LICENSE AUTHORITY FILE COPY

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

DO NOT REMOVE

Posted
Am. 42 to
DPR-71 62

DEC 15 1978

Docket Nos 50-324
and 50-325

Carolina Power and Light Company
ATTN: Mr. J. A. Jones
Senior Vice President
336 Fayetteville Street
Raleigh, North Carolina 27602

Gentlemen:

ISSUANCE OF AMENDMENTS TO FACILITY OPERATING LICENSES FOR BRUNSWICK STEAM ELECTRIC PLANT, UNITS NOS. 1 AND 2 (DPR-71 AND DPR-62)

The Commission has issued the enclosed Amendments No. 42 and No. 17 to Facility Operating Licenses DPR-71 (Unit No. 2) and DPR-62 (Unit No. 1) for the Brunswick Steam Electric Plant. These amendments constitute our action to modify the operating licenses by changing the present cooling tower installation date from January 1, 1979 to that date established as a result of a final determination by the Regional Administrator of the U. S. Environmental Protection Agency.

We have prepared an environmental impact appraisal supporting this action and a copy is enclosed for your information.

Also inclosed is a copy of the notice of issuance and negative declaration regarding these amendments.

Sincerely,

Ronald L. Ballard

Ronald L. Ballard, Chief
Environmental Projects Branch 1
Division of Site Safety
and Environmental Analysis

Enclosures:
1. Amendment No. 17 to DPR-71
2. Amendment No. 42 to DPR-62
3. Environmental Impact Appraisal
4. Notice of Issuance and Negative Declaration

cc w/encls: See next page

DEC 15 1978

cc:
George F. Trowbridge, Esquire
Shaw, Pittman, Potts & Trowbridge
1800 M Street, N. W.
Washington, D. C. 20036

John J. Burney, Jr., Esquire
Burney, Burney, Sperry & Barefoot
110 North Fifth Avenue
Wilmington, North Carolina 28401

Mr. Steve Oarnam
Board of County Commissioners
Brunswick County, Rt. 1, Box 332
Supply, North Carolina 28462

Office of Intergovernmental Relations
116 West Jones Street
Raleigh, North Carolina 27602

Mr. Richard E. Jones, Esquire
Carolina Power & Light Company
336 Fayetteville Street
Raleigh, North Carolina 27602

Herbert P. Scott
Counsel for Project Environment
Prickeet and Scott
P. O. Box 867
7 South Fifth Avenue
Wilmington, North Carolina 28401

Regional Administrator
U. S. Environmental Protection Agency
Region IV Office
345 Courtland Street, NE
Atlanta, Georgia 30308

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

CAROLINA POWER AND LIGHT COMPANY

DOCKET NO. 50-324

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 42
License No. DPR-62

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

   A. The application for amendment by Carolina Power and Light Company (the Licensee) dated March 4, 1977, 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 Paragraph 2.D.c. of Facility Operating License No. DPR-62 as follows:

"c. The licensee shall comply with all the terms, provisions, and conditions of the "Stipulation by Applicant, Intervenor and NRC Regulatory Staff" dated July 8, 1974 (hereafter "the Stipulation"), required to be performed by the licensee, including, but not limited to, any conditions expressly noted in a. above. Provided, however, that the installation date for cooling towers as set forth in Paragraph 3 of the Stipulation of May 1, 1978 is hereby deleted and the installation date will be that date established as a result of the Environmental Protection Agency's adjudicatory hearing proceeding on the facility's Section 402 Federal Water Pollution Control Act permit."

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

FOR THE NUCLEAR REGULATORY COMMISSION

Voss A. Moore

Voss A. Moore, Assistant Director
for Environmental Projects
Division of Site Safety
and Environmental Analysis

Date of Issuance

DEC 15 1978

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

CAROLINA POWER AND LIGHT COMPANY

DOCKET NO. 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 17
License No. DPR-71

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

   A. The application for amendment by Carolina Power and Light Company (the Licensee) dated March 4, 1977, 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 Paragraph 2.E.b of Facility Operating License No. DPR-71 as follows:

"b. The licensee shall comply with all the terms, provisions, and conditions of the "Stipulation by Applicant, Intervenor and NRC Regulatory Staff" dated July 8, 1974 (hereafter "the Stipulation"), required to be performed by the licensee, including, but not limited to, any conditions expressly noted in a. above. Provided, however, that the installation date for cooling towers as set forth in Paragraph 3 of the Stipulation of May 1, 1978 is hereby deleted and the installation date will be that date established as a result of the Environmental Protection Agency's adjudicatory hearing proceeding on the facility's Section 402 Federal Water Pollution Control Act permit."

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

FOR THE NUCLEAR REGULATORY COMMISSION

Voss A. Moore

Voss A. Moore, Assistant Director
for Environmental Projects
Division of Site Safety
and Environmental Analysis

Date of Issuance

DEC 15 1978

UNITED STATES NUCLEAR REGULATORY COMMISSION

BRUNSWICK STEAM ELECTRIC PLANT

DOCKET NOS. 50-325 AND 50-324

CAROLINA POWER AND LIGHT COMPANY

NOTICE OF ISSUANCE OF AMENDMENTS TO FACILITY

OPERATING LICENSES

AND NEGATIVE DECLARATION

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 42 to Facility Operating License No. DPR-62 and Amendment No. 17 to DPR-71 issued to Carolina Power and Light Company, which revised the licenses for operation of the Brunswick Steam Electric Plant, Unit Nos. 1 and 2 located in Brunswick County, North Carolina. The amendments are effective as of the date of issuance.

The amendments delete the installation date of January 1, 1979 for cooling tower completion and require instead that the date be that established by the U. S. Environmental Protection Agency in its adjudicatory hearing proceeding on the facility's Section 402 Federal Water Pollution Control Act permit.

The application for the amendments 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. Notice of Proposed Issuance of Amendment to Facility Operating Licenses in connection with this action was published in

the FEDERAL REGISTER on November 10, 1977 (42 FR 58582). No request for a hearing or petition for leave to intervene was filed following notice of the proposed action.

The Commission has prepared an environmental impact appraisal for the amended licenses and has concluded that an environmental impact statement for this particular action is not warranted because (1) It is appropriate to defer to decisions to be made by EPA as to the choice and installation date of the cooling system and (2) the results of this appraisal have not altered the fundamental conclusions of the FES.

For further details with respect to this action, see (1) the application for amendment dated March 4, 1977, (2) Amendment No. 42 to License No. DPR-62, (3) Amendment No. 17 to License No. DPR-71, and (4) the Commission's 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 Southport-Brunswick County Library, 109 W. Moore Street, Southport, North Carolina 28461. A copy 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 Site Safety and Environmental Analysis.

Dated at Bethesda, Maryland this 15th day of December 1978.

FOR THE NUCLEAR REGULATORY COMMISSION

Ronald L. Ballard

Ronald L. Ballard, Chief
Environmental Projects Branch 1
Division of Site Safety
and Environmental Analysis

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

ENVIRONMENTAL IMPACT APPRAISAL

BY THE DIVISION OF SITE SAFETY AND ENVIRONMENTAL ANALYSIS

SUPPORTING AN AMENDMENT TO THE FACILITY OPERATING LICENSES

REGARDING COOLING TOWER IMPLEMENTATION

BRUNSWICK STEAM ELECTRIC PLANT UNIT NO. 1 AND 2 (DPR-71 AND DPR-62)

CAROLINA POWER AND LIGHT COMPANY

DOCKET NOS. 50-325 AND 50-324

Description of Proposed Action

A request has been made by Carolina Power and Light Company (CP&L) to amend the licenses for the Brunswick Steam Electric Plant-Units 1 and 2. As described in CP&L's letter[1] of March 4, 1977, "[t]he basic thrust of the requested amendments is to eliminate the requirement to construct cooling towers and to terminate NRC's independent assertion of jurisdiction over compliance with the National Pollutant Discharge Elimination System (NPDES) permit issued by the Environmental Protection Agency (EPA)."

The NRC's previous action on CP&L's request has been the noticing[2] of opportunity for hearing on the proposed issuance of amendments which would modify or delete the requirement to install cooling towers. Further, the notice indicated the possible consideration by the Commission of alternatives (to CP&L's proposed amendment) consistent with the objective of reconciling the operating licenses with the NPDES permit. No requests for a hearing were received in response to the Federal Register notice.

The issuance of a modified NPDES permit is still pending the final decision in the EPA adjudicatory proceeding. The Regional Administrator (RA) issued an Initial Decision which was subsequently remanded to him by the EPA Administrator. The RA has supplemented the decision in response to the remand. While it is uncertain as to when the EPA Administrator will reach a final decision, it is certain that CP&L cannot meet the "installation date" of January 1, 1979 as presently required by the NRC-issued licenses. From any date that construction might recommence, a period of 33 to 36 months has been estimated by CP&L for completion of cooling towers.

Based on the statutory mandate of the Federal Water Pollution Control Act (FWPCA) Amendments of 1972, Section 511(c)(2), NRC cannot impose cooling system requirements for protection of water quality and aquatic biota other than any effluent limitation issued by EPA pursuant to the FWPCA. Furthermore, should EPA finally require cooling towers, the NRC could not impose a compliance deadline different from that set by EPA.

We have determined that action on CP&L's request to eliminate the license condition which requires cooling towers at Brunswick should be deferred. NRC could not delete the license condition without performing a supplemental NEPA review, including the assessment of impacts. That assessment would be based on staff review and evaluation of the same information available to the EPA. Therefore, the staff has decided to use, insofar as possible, EPA's assessment as input to any reassessment of the NEPA cost-benefit balance. Any present action to delete the cooling tower requirement would be unsupportable in view of the NRC's (AEC) analysis which supported the imposition of the closed-cycle cooling requirement and EPA's assessment which presently supports the need for reduced flow equivalent to the use of closed-cycle cooling towers.

A second action considered by the staff is whether to amend the licenses to delete or modify the cooling towers installation date. The only alternative to this action is withdrawal of the licenses (i.e., plant shutdown); the NRC is precluded from reviewing other options since the NPDES permit sets no additional limitation on interim operation with once-through cooling. We find that the factors which favored construction of the plant and operation with once-through cooling for the initial three year period also favor continued operation for certain arbitrary periods when compared with the alternative of closing down the plant. The environmental costs are those considered in the FES and the EPA hearing. While these costs entail risks for the long-term well-being of the Cape Fear Estuary, the benefits of electrical generation favor continued operation in the short-term.

The EPA Regional Administrator's Initial Decision supports a finding that adverse impacts are being incurred with the once-through cooling system and that flow reduction should be implemented at the earliest possible date. However, the presently effective Permit provision allows discharge of once-through cooling water until a date set by the RA as a result of his final determination.

Having found that withdrawal of the licenses is not cost beneficial and since the NRC cannot impose a different compliance date than that set by the EPA, we conclude that the appropriate action is to modify the January 1, 1979 "installation date." Facility Operating Licenses DPR-71 (Unit No. 1) and DPR-62 (Unit No. 2) should be amended to read as follows:

"The licensee shall comply with all the terms, provisions, and conditions of the "Stipulation by Applicant, Intervenor and AEC Regulatory Staff" dated July 8, 1974 (hereafter "the Stipulation"), required to be performed by the licensee, including, but not limited to any conditions expressly noted in a. above. Provided, however, that the installation date for cooling towers as set forth in Paragraph 3 of the Stipulation of May 1, 1978 is hereby deleted and the installation date will be that date established as a result of the Environmental Protection Agency's Adjudicatory Hearing proceeding on the facility's Section 402 Federal Water Pollution Control Act permit."

Background

An operating license (DPR-62) for Brunswick Unit 2 (the first of the two units to be placed in operation) was issued December 27, 1974. The license incorporated, by reference, a stipulation agreement entered into by CP&L, the Intervenor (Project Environment) and the AEC Regulatory staff (now the NRC) on July 8, 1974.[3] Paragraph 3 of the "stipulation" states that:

"Applicant will proceed with engineering and procurement activities and with construction of cooling towers on a schedule consistent with the completion of installation of cooling towers (exclusive of their connection to the cooling systems) not later than May 1, 1978 ("installation date")."

The NPDES permit,[4] issued by EPA-Region IV on December 31, 1974, was consistent with the Unit 2 Operating License in requiring cooling towers at the Brunswick plant by May 1, 1978. CP&L requested and was granted a hearing by EPA on March 19, 1975. On March 12, 1976, CP&L petitioned[5] for a declaratory order by EPA confirming that the compliance date in the permit was within the scope of the contested issues and, therefore, stayed under 40 CFR § 125.35 (d)(2). The EPA Administrative Law Judge so found and issued an order[6] which granted a stay in the compliance schedule for construction of cooling towers conditioned upon CP&L obtaining written concurrence for such stay from the NRC.

The NRC staff conducted an Environmental Appraisal of the possible delay in cooling tower construction and determined that operation of the plant with once-through cooling until January 1, 1979 would be equivalent to three years operation of both units at design flow, and so would be acceptable. Bases for this finding were the FES analysis, the delayed start-up of Unit 2, and reduced volume of cooling water passed through the plant. Subsequently, the licenses for both Units 1 and 2 were amended[7] to incorporate the revised "installation date" of January 1, 1979 or that date set by EPA, whichever came first.

Parties to the EPA adjudicatory proceeding entered into a stipulated agreement[8] on June 8, 1976 which included:

1. modification of the NPDES permit as issued on December 31, 1974, and

2. identification of the ultimate issues to be determined in the proceeding.

A subsequent stipulation,[9] approved by the RA on June 22, 1976, added thermal effluent limitations for periods of once-through cooling operation. The "stipulated NPDES permit" is that set forth by these two agreements.

Part I.A. of the stipulated permit would authorize once-through cooling discharge (outfall serial numbers 001 and 002) with a termination date "to be developed as a result of redetermination by the Regional Administrator pursuant to 40 CFR 125.36" and would authorize discharge of cooling system blowdown (outfall serial number 003) with a beginning date "to be developed as a result of redetermination by the Regional Administrator pursuant to 40 CFR 125.36 if closed cycle cooling is ultimately required." Part I.B.1.b. reiterates the compliance schedule.

Part III.E provides for the possible modification of the permit to allow for seasonal operation in a once-through mode. This provision had also been included in the original NPDES permit issued on December 31, 1974. The stipulated issues to be resolved in the EPA adjudicatory proceeding were:

1. Whether the NPDES permit should defer determination pursuant to Section 316(b) and the imposition of Section 316(b) requirements until December 1977 (or such later date as may be appropriate).

2. Whether the closed-cycle cooling requirement in the December 31, 1974, NPDES permit is justified under Section 316(b).

3. Whether the December 31, 1974, NPDES permit should provide for a deferred determination pursuant to Section 316(a) and suspend implementation of closed cycle cooling requirements until December 1977 (or such later date as may be appropriate).

4. Whether an alternative Section 316(a) thermal effluent limitation allowing open-cycle cooling is presently required, considering existing data and the low potential thermal impact of the plant.

5. Whether the heat treatment should be permitted to go to the intake canal.

6. Legal issues referred to the Office of General Counsel for resolution pursuant to 40 CFR 125.36 (m).

As part of the adjudicatory proceeding, an EPA hearing was held during the period June 2-16, 1976 and the transcript was certified[10] by the Administrative Law Judge on September 24, 1976. The interim "stipulated NPDES permit" was issued on March 25, 1977. Because the record was insufficient on the fifth issue (i.e., the heat treatment discharge), on August 17, 1977, the Acting RA served all parties to the hearing with a Request for Information on that issue. By letter dated September 7, 1977, CP&L withdrew the request for approval of the heat treatment discharge and entered a request that the hearing be reopened to review data which had been collected since the June 1976 hearing.[11]

The RA issued his Initial Decision (ID)[12] on November 7, 1977, which denied CP&L's request to reopen the hearing and ordered "...the issuance of a new permit restricting capacity or flow of the intake to the absolute minimum levels consistent with the safe operation of the plant ...Further, the new permit shall include a compliance schedule which will ensure that this reduction is implemented at the earliest possible date." (ID, pp. 90-91).

The following are findings presented in the RA's Initial Decision in support of his order:

> "...entrainment and impingement at Brunswick is a significant adverse environmental impact which must be minimized as quickly as possible in order to protect and preserve the Estuary ecosystem with its many valuable species of fish and shellfish." (ID. p. 44).
>
> "The record is clear that the location of Brunswick's intake structure does not comply with the requirements of Section 316(b)." (ID. p. 54).
>
> The evidence in the record indicates that the design of the Brunswick intake structure is not the best technology available to minimize the adverse environmental impacts occurring as a result of operation of the plant with its current once-through cooling system." (ID. p. 57).
>
> "The capacity of the plant with operation of a once-through cooling system is not the best technology available to minimize adverse environmental impact at that site." (ID. p. 61).

"...the cost of significantly reducing the capacity of Brunswick's cooling water intake structure...is not wholly disproportionate to a 96% reduction in the severe adverse environmental impacts of the plant." (ID. p. 69).

"The evidence indicates that withdrawals of water from the Estuary in that amount [2,000,000,000 gallons of water per day]* will cause a decrease in indigenous species, loss of critical aquatic organisms which are important elements in the food web, a reduction in fish population composition, with a resulting decrease in commercial and sport fisheries, along a significant portion of the Eastern seaboard. Therefore, CP&L is not entitled to a Section 316(a) variance." (ID. p. 71).

"...the only currently feasible alternative at Brunswick to alleviate current and future adverse environmental impacts is to severely restrict the flow of water (capacity) through the plant." (ID. p. 73).

"In considering CP&L's current request for further delays for studies, the record contains overwhelming evidence which indicates that a two-year delay is unjustified." (ID. p. 77-78).

"The record establishes that two more years of study would not alter the ultimate conclusion that the operation of Brunswick with its once-through cooling system is having an adverse environmental impact on the Estuary, therefore, the Section 316 determinations must not be deferred. CP&L is not precluded, however, from conducting studies it deems necessary to make a demonstration regarding seasonal operation of its once-through system." (ID. p. 86).

"...the permit to be developed as a result of this redetermination should not include references to specific cooling technologies, but rather should be confined to limitations on those technical parameters authorized by the statute." (ID. p. 87).

On December 1, 1977, CP&L petitioned the EPA Administrator for review[13] of the RA's Initial Decision and of the General Counsel's Decision, requesting (1) summary reversal of the Initial Decision and issuance of CP&L's Proposed Findings, or, alternatively, (2) reopening of the record and review of the Initial Decision based on the supplemented record, or (3) granting of appeal to review the present record. Other parties to the proceeding (i.e., the Department of Natural Resources and Community Development of the State of North Carolina, and the

---

*Information added for clarification.

Commission Staff of the Utilities Commission of the State of North Carolina) also filed petitions for review of the Initial Decision. The "Public Staff" of the Utilities Commission of the State of North Carolina requested recognition as an additional party and entered a petition for review of the Initial Decision. On January 27, 1978, additional petitions for leave to intervene were filed by Brunswick County, North Carolina and by the City of Southport, North Carolina.

On February 20, 1978, the EPA Administrator remanded the Brunswick case[14] to the RA with instructions to revise the Initial Decision to comply with 40 CFR 125.36(1)(2). Specifically, the Administrator found that the RA, in his initial decision, had not addressed all issues of fact or discretion submitted by the parties in their proposed findings and conclusion. Further, the RA was requested to describe, in his revised decision, (1) the existing data presented by CP&L, (2) data tendered by CP&L in support of its request to reopen the hearing, and (3) data proposed to be collected by CP&L during the remainder of its study. Finally the Administrator admitted the "Public Staff" as an additional party and authorized Brunswick County and the City of Southport to participate as amici curiae.

On March 20, 1978, the RA petitioned[15] the Administrator to reconsider or clarify his remand of the Initial Decision on the bases: that "all issues of fact" means all "material " issues of fact relevant to the questions of whether an NPDES permit should be issued, denied, or modified; that the material and legal issues to be determined as a result of the hearing were defined in the stipulation entered into by the parties; that the Initial Decision adequately discusses these and that if issues of fact relative to the determination have not been adequately addressed, those issues should be specified by the Administrator.

CP&L wrote to NRC, on May 16, 1978, reiterating their request for amendment of license or waiver of enforcement of the installation date.[16] NRC responded on August 2, 1978, requesting from CP&L information on mitigative alternatives with focus on those alternatives which could be implemented by January 1, 1979 and serve in the interim period until the EPA decision.[17]

By letters of June 14, August 2, August 3, and August 16, 1978 CP&L proposed alternatives to closed-cycle cooling for consideration by EPA as a settlement of the pending issues before the EPA Administrator. EPA requested technical review of the proposed alternatives by other Federal agencies.[18] NRC notified EPA by letter dated August 24, 1978 that the information available did not revise NRC's original position that closed-cycle operation is the preferred mode.[19]

By letter dated August 28, 1978, CP&L responded to NRC's request for information,[19] reiterating its view that the NRC had no authority to impose interim mitigative measures and further indicated that the measures which CP&L had studied would require three years for full implementation. In CP&L's opinion, any interim measures required by the NRC would constitute a more restrictive effluent limitation than required by the existing NPDES permit.[20]

The RA provided[21] the Administrator with a decision in response to the remand which was in the form of a "Supplement to the Initial Decision," dated August 31, 1978. On this same day, the RA issued a denial of CP&L's motion to reopen the hearing record.[22] The supplement supported the RA's conclusion that flow reduction (equivalent to closed-cycle) was required at the Brunswick Plant at the "earliest possible date." Action by the EPA Administrator is still pending.

By letter of September 1, 1978, EPA informed CP&L that their proposed alternatives to closed-cycle were inadequate to meet the "best available technology standard."[23]

Discussion

In the FES, the staff evaluated the impacts of continued once-through operation at the Brunswick Plant and found that, on balance, the action required was conversion to a closed-cycle cooling system. A three-year period was selected as an acceptable period of operation while cooling towers were being constructed. By selecting the three-year period, corresponding with the minimum time estimated for completion of tower construction, the staff implied that conversion to closed-cycle should be accomplished at the earliest possible date.

The following excerpts from the FES summarize the NRC staff findings related to potential impacts on aquatic biota from impingement and entrainment at the Brunswick Steam Electric Plant (BSEP):

> "The major impacts...arise primarily from the physical presence of the canal and its operation. The major impacts relate to (a) impingement and entrainment..., (b) modification of marshlands, and (c) partial loss of a freshwater resource." (p. V-1)
>
> "...it is apparent that Snows Marsh including Walden Creek is highly productive, and serves as a nursery ground for many species of commercial importance, including shrimp, blue crab, spot and croaker. It is likely that substantial numbers of shrimp, spot and blue crabs from the Walden Creek and Snows Marsh environs will eventually pass through the plant. These organisms will be particularly vulnerable during their migrations into and out of the Walden Creek-Snow Marsh area" (p. V-26).

"Fish populations will become established in the intake canal and it is expected these populations will rapidly increase until the supporting capacity of the system is reached. ...Adult resident fish that are able to withstand the water velocities ...are less likely to become impinged on the traveling screens than the transient populations of juvenile shrimp and spot. The flow velocity...ranges from about 0.5-0.8 fps under normal conditions and up to 1.4 fps during extremely low water conditions. Juvenile shrimp and spot entering the intake canal, may be impinged on the screens. At velocities greater than 1 fps there is a sharp drop in the ability of juveniles to swim against the current. These data and the fact that Snows Marsh is an important nursery area lead the staff to conclude that significant numbers will be impinged on the traveling screens, especially during low-water conditions" (p. V-28).

"Sufficient data are not available to determine the exact impact resulting from the entrainment of plankton in the cooling water system and the impact of impingement of larger organisms on the traveling screens. Probable estimates based on the qualitative data provided can be summarized by the following statements:

1. During certain periods, all organisms passing through the traveling screen will be killed by either thermal shock, mechanical damage, or chlorination or a combination of these. At other times, the mortality due to passage through the condensers may be relatively low, but the entire process of extreme pressure and turbulence, elevated temperatures for a period of up to five hours, exposure to chlorine and chlorine residuals and final exposure to cooler oceanic temperatures can be expected to cause significant mortality rate to planktonic forms throughout the year.

2. Commercial species, particularly shrimp, utilizing the marsh environs for nursery grounds will be killed in significant numbers resulting in an estimated economic loss to Brunswick County alone estimated at $325,000/yr.

3. White shrimp from the Cape Fear contribute to the shrimp catch in South Carolina, Georgia, and Florida. Entrainment of shrimp larva as well as impingement of developing juveniles will have an effect on the shrimp fishery in those states. As previously stated, the value of the annual shrimp catch in northern South Carolina is estimated at $262,000. Most of these shrimp caught in this region appear to come from the Cape Fear estuary.

> "The applicant states that the plankton mortality resulting from passage through the plant condensers is not considered to represent a significant loss from the estuary due to the small percentage of water from the estuary that will be diverted though the plant. The staff cannot accept this conclusion based on the data available. The staff believes that entrainment will be significantly greater because of the productivity of Snow Marsh and Walden Creek. Thus, the staff concludes, on the basis of the available data and experience from other similar once-through cooling systems, that the operation of Brunswick 1 and 2 with the proposed once-through cooling system has the potential for serious and perhaps irreversible effects on the environment of the Cape Fear Estuary. The staff considers that the impact of plant operation under the present cooling system design will be serious but not irreversible if such operation is limited to the proposed three year period while an alternative cooling system is installed" (p. V-31).

CP&L initiated testing of circulating water pumps in January 1974 and, by monitoring the trash screens and intake flow, obtained data on impingement and entrainment losses. In the ASLB hearing, the staff noted that the number of finfish impinged during pump testing was somewhat lower than had been anticipated; however, the staff did not believe these preliminary data were sufficient to evaluate fully the potential impact (ASLB Hearing Tr. at p. 758).

Staff testimony before the ASLB demonstrates subjectivity in the selection of three years as an acceptable period for once-through cooling. The period was clearly based on the practicality of construction schedules and a subjective judgement that impact during the three years would be reversible.

One effect of the Stipulation, agreed to by the applicant, intervenor, and the AEC Regulatory Staff (now the NRC), was to remove this issue from litigation in the ASLB hearing. The conditions imposed by the Stipulation were incorporated in the ASLB's Decision issued on December 26, 1974. Pertinent findings presented in the Board's Decision are:

- that irreversible impacts on aquatic biota will not result from plant operation with once-through cooling, provided that operation does not extend beyond the three-year period
- that Staff testimony establishes this three-year time frame on the basis of a subjective compromise between hardware availability and probably reversible environmental effect
- that the staff will require Applicant to conduct monitoring programs adequate to permit assessment of any serious environmental impact which might occur

- that the principal benefit of the continued construction of the plant is the addition of approximately 11.5 billion kilowatt hours of electricity per year

- that the environmental and economic benefits from the continued construction and operation of the plant, particularly the necessity for CP&L to supply electrical power to meet the demand and expected growth in electrical use within its service area, are greater than the environmental and economic costs which will necessarily be incurred by continued construction and operation of the plant.

Nearing the end of one year with pump testing at Unit 2, CP&L petitioned EPA for an adjudicatory hearing to contest the terms of the original NPDES permit, which like the license condition effectively required conversion to cooling towers. The request for hearing was granted by EPA on March 19, 1975.

In a conference between EPA and CP&L representatives on June 4, 1975, CP&L presented a data summary of their pump testing studies and proposed a two-year delay in cooling tower construction while additional data were being collected. The same proposal was made informally to NRC representatives in a meeting with CP&L on June 6, 1975. CP&L convened a technical meeting on June 27, 1975 to discuss their data and conclusions with concerned agencies and citizen groups.

Since EPA had granted a hearing on the NPDES permit, that agency took the lead in soliciting comments on CP&L's data results and proposal. Comments provided by the National Marine Fisheries Service, the Fish and Wildlife Service and EPA's own technical staff unanimously concluded that the data presented by CP&L did not justify a two-year delay (see RA's ID at p. C-11). Following review of the same information, Counsel for Project Environment informed both EPA and NRC that:

> "...Project Environment does not object to the proposal outlined by Carolina Power and Light Company and does not intend to object to such modifications of the Company's licenses, permits and other documents as may be necessary in order to permit further study of the impact of the plant's once-through intake system while two units are operating."

On August 13, 1975, CP&L formally requested the NRC to amend the Unit 2 license, deferring the cooling tower installation date for 31 months until December 31, 1980. Prior to the completion of NRC staff review of the technical reports, EPA notified CP&L that it was denying the extension request but indicated that the question of any extension could be explored at the adjudicatory hearing. The NRC staff's technical review and assessment was completed subsequently.[25] Staff findings indicated that the CP&L information did not refute the FES assessment as to the unacceptability of

two-unit operation for an extended period with the once-through cooling system and that there was no technical basis for extending the schedule for conversion to closed-cycle cooling. By letter from H. Denton to H. Zeller dated February 4, 1976, EPA was notified of NRC's intent to cooperate in the adjudicatory hearing by providing testimony on the results of our evaluation of the Brunswick monitoring data. This action was taken pursuant to the mandate of the FWPCA directing maximum cooperation among Federal agencies in the administration of the Act [Section 101(f)] and reflected agreements between NRC and EPA in the Second Memorandum of Understanding dated December 17, 1975.

Prior to the EPA Hearing, the Administrative Law Judge issued an order staying the cooling tower compliance schedule conditioned on CP&L obtaining written concurrence for such stay from the NRC. The amendment which CP&L requested pursuant to this order was evaluated by the NRC staff on the basis of the extent of pumping which had occurred since the time Brunswick had begun operation. Amendment No. 15 to the Unit 2 license extended the "installation date" by eight months to January 1, 1979. The period of once-through cooling operation would have been equivalent to the three years originally analyzed in the FES. The staff's intent in that action was to "...permit the EPA adjudicatory hearing to proceed free of an operating license condition similar to the contested NPDES permit condition and... [was] not [to] be taken as affecting the merits of the cooling tower questions presently being litigated before EPA." The eight-month extension was expected to cover the period of time necessary for resolution by EPA of the ultimate questions concerning cooling towers at the Brunswick plant. The staff recognized that EPA could require either an earlier or a later tower installation date and that an assessment of impacts and further license amendment would be necessary if EPA's compliance schedule allowed once-through operation subsequent to January 1, 1979. The staff did not anticipate having to reconsider the question of a compliance date for cooling tower implemetantion until a final EPA determination had been made on the need for cooling towers, i.e., the ultimate question.

The RA has reached an Initial Decision and has further supported that decision by his supplement in response to the remand of the EPA Administrator. (The Background discussion presents excerpts which summarize the RA's findings.).

The staff believes it to be prudent and proper to apply the findings of the RA in this appraisal. The Commission's order in the Seabrook case makes clear that the NRC may, and in appropriate cases, should accept and use EPA's determination of the magnitude of aquatic impacts from cooling system operation in striking an overall cost-benefit balance for the facility.[26] Thus, although the NRC is not required to use EPA

determinations in every case, we are deferring to the EPA in the Brunswick case for the following reasons:

1. The EPA has held an adjudicatory hearing on those issues which were not litigated in the ASLB hearing.

2. The public interest of the Intervenor in the NRC proceeding has been further served by the EPA Hearing. The Intervenor waived the opportunity to become a party to the proceeding.

3. The NEPA concerns of the NRC staff have been given full consideration in the EPA hearing process:

   (a) Staff findings in the FES were used and referenced.

   (b) Testimony of an expert technical witness for the NRC was received in the EPA hearing.

   (c) The RA's Initial Decision supports the FES findings and reflects the concerns expressed by the NRC expert witness.

4. The EPA Initial Decision presents specific factual findings on the magnitude of environmental impacts with continued once-through cooling system operation.

Once a final EPA decision is reached, the NRC staff should be able to rely heavily on these findings in conducting a cost/benefit assessment of the impacts of operation in conformity with the EPA decision. In accepting the EPA determinations, there arise two items of potential conflict between the NPDES permit and the Operating Licenses:

A. Flow Reduction vs Cooling Towers

The RA's Initial Decision, as supplemented in response to the EPA Administrator's remand, supports the need for flow reduction from that associated with once-through cooling to a level equivalent to closed-cycle operation. Since the NRC has approved cooling towers as the form of closed-cycle cooling to be used, there is a possibility of conflicting requirements between the license and the NPDES permit if flow reduction, equivalent to the use of a different technology, is approved by EPA. However, until such conflict should arise, there is no basis for removal of the cooling tower requirement.

B. Compliance Date vs Installation Date

The interim NPDES permit issued on March 25, 1977 allows once-through operation to an undefined date. The NRC-issued licenses require conversion to cooling towers on January 1, 1979. There is the possibility that the final EPA Administrative decision will not be reached before January 1, 1979 and the certainty that cooling

towers will not be available by the "installation date"; CP&L has estimated 33 to 36 months would be required to complete the cooling towers upon resumption of the construction activity. We have determined that the appropriate action is to delete the installation date and defer to that compliance date to be established by the RA upon completion of the EPA Administrative action. The consequences of this staff action are evaluted in the following section.

Evaluation

In his Initial Decision, the RA determined that:

> "...the evidence already in the record indicates that the plant's once-through cooling system is adversely impacting the Estuary and ecosystem. The exact magnitude of adverse impact remains unknown. The statute does not require that the exact magnitude be determined. Two more years of additional study proposed by CP&L will not yield information which will alter the determination of adverse impact. Each year the plant operates with its once-through cooling system, greater harm occurs to the Estuary and its resources." (ID supplement at p. 134).

The RA states that "[c]ertain testimony in the record misconstrues the statute in emphasizing that effects of Brunswick's intake structure may not be irreversible or irretrievable. The statutory test is 'adverse.' It is possible that those parties who dealt so extensively on the irreversibility question did so in order to show that no permanent damage would be done to the Estuary if that determination were deferred while further studies were conducted. However, in light of the fact that existing data are sufficient to make a Section 316(b) determination at this time, the issue of irreversibility is simply not a relevant consideration" (ID, pp. 28-30). In a footnote to this discussion, the RA further states that "[w]e are not, however, convinced that the effects of two years of two unit operation with once-through cooling would not be irreversible, particularly when considered together with the additional time that will be required to install off-stream cooling" (ID at p. 30, Footnote 61).

Based on these and other findings in the Initial Decision, the RA ordered the issuance of a new NPDES permit restricting capacity or flow to the absolute minimum levels consistent with the safe operation of the plant and including a compliance schedule which will ensure that this reduction is implemented at the earliest possible date (ID at pp. 90-91).

The NRC and the EPA Regional Administrator concur in the adversity of impacts with continued once-through operation of the Brunswick Plant. Both agree on the urgency of implementing flow reduction (equivalent to off-stream cooling) at the earliest possible date. What the NRC

must now determine under NEPA, is whether the costs outweigh the benefits if the plant is allowed continued operation with once-through cooling until flow reduction is implemented. In its 1974 Decision, the ASLB determined that the benefits favored the completion of construction and initial operation with once-through cooling even though serious short-term effects were expected. These short-term effects were not expected to result in irreversible impacts if the period of operation was limited to a stipulated three-year period. To ensure that a more serious effect was not incurred during the three-year period, the Board required that monitoring be an integral part of a continuing assessment.

The Licensee has conducted more extensive monitoring than required by the Environmental Technical Specifications to support its case in the EPA proceeding. Monitoring of the direct effects of entrainment and impingement has shown the magnitude of these observable losses to be increasing as the plant intake flow rate approaches the normal two-unit operational level. Monitoring of the estuarine populations has not identified any catastrophic effects; however, adverse effects can still be predicted with a choice of realistic assumptions in the development and application of theoretical models. The RA concluded that: "In view of the testimony, the results of all the modelers affirmatively demonstrate that adverse environmental impacts are occurring and will continue to occur so long as the plant is operated with once-through cooling" (ID supplement at p. 113).

The RA noted that the exact magnitude of impact remains unknown; therefore, it is instructive in regard to the present assessment to review the range of predicted impact. The licensee believes that its model, which predicts less than 10% decrease in the larval population of the estuary, is conservative. A reduction in the larval populations at the lower level of 2 to 3% is thought more probable by CP&L based on the plant taking in only 2 to 3% of new water flowing into the Estuary with each tide.* With a further hypothesis that the plant flow may induce an increased larval recruitment from the ocean to the Estuary, CP&L concludes that the actual decrease will be closer to 0% than to the model predicted 10% and may even result in a slight increase in the estuarine larval populations.** Witnesses for EPA estimated 46-63% larval reduction and 70% reduction due to both entrainment

---

* The RA notes that this assumption presupposes homogeneous larval distribution throughout the estuary but that the record contains testimony that such is not the case (10 supplement, p. 107).

**The RA states that he finds no support in record for CP&L's belief that the operation of the intake may result in an increase in larval populations in the estuary. (10 supplement p. 111).

and impingement (ID at p. 40). Included in the hearing record (EPA Exhibit 33) are estimates for larval reduction, provided by the National Marine Fisheries Service, ranging from 66-2/3% on the average to 99.9% for the extreme case with a three-week period of larval vulnerability to the intake. In the FES, the staff estimated losses to the shrimp fishery on the basis that about 35% of the shrimp productive area in the Cape Fear estuary would be affected adversely by the plant circulating water system (FES, p. XI-19 and Appendix C).

With the wide range of estimated losses, i.e., from 0% (or even a theorized gain) to 99.9%, the question of whether to allow continued operation remains a subjective judgement. The RA concluded:

> "...it appears that a larval reduction somewhere between 25% and 75% is to be expected from full two-unit operation with once-through cooling. But it must be pointed out that even a larval reduction of 1-5% could result in a substantial reduction in population levels over a long period of time" (ID supplement, p. 113).

It is the staff's present judgement that larval losses in the predicted range of 25% - 75% are incompatible with the long-term well-being of the Cape Fear Estuary ecosystem. However, based on the available data, we do not believe it likely that irreversible damage has been incurred during the first three years of plant operation. Damage which may be incurred in the short-term will not alter the balance, previously struck by the staff and the ASLB, which favored the construction and initial operation with once-through cooling. Further, the methodology for impact assessment does not allow for pin-pointing in time when this balance may be upset. In recognition of this inadequacy of the methodology, we concur in the RA's finding that flow reduction should be implemented at the earliest possible date. We cannot construct a balance which provides better definition of a suitable or necessary installation date.

Conclusions for Negative Declaration

Under 10 CFR § 51.5 (c)(1), the NRC staff has concluded that this environmental appraisal (rather than an environmental impact statement) provides the necessary analysis in support of the amendment. This conclusion is based, in part, on the fact that the NRC has determined that it is appropriate to defer to decisions,to be made by EPA, as to the choice and installation date of the cooling system. It was further influenced by the fact that the results of this appraisal have not altered the fundamental conclusions of the FES. Having made this conclusion, we find that a Negative Declaration is appropriate for this licensing action.

DEC 15 1978

References

1. Letter from E. E. Utley, CP&L Senior Vice President, Power Supply, to Benard C. Rusche, Director of Office of Nuclear Reactor Regulation, NRC, dated March 4, 1977.

2. Federal Register, Volume 42, No. 217, November 10, 1977. pp. 58582-3.

3. Stipulation by Applicant, Intervenor, and AEC Regulatory Staff, dated July 8, 1974. Appendix A to ASLB Initial Decision in the matter of Carolina Power and Light Company (Brunswick Steam Electric Plant, Units 1 and 2), December 26, 1974.

4. NPDES Permit No. NC0007064 issued by EPA Region IV, December 31, 1974.

5. CP&L Petition for Declaratory Order and Motion for Reconsideration, filed with EPA Region IV, on March 12, 1976. (Supporting Brief filed with EPA Region IV on March 17, 1976).

6. Order by EPA Administrative Law Judge dated March 17, 1976 and corrected by Order dated March 19, 1976.

7. Letter from Robert A. Purple, Chief, Operating Reactors Branch #1, to CP&L (ATTN: J. Jones), dated May 18, 1976, transmitting Amendment No. 15 to Facility Operating License No. DPR-62 (Brunswick Steam Electric Plant, Unit No. 2).

8. Stipulation for the Regional Administrator's Approval. In the Matter of NPDES Permit No. NC0007064, CP&L's Brunswick Steam Electric Plant, approved June 22, 1976.

9. Stipulation for the Regional Administrator's Approval, In the Matter of NPDES Permit No. NC0007064, CP&L's Brunswick Steam Electric Plant, approved June 22, 1976.

10. EPA Administrative Law Judge's Certification of Transcript and Recommendations in the matter of NPDES Permit No. NC0007064, Brunswick Steam Electric Plant, dated September 24, 1976.

11. CP&L letter to EPA Region IV, dated September 7, 1977.

12. EPA Region IV Administrator's Initial Decision in the Matter of NPDES Permit No. NC0007064, Brunswick Steam Electric Plant, dated November 7, 1977.

13. CP&L Petition to EPA Administrator for Review of the Initial Decision of the Region IV Administrator and of the Decision of the General Counsel No. 41, dated December 1, 1977.

14. EPA Administrator's Remand in the Matter of NPDES Appeal No. 77-19 Brunswick Steam Electric Plant, dated February 20, 1978.

15. EPA Region IV Petition for Reconsideration or Clarification of Administrator's Remand in NPDES Appeal No. 77-19, dated March 20, 1978.

16. CP&L letter from E. E. Utley to Edson G. Case, Acting Director, Office of Nuclear Reactor Regulation, Re: Cooling Tower Installation Date, dated May 16, 1978.

17. NRC letter from Daniel R. Muller, Acting Director, Division of Site Safety and Environmental Analysis, to E. E. Utley, CP&L, dated August 2, 1978.

18. Letter from Howard Zeller, EPA Region IV Deputy Director for the Enforcement Division, to Charles W. Billups, NRC Aquatic Scientist, dated July 14, 1978.

19. NRC letter from Voss Moore, Assistant Director for Environmental Projects, to Howard Zeller, EPA Region IV, dated August 24, 1978.

20. CP&L letter from E. E. Utley to Harold R. Denton, Director, Office of Nuclear Reactor Regulation, dated August 20, 1978.

21. EPA Region IV Administrator's Denial of Carolina Power and Light Company's Motion to Reopen the Record in NPDES Appeal No. 77-19.

23. EPA letter from Howard D. Zeller to Richard E. Jones, CP&L Associate General Counsel, dated September 1, 1978.

24. Letters from Herbert P. Scott, Counsel for Project Environment, to Benard C. Rusche, Director of NRC's Office of Nuclear Reactor Regulation, and to Jack E. Ravan, EPA-Region IV Administrator, both dated August 8, 1975.

25. Technical Assistance Request (TAR) No. 1818 Response, from Malcolm L. Ernst, Assistant Director for Environmental Technology, to Voss A. Moore, Assistant Director for Environmental Projects, dated January 9, 1976.

26. Public Service Company of New Hampshire (Seabrook Station), CLI-78-1, 7 NRC 1, 23-24 (January 1978).