

March 11, 1994

Docket No. 50-388

Mr. Robert G. Byram
Senior Vice President-Nuclear
Pennsylvania Power and Light
Company
2 North Ninth Street
Allentown, Pennsylvania 18101

Dear Mr. Byram:

SUBJECT: ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT, POWER
UPRATE WITH INCREASED CORE FLOW, SUSQUEHANNA STEAM ELECTRIC STATION,
UNIT 2 (PLA-4055) (TAC NO. M88311)

Enclosed is a copy of an "Environmental Assessment and Finding of No
Significant Impact" for your information. This environmental assessment
pertains to your application dated November 24, 1993, as supplemented
January 7, 1994, for an amendment of the Susquehanna, Unit 2 license to
increase the rated core thermal power from 3293 MWt to 3441 MWt.

This environmental assessment is being forwarded to the Office of the Federal
Register for publication.

Sincerely,

^{/s/}
Richard J. Clark, Senior Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosure:
Environmental Assessment

cc w/enclosure:
See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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A handwritten signature in cursive script that reads "Richard J. Clark".

Richard J. Clark, Senior Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosure:
Environmental Assessment

cc w/enclosure:
See next page

Mr. Robert G. Byram
Pennsylvania Power & Light Company

Susquehanna Steam Electric Station,
Units 1 & 2

cc:

Jay Silberg, Esq.
Shaw, Pittman, Potts & Trowbridge
2300 N Street N.W.
Washington, D.C. 20037

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

Bryan A. Snapp, Esq.
Assistant Corporate Counsel
Pennsylvania Power & Light Company
2 North Ninth Street
Allentown, Pennsylvania 18101

Mr. Harold G. Stanley
Vice President-Nuclear Operations
Susquehanna Steam Electric Station
Pennsylvania Power and Light Company
Box 467
Berwick, Pennsylvania 18603

Mr. J. M. Kenny
Licensing Group Supervisor
Pennsylvania Power & Light Company
2 North Ninth Street
Allentown, Pennsylvania 18101

Mr. Herbert D. Woodeshick
Special Office of the President
Pennsylvania Power and Light Company
Rural Route 1, Box 1797
Berwick, Pennsylvania 18603

Mr. Scott Barber
Senior Resident Inspector
U. S. Nuclear Regulatory Commission
P.O. Box 35
Berwick, Pennsylvania 18603-0035

George T. Jones
Vice President-Nuclear Engineering
Pennsylvania Power and Light Company
2 North Ninth Street
Allentown, Pennsylvania 18101

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

Environmental Protection Agency (5 copies)
Office of Federal Activities (2253)
Room 2119 Mall
401 M Street S.W.
Washington, D.C. 20460

Mr. Jesse C. Tilton, III
Allegheny Elec. Cooperative, Inc.
212 Locust Street
P.O. Box 1266
Harrisburg, Pennsylvania 17108-1266

UNITED STATES NUCLEAR REGULATORY COMMISSION
PENNSYLVANIA POWER AND LIGHT COMPANY
ALLEGHENY ELECTRIC COOPERATIVE, INC.
DOCKET NO. 50-388
ENVIRONMENTAL ASSESSMENT AND FINDING OF
NO SIGNIFICANT IMPACT

The U. S. Nuclear Regulatory Commission (the Commission) is considering issuance of an amendment to Facility Operating License No. NPF-22, issued to Pennsylvania Power and Light Company, (the licensee), for operation of the Susquehanna Steam Electric Station, Unit 2, located in Luzerne County, Pennsylvania.

ENVIRONMENTAL ASSESSMENT

Identification of Proposed Action:

This Environmental Assessment has been prepared to address potential environmental issues related to the licensee's application of November 24, 1993, as supplemented January 7, 1994, to amend the Susquehanna, Unit 2 operating license. The proposed amendment would increase the licensed core thermal power from 3293 Mwt to 3441 Mwt, which represents an approximate increase of 4.5% over the current licensed power level.

The proposed action involves NRC issuance of a license amendment to uprate the authorized power level by changing the operating license, including Appendix A of the license (Technical Specifications). No change is needed to Appendix B of the license (Environmental Protection Plan - Non-radiological).

The Need for the Proposed Action:

The proposed action is needed to permit an increase in the licensed core thermal power from 3293 MWt to 3441 MWt and provide the licensee with the flexibility to increase the potential electrical output of Susquehanna, Unit 2, providing additional electrical power to service domestic and commercial areas of the Pennsylvania Power and Light (PP&L) Company and Allegheny Electric Cooperative, Inc. grid.

Environmental Impacts of the Proposed Action:

The "Final Environmental Statement (FES) related to operation of Susquehanna Steam Electric Station, Units 1 and 2" was issued June 1981 (NUREG-0564). By letter of June 15, 1992, the licensee submitted "Licensing Topical Report NE-092-001 for Power Uprate With Increased Core Flow" for Susquehanna Steam Electric Station (SSES), Units 1 and 2. The report was submitted to support future proposed amendments to Units 1 and 2 licenses to permit up to a 4.5-percent increase in reactor thermal power and an 8-percent increase in core flow for each unit. The NRC approved the topical report by letter of November 30, 1993. The licensee submitted the proposed amendment to implement power uprate for Unit 2 by the letter of November 24, 1993, which is the subject of this environmental assessment. The licensee expects to submit a similar application for Unit 1 within the next year. Section 11.4 of the above Topical Report provided an environmental assessment of the proposed power uprate, including projected nonradiological environmental effects and radiological effects from postulated accidents. Sections 8.1, 8.2 and 8.3 of the Topical Report discussed the potential effect of power uprate on the liquid, gaseous and solid radwaste systems. Sections 8.4, 8.5 and 8.6

discussed the potential effect of power uprate on radiation sources within the plant and radiation levels from normal and post-accident operation. Section 9.2 of the Topical Report presented the results of the calculated whole body and thyroid doses at uprated power vs current authorized power conditions at the exclusion area boundary and the low population zone (LPZ) that might result from the postulated design basis radiological accidents [i.e., loss-of-coolant accident (LOCA), main steam line break accident (MSLBA) outside containment, fuel handling accident (FHA) and control rod drop accident (CRDA)]. Other accidents (non-LOCA) that were previously analyzed in the licensee's Final Safety Analysis Report (FSAR) were also reassessed. All off-site radiological doses remain well below established regulatory limits for power uprate operation.

Supplemental information related to the non-radiological environmental assessment was also presented in the licensee's letter of February 7, 1994.

The licensee summarized their reassessment of potential radiological and non-radiological impacts of station operation at a slightly higher power level as follows:

Non-Radiological Environmental Assessment:

Since power uprate will not significantly change the methods of generating electricity, nor of handling any influents from the environment or effluents to it, no new or different environmental impacts are expected. The conservative models and methods used in the environmental assessments of the original design, confirmed by studies conducted during actual operation, show that more than adequate margin exists for the proposed power uprate without exceeding the nonradiological environmental effects estimated in the original estimates and analyses and cited in the original permit applications and impact statements.

The maximum withdrawal rate from the river will increase from the current value of 38,800 gpm to 40,700 gpm after power uprate, an

increase of 5%. The maximum blowdown rate will increase from the current value of 10,300 gpm to 10,800 gpm, an increase of 5%.

After reviewing the additional water withdrawal requirements and increased blowdown rate from the natural draft cooling towers at the Susquehanna SES (SSES) associated with power uprate, PP&L determined that there will be no adverse effects to the river flow or river biota. This conclusion is based on two factors. First, the projected number of fish estimated to be impinged per day would increase from 20 to 21 and the number of larvae estimated to be entrained would increase by only 13,000 to 363,000 per day. Biologically, these estimated increases represent a negligible impact to the river ecosystem. Second, the maximum cooling tower blowdown flow after power uprate is estimated to increase by only 5% which amounts to 500 gpm. This amounts to less than .5% of the average river flow.

The cooling blowdown from the cooling tower basin is through a diffuser into the river. The characteristics of the cooling tower are such that there is greater air flow through the tower caused by the higher circulating water return temperature at power uprate conditions. This increased air flow removes the additional heat load resulting in negligible cooling tower basin temperature changes.

Estimates, assuming that both SSES cooling towers are operating at the original 100% power level for a year, would result in 58,000 pounds of solids per year as salt drift, spread over a large area. Modelling indicated the heaviest localized deposition of solids would be 3 pounds/acre/year (SSES Environmental Report Section 5.3.4). The power uprate should have no impact on these estimates, especially with the conservatism built into the model by assuming 100% capacity factor. Note also that the design cooling tower drift is a function of circulating water flow which is not changing for power uprate.

Studies on the possible effects of salt drift have been conducted at the SSES since 1977. These studies have included monthly examination of natural vegetation during the growing season (1977 to date), annual quantitative vegetation studies (1977 to date), a two-year study on the effect of simulated salt drift on corn and soybeans (1985-86), and annual forest inspections since 1982.

The monthly examinations have utilized several transects (salt drift transects) in the vicinity of the power station for possible salt damage to natural vegetation and incidence of parasitic plant diseases. The annual vegetation studies consider possible long-term changes in forest utilized salt spray approximating the composition of the cooling tower drift from the SSES at "worst case" concentration on agricultural crops in two fields.

None of the studies have found evidence for damage to agricultural crops or natural vegetation from salt drift. It should be noted that the

water used at the SSES (from the Susquehanna River) does not contain the same salts as brackish water used at estuarine cooling tower[s]; its effects are more like plant micronutrients. The natural vegetation studies over 15 years have found no salt drift damage and plant diseases in accordance with host presence and location. The simulated salt drift studies utilized concentrations estimated at 5 and 10 times maximum salt drift concentration in the SSES plume. It is therefore unlikely that salt drift damage would occur from an approximate 5% consumptive rise in water usage.

There will be no changes to the cooling tower water chemistry as a result of power uprate. The pre-uprate levels of cycles of concentration will be maintained. Since there will be a 5% increase in blowdown flow, there will be a 5% increase in chemical discharge to the river.

The velocity of the intake water will increase by 5% to .37 ft/sec with power uprate which is below the recommended intake design velocity of 0.5 ft/sec.

Sound level monitoring was conducted at both near site (less than 1 mile) and far site locations (greater than 1 mile) from the Susquehanna SES site from 1972 and 1985. This survey was conducted prior to and during construction and during one and two unit operation. The two Cooling Towers were identified to be one of the major site noise sources. The cumulative effects of all noise sources associated with station operation were determined to be less than the U.S. Environmental Protection Agency recommended day-night equivalent sound level limit of 55 dBA at all monitoring locations. It is not expected that this level will be exceeded at any of the locations with the possible exception of an area approximately 2,200 feet southeast of the Cooling Towers where the measured sound level including a nighttime weighting factor of +10 dBA was 54 DBA. Sound levels will be monitored at power uprate conditions.

As indicated previously, water discharge flow from power uprate may increase 5% above the design discharge rate to 10,800 gpm. This is well below the maximum flow of 16,000 gpm reviewed in the SSES Environmental Report (Table 3.3-1) and, therefore, the additional flow from power uprate is not considered to be an adverse impact to the river.

At the Susquehanna SES cooling tower blowdown discharges into the river through a diffuser pipe located on the river bottom. Velocity of this discharge was calculated in Appendix G, Thermal Discharge, Response 1, pages THE-1.1 and 1.2 of the Environmental Report. Water discharges through 72-4" ports into the river. The velocity associated with a 10,000 gpm discharge was calculated to be 5.83 fps and rounded to 6 fps. This rounded off value was used when preparing [the] SSES Environmental Report. The velocity associated with a 10,800 gpm discharge is also approximately 6 fps.

Thermal plume studies conducted in the fall, winter, and spring of 1986-87 indicated a maximum temperature rise of 1°F within an 80 foot mixing zone from the diffuser pipe. Present Pennsylvania Department of Environmental Resources water quality criteria states that ambient river temperature rise from thermal discharges shall not cause the temperature in the receiving water body to rise more than 2°F in one hour. The thermal discharges from the cooling tower blowdown from power uprate will not exceed this water quality criteria.

Chemical composition of the blowdown after power uprate will not exceed the NPDES permit limits.

The staff reviewed the potential effect of power uprate on plant makeup water usage. There will be no significant increase in makeup water requirements for any plant systems as a result of power uprate. This includes the reactor coolant system, the condensate, feedwater and steam systems, the emergency service water system, the reactor and turbine building closed cooling water systems or any of the normal service water systems. The only effect of power uprate on the component cooling water system and turbine plant cooling water system from power uprate is an increased heat load. The service water system removes heat from the heat exchangers in the turbine, reactor and radwaste buildings and transfers this heat to the cooling towers where it is dissipated. The increased heat load on intermediate systems is reflected in the discussion of potential impacts from increased cooling tower blowdown and thermal discharges remain acceptable. Inventory makeup is not affected. Makeup requirements for the auxiliary boiler, the fire protection system or other auxiliary systems are unaffected by power uprate.

The licensee has stated that there are no changes required to the SSES Environmental Protection Plan as a result of operation at uprated power. Specifically, the licensee stated:

Chapter 3, Consistency Requirements, Section 3.1, Plant Design Operations, of this plan discusses how proposed changes need to be addressed. Through the PP&L Unreviewed Environmental Question Program, changes such as that of power uprate will be reviewed.

An "Unreviewed Environmental Question" evaluation was conducted in accordance with each unit's "Environmental Protection Plan" to determine if power uprate could cause any significant environmental impacts. This included a review of the National Pollutant Discharge Elimination System (NPDES) Permit and other environmental permits, and indicated that power uprate should not contribute to any new noncompliances. No significant increase in generation of hazardous or nonhazardous waste is expected, except for a 3 to 5% increase in sediment removed from the cooling tower. Nor is any change expected in the load on the sewage treatment plant. River water use will remain within the existing agreement with the Susquehanna River Basin Commission. PP&L has determined that power uprate is not an "unreviewed environmental question."

The proposed power uprate therefore requires no change to the "Environmental Protection Plans" since it does not involve:

- a) A significant increase in any adverse environmental impact previously evaluated in the "Environmental Report - Operating License Stage," or the "Final Environmental Statement," or in any decision of the Atomic Safety and Licensing Board;
- b) A significant change in effluents or power levels, or
- c) A matter not previously reviewed and evaluated in the documents specified in paragraph (a) which might have a significant adverse environmental impact.

Radiological Environmental Assessment:

As discussed previously, the licensee addressed potential radiological impacts attributable to operation at uprated power conditions in Sections 8, 9, and 11 of the initial Topical Report. The licensee concluded:

Adequate margin also exists for the proposed power uprate without exceeding regulatory limits for radiological effects. Current operating experience indicates that actual releases and waste disposal after power uprate will continue to be significantly less than the original estimates. For these reasons, power uprate is not expected to have an adverse effect on the routine operation "dose commitment" estimated by previous radiological environmental analyses, and no revision of these analyses is required.

The environmental assessment includes an estimate of potential exposure from all accident types combined. Regulatory Guide 1.49 requires calculation of accident doses at 102% of uprated thermal power, or 3510 MWt. Although direct comparison with the original analyses is not meaningful because of changes in methodology, a comparison on a consistent basis would show that the expected dose is approximately proportional to power. The original calculation was done at 3439 MWt. The estimated potential exposure from all accident types combined will therefore change by about the ratio of 3510/3439, or about 2 percent, which is not a significant change compared to the uncertainty in the probability estimates. No revision of these analyses is therefore required.

[Liquid radwaste throughput may increase up to 5% to a level which is within the processing capability of the system.] The activity levels of some radwaste streams containing coolant activation products may increase up to 10%, due to the 4.5% core flux increase and a 5% crud increase to the reactor which are assumed to occur.

Since the power uprate level of 3441 MWt is not significantly different from that analyzed previously, it is not anticipated there will be a significant increase in radiological effluents. Also, pre-power uprate technical specification limits will be maintained.

The NRC staff has concluded that the NRC's FES (NUREG-0564) is valid for operation at the proposed uprated power conditions. The staff also concluded that the plant operating parameters impacted by the proposed power uprate would remain within the bounding conditions on which the conclusions of the FES are based.

The NRC staff has reviewed the licensee's re-evaluation of the potential radiological and non-radiological environmental impacts for the proposed action. On the basis of this review, the NRC staff finds that the radiological and non-radiological environmental impacts associated with the proposed small increase in power are essentially immeasurable and do not change the conclusion in the FES that the operation of Susquehanna would cause no significant adverse impact upon the quality of the human environment.

Accordingly, the Commission concludes that this proposed action would result in no significant radiological or non-radiological environmental impact.

Alternatives to the Proposed Action:

Since the Commission concluded that there are no significant environmental effects that would result from the proposed license amendment, any alternative with equal or greater environmental impacts need not be evaluated.

The principal alternative would be to deny the requested amendment. This would not significantly reduce the environmental impact of plant operation but would restrict operation of Susquehanna, Unit 2 to the currently licensed power level and prevent the facility from generating the approximately 50 MWe that is obtainable from the existing plant design.

Alternative Use of Resources:

This action does not involve the use of any resources not previously considered in the "Final Environmental Statement related to the operation of Susquehanna Steam Electric Station, Units 1 and 2," dated June 1981.

Agencies and Persons Consulted:

The Commission's staff reviewed the licensee's request and consulted with the Bureau of Radiation Protection, Pennsylvania Department of Environmental Resources. The State Liaison Officer had no comment regarding the NRC's proposed action.

FINDING OF NO SIGNIFICANT IMPACT

Based upon the foregoing environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment. The Commission has determined not to prepare an environmental impact statement for the proposed license amendment.

For further details with respect to this action, see the application for amendment dated November 24, 1993. This document is available for public inspection at the Commission's Public Document Room, The Gelman Building, 2120 L Street, NW, Washington, DC 20555 and at the Osterhout Free Library, Reference Department, 71 South Franklin Street, Wilkes-Barre, Pennsylvania 18701.

Dated at Rockville, Maryland, this 11th day of March 1994.

FOR THE NUCLEAR REGULATORY COMMISSION

Charles L. Miller

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