg temperature. A thermocouple reading at Connecticut Yankee (Docket No. 50-213) has confirmed that the upper head is hotter than originally assumed. We will require that this matter be resolved prior to authorizing full power operation.

Appendix A Technical Specification Changes

By letter dated November 8, 1976, Public Service Electric and Gas Company has proposed certain changes to the Appendix A Technical Specifications for Salem, Unit No. 1. These changes would (1) modify the testing requirements for the auxiliary building exhaust air filtration system, the control room emergency air conditioning system, and the fuel handling area ventilation system; (2) reduce from two to one the number of required high efficiency particulate air filter trains in the auxiliary building exhaust air filtration system.

DISCUSSION

~~Commission Imposed Limitations~~

~~On July 21, 1976, the U. S. Court of Appeals for the District of Columbia Circuit handed down two decisions related to actions of the Commission, holding that: (1) the rule for considering the environmental effects of the uranium fuel cycle for individual light water cooled power reactors was~~

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inadequately supported in the areas of reprocessing of used fuel and the management of radioactive wastes, and (2) before the Commission can license a nuclear power plant, the National Environmental Policy Act of 1969 requires that the environmental effects of fuel reprocessing and waste management be considered through rulemaking or in individual licensing proceedings.

On August 13, 1976, the Commission issued a General Statement of Policy regarding the court decisions which enunciated that: (1) the Commission would reopen the rulemaking proceeding on the environmental effects of the uranium fuel cycle to supplement the record on reprocessing and waste management issues and to determine, on the basis of the supplemental record, if the existing rule should be amended, (2) the staff is to review the technical literature and produce a revised and adequately documented environmental survey on the probable environmental costs of reprocessing and waste management in licensing a nuclear power reactor, (3) the issuance of new full power licenses would be temporarily suspended until completion of the revised environmental survey at which time the Commission would determine if it could be used to justify the development of an interim rule to serve as the basis for resuming licensing activities, and (4) under certain conditions that operating licenses allowing for fuel loading and low-power testing would be authorized.

On October 8, 1976, the Court of Appeals delayed the effectiveness of its decision regarding environmental effects of the uranium fuel cycle and further indicated its view that the Commission could continue issuing licenses on a conditional basis.

On October 13, 1976, the Commission announced a proposed interim rule dealing with the environmental impacts of fuel reprocessing and waste management in licensing nuclear power plants. The proposed interim rule was based on the newly completed evaluation of the environmental impacts of fuel reprocessing and waste management. This evaluation found that environmental impacts of fuel reprocessing and waste management as they relate to individual nuclear plants continue to be small, even when impacts which were not completely accounted for in the past are considered. The Commission also announced that it was reviewing the evaluation and the October 8 order of the Court of Appeals, and would decide how these actions would impact on other aspects of its August 13 General Statement of Policy. Said review would include whether licenses may be issued in pending cases before an interim or final rule is made effective.

The Commission's Supplemental General Statement of Policy [Docket RM-50-3], Environmental Effects of the Uranium Fuel Cycle, sets forth conditions whereby the limitations imposed by its original General Statement of

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Policy may be removed. In brief, the Commission has concluded that full power licenses may be issued in pending cases in advance of the adoption of an interim rule on the basis of the currently effective chemical reprocessing and waste storage values of Table S-3 in 10 CFR Part 51. However, any full-power operating license so issued will be conditioned in accordance with the Court's order staying its mandate dated October 8, 1976.

Reactor Vessel Overpressurization

Our letter of August 27, 1976 requested that Public Service Electric and Gas company conduct an analysis of their system design to determine the susceptibility of Salem Unit No. 1 to reactor vessel overpressurization events. The letter provided information and conclusions reached by the staff regarding reactor vessel overpressurization, and identified criteria to be applied in determining the adequacy of protection against pressure transients. Should the results of their analysis show that design modifications are necessary to meet the acceptance criteria, they were advised to include the modifications in their analysis. Pending implementation of the design modifications identified, they were advised that short-term measures should be incorporated to reduce the likelihood of overpressurization events prior to implementing the long-term design modifications. The letter also requested that they notify the staff within 20 days of receipt of the letter as to whether they would provide the information requested within 60 days.

By letter dated September 15, 1976, (the 20 day letter), Public Service Electric and Gas Company indicated that they had joined a Task Group of utilities with Westinghouse designed plants to examine the complexity of the pressure transient events and to identify similarities between Westinghouse plants for determining a consistent solution to the issue. This letter also informed us that they would report the results of the Task Group meetings as applicable to Salem Unit No. 1 at the end of the 60 day period.

By letter dated October 25, 1976, (the 60 day letter), Public Service Electric and Gas Company informed us of the results of meetings held by the Task Group. This letter highlighted the course of action which will be pursued to analyze the pressure transients and stated that the proposed long-term corrective actions would be based on the results of transient analyses. These analyses will include consideration of mass input induced overpressurization and heat input induced overpressurization. The letter indicates that these transient analyses will be completed within approximately six months, after which time modification to the Salem plant will be initiated. This letter also addresses interim measures which have been taken to preclude overpressurization events.

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These measure include the modification of operating instructions I-3.6, Hot Standby to Cold Shutdown and II-1.3.4, Filling and Venting. These modifications will minimize the time that the system is operated in a water solid condition. This letter also states that compliance with Appendix G to 10 CFR Part 50 will be verified by temperature and pressure recorders in the control room. The hot and cold leg temperatures on each of the four loops will be monitored in the control room by four temperature recorders while starting up, shutting down or during periods of cold shutdown. The hot leg pressure will be monitored in the control room by a pressure recorder and two pressure indicators during all modes of operation.

ECCS Criteria

On August 9, 1976, Westinghouse informed <sup>the</sup> staff that (1) the fluid temperature in the upper head region of the reactor vessel may be higher than assumed in the loss-of-coolant accident analysis for Salem Unit No. 1, and (2) results of analysis using the upper head temperature modeled as the hot leg temperature, rather than as the cold leg temperature, increased the peak cladding temperature by 80 degrees Fahrenheit in a 4-loop, 17 x 17 plant operating at full power. Application of this result to Trojan (Docket No. 50-344) indicated that with this modification of the upper head water temperature, the calculated peak cladding temperature for the worst case break would not exceed the Commission's emergency core cooling system performance criteria. Nevertheless, since the fluid temperature in the upper head region of the reactor vessel may be higher than assumed for Salem Unit No. 1, we will require new calculations pursuant to Appendix K of 10 CFR Part 50 to verify that the criteria of Section 50.46 of 10 CFR Part 50 are not exceeded prior to authorizing <sup>ing</sup> full-power operation.

Appendix A Technical Specification Changes

By letter dated November 8, 1976, the licensee has proposed two basic changes to the Appendix A Technical Specification. One change would reduce the number of high efficiency particulate air filter banks required in the auxiliary building air exhaust system from two to one. The other change would delete the phrase "in accordance with ANSI NS10-1975" from the surveillance requirements for the control room, auxiliary building, and fuel handling ventilation systems.

The design of the auxiliary building exhaust air filtration system ensures that radioactive materials that might possibly leak from the emergency core cooling equipment subsequent to a highly unlikely but postulated loss-of-coolant accident are effectively filtered prior to being exhausted to the

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atmosphere. The present design includes two banks of high efficiency particulate air filters for particulate removal, but only one bank of charcoal filter trays for radioiodine removal. The licensee therefore proposes that we consider only one bank of high efficiency particulate air filters in the Appendix A Technical Specification, as is the case for single bank filter systems.

The air filtration systems for the control room, auxiliary building, and fuel handling area were designed, reviewed and approved by the Commission, purchased and installed prior to the issuance of ANSI N510-1975; therefore, the licensee has proposed to delete the phrase "in accordance with ANSI N510-1975" as surveillance requirements for these systems. The licensee will, however, include ANSI N510-1975 as a procedural guideline document in the bases sections of the Appendix A Technical Specification for these systems.

EVALUATION

Commission Imposed Limitations

Facility Operating License No. DPA-70, as amended, was issued pursuant to the Commission's General Statement of Policy, [Docket RM 50-3], Environmental Effects of the Uranium Fuel Cycle (41 F.R. 34707, August 16, 1976) which, under certain conditions, authorizes the licensing of nuclear power plants for low-power testing purposes. In accordance with the Commission's Supplemental Statement of General Policy of November 5, 1976 (41 F.R. 49898, November 11, 1976), which sets forth conditions whereby full power licensing may be resumed, the staff has determined in the enclosed Environmental Assessment that the use of revised values for reprocessing and waste management would not tilt the cost-benefit balance for Salem Unit No. 1 against issuance of a full power license.

Reactor Vessel Overpressurization

A comprehensive evaluation of the matter of reactor vessel overpressurization is contained in a report prepared by an NRR Task Group entitled, "Technical Report on Reactor Vessel Pressure Transients" dated November 1, 1976. This report evaluated overpressurization events which exceeded the pressure-temperature limits of the Appendix A Technical Specifications. Each event was initiated by either an operator error or equipment malfunction. Two of the conclusions in this report are that (1) no event resulted in any release of radioactivity, and (2) all the pressure transients were such that fracture mechanics and fatigue calculations indicate that the reactor vessels were not damaged and that continued operation of these vessels was

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acceptable. This report also concludes that because of the very large safety margins to failure for unirradiated reactor vessels, new plants can be permitted to be licensed under existing safety criteria, but that administrative procedures and overpressure protection devices should be upgraded in an appropriate time frame to reduce the likelihood of future pressure transient events for new plants.

By letter dated October 25, 1976, Public Service Electric and Gas Company has described certain interim measures which have been taken to preclude reactor vessel overpressurization. We have reviewed these measures, which include modifying operating instructions so as to minimize the time that the system is in a water solid condition, and informing operators of the potential of overpressurization transients when the plant is in a water solid condition. This letter also describes the pressure and temperature recorders which are in the control room to verify compliance with Appendix G to 10 CFR Part 50. Based on our review of these interim measures, which are basically administrative, we have determined that although they are responsive to some of the interim measures delineated in our letter of August 27, 1976, they do not provide an acceptable degree of protection. We have determined that the method used for measuring and recording system pressures and temperatures does not provide sufficient assurance that overpressurization events will be detected on a timely basis. Accordingly, we will require that the interim measures be augmented to include the installation of an acceptable over-pressure alarm in the control room. We will require this alarm to (1) be operable whenever the system is in cold shutdown (Mode 5) or not shutdown (Mode 4); (2) be actuated whenever the system pressure exceeds the technical specification limits; (3) not compromise any safety related instrumentation; and (4) be installed prior to authorizing Mode 1 operation.

The October 25 letter also reported on the progress to date regarding the long-term modifications and described the analyses required to determine the most appropriate course of action. Analyses yet to be performed include transient analysis of mass input induced overpressurization and heat input induced overpressurization events. Public Service Electric and Gas Company estimates that these analyses will be completed in approximately six months, at which time they will determine the most appropriate measures to be taken for the long-term modifications. Based on our review, we have determined that this matter is being resolved in a manner that is consistent with the conclusions contained in the aforementioned report entitled, "Transient Report on Reactor Vessel Pressure Transients" and that this matter will be resolved in accordance with Commission requirements.

We will review the results of the analyses and the proposed long-term modifications, when submitted, and will require that approved long-term modifications be implemented during or prior to the first refueling outage.

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ECCS Criteria

We have evaluated the combined effect of reduced power operation and the allowable peaking factor on the peak linear heat generation rate for Salem Unit No. 1. The peaking factor allowed by the technical specification for power levels above fifty percent of rated core power is inversely proportional to the ratio of generated thermal power to rated thermal power. This inverse relationship limits the peak linear heat generation rate to the value assumed in the ECCS analysis and permits the plant to be operated at identical peak linear heat generation rates at power levels above fifty percent of rated. However, at power levels below fifty percent, the allowable peaking factor is constant. This constant peaking factor reduces the peak linear heat generation rate in direct proportion to the reduction in power. Thus, at twenty percent of rated core power the peak linear heat generation rate would be sixty percent lower than that at fifty percent.

We have evaluated the effect of such a reduction and have concluded that operation at twenty percent of rated core power would assure conformance with the Commission's ECCS criteria. At this power level the uncertainties associated with the effects of a higher than anticipated temperature at the upper head region would be completely offset. We will limit power operation to twenty percent of rated until ECCS performance calculations which fully account for the effect of higher upper head temperatures are performed for Salem Unit No. 1. Operation at full power will not be authorized until we have reviewed and approved these performance calculations.

Appendix A Technical Specification Changes

We have reviewed the two basic changes to the Appendix A Technical Specification proposed by the licensee. One change would reduce the number of required high efficiency particulate air filters in the auxiliary building exhaust air filtration system from two to one. Although the design of this system includes two banks of high efficiency particulate air filters, it only includes one bank of charcoal filters; therefore, the licensee has proposed that we consider this system as having only one high efficiency particulate air filter in the Appendix A Technical Specification.

Since there is only one bank of charcoal filters and since the licensee has committed to shutting down the reactor within twenty-four hours if the considered, and required, high efficiency particulate air filter bank is inoperable, we have determined that the proposed change would be identical to previously approved single bank filter system. We therefore find this change acceptable.

The other basic change would delete the phrase "in accordance with ANSI N510-1975" from the surveillance requirements for the control room, auxiliary building, and fuel handling air filtration systems. These

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systems were designed, reviewed and approved by the Commission, purchased and installed prior to issuance of ANSI N510-1975. We have determined that testing of these systems in strict accordance with ANSI N510-1975 is therefore not possible without major changes to the filter systems. Nevertheless, we have determined that the licensee will meet the intent of ANSI N510-1975 by including ANSI N510-1975 as a procedural guideline requirement in the bases sections of the Technical Specification for these systems. In addition, since the proposed changes are in accordance with Appendix A Technical Specifications currently being issued, we find that the proposed change is acceptable.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

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temperature recorders which are in the control room to verify that the limits of Appendix G to 10 CFR Part 50 are not exceeded. Based on our review of these interim measures, which are basically administrative, we have determined that although they are responsive to some of the interim measures delineated in our letter of August 27, 1976, they <sup>alarms</sup> are lacking with regard to certain considerations, such as ~~alarms~~ and the disabling of injection pumps. For example, the method used for measuring and recording system pressures and temperatures does not provide sufficient assurance that overpressurization events will be detected on a timely basis. To ensure the timely detection of overpressurization events, we will require that the interim measures be augmented to include the installation of an acceptable over-pressure alarm in the control room. We will require this alarm to (1) be operable whenever the system is in cold shutdown (Mode 5) or hot shutdown (Mode 4); (2) be actuated whenever the system pressure exceeds the technical specification limits; (3) not compromise any safety related instrumentation; and (4) be installed prior to authorizing Mode 1 operation. Other <sup>measures</sup> requirements are currently under staff considerations. ~~Public Service Electric and Gas Company will be required~~ to comply with any additional measures the staff deems appropriate as a result of the generic review of this matter.

*The staff will call upon the licensee*

The October 25 letter also reported on the progress to date regarding the long-term modifications and described the analyses required to determine the most appropriate course of action. Analyses yet to be performed include transient analysis of mass input induced overpressurization and heat input induced overpressurization events. Public Service Electric and Gas Company estimates that these analyses will be completed in approximately six months, at which time they will determine the most appropriate measures to be taken for the long-term modifications. Based on our review, we have determined that this matter is being resolved in a manner that is consistent with the conclusions contained in the aforementioned report entitled, "Transient Report on Reactor Vessel Pressure Transients" and that this matter will be resolved in accordance with Commission requirements.

We will review the results of the analyses and the proposed long-term modifications, when submitted, and will require that approved long-term modifications be implemented during or prior to the first refueling outage.

ECCS Criteria

We have evaluated the combined effect of reduced power operation and the allowable peaking factor on the peak linear heat generation rate for Salem Unit No. 1. The peaking factor allowed by the technical specification

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

DEC 1 1976

Docket No. 50-272

Public Service Electric & Gas Company  
ATTN: Mr. F. P. Librizzi  
General Manager - Electric Production  
Production Department  
80 Park Place, Room 7221  
Newark, New Jersey 07101

Gentlemen:

ISSUANCE OF AMENDMENT NO. 3 TO FACILITY OPERATING LICENSE NO. DPR-70  
FOR SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 3 to Facility Operating License No. DPR-70. Amendment No. 3 is effective as of the date of issuance. Facility Operating License No. DPR-70, as amended, shall expire at midnight, September 25, 2008.

In accordance with the Commission's Supplemental Statement of General Policy of November 5, 1976 (41 F.R. 49898, November 11, 1976), the staff has determined in the enclosed Environmental Assessment, that use of revised values for reprocessing and waste management would not tilt the cost-benefit balance for Salem Unit No. 1 against issuance of a full power operating license. Accordingly, Amendment No. 3 to License No. DPR-70 authorizes the Public Service Electric and Gas Company to operate the Salem Nuclear Generating Station, Unit No. 1 at a reactor core power level of 3338 megawatts thermal (one hundred percent of the rated core thermal power). However, in accordance with Amendment No. 3 and the revised Attachment 1 to License DPR-70, the amended license is conditioned to provide a sequential approach to full power which takes into account a series of incomplete construction items, preoperational tests, startup tests and other items, and provides for further Commission approval at various stages of these activities.

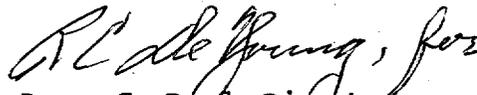
Other changes include (1) the requirement for a long-term means of providing overpressure protection; (2) the temporary limitation of power operation to twenty percent of rated core power until the ECCS performance is reevaluated by modeling the upper head temperature as the hot leg temperature; (3) the condition that Facility Operating License No. DPR-70 is subject to the outcome of the proceedings in Natural Resources Defense Council v. NRC (D. C. Circuit, July 21, 1976)

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Nos. 74-1385 and 74-1586, and (4) changes to the Appendix A Technical Specifications, in response to your request dated November 8, 1976. Facility Operating License No. DPR-70 initially contained several conditions relating to environmental matters. Since these conditions are included in the Appendix B Technical Specifications, they have been deleted from the license proper.

Copies of the related Safety Evaluation and the Federal Register Notice of Issuance of Amendment are also enclosed.

Sincerely,



Roger S. Boyd, Director  
Division of Project Management  
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 3 to License  
No. DPR-70
2. Environmental Assessment
3. Federal Register Notice
4. Safety Evaluation

cc: See page 3

DEC 1 1976

cc: Fred Broadfoot, Esq.  
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Atlantic City Electric Company  
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Governor's Office of State Planning  
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Department of Environmental Resources  
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Honorable David A. Fogg  
Mayor, Lower Alloways Creek Township  
Salem County, New Jersey 08079

Chief, Energy Systems  
Analysis Branch (AW-459)  
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Interdevelopment, Inc.  
ATTN: Micealae Delgado  
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PUBLIC SERVICE ELECTRIC AND GAS COMPANY  
PHILADELPHIA ELECTRIC COMPANY  
DELMARVA POWER AND LIGHT COMPANY  
ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-272

SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

FACILITY OPERATING LICENSE

Amendment No. 3  
License No. DPR-70

1. The Nuclear Regulatory Commission (the Commission) having found that:
  - A. The application for license filed by the Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company, and Atlantic City Electric Company (the licensees) and the application for license amendment dated November 8, 1976, filed by Public Service Electric and Gas Company comply with the standards and requirements of the Atomic Energy Act (the Act) of 1954, as amended, and the Commission's rules and regulations set forth in 10 CFR Chapter I and all required notifications to other agencies or bodies have been duly made;
  - B. Construction of the Salem Nuclear Generating Station, Unit No. 1 (facility) has been substantially completed in conformity with Provisional Construction Permit No. CPPR-52 and the application, as amended, the provisions of the Act and the rules and regulations of the Commission;
  - C. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;
  - D. There is reasonable assurance: (i) that the activities authorized by this amended operating license can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the rules and regulations of the Commission;
  - E. Public Service Electric and Gas Company is technically qualified and the licensees are financially qualified to engage in the activities authorized by this amended operating license in accordance with the rules and regulations of the Commission;

- F. The licensees have satisfied the applicable provisions of 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements," of the Commission's regulations;
  - G. The issuance of this amended operating license will not be inimical to the common defense and security or to the health and safety of the public;
  - H. After weighing the environmental, economic, technical, and other benefits of the facility against environmental and other costs and considering available alternatives, the issuance of Amendment No. 3 to Facility Operating License No. DPR-70 subject to the conditions for protection of the environment set forth in the Technical Specifications, Appendix B is in accordance with 10 CFR Part 51 (and with former Appendix D to 10 CFR Part 50) of the Commission's regulations and all applicable requirements have been satisfied; and
  - I. The receipt, possession, and use of source, byproduct and special nuclear material as authorized by this amended license will be in accordance with the Commission's regulations in 10 CFR Parts 30, 40, and 70, including 10 CFR Sections 30.33, 40.32, and 70.23 and 70.31.
2. Facility Operating License No. DPR-70, issued to the Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company, and Atlantic City Electric Company, is hereby amended in its entirety, to read as follows:
- A. This amended license applies to the Salem Nuclear Generating Station, Unit No. 1, a pressurized water nuclear reactor and associated equipment (the facility), owned by the Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company, and Atlantic City Electric Company and operated by Public Service Electric and Gas Company. The facility is located on the applicants' site in Salem County, New Jersey, on the southern end of Artificial Island on the east bank of the Delaware River in Lower Alloways Creek Township, and is described in the "Final Safety Analysis Report" as supplemented and amended (Amendments 10 through 39) and the Environmental Report as supplemented and amended (Amendments 1 through 3).
  - B. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses

- F. The licensees have satisfied the applicable provisions of 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements," of the Commission's regulations;
  - G. The issuance of this amended operating license will not be inimical to the common defense and security or to the health and safety of the public;
  - H. After weighing the environmental, economic, technical, and other benefits of the facility against environmental and other costs and considering available alternatives, the issuance of Amendment No. 3 to Facility Operating License No. DPR-70 subject to the conditions for protection of the environment set forth in the Technical Specifications, Appendix B is in accordance with 10 CFR Part 51 (and with former Appendix D to 10 CFR Part 50) of the Commission's regulations and all applicable requirements have been satisfied; and
  - I. The receipt, possession, and use of source, byproduct and special nuclear material as authorized by this amended license will be in accordance with the Commission's regulations in 10 CFR Parts 30, 40, and 70, including 10 CFR Sections 30.33, 40.32, and 70.23 and 70.31.
2. Facility Operating License No. DPR-70, issued to the Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company, and Atlantic City Electric Company, is hereby amended in its entirety, to read as follows:
- A. This amended license applies to the Salem Nuclear Generating Station, Unit No. 1, a pressurized water nuclear reactor and associated equipment (the facility), owned by the Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company, and Atlantic City Electric Company and operated by Public Service Electric and Gas Company. The facility is located on the applicants' site in Salem County, New Jersey, on the southern end of Artificial Island on the east bank of the Delaware River in Lower Alloways Creek Township, and is described in the "Final Safety Analysis Report" as supplemented and amended (Amendments 10 through 39) and the Environmental Report as supplemented and amended (Amendments 1 through 3).
  - B. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses

- (1) Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company, and Atlantic City Electric Company to possess the facility at the designated location in Salem County, New Jersey, in accordance with the procedures and limitations set forth in this amended license;
- (2) Public Service Electric and Gas Company, pursuant to Section 104b of the Act and 10 CFR Part 50, "Licensing of Production and Utilization Facilities," to possess, use and operate the facility;
- (3) Public Service Electric and Gas Company, pursuant to the Act and 10 CFR Part 70, to receive, possess and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;
- (4) Public Service Electric and Gas Company, 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;
- (5) Public Service Electric and Gas Company, 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
- (6) Public Service Electric and Gas Company, pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This amended license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; 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

Public Service Electric and Gas Company is authorized to operate the facility at a steady state reactor core power level not in excess of 3338 megawatts (one hundred percent of rated core power). Prior to attaining the one hundred percent power level, Public Service Electric and Gas Company shall complete the preoperational tests, startup tests and other items identified in Attachment 1 to this amended license in the sequence specified. Attachment 1 is an integral part of this amended license.

(2) Technical Specifications

The Technical Specifications contained in Appendix A issued on August 13, 1976, amended on September 29, 1976, and as revised in the attached pages, are incorporated in this amended license. The Technical Specifications contained in Appendix B issued on August 13, 1976, are incorporated in this license amendment. Public Service Electric and Gas Company shall operate the facility in accordance with the Technical Specifications.

(3) Steam Generator Water Rise Rate

Except for the purpose of performing secondary side flow stability tests, Public Service Electric and Gas Company shall, whenever the secondary side water level in a steam generator is below the level of the feedwater sparger, limit the secondary side water level rise rate in each steam generator to less than 1.2 inches per minute and shall reduce the rise rate to within this limit within two (2) minutes. This condition will be removed by amendment of this license when Public Service Electric and Gas Company demonstrates to the satisfaction of the Commission that secondary side flow instability (water hammer) does not result in unacceptable consequences.

- D. The licensees shall maintain in effect and fully implement all provisions of the NRC Staff-approved physical security plan, including amendments and changes made pursuant to the authority of 10 CFR 50.54(p). The approved security plan consists of proprietary documents, collectively titled Salem Nuclear Generating Station "Industrial Security Plan" as follows:

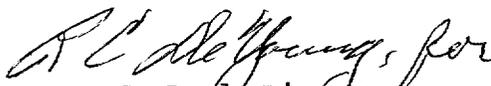
Original, submitted with letter dated June 29, 1973

Revision 1, submitted with letter dated November 26, 1973

Revision 2, submitted with letter dated July 20, 1976

- E. In accordance with the requirement imposed by the October 8, 1976, order of the United States Court of Appeals for the District of Columbia Circuit in Natural Resources Defense Council v. Nuclear Regulatory Commission, No. 74-1385 and 74-1586, that the Nuclear Regulatory Commission "shall make any licenses granted between July 21, 1976 and such time when the mandate is issued subject to the outcome of the proceedings herein," the license amendment issued herein shall be subject to the outcome of such proceedings.
- F. Prior to exceeding twenty percent of rated core power, Public Service Electric and Gas Company shall reanalyze, to the satisfaction of the Commission, the emergency core cooling system performance as delineated in Item F.1. of Attachment 1 of this amended license.
- G. Prior to startup following the first regularly scheduled refueling outage, Public Service Electric and Gas Company shall install, to the satisfaction of the Commission, a long-term means of protection against reactor coolant system over-pressurization when water-solid.
- H. This amended license is effective as of the date of its issuance. Facility Operating License No. DPR-70, as amended, shall expire at midnight, September 25, 2008.

FOR THE NUCLEAR REGULATORY COMMISSION



Roger S. Boyd, Director  
Division of Project Management  
Office of Nuclear Reactor Regulation

Attachments:

1. Incomplete Preoperational Tests,  
Startup Tests, and Other Items  
Which Must be Completed
2. Page Changes to Technical Specifications,  
Appendix A

Date of Issuance: December 1, 1976

ATTACHMENT 1 TO LICENSE DPR-70

Incomplete Preoperational Tests, Startup Tests, and  
Other Items Which Must be Completed

This attachment identifies certain preoperational tests, startup tests, and other items which must be completed to the Commission's satisfaction prior to proceeding to certain specified Operational Modes. Public Service Electric and Gas Company shall not proceed beyond the authorized Operational Modes without prior written authorization from the Commission.

- A. Public Service Electric and Gas Company may at the license issue date proceed directly to Operational Mode 6 (initial fuel loading), and may subsequently proceed to Operational Mode 5 (cold shutdown).
- B. Prior to proceeding to Operational Mode 4 (hot shutdown), Public Service Electric and Gas Company shall test the response times of primary sensors in the reactor coolant system per SUP 20.1. Subsequent to the verification by the Office of Inspection and Enforcement of the acceptable completion of this item, and upon written authorization by the Commission, Public Service Electric and Gas Company may proceed to Operational Mode 4 (hot shutdown).
- C. Prior to proceeding to Operational Mode 3 (hot standby), Public Service Electric and Gas Company shall complete the following items:
  1. Testing operation of RHR pump recirculation valves 11RH29 and 12RH29 per SUP 50.0.
  2. Testing motor winding temperatures of RHR pump motors Nos. 11 and 12 per SUP 12.
  3. Testing the following snubbers per SUP 50.4:
    - RHRH 11-29A
    - RHRH 11-29B
    - RHRH 12-34B
    - RHRH 12-34C
  4. Testing the boron recycle system per SUP 10.5.
  5. Demonstrate beta dosimetry capability.
  6. Testing process radiation monitors, excluding those required for fuel loading, per SUP 21.
  7. Testing service water system per SUP 28.

(Revised September 10, 1976)

8. Testing chilled water portion of the control room air conditioning system per SUP 19.7.
9. Prepare the following radiochemistry procedures:
  - (a) PD 3.3.010 - procedure to determine the average energy of gamma emitting isotopes;
  - (b) PD 3.3.011 - procedure for detecting fission gases by gamma spectroscopy in the presence of other gases;
  - (c) PD 3.3.003 - procedure to determine the dose equivalent Iodine 131 in the primary coolant.
10. Replace the existing standby charcoal filters in the auxiliary building ventilation system with charcoal filters capable of removing 90 percent of the organic iodines.

Subsequent to verification by the Office of Inspection and Enforcement of the acceptable completion of the above listed items, and upon written authorization from the Commission, the Public Service Electric and Gas Company may proceed to Operational Mode 3 (hot standby).

- D. Prior to proceeding to Operational Mode 2 (initial criticality), Public Service Electric and Gas Company shall complete the following items:
  1. Testing high temperature alarm TE463A on pressurizer relief line per SUP 50.6.
  2. Testing control of steam generator blowdown flow by valves GB8 and GB10 per SUP 50.13.
  3. Testing upper motor bearing of reactor coolant pump No. 14 per SUP 50.0.
  4. Testing pump seal of reactor coolant pump No. 11 per SUP 50.0.
  5. Testing RID's Nos. 423B, 431A, 433B and 440B in the reactor coolant system per SUP 50.7.
  6. Testing the following snubbers per SUP 50.4:

(Revised September 10, 1976)

1 - PRA-146	1-PRSN-7	1-PRSN-28	1-PRSN-400
1 - PRA-150	1-PRSN-9	1-PRSN-29	1-PRSN-401
1 - PRA-154	1-PRSN-10	1-PRSN-30	1-PRSN-402
1 - PRA-158	1-PRSN-11	1-PRSN-32A	1-PRSN-405
1 - PRA-162	1-PRSN-12	1-PRSN-32B	1-PRSN-405A
	1-PRSN-13	1-PRSN-33	1-PRSN-406
1-PRSN-1	1-PRSN-16	1-PRSN-34	1-PRSN-406A
1-PRSN-2	1-PRSN-17	1-PRSN-36	
1-PRSN-3	1-PRSN-19	1-PRSN-37	
1-PRSN-3A	1-PRSN-20	1-PRSN-38A	
1-PRSN-4	1-PRSN-23	1-PRSN-38B	
1-PRSN-5	1-PRSN-25	1-PRSN-39	
1-PRSN 5A	1-PRSN-27	1-PRSN-42	

Subsequent to verification by the Office of Inspection and Enforcement of the acceptable completion of the above items, and upon written authorization from the Commission, Public Service Electric and Gas Company may proceed to Operational Mode 2 (initial criticality).

E. Prior to proceeding to Operation Mode 1 (power operation), the following items shall be completed:

1. Reactor Vessel Overpressure Alarm - A reactor vessel overpressure alarm shall be installed in the control room. This alarm shall be operable whenever the system is in cold shutdown or hot shutdown, shall be actuated whenever the system pressure exceeds the technical specification limits, and shall not compromise safety related equipment.
2. Maintenance Procedures - The maintenance procedures delineated in Inspection and Enforcement Report 50-272/76-38 shall be completed.

Subsequent to verification by the Office of Inspection and Enforcement of the acceptable completion of the above items, and upon written authorization by the Commission, Public Service Electric and Gas Company may proceed in its power ascension program to Operational Mode 1, with the power level limited to twenty percent of rated core power.

F. Prior to exceeding the twenty percent power limit, the following items shall be completed.

(Revised December 1, 1976)

1. ECCS Analysis - A reanalysis of the ECCS system in conformance with Appendix K of 10 CFR Part 50 shall be provided as soon as possible. Said reanalysis shall verify that the ECCS performs in accordance with the Commission's ECCS performance criteria by calculating the peak cladding temperature, for the worst case break, with the upper head temperature modeled as the hot leg temperature. The worst case break shall be identified by performing a break spectrum calculation with a minimum of three break sizes.
2. Snubber Tests - The following snubbers shall be tested at a power level between fifteen and twenty percent of rated core power per SUP 50.4:

11-FWSN-12A	12-FWSN-15	14-FWSN-13A
11-FWSN-12B	13-FWSN-15A	14-FWSN-13B
11-FWSN-16	13-FWSN-15B	14-FWSN-15A
12-FWSN-13A	13-FWSN-17A	14-FWSN-15B
12-FWSN-13B	13-FWSN-17B	

The acceptable completion of the above tests will be verified by the Office of Inspection and Enforcement.

Upon written acceptance by the Commission of the ECCS analysis and the snubber tests, Public Service Electric and Gas Company may proceed in its power ascension program to a power level not exceeding forty percent of rated core power.

- G. Prior to exceeding the forty percent power limit, the snubber tests delineated in Item F above shall be repeated at a power level between thirty and forty percent of rated core power. Upon written acceptance by the Commission of the above items, Public Service Electric and Gas Company may proceed in its power ascension program to a power level not exceeding ninety percent of rated core power.
- H. Prior to exceeding the ninety percent power limit, the snubber tests delineated in Item F above shall be repeated at a power level between eighty and ninety percent of rated. Upon written acceptance by the Commission of these tests, Public Service Electric and Gas Company may proceed in its power ascension program to full-power.

Upon attaining full-power, or as soon as possible thereafter, Public Service Electric and Gas Company shall perform a final verification test of these snubbers. The Office of Inspection and Enforcement will review the results of these verification tests, and absent any notification to the contrary, Public Service Electric and Gas Company may sustain full-power operation.

(Revised December 1, 1976)

DEC 1 1976



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

ENVIRONMENTAL ASSESSMENT

DOCKET NO. 50-272

SALEM NUCLEAR GENERATING STATION UNIT 1 FUEL CYCLE CONSIDERATIONS

On July 21, 1976, the United States Court of Appeals for the District of Columbia Circuit decided in Natural Resources Defense Council v. NRC that the NRC's final fuel cycle rule (39 FR 14188) was inadequately supported by the record insofar as it treated two aspects of the fuel cycle -- the impacts from reprocessing of spent fuel and radioactive waste management. The decision generally complimented other aspects of the Commission's survey underlying Table S-3.

In response to the Court decisions, the Commission issued a General Statement of Policy (41 FR 34707, August 16, 1976). In that statement, the Commission announced its intention to reopen rulemaking proceedings on the environmental effects of the fuel cycle to supplement the existing record with regard to reprocessing and waste management, to determine whether the rule should be amended, and if so, in what respect. The Commission directed the staff to prepare a well-documented supplement to WASH-1248 to establish a basis for identifying environmental impacts associated with fuel reprocessing and waste management activities that are attributable to the licensing of a model light water reactor (LWR). The NRC staff issued NUREG-0116, Environmental Survey of the Reprocessing and Waste Management Portions of the LWR Fuel Cycle in October 1976 for this purpose.

On November 5, 1976 the Commission issued a Supplemental General Statement of Policy regarding the licensing of nuclear power plants as related to the analysis of fuel cycle environmental impacts. The Commission concluded that licensing of light water reactors may be resumed on a conditional basis using existing Table S-3 values for reprocessing and waste management, provided the revised values presented in the Commission's notice of proposed rulemaking of October 18, 1976 were also examined to determine the effect on the cost-benefit balance for constructing or operating the plant.

The staff has based this assessment of fuel cycle environmental impacts for Salem Unit 1 on Table S-3 and has also specifically considered the revised values for reprocessing and waste management in its determination of effects on the cost-benefit balance as presented in the FES for Salem.

The natural resource uses identified in Table S-3, i.e., land, water, fossil fuel, and radiological and non-radiological effluents, have been evaluated for the plant fuel cycle activities. The attached Table 1 presents a summary of these potential fuel cycle environmental impacts for Salem Unit 1 based on Table S-3 and compares them, where appropriate, with those environmental impacts directly related to the operation of Salem Unit 1 as identified in the FES of April 1973.

The approximate total annual fuel cycle land use commitment associated with the operation of Salem Unit 1 is 72 acres. This consists of about 53 acres which are temporarily committed and approximately 5 acres which

are permanently committed. The land use commitment for fuel cycle operations over 30 years for Unit No. 1 represents about half the overall land requirement of 4,120 acres for operation of the generating station during its expected 30-year electrical production lifetime. The annual land requirement of 71.9 acres for fuel cycle operation is comparable to that used by a small coal-fired power plant of approximately 100 MWe capacity.

The annual total water usage and thermal output associated with the fuel cycle for Salem Unit 1 are respectively about 12,027 millions of gallons and 2,839 billions of BTU's. The corresponding annual water use and thermal output at Salem Unit 1 assuming a 78% capacity factor are respectively 599,180 millions of gallons and 65,000 billions of BTU's. Thus, the approximate 3% and 5% increases in water use and thermal loading respectively, for fuel cycle operations are low percentages of actual plant values.

Electrical energy is required during various phases of the fuel cycle process. This electrical energy is usually produced by the consumption of fossil fuel at conventional power plants. It is estimated that approximately 350,000 MW-hours of energy will be utilized annually in the fuel cycle for Salem. This represents less than 5% of the annual net electrical output of Salem Unit 1 at a 78% capacity factor. It represents an annual consumption of about 127,450 MT of coal, along with the corresponding gaseous and particulate chemical effluents which are equivalent to those produced by a small 49 MWe coal-fired plant operating for a year.

Liquid chemical effluents produced by the fuel cycle process constitute a potential for adverse environmental impacts but such constituents are present in dilute concentrations and need only a small amount of additional dilution by receiving bodies of water to reach levels below permissible standards. The amount of dilution water needed for various constituents are: ammonia - 654 cfs, nitrate - 22 cfs, and fluoride - 76 cfs. Tailings solutions resulting from the fuel cycle represent an insignificant effluent to the environment.

Solids are produced principally during the milling process in the fuel cycle and are not released in significant quantities to create an impact upon the environment.

Radioactive effluents released to the environment estimated to result from the reprocessing and waste management activities or other phases of the fuel cycle process are set forth in Table 1. It is estimated that the overall gaseous dose commitment to the U. S. population from the fuel cycle for a 1000 MWe reference reactor would be approximately 250 man-rem per year. This is approximately .001% of the average natural background dose of approximately 21,000,000 man-rem<sup>1</sup> to the U. S. population. Based on Table S-3 values the additional dose commitment to the U. S. population from radioactive liquid effluents due to fuel cycle operations would be approximately 260 man-rem per year for a 1000 MWe reference reactor. The fuel cycle dose commitment for Salem Unit 1 would be slightly more than that given for the reference reactor, since it has a net generating capacity of 1090 MWe.

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<sup>1</sup> Based upon a natural background dose rate of 100 mrem/yr.

The overall estimated involuntary dose commitment to the U. S. population from radioactive gaseous and liquid releases due to the fuel cycle is approximately 500 man-rem per reference reactor year. This is higher than the small involuntary dose to the public from operating Salem Unit 1, approximately 15 man-rem. However, the occupational dose from the fuel cycle is comparable to the estimated occupational total dose commitment associated with operation and maintenance of the reactor, some 500 man-rem. The overall effect of such exposure will be extremely small and may not be detectable against natural background radiation exposure levels.

Both high and low level radioactive solid waste produced during fuel cycle operations are to be buried at licensed repositories and are not released to the environment.

In the original fuel cycle rule, the environmental impacts for fuel cycle activities necessary for the support of an LWR were summarized in Table S-3 as shown in 10 CFR 51.20 and presented in the attached Table 2. As indicated, this environmental assessment is based on fuel cycle parameters set forth in Table S-3 as well as modifications to it. Table 2 presents a summary of environmental considerations of the uranium fuel cycle as originally contained in Table S-3 together with the modifications given in the proposed rulemaking notice of October 18, 1976, and presented in NUREG-0116. Principal changes include those in the categories of land use, chemical effluents, iodine releases, Carbon-14 releases, and buried solids.

The following describes the differences between the impacts described in Table S-3 as it was originally promulgated in 10 CFR 50.21 and the

change in certain impacts resulting from the revised assessment of reprocessing and waste management considerations in NUREG-0116. The land commitment reflected in NUREG-0116 is slightly larger than that presented in the original Table S-3. The original estimates were smaller by some 30 acres per reference reactor year in temporarily committed land and about 3 acres per year in permanently committed land for waste disposal. This does not constitute a significant change.

Hydrogen chloride has been included in NUREG-0116 as a gaseous chemical effluent, resulting from incineration of plastics in the waste management systems. The amount is a small fraction of other acid gas effluents from the fuel cycle discussed in both Table S-3 and NUREG-0116. No significant impact is attributable to the change.

There have been increases in NUREG-0116 in the estimated Carbon-14, Iodine and Tritium release rates. However, the principal addition in radioactive gaseous effluents is the dose estimate of 110 man-rem for the release of Carbon-14. These additional releases will add some 150 man-rem to the gaseous U. S. dose commitment of 250 man-rem as determined with Table S-3. The total gaseous and liquid involuntary dose commitment to the U. S. population utilizing revised source term data presented in NUREG-0016 is comparable to the approximate 500 man-rem dose evaluated with Table S-3.

The substitution of a "throw away" cycle would increase the dose commitment accumulated to the year 2000 for the reprocessing and waste management portions of the fuel cycle. This is due principally to increased occupational exposure during fuel storage. These effects amount to some 12,000 man-rem total to the year 2000 and would have

only a small effect on the overall population dose commitment. Furthermore, they may not be detectable against the natural background exposure during this 25 year period of some 2-3 rem for every member of the general public.<sup>2</sup>

There is an increase to the transportation dose commitment presented in Table S-3. The revised transportation dose value of some 2.5 man-rem is based upon refined calculational assumptions and modeling techniques. This dose is not considered significant in comparison to the natural background dose.

There has been an increase in the quantity of buried radioactive waste material (both high level and transuranic). These wastes are placed in the geosphere and are not released to the biosphere and no radiological environmental impact is expected from such disposal. Table S-3 did not include either the disposal of high level or transuranic wastes nor low-level wastes from reactors which were buried.

The fuel cycle effects presented in Table S-3 as discussed above are sufficiently small so that, when they are superimposed upon the other environmental impacts assessed with respect to operation of the reactor, the changes in the overall environmental impact from operation of Salem Unit 1 are not substantial. Taking the impacts into account, the staff has concluded that the overall cost-benefit balance previously developed in the Salem FES remains unaltered and, therefore, on balance, the full power operating license should be granted.

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<sup>2</sup> As a result of increased requirements for new source material due to a "throw away" cycle, estimated releases from mining and milling would be increased. This, in turn, would increase the estimated dose commitment for the total fuel cycle by some 600 man-rem per reference reactor year. Although this is larger than the dose commitment due to other elements of fuel cycle, it is still small compared to the natural background exposure level of some 21,000,000 man-rem per year.

In accordance with the Commission's directive contained in the Supplemental General Statement of Policy, the staff has also assessed as set forth above, the effect of using the revised chemical processing and waste storage values set forth in the Commission's Notice of Proposed Rulemaking of October 18, 1976, on the cost-benefit balance for the Salem facility. These changes, as discussed above, are so small that there is no significant change in impact from that associated with the effects presented in Table S-3 and, accordingly, the use of the revised values would not tilt the cost-benefit balance against issuance of the license.

Table 1

Fuel Cycle Environmental Impacts  
vs.  
Plant Operating Environmental Impacts

Natural Resource Use	Fuel Cycle Impacts per AFR <sup>a</sup> (WASH-1248 Table S-3)	Fuel Cycle Impacts per Year for the Plant <sup>b</sup>	Plant Operating Impacts per Year
<u>Land (Acres)</u>			
Temporarily Committed	63	67	4,115)*
Undisturbed Area	45	48	3,900)*
Disturbed Area	18	19	215)*
Permanently Committed	4.6	4.9	5)*
Overburden Moved (millions of MT)	2.7	2.9	
<u>Water (millions of gal.)</u>			
Discharged to air	156	166	0
Discharged to water bodies	11,040	11,730	599,180
Discharged to ground	123	131	0
Total Water	11,319	12,027	599,180
<u>Fossil Fuel</u>			
Electrical energy (thousand MW-hr.)	317	337	
Equivalent coal (thousand MT)	115	122	
Natural Gas (million scf)	92	98	
<u>Effluents</u>			
<u>Chemical (MT)</u>			
<u>Gases (MT)</u>			
SO <sub>x</sub>	4,400	4,700	10.5
NO <sub>x</sub>	1,177	1,251	15.7
Hydrocarbons	13.5	13.3	
CO	28.7	30.5	
Particulates	1,156	1,229	4.5
<u>Other Gases</u>			
F <sup>-</sup>	0.72	0.77	
HCl	-	-	

\*Over Plant Operating Lifetime

Table 1 (Continued)

Natural Resource Use	Fuel Cycle Impacts per AFR (WASH-1248 Table S-3)	Fuel Cycle Impacts per Year for the Plant	Plant Operating Impacts per Year
<u>Effluents (Cont'd.)</u>			
<u>Liquids</u>			
SO <sub>4</sub> <sup>=</sup>	10.3	10.9	130
NO <sub>3</sub> <sup>-</sup>	26.7	28.4	0.20
Fluoride	12.9	13.7	
Ca <sup>++</sup>	5.4	5.7	11.1
Cl <sup>-</sup>	8.6	9.1	11.3
NA <sup>+</sup>	16.9	18.0	50
NH <sub>3</sub>	11.5	12.2	
Tailings Solutions (thousands)	240	255	
Fe	0.4	0.4	
<u>Solids</u>	91,000	97,000	<80
<u>Radiological (curies)</u>			
<u>Gases (including entrainment)</u>			
Rn-222	74.5	79.2	
Ra-226	0.02	0.02	
Th-230	0.02	0.02	
Uranium	0.032	0.034	
Tritium (thousands)	16.7	17.7	
Kr-85 (thousands)	350	370	0.014
I-129	0.0024	0.0026	
I-131	0.024	0.026	0.21
Fission Products	1.0	1.1	2,800
Transuranics	0.004	0.004	
C-14	-	-	
<u>Liquids</u>			
Uranium & Daughters	2.1	2.2	
Fission & Activation Products	-	-	5
Ra-226	0.0034	0.0036	
Th-230	0.0015	0.0016	
Th-234	0.01	0.01	
Tritium (thousands)	2.5	2.7	1,000
Ru-106	0.15	0.16	1.8E-5

Table 1 (Continued)

Natural Resource Use	Fuel Cycle Impacts per AFR (WASH-1248 Table S-3)	Fuel Cycle Impacts per Year for the Plant	Plant Operating Impacts per Year
<u>Effluents (Cont'd)</u>			
<u>Radiological (curies) (Cont'd)</u>			
<u>Solids (buried onsite)<sup>b</sup></u>			
Other than high level (shallow)	601	639	
TRU & HLW (deep)	-	-	
<u>Thermal (billions of Btu)</u>	3,360	3,570	65,000
<u>Transportation (man-rems)</u>			
Exposure of workers and general public	0.334	0.355	10.6

<sup>a</sup> AFR is an annual fuel requirement which is equivalent to operating a 1000 MWe reactor at 80% of its maximum capacity for one year.

<sup>b</sup> Fuel cycle impacts normalized to 1090 MWe output of Salem Unit No. 1

<sup>c</sup> Not released to the environment.

Table 2

Summary of Environmental Considerations  
For Uranium Fuel Cycle Normalized to  
Model LWR Reference Reactor Year<sup>a</sup>

Natural Resource Use	Total	
	WASH-1248 <sup>b</sup>	NUREG-0116 <sup>c</sup>
<u>Land (Acres)</u>		
Temporarily Committed	63	94
Undisturbed Area	45	73
Disturbed Area	18	22
Permanently Committed	4.6	7.1
Overburden Moved (millions of MT)	2.7	2.8
<u>Water (millions of gal.)</u>		
Discharged to air	156	159
Discharged to water bodies	11,040	11,090
Discharged to ground	123	124
Total Water	11,319	11,373
<u>Fossil Fuel</u>		
Electrical energy (thousand MW-hr.)	317	321
Equivalent coal (thousand MT)	115	117
Natural Gas (million scf)	92	124
<u>Effluents</u>		
<u>Chemical (MT)</u>		
<u>Gases (MT)</u>		
SO <sub>x</sub>	4,400	4,400
NO <sub>x</sub>	1,177	1,190
Hydrocarbons	13.5	14
CO	28.7	29.6
Particulates	1,156	1,154
<u>Other Gases</u>		
F <sup>-</sup>	0.72	0.67
HCl	-	0.14

Table 2 (Continued)

## Natural Resource Use

	Total	
	WASH-1248	NUREG-0116
<u>Effluents (Cont'd.)</u>		
<u>Liquids</u>		
SO <sub>4</sub> <sup>=</sup>	10.3	9.9
NO <sub>3</sub> <sup>-</sup>	26.7	25.8
Fluoride	12.9	12.9
Ca <sup>++</sup>	5.4	5.4
Cl <sup>-</sup>	8.6	8.5
NA <sup>+</sup>	16.9	12.1
NH <sub>3</sub>	11.5	10.0
Tailings Solutions (thousands)	240	240
Fe	0.4	0.4
<u>Solids</u>	91,000	91,000
<u>Radiological (curies)</u>		
<u>Gases (including entrainment)</u>		
Rn-222	74.5	74.5
Ra-226	0.02	0.02
Th-230	0.02	0.02
Uranium	0.032	0.034
Tritium (thousands)	16.7	18.1
Kr-85 (thousands)	350	400
I-129	0.0024	1.3
I-131	0.024	0.83
Fission Products	1.0	0.021
Transuranics	0.004	0.024
C-14	-	24
<u>Liquids</u>		
Uranium & Daughters	2.1	2.1
Fission & Activation Products	-	5.9E-6
Ra-226	0.0034	0.0034
Th-230	0.0015	0.0015
Th-234	0.01	0.01
Tritium (thousands)	2.5	-
Ru-106	0.15	-

Table 2 (Continued)

Natural Resource Use	Total	
	WASH-1248	NUREG-0016
<u>Effluents (Cont'd)</u>		
<u>Radiological curies) (Cont'd)</u>		
<u>Solids (buried onsite)<sup>d</sup></u>		
Other than high level (shallow)	601	5,300
TRU & HLW (deep)	-	1.1E+7
<u>Thermal (billions of Btu)</u>	3,360	3,462
<u>Transportation (man-rems)</u>		
Exposure of workers and general public	0.334	2.46

<sup>a</sup>Reference Reactor Year (RRY) is a 1000 MWe reactor operating at 80% of its maximum capacity for one year. An RRY is equivalent to an Annual Fuel Requirement as used in WASH-1248 dated April 1974.

<sup>b</sup>Table S-3 values.

<sup>c</sup>Revised Table S-3 values.

<sup>d</sup>Not released to the environment.

SOURCES: Environmental Supply of the Reprocessing and Waste Management Portions of the LWR Fuel Cycle, NUREG-0116, October 1976.

Environmental Survey of the Uranium Fuel Cycle, WASH-1248, April 1974.

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-272

PUBLIC SERVICE ELECTRIC AND GAS COMPANY, ET AL.

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

Notice is hereby given that the U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 3 to Facility Operating License No. DPR-70, issued to Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company, and Atlantic City Electric Company for the Salem Nuclear Generating Station, Unit No. 1, located in Salem County, New Jersey. Amendment No. 3 authorizes Public Service Electric and Gas Company to operate the facility at full power. However, the amended license is conditioned to provide a sequential approach to full power which takes into account a series of incomplete construction items, preoperational tests, startup tests and other items, and provides for further Commission approval at various stages of these activities.

In accordance with the Commission's General Statement of Policy (41 F.R. 34707, August 16, 1976), Public Service Electric and Gas Company, et al. was issued Facility Operating License No. DPR-70 on August 13, 1976 authorizing operation of Salem Nuclear Generating Station, Unit No. 1, at a reactor core power level not to exceed 33.38 megawatts thermal (1%) for testing purposes, limited to a cumulative fuel exposure of 300 megawatt days. Subsequently, the Commission issued Supplemental General Statement of Policy (41 F.R. 49898, November 11, 1976) which concluded that full-power licensing of light water reactors may be resumed on a conditional basis

using existing fuel cycle impact values (Table S-3) for reprocessing and waste management, provided the revised values presented in the Commission's notice of proposed rulemaking of October 18, 1976 (41 F.R. 45849) were also examined to determine the effect on the cost-benefit balance for operating the plant. This examination has been performed by the Commission staff and is set forth in the "Environmental Assessment, Salem Nuclear Generating Station, Unit No. 1, Fuel Cycle Considerations." The assessment concludes that use of such revised values would not tilt the cost-benefit balance against issuance of the operating license.

The amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. The Commission has also made appropriate findings which are set forth in the license amendment regarding the environmental impacts associated with operation of the facility. Amendment No. 3 also includes the condition that the license is subject to the outcome of the proceedings in Natural Resources Defense Council v. NRC (D. C. Circuit, July 21, 1976), Nos. 74-1385 and 74-1586.

In addition, Amendment No. 3 includes (1) the requirement for a long-term means of providing overpressure protection, (2) the temporary limitation of power operation to twenty percent of rated core power until the Emergency core Cooling System performance is reevaluated by modeling the upper head temperature as the hot leg temperature, and (3) changes

to the Appendix A Technical Specifications concerning (a) the high efficiency particulate air filters in the auxiliary building exhaust air filtration system and (b) the surveillance requirements for the control room, auxiliary building, and fuel handling air filtration systems. These three items are discussed in the Safety Evaluation dated December 1, 1976. Facility Operating License No. DPR-70 initially contained several conditions relating to environmental matters. Since these conditions are included in the Appendix B Technical Specifications, they have been deleted from the license proper.

Amendment No. 3 is effective as of the date of issuance. Facility Operating License No. DPR-70, as amended, shall expire at midnight, September 25, 2008. This action is in furtherance of the licensing action encompassed in the "Notice of Consideration of Issuance of Facility Operating Licenses and Notice of Opportunity for Hearing," dated October 6, 1972.

For further details with respect to this action, see (1) the application for amendment dated November 8, 1976; (2) Amendment No. 3 to License No. DPR-70; (3) the Commission's related Safety Evaluation, dated December 1, 1976; (4) the "Environmental Assessment, Salem Nuclear Generating Station Unit No. 1, Fuel Cycle Considerations," (5) the report on the Advisory Committee on Reactor Safeguards, dated February 14, 1975; (6) the Office of Nuclear Reactor Regulation's Safety Evaluation Report and Supplements Nos. 1 and 2 thereto, dated October 11, 1974, June 28, 1976 and August 13, 1976 respectively; (7) the Final Safety Analysis Report and amendments thereto; (8) the applicants' Environmental Report dated June 30, 1970 and

supplements thereto; (9) the Draft Environmental Statement dated October 1972; and (10) the Final Environmental Statement dated April 1973. These items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Salem Free Public Library, 112 West Broadway, Salem, New Jersey.

Single copies of items (2), (3), (4), (5), (6) and (10) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Project Management.

Dated at Bethesda, Maryland, this 1st day of December, 1976.

FOR THE NUCLEAR REGULATORY COMMISSION



I. Villalva, Acting Chief  
Light Water Reactors  
Branch No. 2  
Division of Project Management

DEC 1 1976



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

SAFETY EVALUATION BY THE  
OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 3 TO  
FACILITY OPERATING LICENSE DPR-70

PUBLIC SERVICE ELECTRIC AND GAS COMPANY,  
PHILADELPHIA ELECTRIC COMPANY,  
DELMARVA POWER AND LIGHT COMPANY, AND  
ATLANTIC CITY ELECTRIC COMPANY

SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

DOCKET NO. 50-272

INTRODUCTION

This safety evaluation addresses three items amending Facility Operating License No. DPR-70: (1) reactor vessel overpressurization, (2) ECCS criteria, and (3) Appendix A technical specification changes.

Reactor Vessel Overpressurization

By letter dated August 27, 1976, we informed Public Service Electric and Gas Company of our concern regarding reactor vessel overpressurization, and requested information regarding steps being taken to minimize the likelihood of such events. By letters dated September 15, 1976 and October 25, 1976 Public Service Electric and Gas Company informed the Commission of its proposed program to preclude overpressurizing the reactor vessel.

ECCS Criteria

At a meeting on August 9, 1976, Westinghouse reported that the fluid temperature in the upper head region may be higher than assumed in the loss-of-coolant accident analysis for Salem Unit No. 1. Since the design bypass flow pattern is from the downcomer, through the upper head, and into the upper plenum via the control rod guide tubes, the upper head temperature was assumed to be at the cold leg temperature. Recent data, however, have indicated an upward flow into the upper head from the central guide tubes, and a return flow through the peripheral guide tubes. Consequently, the upper head temperature is hotter than the cold leg temperature. A thermocouple reading at Connecticut Yankee (Docket No. 50-213) has confirmed that the upper head is hotter than originally assumed. We will require that this matter be resolved prior to authorizing full power operation.

## Appendix A Technical Specification Changes

By letter dated November 8, 1976, Public Service Electric and Gas Company has proposed certain changes to the Appendix A Technical Specifications for Salem, Unit No. 1. These changes would (1) modify the testing requirements for the auxiliary building exhaust air filtration system, the control room emergency air conditioning system, and the fuel handling area ventilation system; (2) reduce from two to one the number of required high efficiency particulate air filter trains in the auxiliary building exhaust air filtration system.

### DISCUSSION

#### Reactor Vessel Overpressurization

Our letter of August 27, 1976 requested that Public Service Electric and Gas company conduct an analysis of their system design to determine the susceptibility of Salem Unit No. 1 to reactor vessel overpressurization events. The letter provided information and conclusions reached by the staff regarding reactor vessel overpressurization, and identified criteria to be applied in determining the adequacy of protection against pressure transients. Should the results of their analysis show that design modifications are necessary to meet the acceptance criteria, they were advised to include the modifications in their analysis. Pending implementation of the design modifications identified, they were advised that short-term measures should be incorporated to reduce the likelihood of overpressurization events prior to implementing the long-term design modifications. The letter also requested that they notify the staff within 20 days of receipt of the letter as to whether they would provide the information requested within 60 days.

By letter dated September 15, 1976, (the 20 day letter), Public Service Electric and Gas Company indicated that they had joined a Task Group of utilities with Westinghouse designed plants to examine the complexity of the pressure transient events and to identify similarities between Westinghouse plants for determining a consistent solution to the issue. This letter also informed us that they would report the results of the Task Group meetings as applicable to Salem Unit No. 1 at the end of the 60 day period.

By letter dated October 25, 1976, (the 60 day letter), Public Service Electric and Gas Company informed us of the results of meetings held by the Task Group. This letter highlighted the course of action which will be pursued to analyze the pressure transients and stated that the proposed long-term corrective actions would be based on the results of transient analyses. These analyses will include consideration of mass input

induced overpressurization and heat input induced overpressurization. The letter indicates that these transient analyses will be completed within approximately six months, after which time modification to the Salem plant will be initiated. This letter also addresses interim measures which have been taken to preclude overpressurization events. These measures include the modification of operating instructions I-3.6, Hot Standby to Cold Shutdown and II-1.3.4, Filling and Venting. These modifications are intended to reduce the time that the system is operated in a water solid condition. This letter also states that compliance with Appendix G to 10 CFR Part 50 will be verified by temperature and pressure recorders in the control room. The hot and cold leg temperatures on each of the four loops will be monitored in the control room by four temperature recorders while starting up, shutting down or during periods of cold shutdown. The hot leg pressure will be monitored in the control room by a pressure recorder and two pressure indicators during all modes of operation.

#### ECCS Criteria

On August 9, 1976, Westinghouse informed the staff that (1) the fluid temperature in the upper head region of the reactor vessel may be higher than assumed in the loss-of-coolant accident analysis for Salem Unit No. 1, and (2) results of analysis using the upper head temperature modeled as the hot leg temperature, rather than as the cold leg temperature, increased the peak cladding temperature by 80 degrees Fahrenheit in a 4-loop, 17 x 17 plant operating at full power. Since the fluid temperature in the upper head region of the reactor vessel may be higher than assumed for Salem Unit No. 1, we will require new calculations pursuant to Appendix K of 10 CFR Part 50 to verify that the criteria of Section 50.46 of 10 CFR Part 50 are not exceeded prior to authorizing full-power operation.

#### Appendix A Technical Specification Changes

By letter dated November 8, 1976, the licensee has proposed two basic changes to the Appendix A Technical Specification. One change would reduce the number of high efficiency particulate air filter banks required in the auxiliary building air exhaust system from two to one. The other change would delete the phrase "in accordance with ANSI N510-1975" from the surveillance requirements for the control room, auxiliary building, and fuel handling ventilation systems.

The design of the auxiliary building exhaust air filtration system ensures that radioactive materials that might possibly leak from the emergency core cooling equipment subsequent to a highly unlikely but postulated loss-of-coolant accident are effectively filtered prior to

being exhausted to the atmosphere. The present design includes two banks of high efficiency particulate air filters for particulate removal, but only one bank of charcoal filter trays for radioiodine removal. The licensee therefore proposes that we consider only one bank of high efficiency particulate air filters in the Appendix A Technical Specification, as is the case for single bank filter systems.

The air filtration systems for the control room, auxiliary building, and fuel handling area were designed, reviewed and approved by the Commission, purchased and installed prior to the issuance of ANSI N510-1975; therefore, the licensee has proposed to delete the phrase "in accordance with ANSI N510-1975" as surveillance requirements for these systems. The licensee will, however, include ANSI N510-1975 as a procedural guideline document in the bases sections of the Appendix A Technical Specification for these systems.

#### EVALUATION

##### Reactor Vessel Overpressurization

A comprehensive evaluation of the generic matter of reactor vessel overpressurization is contained in a report prepared by an NRR Task Group entitled, "Technical Report on Reactor Vessel Pressure Transients" dated November 1, 1976. This report evaluated overpressurization events which exceeded the pressure-temperature limits of the Appendix A Technical Specifications. Each event was initiated by either an operator error or equipment malfunction. Two of the conclusions in this report are that (1) no event resulted in any release of radioactivity, and (2) all the pressure transients were such that fracture mechanics and fatigue calculations indicate that the reactor vessels were not damaged and that continued operation of these vessels was acceptable. This report also concludes that because of the very large safety margins to failure for unirradiated reactor vessels, new plants can be permitted to be licensed under existing safety criteria, but that administrative procedures and overpressure protection devices should be upgraded in an appropriate time frame to reduce the likelihood of future pressure transient events for new plants.

By letter dated October 25, 1976, Public Service Electric and Gas Company has described certain interim measures which have been taken to reduce the likelihood of reactor vessel overpressurization. We have reviewed these measures, which include modifying operating instructions to reduce the time that the system is in a water solid condition, and informing operators of the potential of overpressurization transients when the plant is in a water solid condition. This letter also describes the pressure and

temperature recorders which are in the control room to verify that the limits of Appendix G to 10 CFR Part 50 are not exceeded. Based on our review of these interim measures, which are basically administrative, we have determined that although they are responsive to some of the interim measures delineated in our letter of August 27, 1976, they are lacking with regard to certain considerations, such as alarms and the disabling of injection pumps. For example, the method used for measuring and recording system pressures and temperatures does not provide sufficient assurance that overpressurization events will be detected on a timely basis. To ensure the timely detection of overpressurization events, we will require that the interim measures be augmented to include the installation of an acceptable over-pressure alarm in the control room. We will require this alarm to (1) be operable whenever the system is in cold shutdown (Mode 5) or hot shutdown (Mode 4); (2) be actuated whenever the system pressure exceeds the technical specification limits; (3) not compromise any safety related instrumentation; and (4) be installed prior to authorizing Mode 1 operation. Other measures are currently under staff consideration. The staff will call upon Public Service Electric and Gas Company to comply with any additional measures the staff deems appropriate as a result of the generic review of this matter.

The October 25 letter also reported on the progress to date regarding the long-term modifications and described the analyses required to determine the most appropriate course of action. Analyses yet to be performed include transient analysis of mass input induced overpressurization and heat input induced overpressurization events. Public Service Electric and Gas Company estimates that these analyses will be completed in approximately six months, at which time they will determine the most appropriate measures to be taken for the long-term modifications. Based on our review, we have determined that this matter is being resolved in a manner that is consistent with the conclusions contained in the aforementioned report entitled, "Transient Report on Reactor Vessel Pressure Transients" and that this matter will be resolved in accordance with Commission requirements.

We will review the results of the analyses and the proposed long-term modifications, when submitted, and will require that approved long-term modifications be implemented during or prior to the first refueling outage.

#### ECCS Criteria

We have evaluated the combined effect of reduced power operation and the allowable peaking factor on the peak linear heat generation rate for Salem Unit No. 1. The peaking factor allowed by the technical specification

for power levels above fifty percent of rated core power is inversely proportional to the ratio of generated thermal power to rated thermal power. This inverse relationship limits the peak linear heat generation rate to the value assumed in the ECCS analysis and permits the plant to be operated at identical peak linear heat generation rates at power levels above fifty percent of rated. However, at power levels below fifty percent, the allowable peaking factor is constant. This constant peaking factor reduces the peak linear heat generation rate in direct proportion to the reduction in power below fifty percent power. The use of an incorrect value for upper head temperature in the previously submitted evaluation can affect the calculated peak clad temperature at high power operation. For lower power operation, the effect of a higher upper head temperature would not be sufficient to significantly affect the results of the ECCS performance evaluation. At twenty percent of rated core power the peak linear heat generation rate would be sixty percent lower than that at fifty percent.

We have evaluated the effect of such a reduction and have concluded that operation at twenty percent of rated core power would assure conformance with the Commission's ECCS criteria. At this power level the uncertainties associated with the effects of a higher than anticipated temperature at the upper head region would be completely offset. We will limit power operation to twenty percent of rated until loss-of-coolant accident analyses which fully account for the effect of higher upper head temperatures are performed for Salem Unit No. 1. Operation at full power will not be authorized until we have reviewed and approved these calculations.

#### Appendix A Technical Specification Changes

We have reviewed the two basic changes to the Appendix A Technical Specification proposed by the licensee. One change would reduce the number of required high efficiency particulate air filters in the auxiliary building exhaust air filtration system from two to one. Although the design of this system includes two banks of high efficiency particulate air filters, it only includes one bank of charcoal filters; therefore, the licensee has proposed that we consider this system as having only one high efficiency particulate air filter in the Appendix A Technical Specification.

During the course of preoperational testing, one bank of high efficiency particulate air (HEPA) filters did not satisfy all requirements to enable specific credit to be given to its performance. While this system will remain in place and will be available to backup the other HEPA bank, no credit is accorded to this capability. Consequently, the system must be treated as a single bank system and more stringent

limitations are needed in the event that the satisfactory HEPA filter is inoperable. Public Service Electric and Gas Company proposed more restrictive specifications for this system requiring the reactor to be shutdown in the event that the required HEPA filter is inoperable. This is similar to requirements for the other single bank components in the system. We find the proposed change, deleting requirements for one bank of HEPA filters and increasing the requirements for operability of the other system, to be acceptable.

The other basic change would delete the phrase "in accordance with ANSI N510-1975" from the surveillance requirements for the control room, auxiliary building, and fuel handling air filtration systems. These systems were designed, reviewed and approved by the Commission, purchased and installed prior to issuance of ANSI N510-1975. We have determined that testing of these systems in strict accordance with ANSI N510-1975 is therefore not possible without major changes to the filter systems. Nevertheless, we have determined that the licensee will meet the intent of ANSI N510-1975 by including ANSI N510-1975 as a procedural guideline requirement in the bases sections of the Technical Specification for these systems. In addition, since the proposed changes are in accordance with Appendix A Technical Specifications, currently being issued, we find that the proposed change is acceptable.

#### CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

SEP 29 1976

Docket No. 50-272

Public Service Electric & Gas Company  
ATTN: Mr. F. P. Librizzi  
General Manager - Electric  
Production  
Production Department  
80 Park Place, Room 7221  
Newark, New Jersey 07101

Gentlemen:

ISSUANCE OF AMENDMENT NO. 2 TO FACILITY OPERATING LICENSE NO. DPR-70  
FOR SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

In response to your request of September 20, 1976, the Commission has issued the enclosed Amendment No. 2 to Facility Operating License No. DPR-70. This amendment consists of changes to certain pages of the Technical Specifications, Appendix A to License No. DPR-70, copies of which are also enclosed.

Amendment No. 2 to Facility Operating License No. DPR-70 has been issued to correct typographical errors and inadvertent omissions. The staff has concluded that the changes are editorial corrections which resolve conflicting requirements involving the containment atmosphere radiation monitoring system. We have, therefore, concluded that the changes (1) do not increase the probability or consequences of accidents previously considered; (2) do not involve a decrease in safety margin nor do they involve new hazards considerations; and (3) that there is reasonable assurance that the changes will not endanger the health and safety of the public.

A copy of the Federal Register notice is also enclosed.

Sincerely,

Original signed by R. C. DeYoung

*for* Roger S. Boyd, Director  
Division of Project Management  
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Amendment No. 2 to License No. DPR-70
- 2. Federal Register Notice

DPM:LWR #24.1  
IVillalva:mt  
9/24/76

JMcBough  
9/24/76

OFFICE >		DPM:LWR #24.1	ELD	DPM:AD/LWR	DPM
SURNAME >	See page 2	KKniel	Browne	DBVassallo	RSE Boyd
DATE >		9/24/76	9/28/76	9/28/76	9/29/76

SEP 29 1976

cc: Fred Broadfoot, Esq.  
Public Service Electric & Gas Company  
80 Park Place  
Newark, New Jersey 07101

Joseph B. Knotts, Jr., Esq.  
Conner & Knotts  
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1747 Pennsylvania Avenue, N. W.  
Washington, D. C. 20006

Philadelphia Electric Company  
2301 Market Street  
Philadelphia, Pennsylvania 19105

Delmarva Power & Light Company  
800 King Street  
Wilmington, Delaware 19899

Atlantic City Electric Company  
1600 Pacific Avenue  
Atlantic City, New Jersey 08401

State House Annex  
ATTN: Deputy Attorney General  
State of New Jersey  
36 West State Street  
Trenton, New Jersey 08625

Department of Natural Resources  
and Environmental Control  
ATTN: Director, Division of  
Environmental Control  
Tatnall Building  
Dover, Delaware 19901

Governor's Office of State Planning  
and Development  
ATTN: Coordinator, Pennsylvania  
State Clearinghouse  
P. O. Box 1323  
Harrisburg, Pennsylvania 17120  
(w/o enclosures)

Department of Environmental Resources  
ATTN: Director, Office of  
Radiological Health  
P. O. Box 2063  
Harrisburg, Pennsylvania 17105  
(w/2 enclosures)

Honorable David A. Fogg  
Mayor, Lower Alloways Creek Township  
Salem County, New Jersey 08079

Dr. Neill Thomasson (AW-459)  
Chief, Energy Systems Analysis Branch  
Office of Radiation Programs  
U. S. Environmental Protection Agency  
401 M. Street, S. W.  
Washington, D. C. 20460

Mr. Paul A. Giardina  
Regional Radiation Representative  
U. S. Environmental Protection Agency  
26 Federal Plaza  
New York, New York 10007

Mr. Bruce Blanchard  
Environmental Projects Review  
U. S. Department of the Interior  
Room 5321  
18th and C Streets, N. W.  
Washington, D. C. 20240

Mr. Sheldon Meyers  
ATTN: Mr. Jack Anderson  
Office of Federal Activities  
U. S. Environmental Protection Agency  
Room W-541, Waterside Mall  
401 M Street, S. W.  
Washington, D. C. 20460

Colonel Howard Sargent  
Executive Director of Civil Works  
Office of the Chief of Engineers  
Corps of Engineers  
Department of the Army  
Forrestal Building, Room G060  
10th and Independence  
Washington, D. C. 20314

DISTRIBUTION FOR FACILITY OPERATING LICENSE NO. DPR-70-AMENDMENT NO. 2  
DATED **SEP 29 1976**

Docket File  
NRC PDR  
Local PDR  
LWR #2 File  
Attorney, ELD  
R. C. DeYoung  
K. Kniel  
Project Manager  
J. Lee  
F. J. Williams  
H. Smith  
B. Scott, PM  
IE (5)  
N. Dube, MIPC  
M. Jinks, OA (w/4 enclosures)  
W. Miller, ADM  
ACRS (16)  
H. Denton, DSE  
V. A. Moore, DSE  
R. H. Vollmer, DSE  
M. L. Ernst, DSE  
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D. Eisenhut, OR  
J. R. Buchanan, NSIC  
Thomas B. Abernathy, TIC  
A. Rosenthal, ASLAB  
N. H. Goodrich, ASLBP  
D. B. Vassallo

PUBLIC SERVICE ELECTRIC AND GAS COMPANY  
PHILADELPHIA ELECTRIC COMPANY  
DELMARVA POWER AND LIGHT COMPANY  
ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-272

SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

AMENDMENT TO  
FACILITY OPERATING LICENSE - LIMITED OPERATION FOR TESTING

Amendment No. 2  
License No. DPR-70

1. The Nuclear Regulatory Commission (the Commission) has found that:

- A. The application for amendment by Public Service Electric and Gas Company, on behalf of itself, Philadelphia Electric Company, Delmarva Power and Light Company and Atlantic City Electric Company, (the licensees) dated September 20, 1976, 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, the license is amended by a change to the Technical Specifications as indicated in the attachment to this license amendment. In addition, Paragraph 2.C(2) of Facility Operating

License No. DPR-70 is hereby amended to read as follows:

OFFICE >					
SURNAME >					
DATE >					

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised, are hereby incorporated in this license. Public Service Electric and Gas Company shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by R. C. DeYoung

*for* Roger S. Boyd, Director  
Division of Project Management  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical Specifications,  
Appendix A (Pages 3/4 3-18, 3/4 3-25  
and 3/4 3-35)

Date of Issuance: SEP 29 1976

OFFICE →	DPM:LWR #2 <i>2.0</i>	OR <i>OR</i>	DPM:LWR #2 <i>2</i>	ELD <i>ELD</i>	DPM:AD/LWR	DPM
SURNAME →	IVillalva:mt	JMcGough	KKniel	<i>BROWN</i>	DBVassallo	RSBoyd
DATE →	9/21/76	9/29/76	9/24/76	9/28/76	9/28/76	9/29/76



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

PUBLIC SERVICE ELECTRIC AND GAS COMPANY  
PHILADELPHIA ELECTRIC COMPANY  
DELMARVA POWER AND LIGHT COMPANY  
ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-272

SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

AMENDMENT TO  
FACILITY OPERATING LICENSE - LIMITED OPERATION FOR TESTING

Amendment No. 2  
License No. DPR-70

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Public Service Electric and Gas Company, on behalf of itself, Philadelphia Electric Company, Delmarva Power and Light Company and Atlantic City Electric Company, (the licensees) dated September 20, 1976, 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, the license is amended by a change to the Technical Specifications as indicated in the attachment to this license amendment. In addition, Paragraph 2.C(2) of Facility Operating License No. DPR-70 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised, are hereby incorporated in this license. Public Service Electric and Gas Company shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION



Roger S. Boyd, Director  
Division of Project Management  
Office of Nuclear Reactor Regulation

Attachment:

Changes to the Technical Specifications,  
Appendix A (Pages 3/4 3-18, 3/4 3-25  
and 3/4 3-36)

Date of Issuance: SEP 29 1976

ATTACHMENT TO LICENSE AMENDMENT NO. 2

FACILITY OPERATING LICENSE NO. DPR-70

DOCKET NO. 50-272

**SEP 29 1976**

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

Pages

3/4 3-18

3/4 3-25

3/4 3-36

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

SALEM - UNIT 1

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Amendment No. 2

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
b. Phase "B" Isolation					
1) Manual	2 sets of 2	1 set of 2	2 sets of 2	1, 2, 3, 4	18
2) Automatic Actuation Logic	2	1	2	1, 2, 3, 4	13
3) Containment Pressure--High-High	4	2	3	1, 2, 3	16
c. Purge and Exhaust Isolation					
1) Manual	2	1	2	1, 2, 3, 4	17
2) Containment Atmosphere Radioactivity-High	3	1	2**	1, 2, 3, 4	17
4. STEAM LINE ISOLATION					
a. Manual	1/steam line	1/steam line	1/operating steam line	1, 2, 3	18
b. Automatic Actuation Logic	2	1	2	1, 2, 3	13
c. Containment Pressure--High-High	4	2	3	1, 2, 3	16

\*\*All three (3) channels may be removed from service and used for monitoring plant stack effluent rather than for monitoring containment atmosphere for up to 8 hours per 24 hour interval while either purging the containment atmosphere or venting a gas decay tank.

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
5. TURBINE TRIP AND FEEDWATER ISOLATION		
a. Steam Generator Water Level-- High-High	$\leq$ 67% of narrow range instrument span each steam generator	$\leq$ 68% of narrow range instrument span each steam generator
6. UNDERVOLTAGE, VITAL BUS	$\geq$ 70% of bus voltage	$\geq$ 65% of bus voltage

TABLE 3.3-6

RADIATION MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ALARM/TRIP SETPOINT</u>	<u>MEASUREMENT RANGE</u>	<u>ACTION</u>
1. AREA MONITORS					
a. Fuel Storage Pool Area	1	*	$\leq 15$ mR/hr	$10^{-1} - 10^4$ mR/hr	19
2. PROCESS MONITORS					
a. Containment					
1) Gaseous Activity	1#				
a) Purge & Pressure- Vacuum Relief Isolation		1, 2, 3, 4 & 6	$\leq 2$ x background	$10^1 - 10^6$ cpm	22
b) RCS Leakage Detection		1, 2, 3 & 4	N/A	$10^1 - 10^6$ cpm	20
2) Air Particulate Activity	1#				
a) Purge & Pressure- Vacuum Relief Isolation		1, 2, 3, 4 & 6	$\leq 2$ x background	$10^1 - 10^6$ cpm	22
b) RCS Leakage Detection		1, 2, 3 & 4	N/A	$10^1 - 10^6$ cpm	20
3) Fixed Filter Iodine- Purge & Pressure - Vacuum Relief Isolation	1#	1, 2, 3, 4 & 6	$\leq 2$ x background	$10^1 - 10^6$ cpm	22

\* With fuel in the storage pool or building.

# Channel may be removed from service and used for monitoring plant stack effluent rather than for monitoring containment atmosphere for up to 8 hours per 24 hour interval while either purging the containment atmosphere or venting a gas decay tank.

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-272

PUBLIC SERVICE ELECTRIC AND GAS COMPANY, ET AL

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

Notice is hereby given that the U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 2 to Facility Operating License No. DPR-70, issued to Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company, and Atlantic City Electric Company which revised the Technical Specifications to Facility Operating License No. DPR-70 for Salem Nuclear Generating Station, Unit No. 1, located in Salem County, New Jersey. The amendment is effective as of its date of issuance.

The amendment changes certain Technical Specifications (Appendix A to License No. DPR-70) by correcting typographical errors and including inadvertent omissions to resolve conflicting operating requirements.

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of this amendment is not required since the amendment does not involve a significant hazards consideration.

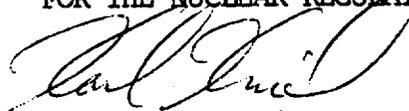
The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR Section 51.5(d)(4) an environmental statement, negative declaration or environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

For further details with respect to this action, see (1) the application for amendment dated September 20, 1976, and (2) Amendment No. 2 to License No. DPR-70. Both of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Salem Free Public Library, 112 West Broadway, Salem, New Jersey.

A copy of item (2) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Project Management.

Dated at Bethesda, Maryland, this 29th day of September, 1976.

FOR THE NUCLEAR REGULATORY COMMISSION



Karl Kniel, Chief  
Light Water Reactors  
Branch No. 2  
Division of Project Management