UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

AUG 31 1973

Docket Nos. 50-280
and 50-281

Virginia Electric and Power Company
ATTN: Mr. Stanley Ragone
Senior Vice President
P. O. Box 26666
Richmond, Virginia 23261

Change No. 11
License Nos. DPR-32
and DPR-37

Gentlemen:

Your letter dated July 16, 1973 submitted proposed changes in the temperature limitations on condenser cooling water discharged by Units 1 and 2 of the Surry Nuclear Power Station. These limitations are in Section 4.14 of the Technical Specifications.

Subsequent telephone conversations between your representatives and members of the Regulatory staff resulted in several modifications which were incorporated in proposed Change No. 11. This was received with your letter dated August 29, 1973.

We have reviewed your proposed Change No. 11 as shown in Enclosure 1 and find that no significant environmental impact should result from its adoption. We have also concluded that this proposed change does not present a significant hazards consideration and that there is reasonable assurance that the health and safety of the public will not be endangered.

Pursuant to 10 CFR Part 50, Section 50.59, Section 4.14 of the Technical Specifications appended to Operating Licenses No. DPR-32 and No. DPR-37 are changed as shown in Enclosure 2.

Sincerely,

P. J. Youngblood for

Daniel R. Muller, Assistant Director
for Environmental Projects
Directorate of Licensing

Enclosures:
See next page

Enclosures:
1. Evaluation of Proposed Change No. 11
2. T.S. 4.14 as modified by Change No. 11

cc: George D. Gibson, Esq.
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Richmond, Virginia 23213

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Copy of the original sent to: J. L. Hamrick
Commonwealth of Virginia
State Water Control Board
P. O. Box 11143, Richmond, Va. 23230

PLEASE SEE ATTACHED YELLOW FOR CONCURRENCES

OFFICE	L:EP-2	L:EP-2	OGC	L:ADPWR	L:ADPR
SURNAME	PHLeech:pb	GKDicker	MKarman	RCDeYoung	DRMuller
7588 DATE	8/30/73	8/31/73	8/31/73	8/31/73	8/31/73

Form AEC-318 (Rev. 9-53) AECM 0240 GPO C43 16 81465-1 445-678

Enclosure 1

EVALUATION OF PROPOSED CHANGE NO. 11 IN THE TECHNICAL SPECIFICATIONS SURRY POWER STATION UNITS 1 AND 2 DOCKET NOS. 50-280 AND 50-281

Introduction

Section 4.14 was added to the Technical Specifications on January 29, 1973 as part of Change No. 5 so as to apply temperature limitations on condenser cooling water discharged from the station. The purpose of this specification is to limit thermal stress on the aquatic ecosystem in the James River.

In a letter dated February 20, 1973, the Licensee proposed revisions in Section 4.14 which included: (1), a change in 4.14.1 to allow a maximum discharge temperature of 106°F rather than 98°F; (2), deletion of the phrase in 4.14.1 which reads "without dilution of the water which passes through the condensers."; and (3), a change in 4.14.2 to allow 15°F rather than 14°F as the full-load temperature rise of the cooling water as it passes through the condensers.

Our analysis of the Licensee's proposal was made with assistance by the Environmental Specialist's Branch, and it was conducted in conjunction with our evaluation of fish impingement experience at the Surry Power Station (the latter is documented in a report attached to a letter from Gordon K. Dicker to Virginia Electric and Power Company, dated April 11, 1973). This analysis led to a meeting of AEC and Licensee representatives on May 30, 1973, for clarification of both subjects (summarized in a report to Daniel R. Muller by Paul H. Leech, dated June 7, 1973).

Consistent with understanding reached during the May 30th meeting, with one exception, the Licensee submitted revisions to its proposed changes in Specification 4.14 in a letter dated July 16, 1973. The one exception the Licensee proposed was that six hours be allowed as the duration of cooling water discharge temperatures in excess of 98°F during periods of emergency or exceptional load demand rather than three hours. This exception and some refinements in reporting requirements were discussed several times on the telephone by Licensee and AEC representatives, with the result that the Licensee submitted a further modification of its proposed changes in Section 4.14 in a letter dated August 29, 1973.

Evaluation of Environmental Impact

Based upon the assessments contained in our Final Environmental Statements issued in May and June of 1972 for Units 1 and 2, and considering the additional river temperature data submitted with the Licensee's letter of February 20, our environmental evaluation of the proposed changes is as follows:

1. The discharge of condenser cooling water at temperatures greater than 98°F for six hours could subject organisms in the river to lethal temperatures for the duration of a full tidal stage (ebb or flood) without reductions in temperature from tidal mixing. It is also the staff's opinion that discharges greater than 98°F for more than three hours would result in a thermal plume that may violate state water quality standards. However, inspection of the temperature records for the James River indicates that the mid-depth ambient temperature in the vicinity of this station seldom exceeds 83°F for more than three hours; thus, a temperature rise of 15°F during passage through the condensers would seldom result in discharges above 98°F for more than three hours. Our analysis of the time-temperature effects on aquatic organisms indicates that exposure to temperatures a few degrees higher than 98°F for three hours would not have significantly adverse effects on fish populations in the James River. The Licensee's proposed change in 4.14.1 was revised by its August 29 letter to adopt the three-hour limitation.

2. The Licensee's letter dated July 16, 1973, redesignates 4.14.1 as 4.14.A.1 and substitutes the words "flow augmentation for the sole purpose of meeting the 98°F criterion" for "dilution of water which passes through the condensers." This change simply clarifies the staff's intent that organisms entrained in water that does not flow through operating condensers should not be exposed unnecessarily to the temperatures in the discharge canal.

3. The Licensee's letter of July 16, 1973, redesignates 4.14.2 as 4.14.A.2 and changes the temperature rise of cooling water passing through the condensers from 14°F to 15°F so as to conform to the actual design criterion for the condenser. This is, in effect, a correction of the 14°F figure which was printed in the Applicant's Environmental Report, and the small increase in temperature rise should result in no significant environmental effects.

4. The Licensee's letter of July 16, 1973, redesignates 4.14.3 as 4.14.A.3 and inserts the words "an average rate of change of" in the first sentence. This allows for brief fluctuations in the rate of change of cooling water discharge temperature as reactor power levels are being changed and should have no significant environmental effects.

5. Section 4.14.4 is redesignated 4.14.B.1 and the wording has been modified to clarify the definition of "emergency or exceptional load demand" under which the thermal discharge limits in 4.14.A may be exceeded. This provision recognizes that conditions could exist on the power supply system whereby the limits may have to be exceeded if the health and safety of the public would otherwise be adversely affected by an inadequate and unreliable supply of electrical energy. Such conditions are expected to occur so infrequently and be so brief that fish populations in the James River should not be significantly affected.

6. Section 4.14.B.2 has been added to permit up to 23°F cooling water temperature rise through a condenser when the condenser or circulating water system components must be partially shut down for inspection and/or repair. This will subject organisms in the reduced water flow to higher temperatures for such periods; however, the duration of these periods will usually be less than 24 hours. The mortality of organisms should not be appreciably different than previously anticipated in our Final Environmental Statement, where it was assumed that a majority of those passing through the condensers would be affected. To assure that we are aware of extended periods of such operation, provision is made in this section that authorization shall be obtained from the Director of Licensing if operation with more than 15°F rise is expected longer than 24 hours.

7. Reporting requirements in 4.14.4 have been revised and placed in a new section, 4.14.C. Included in this revision is a requirement that the Commission be notified within 24 hours if there is evidence of significant adverse environmental impact from exceeding the thermal discharge limits as allowed under 4.14.B.

8. The discussion given in the Basis has been revised as appropriate to these changes.

Conclusion

We find that no significant environmental impact should result from adopting the Licensee's proposed Change No. 11 as presented with its letter to Mr. R. C. DeYoung, dated August 29, 1973. We have also concluded that this proposed change does not involve significant hazards considerations.

Paul H. Leech

Paul H. Leech, Project Manager
Environmental Projects Branch 2
Directorate of Licensing

Gordon K. Dicker

Gordon K. Dicker, Chief
Environmental Projects Branch 2
Directorate of Licensing

Date: August 30, 1973

4.14 TEMPERATURE LIMITATIONS ON CONDENSER COOLING WATER DISCHARGE

Applicability

These limitations apply to heat added to the water passing through the turbine steam condensers and to the river by the heated water discharged from the condensers.

Objective

The purpose of this specification is to limit thermal stress to the aquatic ecosystem in the James River from the station's thermal discharge.

Specifications

A. 1. The condenser cooling water discharge temperature shall not exceed 98°F, as measured continuously at the control structure in the discharge canal and without flow augmentation for the sole purpose of meeting the 98°F criterion, for more than 3 hours each day. 11

2. The difference (ΔT) between the river water ambient temperature measured at the station high level intake and cooling water at the discharge control structure shall not exceed 15°F, except for brief fluctuations during changes in power levels. 11

3. Normal plant operations shall be controlled such that changes in cooling water temperature at the discharge control structure do not exceed an average rate of change of 3°F per hour. This limitation is expected to restrict temperature changes in the river to less than 2°F per hour within a short distance from the discharge control struc- 11

ture.

B. 1. The foregoing thermal discharge limits shall not be exceeded except as necessary for safe shutdown of a reactor, or to meet emergency or exceptional load demands upon the licensee's power supply system An emergency or exceptional load demand shall be considered to exist if the system is unlikely to meet the demand after the licensee has attempted to satisfy its requirements by all other available means, such as use of spinning reserves, standby generation, and purchase from other utilities.

2. Specification 4.14.A.2 may be modified to permit operation at reduced power levels during inspections or periods of maintenance and repair to the condenser or circulating water system. In those instances where a condenser may be partially shut down, the temperature difference across the affected condenser shall not exceed 23°F. If the temperature difference is expected to exceed 15°F for more than 24 hours, authorization shall be obtained from the Director of Licensing. 11

C. 1. In all instances where thermal discharge limits stated in specification 4.14.A are exceeded, except as allowed under 4.14.B, these shall be reported as follows: (1), to the Director, Region II, Directorate of Regulatory Operations, via telephone or telegraph within 24 hours of the time of occurrence; and (2) to the Director of Licensing by letter within 15 days, stating the reason or reasons such limits were exceeded, when the incident occurred, its duration, any evidence of adverse environmental impact, and what actions are being taken to prevent recurrence.

2. In all instances where thermal discharge limits are exceeded, including those allowed under 4.14.B, appropriate notations shall be included 11

in the Semi-Annual Operating Report to the Director of Licensing. In addition, if there is evidence of significant adverse environmental impact, such as fish killed in the James River, from exceeding the thermal discharge limits as allowed under 4.14.B, this shall be reported to the Director, Region II, Directorate of Regulatory Operations, by telephone or telegraph within 24 hours. 11

Basis

The once-through condenser cooling system is designed to add a maximum of 15°F to river water flowing through the system during full-load operation. Limiting the total temperature of the discharged water to 98°F is expected to restrict the 5°F isotherm to less than half the width of the James River at flows as low as 2000 cfs, as shown in Fig. 3.14 on page 53 of the AEC's Final Environmental Statement issued for Unit 2 in June, 1972. Thus, the fish in this area should be able to avoid temperatures in excess of 90°F (which approaches the lower threshold of the lethal temperature range for most species). 11

Larval fish and eggs exposed to temperatures above 90°F for 30 minutes or longer as they pass through the condensers, the discharge canal and the thermal plume in the river will suffer some mortality. However, the 98°F total temperature limit at the discharge control structure should result in restricting damage to biota entrained by the plume to those within a relatively small area offshore from the discharge. This is an important consideration in view of the nursery functions of the James River in the station vicinity. 11

Allowing the discharge cooling water to exceed 98°F for a maximum of 3 hours each day should enable the station to meet usual peak load demands during those infrequent periods when ambient river temperatures exceed 83°F These brief exposures to higher temperatures should not unduly stress the aquatic biota.

There may be occasion when exceptionally high electrical demands will be made on the licensee's power supply system concurrently with the existence of high ambient temperature water conditions and generally low river flows. Under such circumstances, the licensee should first utilize all reasonable means of meeting the system requirements, other than an increase in the station's power level which would result in exceeding its thermal discharge limits. However, it is recognized that operation of the station at a higher power level may also be necessary for a short time to assure reliability of the power supply system. This may result in higher temperatures than are desirable in the river, but such incidents are expected to occur infrequently and to be so brief as to have no irreversible impacts on fish populations. 11