

Docket
File

DECEMBER 13 1979

Docket No. 50-272

REGULATORY DOCKET FILE COPY

Mr. F. P. Librizzi, General Manager
Electric Production
Public Service Electric and Gas Company
80 Park Place, Room 7221
Newark, New Jersey 07101

Dear Mr. Librizzi:

The Commission has issued the enclosed Amendment No. *23* to Facility Operating License No. DPR-70 for the Salem Nuclear Generating Station, Unit No. 1. This amendment consists of changes to the Technical Specifications in response to your request dated December 21, 1977 as supplemented on May 9, 1979.

The amendment changes the non-radiological Environmental Technical Specifications, Appendix B to the license by (1) making administrative changes to clarify and improve the Technical Specifications, (2) removing the condenser T and suspended solid limits, (3) changing certain sampling and monitoring requirements and, (4) deleting some special studies that will be evaluated as part of the 316b demonstration. During our review of your proposed amendments, we found that certain modifications were necessary to meet our requirements. Your staff has agreed to these modifications and they have been incorporated in these amendments.

Copies of the Environmental Impact Appraisal and the Notice of Issuance/Negative Declaration are also enclosed.

Sincerely,

Original Signed By *AS* 12-13-79

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

- Enclosures:
1. Amendment No. *23* to DPR-70
 2. Environmental Impact Appraisal
 3. Notice of Issuance/Negative Declaration

cc: w/enclosures
See next page

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

December 13, 1979

Docket No. 50-272

Mr. F. P. Librizzi, General Manager
Electric Production
Public Service Electric and Gas Company
80 Park Place, Room 7221
Newark, New Jersey 07101

Dear Mr. Librizzi:

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Copies of the Environmental Impact Appraisal and the Notice of Issuance/Negative Declaration are also enclosed.

Sincerely,

A handwritten signature in cursive script, appearing to read "A. Schwencer".

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Enclosures:

1. Amendment No. 23 to DPR-70
2. Environmental Impact Appraisal
3. Notice of Issuance/Negative Declaration

cc: w/enclosures
See next page

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Public Service Electric and Gas Company - 2 - December 13, 1979

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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

Amendment No. 23
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, Philadelphia Electric Company, Delmarva Power and Light Company and Atlantic City Electric Company (the licensees) dated December 21, 1977 as supplemented May 9, 1979, 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 changes to the Technical Specifications as indicated in the attachment to this license amendment, and 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 through Amendment No. 23, are hereby incorporated in the license. The licensee 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



A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 13, 1979

ATTACHMENT TO LICENSE AMENDMENT NO. 23

FACILITY OPERATING LICENSE NO. DPR-70

DOCKET NO. 50-272

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Remove Pages

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ENVIRONMENTAL TECHNICAL SPECIFICATIONS

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ENVIRONMENTAL TECHNICAL SPECIFICATIONS

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1.0 DEFINITIONS, ABBREVIATIONS AND NOTES

1.1 DEFINITIONS

1. AMBIENT TEMPERATURE

Temperature of the river unaffected by localized waste heat discharge; temperature of the river outside the designated mixing zone.

2. AMPEROMETRIC TITRATION

Specific adaptation of polarographic principles which are used to measure the total residual chlorine or to differentiate between the free available and combined chlorine.

3. CALIBRATION

Use of a known quantity of a measured parameter to determine the accuracy of the measuring instrument.

4. CHLORINE DEMAND

The amount of chlorine required to oxidize substances in the water which reduce free available chlorine.

5. COMBINED CHLORINE RESIDUAL

Residual consisting of mono-, di-, and trichloramines.

6. CONDENSER

Shall include the three condenser shells utilized in the Circulating Water System for each unit.

7. CONDENSER OUTLET TEMPERATURE

The average condenser outlet circulating water temperature of those condenser sections in service measured as per DISCHARGE TEMPERATURE.

8. CONDENSER SHELL

A single heat exchanger in the Circulating Water System which includes two inlet and outlet water boxes and two tube bundles.

9. CONTROL STATION

Sample location that is far enough away from the station that it will not be affected by radiological emissions or other station releases.

21. NORMAL OPERATION

Steady state operation at any power level; includes operation with up to 10% of condenser tubes blocked.

22. REPORT LEVEL

The numerical level of an environmental parameter below which the environmental impact is considered reasonable based on available information.

23. SPECIAL STUDY PROGRAMS

Environmental study programs designed to evaluate the impact of station operation on an environmental parameter.

24. TOTAL AVAILABLE CHLORINE RESIDUAL

Sum of free available and combined chlorine residuals.

2.0 LIMITING CONDITIONS FOR OPERATION

2.1 THERMAL

2.1.1 Thermal Characteristics of Cooling Water Discharge

Objective

To limit thermal stress to the aquatic ecosystem by limiting the maximum ΔT across the condenser and the maximum discharge temperature.

Specification

The results of the monitoring required by the NPDES shall be summarized, analyzed, interpreted, and reported in accordance with Subsection 5.6.1.1 of these ETS.

A nonroutine report, as specified in Subsection 5.6.2.b, shall be made if thermal characteristics of the discharge fail to comply with the relevant effluent limitations prescribed by the State of New Jersey and the U.S. Environmental Protection Agency in the certificates and permits issued to the licensee pursuant to the provisions of Sections 401 and 402 of P.L. 92-500.

Monitoring Requirement

During operation of the station, temperatures of the ambient intake water and the discharge from the cooling system to the river shall be measured as described in NPDES Permit No. NJ0005622.

Bases

The purpose of these monitoring and reporting requirements is to assure that the thermal characteristics of cooling water discharge from the Salem Nuclear Generating Station into the waters of the Delaware River are environmentally acceptable.

The FES-OL for Salem Nuclear Generating Station and subsequent Environmental Impact Appraisals (EIA) provide the analysis of potential thermal effects of the condenser cooling system discharge on the water quality and aquatic biota of the receiving water.

The licensee has demonstrated that the controlled discharge of selected amounts of heated water directly to the Delaware River at Hancock Bridge under certain conditions of ambient river flow and temperature has resulted in no measurable adverse impact on the water quality and biotic communities of that ecosystem. The NRC staff reviewed the licensee's 316(a) Demonstration and the annual reports and has concluded that the impact during station operation is not significant (Environmental Impact Appraisal dated September 12, 1979). The limits set by the NPDES Permit are those evaluated in the September 12, 1979 EIA and were found to not result in significant damage to the biota or water quality of the discharge water. Occasional temperature excursions of brief duration similarly are not expected to exert significant biological effects on Delaware River populations.

The above monitoring program will assure that the station is operating according to the requirements of the NPDES permit with respect to ΔT and maximum discharge temperature.

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2.1-4

Amendment No. 23

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Monitoring Requirement

Discharge temperature shall be monitored every 15 minutes during power reductions at a rate of greater than 25% of full power per hour utilizing the average of the computer printout of the discharge temperature measured at a point downstream of the condenser in each of the two 84-inch ID discharge lines from each condenser shell. Instrumentation accuracy is $\pm 0.5^{\circ}\text{F}$ between the range of 32°F and 150°F .

If the plant computer is out of service, the discharge temperature shall be monitored every two hours utilizing local reading instrumentation until the plant computer is returned to service.

Bases

All organisms have lower lethal temperatures. In temperature latitudes, such lethal temperatures are generally reached only when the ambient water temperature approaches freezing. The phenomenon of "cold shock" has been found to be most severe during the period of low ambient water temperatures ($<40^{\circ}\text{F}$). The likelihood of reaching lower lethal temperatures can be minimized by maintaining a heated discharge during the period when ambient temperatures are $<40^{\circ}\text{F}$. The potential for cold shock and its effects will be minimized since the thermal effluent from one unit will compensate for possible shutdown of the other unit.

Normal plant power reduction rate is less than 25% of full power per hour. Hourly discharge temperature monitoring for normal power reductions is adequate in view of the potentially long periods involved.

2.2 CHEMICAL

2.2.1 BIOCIDES

Objective

To insure that the chlorine residual released from the Circulating Water and Service Water Systems is controlled and will not have an adverse effect on the natural aquatic environment of the receiving waters.

Specification

1. The concentration of free available chlorine produced by chlorinating the Circulating Water System and Service Water System shall not be greater than 1.0 mg/liter at the circulating water discharge standpipe. If this specification is exceeded, the chlorine addition rate shall be reduced as necessary to operate within the specification
2. Circulating Water and Service Water pump intakes shall not be chlorinated more than 3 times per day. Chlorination periods shall not exceed 30 minutes. Chlorination of more than 3 Circulating Water pump intakes at one time shall not be permitted.

Monitoring Requirement

One circulating water discharge associated with Unit 1 and one circulating water discharge associated with Unit 2 shall be continuously monitored for free available chlorine residual during treatment at the circulating water discharge standpipe. The continuous monitoring (during treatment) shall be performed using a free chlorine residual analyzer equipped with a strip chart recorder.

The chlorine monitors shall be calibrated once per month when the chlorination system is in service with an amperometric titrator using ASTM Methods D-1253 and D-1427.*

If the chlorine monitors are inoperable, free available chlorine residual shall be determined by manual analysis of a grab sample taken at the same location during the chlorination cycle.

Bases

The Water Quality Certificate issued by the Delaware River Basin Commission for Salem Nuclear Generating Station limits the free chlorine residual in circulating water discharged from the plant to maximum of 0.1 mg/liter. This also conforms to EPA-NPDES requirements of 0.2 to 0.5 mg/liter.

Intermittent treatment of cooling circuits in fresh and brackish water environments with a biocide (chlorine, sodium hypochlorite) is a reliable method for maintaining these circuits free from fouling.

It has been determined from past experience that treatment with chlorine at a concentration of 0.1 mg/liter free available chlorine residual in the circulating water discharge to the receiving stream for 30 minutes three times a day is usually sufficient for maintaining system cleanliness although higher

*For a discussion of precision and accuracy obtainable through amperometric titration, see Standard Methods, 14th edition, pp. 310-313.

concentrations in the heat exchangers themselves may be needed periodically. However, the free chlorine residual discharged to the river will be maintained at 0.1 mg/liter or less.

The circulating water will be chlorinated by controlled injection of sodium hypochlorite into the intake water to the condensers. Three of the twelve intakes are chlorinated at a time as a group. The period of chlorination will be no greater than 30 minutes and will be done 3 times per day.

Three of the twelve intakes are chlorinated as a group. The free chlorine residual of simultaneous samples recently taken from condenser tailpipes 11A, 12A, 13A and condenser tailpipes 11B, 12B and 13B showed slight but nominal differences among the three outlet condensers, on the same order as instrument accuracy. Therefore, for the purpose of maintaining 0.1 mg/l free available chlorine residual or less at the circulating water discharge it will be adequate to monitor only one of the three discharges from each unit.

The service water system will be chlorinated at a frequency not to exceed 3 times a day for periods of not greater than 30 minutes, and not at the same time as the Circulating Water System. The concentration of free available chlorine residual at the circulating water discharge to the river will be less than 0.1 mg/liter.

2.2.2 SUSPENDED SOLIDS

Objective

To insure that suspended solids released from Non-Radioactive Chemical Waste Disposal System are controlled and will not have an adverse effect on the natural aquatic environment of the receiving waters.

Specification

The licensee shall furnish the NRC with results of monitoring programs required by NPDES Permit No. NJ0005622 for total suspended solids in accordance with Section 5.6.1.1 of these ETS.

A nonroutine report, as specified in Section 5.6.2.1 shall be made if the concentration of total suspended solids exceeds the limits prescribed by the State of New Jersey and the U.S. Environmental Protection Agency in the certificates and permits issued to the licensee pursuant to the provisions of Section 401 and 402 of P.L. 92-500.

Monitoring Requirement

The licensee shall conduct monitoring for total suspended solids as described by NPDES Permit No. NJ0005622.

Bases

The purpose of these monitoring and reporting requirements is to assure that the chemical characteristics of cooling water discharge from the Salem Nuclear Generating Station into the waters of the Delaware River are environmentally acceptable.

The FES-OL for Salem Nuclear Generating Station and subsequent Environmental Impact Appraisals (EIA) provide the analysis of potential effects of total suspended solids discharge on the water quality and aquatic biota of the receiving water.

The licensee has demonstrated that the controlled discharge of total suspended solids to the Delaware River at Hancock Bridge has resulted in no measurable adverse impact on the water quality and biotic communities of that ecosystem. The NRC staff reviewed the Annual Environmental Monitoring Reports demonstrating this and has concluded that the impact during station operation was insignificant (Environmental Impact Appraisal dated September 12, 1979). The limits set by the NPDES Permit were evaluated in the September 12, 1979 EIA and were found to not result in significant damage to the biota or water quality of the discharge water. Occasional discharges of brief duration outside of these limits similarly are not expected to exert significant biological effects on Delaware River populations.

The above specification will assure that the station is operating according to the requirements of the NPDES Permit.

2.2.3 pH

Objective

To insure that the pH of the effluent released from the Non-Radioactive Chemical Waste Disposal System is controlled and will not have an adverse effect on the natural aquatic environment of the receiving waters.

Specification

The pH of the Non-Radioactive Chemical Liquid Waste Disposal system effluent shall be within the range of 6.0 to 9.0 pH units after mixing with the circulating water discharge stream. If this specification is exceeded, the discharge shall be terminated until the pH is corrected to within specification.

Monitoring Requirement

The pH of all in-service circulating water discharges shall be grab sampled twice weekly during a discharge from the nonradioactive liquid waste basin and measured for pH using a pH probe with an accuracy of +2%.

pH measurements from the circulating water discharges receiving NRW basin wastes will be compared with those from discharges not receiving NRW basin wastes.

Bases

The New Jersey Department of Environmental Protection Water Quality Criteria and the Delaware River Basin Commission Effluent Quality Requirements impose stream quality limitations on the effluents entering the receiving waters. These agencies consider the mixing of waste streams to bring one or more of these streams within pH limits as acceptable. Prior decisions by the United States Environmental Protection Agency have indicated that waste streams could be combined with cooling water for the sole purpose of pH neutralization, as long as the final discharge was in the pH range of 6.0 to 9.0, as required by the Salem Station NPDES Discharge Permit. Twice weekly grab sampling of the circulating water discharges is specified in NPDES permit.

No significant change in the background pH of the river water is expected due to the operation of the Salem Station.

3.1 NONRADIOLOGICAL SURVEILLANCE

3.1.1 ABIOTIC

3.1.1.1 Chlorine

DELETED

3.1.1.2 Dissolved Gases

Objective

To ascertain that the dissolved oxygen level is not depressed to the extent that it may be harmful to the indigenous population of the receiving waters as a result of station operation.

Specification

The dissolved oxygen levels shall be monitored once per month (weather permitting) utilizing a method which is approved by the EPA. Grab samples shall be taken at the intake structure (10 ft. below the surface), the outfall of the discharge (8 ft. below the surface), and at a point outside the downstream of the mixing zone (5 ft. below the surface).

The monitoring method selected will be carefully followed and the appropriate corrections to the specific method to accommodate estuarine conditions will be made.

Reporting Requirements

If dissolved oxygen level is found to be less than 6 mg/l at the discharge, a comparison study of the intake, discharge and downstream dissolved oxygen levels shall be conducted to determine if the oxygen depression has been caused by station operation. If it is so determined a report shall be made in accordance with Specification 5.6.2.

Bases

Monthly analyses of dissolved oxygen will aid in differentiating between normal seasonal fluctuations and changes due to station operation. The EPA - acceptable methods are adequate to detect both kinds.

The 6 mg/liter limitations is required by the Water Quality Certificate issued by the Delaware River Basin Commission. The EPA recognizes more than one analytical method; therefore none is specified herein.

3.1.1.3 Suspended Solids

Objective

To determine the effect of plant operation on suspended solids in the receiving waters.

Specification

Suspended solids shall be monitored once per month (weather permitting). Grab samples shall be taken at the intake structure (10 ft. below the surface), the outfall of the discharge (8 ft. below the surface), and at a point outside and downstream of the mixing zone (5 ft. below the surface). These samples shall be analyzed for suspended solids by means of a method acceptable to EPA. Dissolved solids shall not be monitored.

Reporting Requirement

Reporting levels shall be developed after the initial phases of plant operation. Post-operational data will be related to preoperational data to yield norms from which report levels will be established. An initial evaluation of the reporting levels will be provided in the first annual report.

Bases

Monthly analyses of suspended solids will aid in differentiating between normal seasonal fluctuations, changes due to tide, wind and current, and those due to station operation.

The filtration/gravimetric method is the present means recognized by EPA for the measurement of suspended solids. However, Proposed Water Quality Information, Vol. II, October 1973, EPA, page 88 states that "accuracy data on actual samples cannot be obtained at this time."

Dissolved solids will not be measured since none of the applicable Regulatory agencies have issued guidelines for this parameter for the Delaware River zone in the vicinity of the Station site.

3.1.1.4 Other Chemicals

Objective

To determine the effects of plant operation on the quality of the receiving waters.

Specification

Grab samples shall be taken once per month (weather permitting) and analyzed for the parameters listed in Table 3.1-1. The samples shall be taken at the intake structure (10 ft. below the surface), the outfall of the discharge (8 ft. below the surface) and at a point outside and downstream of the mixing zone (5 ft. below the surface). These samples shall be analyzed for the parameters listed in Table 3.1-1 by a method acceptable to EPA.

Reporting Requirement

Reporting levels will be developed after the initial phases of plant operation. Post-operational data will be related to preoperational data to yield norms from which report levels will be established.

Bases

This monitoring program will serve to determine the effect of station operation on the quality of the receiving water. An evaluation of the program, after six months of full power operation, will be performed and those parameters which can be shown to be not significantly affected by station operation will be eliminated from the monitoring program subsequent to NRC staff review and approval. This program is in conformance with NPDES requirements.

The utilization of tests prescribed by EPA will insure the employment of current, state-of-the-art methods and accuracies.

2. Terrestrial Studies

1. Seasonal monitoring (June through November, weather permitting) of nesting by diamondback terrapin on Sunken Ship Cove Beach and in regions outside the thermal plume.
2. Monitoring occurrence and nesting of the osprey and southern bald eagle within a general 5 mile radius of the station.

TABLE 3.1-1

WATER QUALITY ANALYSIS PARAMETERS

<u>Parameter</u>	<u>PPM, as</u>	<u>Parameter</u>	<u>PPM, as</u>
Ammonia (NH ₃)	NH ₃	Iron, Total (Fe)	Fe
Biochemical Oxygen Demand	BOD	Kjeldahl Nitrogen	N
Calcium (Ca)	CaCO ₃	Magnesium (Mg)	CaCO ₃
Chemical Oxygen Demand	COD	Nitrate (NO ₃)	NO ₃
Chloride (Cl)	CaCO ₃	pH	--
Chloride (Cl)	NaCl	Phosphate (PO ₄)	PO ₄
Chlorine Demand, 30 Sec.	Cl	Potassium (K)	CaCO ₃
Chlorine Demand, 3 Min.	Cl	Sodium (Na)	CaCO ₃
Chlorine Residual, Free	Cl	Solids, Filterable (Susp.)	--
Chlorine Residual, Combined	Cl	Solids, Non-Filterable (Diss.)	--
Conductivity (umhos)	--	Sulfate (SO ₄)	CaCO ₃
Copper, Total (Cu)	Cu	Sulfate (SO ₄)	SO ₄
Dissolved Oxygen	O ₂	Turbidity (JTU)	--

TABLE 3.1-2

SUMMARY OF AQUATIC, TERRESTRIAL AND AERIAL SAMPLING PROGRAMS

<u>Sample</u>	<u>Method</u>	<u>Frequency</u>	<u>Area</u>
<u>AQUATIC</u>	(Deleted)		
<u>TERRESTRIAL AND AERIAL</u>			
Diamondback Terrapin*	Visual Observations	Monthly	Sunken Ship Cove Beach and regions outside the thermal plume
Osprey and Bald Eagle*	Visual Observations	Biweekly to Quarterly	Within 3-5 mile radius of site

* In appropriate seasons.

4.2

THERMAL AND CHEMICAL RESPONSES OF ESTUARINE ORGANISMS

DELETED

(Pages 4.2-2, 4.2-3 and 4.2-4 intentionally deleted)

5.6 PLANT REPORTING REQUIREMENTS

5.6.1 ROUTINE REPORTS

5.6.1.1 Annual Environmental Operating Report

1.a. Nonradiological Report

A report on the environmental surveillance programs for the previous 12 months of operation shall be submitted to the Director of the Regional Inspection and Enforcement Office (with copy to the Director, Office of Nuclear Reactor Regulation) as a separate document within 165 days after January 1 of each year. The period of the first report shall begin with the date of initial criticality. The report shall include summaries, interpretations, and statistical evaluation of the results of the non-radiological environmental surveillance activities (Section 3.0) and the environmental monitoring programs required by limiting conditions for operation (Section 2.0) for the report period, including a comparison with preoperational studies, operational controls (as appropriate), and previous environmental surveillance reports and an assessment of the observed impacts of the plant operation on the environment. If harmful effects or evidence of irreversible damage are detected by the monitoring, the licensee shall provide an analysis of the problem and a proposed course of action to alleviate the problem.

b. Reports to Other Agencies

Copies of routine reports required by Federal, State, local, and regional authorities for the protection of the environment shall be submitted to the Director, Office of Nuclear Reactor Regulation, USNRC, for information.

5.6.1.2 Radioactive Effluents Release Report

1. A report on the radioactive discharges released from the site during the previous 6 months of operation shall be submitted to the Director of the Regional Inspection and Enforcement Office (with copy to the Director, Office of Nuclear Reactor Regulation) within 60 days after January 1 and July 1 of each year. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the plant as outlined in Reference 1, with data summarized on a quarterly basis following the format of Appendix B thereof.
2. The report shall include a summary of the meteorological conditions concurrent with the release of gaseous effluents during each quarter as outlined in Reference 1, with data summarized on a quarterly basis following the format of Appendix B thereof. Calculated offsite dose to humans resulting from the release of effluents and their subsequent dispersion in the atmosphere shall be reported as recommended in Reference 1.

5.6.2 NONROUTINE REPORTS

5.6.2.1 Nonroutine Environmental Operating Reports

A report shall be submitted in the event that (a) a limiting condition for operation is exceeded (as specified in Section 2.0, "Limiting Conditions for Operation"), (b) a report level is reached as specified in Section 3.0, "Environmental Surveillance") or (c) an unusual or important event occurs that causes a significant environmental impact, that affects potential environmental impact from plant operation, that has high public or potential public interest concerning environmental impact from plant operation, or (d) the licensee exceeds the limits specified in relevant permits and certificates issued by other Federal, State and local agencies.



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

ENVIRONMENTAL IMPACT APPRAISAL BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 23 TO FACILITY OPERATING LICENSE NO. 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

By application dated December 21, 1977 supplemented on May 9, 1979, the Public Service Electric and Gas Company (the licensee) requested changes to Facility Operating License No. DPR-70 Appendix B, Non-Radiological Environmental Technical Specifications (ETS) for the Salem Nuclear Generating Station Unit No. 1. The application supported requests that would:

1. Make administrative changes to clarify and improve the Technical Specifications;
2. Remove the condenser ΔT and suspended solid limit;
3. Change certain sampling and monitoring requirements; and
4. Delete some special studies that will be evaluated as part of the 316b demonstration.

During our review of the licensee's proposals for this amendment, we found that certain changes were necessary to meet our requirements. The licensee's staff agreed to these changes and they have been incorporated in this amendment.

Environmental Impacts of the Proposed Actions

Section 1.1

Description

Changes to definitions are proposed to reflect the latest terminology regarding chlorine usage.

Evaluation

No evaluation is necessary for this administrative change. It has no environmental impact.

Sections 3.1.1a, 2.1.1b and 2.1.2

Description

Changes are proposed for consistency with the NPDES permit. The requirements to limit the ΔT to 16.5°F and the discharge temperature to 104°F would be deleted. Rather than change the numerical limits in the ETS as requested by the licensee, the staff recommends relying on the NPDES permit to control discharges of heated water from Salem. Specifically, the ETS should incorporate the National Pollutant Discharge Elimination System (NPDES) limits and monitoring by reference and require that the NRC be notified when the NPDES limits are exceeded.

Evaluation

The Salem Nuclear Generating Station has been designed so that each unit is equipped with six circulating water pumps to handle cooling water flow. The current ETS require that the ΔT across the condenser be limited to 16.5°F and that maximum pump discharge temperature be limited to 104°F during normal operation. During pump outage (five or fewer circulating water pumps in operation), the allowable condenser ΔT is 27.5°F, with a maximum discharge temperature of 115°F. Operation during pump outage is further constrained by time requirements limiting: the amount of time allowed with a ΔT above 16.5°F to 24 consecutive hours; the time allowed for operation with discharge temperature above 104°F to 24 consecutive hours; and the amount of time with discharge temperature above 115°F to 8 consecutive hours within any 24-hour period.

The U. S. Environmental Protection Agency has set a limit of 27.5°F as the maximum ΔT and 115°F as the maximum discharge temperature permitted under the NPDES permit. These are the same limits as those in the current ETS for less than six-pump operation. Although the licensee has conducted a 316a thermal demonstration, EPA has not yet issued a final determination on 316a compliance. In the event that a favorable finding is not made, alternate requirements in the NPDES permit, which could only be satisfied by discharge of cold-side blowdown from a closed-cycle cooling system, will apply.

Thus, in effect, reliance on the NPDES limit to control ΔT and maximum discharge temperature would allow for limits which are numerically no less stringent than those in the ETS. What would be allowed would be greater operational flexibility because the time constraints to bring the plant back to normal (six-pump) operation would be relaxed. The licensee has indicated that operating mode and repairs will be made with all reasonable speed to restore normal (six-pump) operation. Examination of past operational history indicates that pump outages in the past two years are normally corrected within 24 hours.

The licensee has furnished information which indicates that operation for considerable lengths of time with a ΔT of 27.5°F and a discharge temperature of 115°F would not cause significant impacts on receiving-water biota. The following factors combine to assure that impacts occurring due to operation during pump outages will not be significantly greater than those assessed in the Final Environmental Statement (FES) for the Salem Station dated April 1973.

1. Comparative small (on the order of 1%) amounts of water are utilized during normal operation compared to tidal flow. Operation with fewer than six circulating water pumps would use even less water and numbers of organisms impinged and entrained would also be less.
2. Studies show a relatively high survival among potentially entrainable important species found in the vicinity of the plant exposed for 10 minutes to a ΔT of 27.5°F. During a pump outage, the number of organisms entrained would be less due to the reduction in flow.
3. No temperature blockages for the Delaware estuary are predicted by the thermal plume model for a ΔT of 27.5°F, even with an inlet temperature as high as 87.5°F.
4. Because the thermal plume is bouyant for most of the year, effects of the higher temperature discharge would have little effect on benthic macroinvertebrates.

Based on the analysis above, the staff concludes that deletion of the current ETS requirements and reliance on the NPDES permit is acceptable. Because the licensee would be required to submit copies of monitoring reports required by the NPDES permit and to notify the NRC of any violations that may occur, the staff would continue to be made aware of the potential thermal impacts of operation.

Section 2.1.3

Description

Changes are proposed for administrative purposes and to clarify intent with respect to rate of power change.

Evaluation

Since no substantive changes to the specification or monitoring requirements have been made, no technical evaluation is necessary. We conclude that this proposed change would appropriately clarify the intent. The bases would be changed by adding a paragraph explaining the rationale for monitoring as specified.

Section 2.2.1

Description

Several changes are proposed to reflect new terminology, clarification of monitoring requirements to reflect simultaneous chlorination of three intakes, correction to chlorine monitor accuracy, and correction of erroneous ASTM references.

Evaluation

No technical evaluation is necessary for these administrative changes. We conclude that they are acceptable.

Section 2.2.2

Description

Changes are proposed to achieve consistency with the NPDES permit. The existing ETS requirement that the average annual suspended solids concentration not exceed 25 mg/liter would be deleted.

Evaluation

Rather than change the numerical limits in the ETS to those duplicative of the NPDES permit, we would find it acceptable to rely entirely on the NPDES permit to control discharges of suspended solids from Salem. The ETS should incorporate the NPDES limits and monitoring by reference and require that the NRC be notified when the NPDES limits are exceeded. The NPDES permit limits the average daily concentration to 30 mg/liter and the maximum daily concentration to 100 mg/liter over a seven-day period. The licensee has agreed to this alternate change.

The preoperational suspended solids concentration in the Delaware River in the vicinity of the plant was as high as 700 mg/liter, with a ten-year average of 150 mg/liter. The discharge limits set by the NPDES permit assure adequate control over this parameter as they are within the background range and the proposed change is acceptable.

Section 2.2.3

Description

The change would reduce sampling frequency for pH from continuous sampling during discharge to twice weekly during discharge.

Evaluation

Changing the monitoring requirement from continuous monitoring during discharge to twice weekly during discharge is acceptable. The trade-off involved is the exchange of continuous monitoring of dubious quality for twice-weekly grab samples of high accuracy. Because the in-line probe used for continuous monitoring is continuously immersed in the waste stream, proper maintenance and calibration are difficult to achieve. The portable pH meter used for grab samples is likely to be more accurate because it is easily maintained and calibrated. With automatic neutralization of wastes prior to discharge, the pH is automatically maintained within the specified range. Grab samples taken twice weekly will provide adequate assurance that automatic pH neutralizer system is functioning correctly and that any waste discharges outside the 6.0 to 9.0 pH range are of short duration. Should the system fail to perform as it is supposed to, the fact that the discharge would be of short duration, amounts to far less than 1% of the tidal flow in the river at this point, and is into a well-buffered system will prevent significant adverse environmental impacts.

Section 3.1.1.1

Description

The requirement to monitor river chlorine concentrations at the intake, discharge and outside of the mixing zone weekly during the chlorination cycle would be deleted.

Evaluation

In 1977 and 1978, the licensee measured total residual chlorine at the intake, discharge and outside the mixing zone during chlorination. At no time did the total residual chlorine at any of the sampling stations exceed 0.1 mg/liter. Specification 2.2.1 requires that chlorine be monitored and limited to 0.1 mg/liter prior to discharge. We conclude that it is not necessary to continue the river chlorine monitoring program to determine compliance with the limit or to assess the impacts resulting from discharge of chlorine at that concentration.

Section 3.1.1.2, pp. 3.1-2, 3.1-2a

Description

The requirement for using the Winkler titration method for measuring dissolved oxygen (D.O.) would be deleted and replaced by reference to EPA-approved methodology. Also, the sampling depth for D.O. downstream of the mixing zone would be changed from 18 ft. to 5 ft.

Evaluation

The methodology for measuring D.O. would still be acceptable with the proposed change as the accuracy and sensitivity is specified in the specification; the sampling depth of 5 ft., rather than 18 ft., would assure that the sample is taken from the mixed surface layer where D.O. would potentially be most affected by plant operation. On these bases we find these changes acceptable.

Section 3.1.1.3

Description

A change of wording is proposed to clarify the meaning of the sentence describing the depths at which samples for river monitoring of suspended solids are to be taken. Also, the sampling depth outside and downstream of the mixing zone would be changed from 18 ft. to 5 ft.

Evaluation

These twelve parameters were identified in the 1977 Salem Annual Environmental Operating Report (Non-radiological) as not be significantly affected by station operation. Additional data collected in 1978 also failed to indicate any impact from the station on the same parameters. Because there is no direct causal link with the plant, we conclude that the following twelve parameters can be deleted from Table 3.1-1 and no longer be required in monthly river monitoring:

chromium	phenolphthalein alkalinity	sulfides
free carbon dioxide	phenols	total organic carbon
manganese	reducing substances	total volatile solids
methyl orange alkalinity	silica	zinc

No evaluation is necessary for the change in wording to clarify the depth of samples taken at the intake and discharge, as none of the basic requirements have changed. The sampling depth of 5 ft. rather than 18 ft. assures that the sample is taken from the mixed surface layer where the discharge from the plant is more likely to be found. These changes are acceptable.

Section 3.1.2.1.2

Description

The requirement to conduct a monthly bird survey in the area of Artificial Island would be deleted. Also, clarification of the sampling schedule for the diamondback terrapin has been proposed.

Evaluation

Bird surveys have been conducted in the vicinity of Artificial Island on the Delaware River since 1975. Distribution of birds, other than gulls, has remained unchanged since Salem began operation. More gulls have been observed in the area of the discharge and sluice outlets when the station is operating than during the pre-operational period. However, no apparent change in abundance of gulls over the total area surveyed has been observed since operation began. The mallard was the only bird species showing a change in abundance when compared to pre-operational data, and this change was unrelated to station operation. The winters of 1976-1977 and 1977-1978 were much colder than previous winters, freezing most of the marsh and freshwater areas in the region and forcing waterfowl to use the open water of the river, thus increasing their numbers near the plant.

The schedule for monitoring of nesting of diamondback terrapin would be modified so that surveys are conducted only during months when nesting is likely to occur. This change, for purposes of clarification, is acceptable and needs no technical evaluation.

Section 4.2

Description

Sections 4.2.1, 4.2.2, 4.2.3 and 4.2.4, requiring special studies of thermal and chemical responses of estuarine organisms, would be deleted.

Evaluation

These studies were to be conducted for a period of one year after Unit 1 became operational. The studies have been completed and the results reported in Volume 3 of the 1977 Annual Environmental Monitoring Report (Non-radiological). These studies will be reviewed and evaluated as part of the licensee's 316b demonstration. Because the studies have been conducted and reported as required by the ETS, deletion of these sections is acceptable.

Section 5.6.1

Description

The submittal period of the annual report would be changed to 165 days after January 1 to coincide with 316b study reporting periods.

Evaluation

This will not cause additional environmental impact nor will it affect the staff's regulatory capability and, therefore, is acceptable.

Conclusion

On the basis of the foregoing analysis, it is concluded that there will be no significant environmental impact attributable to the proposed action. Having made this conclusion, the Commission has further concluded that no environmental impact statement for the proposed action need be prepared and that a negative declaration to this effect is appropriate.

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.

Date: December 13, 1979

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-272
PUBLIC SERVICE ELECTRIC AND GAS COMPANY,
PHILADELPHIA ELECTRIC COMPANY,
DELMARVA POWER AND LIGHT COMPANY, AND
ATLANTIC CITY ELECTRIC COMPANY

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY
OPERATING LICENSE
AND NEGATIVE DECLARATION

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 23 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 (the licensees), which revised Technical Specifications for operation of the Salem Nuclear Generating Station, Unit No. 1 (the facility) located in Salem County, New Jersey. The amendment is effective as of the date of issuance.

The amendment changes Appendix B to the license, Non-Radiological Environmental Technical Specifications, to: (1) make administrative changes that clarify and improve the Technical Specifications; (2) remove the condenser ΔT and suspended solid limits; (3) change certain sampling and monitoring requirements; and (4) delete some special studies that will be evaluated as a part of the 316b demonstration.

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 was not required since the amendment does not involve a significant hazards consideration.

The Commission has prepared an Environmental Impact Appraisal for the revised Technical Specifications and has concluded that an Environmental Impact Statement for this particular action is not warranted because there will be no significant environmental impact attributable to the action other than that which has already been predicted and described in the Commission's Final Environmental Statement for the facility dated April 1973.

For further details with respect to this action, see (1) the application for amendment dated December 21, 1977 as supplemented on May 9, 1979, (2) Amendment No. 23 to License No. DPR-70, and (3) the Commission's concurrently issued Environmental Impact Appraisal. All 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 items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 13th day of December, 1979.

FOR THE NUCLEAR REGULATORY COMMISSION



A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors