

June 25, 2002

Ms. Sandra S. Tucker
Field Supervisor
Fish and Wildlife Services
U.S. Department of the Interior
247 South Milledge Avenue
Athens, Georgia 30605

Ms. Tucker:

In a letter dated November 27, 2001, you provided comments on the U.S. Nuclear Regulatory Commission (NRC) staff's "Generic Environmental Impact Statement for License Renewal of Nuclear Plants." (GEIS, NUREG-1437), Supplement 4, regarding the Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2. The Final Supplemental Environmental Impact Statement (FSEIS) for HNP was published in May 2001. In this letter, the staff responds to your comments.

You expressed a general concern about a number of recreationally and commercially valuable species and made comments related to two specific areas: (1) the adequacy of the entrainment and mortality evaluation for the combined two-unit operation conducted in 1979 and (2) the reliability of the results of the thermal discharge plume field verification study reported in the licensee's 1981 316(b) study. In your letter you recommended that the NRC require the Southern Nuclear Operating Company (SNC) to conduct a "current and thorough fish entrainment and mortality study to adequately characterize" two-unit fish entrainment conditions. Additionally, you recommended that SNC conduct field studies to evaluate thermal discharges under two-unit operating conditions. The following summarizes the staff's response to these concerns.

Fish and Wildlife Resources

The NRC had, within the purview of its statutory authority, an obligation to evaluate the environmental impacts that an additional 20 years of operation at HNP, Units 1 and 2, would have on Federally-listed endangered species. In this regard, on August 31, 2000, the staff issued a biological assessment for license renewal of HNP to the National Marine Fisheries Service (NMFS) evaluating the environmental impact on the shortnose sturgeon (*Acipenser brevirostrum*), a Federally-protected endangered species. Using information provided by SNC and other sources, the staff concluded the proposed activity may affect, but is not likely to adversely affect, the shortnose sturgeon. NMFS and NRC continue to discuss concerns related to this species.

The Georgia Department of Natural Resources' Environmental Protection Division (GADNR EPD), through state statutes and authority from the U.S. Environmental Protection Agency, has the responsibility of protecting non-Federally listed fish and wildlife resources. The NRC staff coordinated its review with GADNR EPD and did not identify the need for additional mitigation beyond that already employed to protect fish and wildlife resources. If you still have concerns related to non-Federally listed aquatic species, these concerns should be addressed to GADNR EPD, which has jurisdiction in those matters.

Fish Entrainment and Impingement

Your letter expressed concern about the appropriateness of the entrainment and mortality evaluation for two-unit operation. You stated that increased intake velocities coincident with lower river levels may result in increased entrainment of eggs, larvae, and juvenile fish. Additionally, you stated that the majority of the entrainment sampling occurred during a period when only one unit was in operation, that all of the data were over 20 years old, and that fish populations (in particular the American shad) had changed since then. You then concluded that "two-unit operation at Plant Hatch may have adverse impacts on fishery resources" and that an updated assessment of fish entrainment and mortality should be conducted.

The staff considered various sources of information in its evaluation of the fish entrainment and mortality issue, including the information submitted by SNC in its Environmental Report (ER) for license renewal and plant operating experience throughout the industry, as reported in NUREG-1437, Vol. 1 and 2.

You stated that two-unit operation at HNP may have significant adverse impacts on fishery resources through increased entrainment of eggs, larvae, and juvenile fish for several species of concern. You based this statement on some of the intake velocities reported in SNC's 1981 Section 316(b) report. The staff has reviewed the information submitted by SNC and neither the measured intake velocity nor empirical sampling of entrained fish, eggs, and larvae indicate that there will be a significant impact on the fisheries resources in general, or the shortnose sturgeon in particular. As discussed with Mark Bowers of your Athens office at the site, and documented in our May 14, 2001, summary of the meeting, intake velocities at the design maximum intake flow would range from 0.36 fps to 1.2 fps at river elevations of 76.25 ft above mean sea level (MSL) and 62 ft above MSL, respectively. On average, the actual intake flows are two-thirds of the values stated above. Similarly, the actual intake velocities are approximately two-thirds of the maximum design intake velocities. The intake flows and velocities are fairly low because the plant uses cooling towers. The percentage of flow entrained by two-unit operation is approximately 8.9% of the river flow under observed minimum daily flow rate in the river of 1200 cfs. In the final environmental statement for the operation of Unit 2 (NUREG-0417), published by the NRC in March 1978, the staff evaluated the impacts of entrainment from both single and two-unit operation at a calculated minimum river flow rate of 900 cfs, a value below the recorded minimum flow in the river. At this flow rate, the percentage of entrained flow was 11.8%. With an average river flow of 13,000 cfs, the percentage entrained by the plant is less than 1% for two-unit operation. It is the opinion of the staff that these entrainment percentages will not result in a significant adverse impact on the fishery resources.

Intake flow and flow volumes through the plant are not the only factors affecting entrainment and impingement. Entrainment and impingement are also a function of proximity to the spawning site and habitat used by juveniles. SNC stated in its ER for license renewal that the documented spawning activities for the shortnose sturgeon, an endangered species, occur 70 river kilometers downstream of the plant. Another suspected site may exist 40 river kilometers upstream of the plant. Because shortnose sturgeon eggs are demersal and adhesive after

fertilization, the staff believes that the eggs of shortnose sturgeon are not susceptible to entrainment. Based on past studies, the impacts of entrainment on other species are also small.

With respect to impingement, the young shortnose sturgeon stay close to the bottom and are preferentially found in deeper portions of the river and therefore not susceptible to this impact. Because of the low flow velocities at the intake structure, impingement of healthy adults is unlikely. (See the NRC staff's biological assessment submitted to NMFS on August 31, 2000.)

Therefore, the impact due to plant operation would not be significant considering the distance between known spawning locations and the plant intake structure, the location of the intake in relation to the river channel, and the relatively low intake flows and velocities. You have not provided information that indicates that the spawning area for any endangered species that could be affected significantly by plant operation is in close proximity to the plant. Without new and significant information, this matter is considered closed.

You also raised concerns with respect to the adequacy of the entrainment studies conducted from 1975 through 1980. The staff has evaluated the studies and compared the results to other plants with similar intake designs. This plant already incorporates a closed-cooling system. The staff concluded that the findings in the 1975 through 1980 entrainment studies were consistent with observations made throughout the industry as reflected in NUREG-1437, Section 4.3. The staff found that operating plants with a closed-cooling system, such as HNP, use a fraction (5 to 10 percent) of the water used by once-through cooling systems, thus reducing the impacts of fish entrainment. The staff acknowledged that "even low rates of entrainment and impingement at a closed-cycle cooling system can be a concern when an unusually important resource is affected" (NUREG-1437, Vol. 1, p 4-33). Information submitted by SNC, NMFS, and the Fish and Wildlife Service (FWS) indicates that the plant intake structure is not in close proximity to spawning areas for shortnose sturgeon or other protected aquatic species, and thus should not have an effect on population restoration efforts.

To summarize, the NRC staff reviewed various sources of information concerning the impacts of entrainment and impingement associated with the operation of HNP. These included the Section 316(b) study for the plant, the staff's final environmental statements for initial licensing of the units, SNC's environmental report for license renewal, and the staff's Generic Environmental Impact Statement for License Renewal of Nuclear Plants (NUREG-1437). No new information has been provided to suggest that the populations of shortnose sturgeon or other species are adversely impacted by the current plant configuration. Therefore, the staff continues to rely on its conclusion in the FSEIS that no additional studies are necessary. You have not provided information that indicates that the spawning area for any endangered species that could be affected significantly by plant operation is in close proximity to the plant. Absent the introduction of new and significant information, the NRC staff considers this matter closed. If FWS believes that HNP is not in compliance with Section 316(b) of the Clean Water Act, then we encourage you to contact the GADNR EPD, which has the responsibility for determining compliance with Section 316(b).

Thermal Discharge

You also questioned the results of the thermal discharge plume field verification reported in the 1981 study and the Thermal Plume Model and stated that they were not reliable and do not properly “characterize adverse impacts to the river by temperature deviations resulting from the full two-unit operation of HNP during low summer and fall flows.” You recommend a daily field study for a minimum of two years to study river conditions during the critical low flow periods in summer and fall.

The staff considered plant operating experience throughout the industry as part of its review. As stated in the GEIS (NUREG-1437, Vol.1) Section 4.2.2.1.4, thermal discharge effects and cold shock are well known phenomena in steam-electric generation and mitigative measures have been employed across the country. Typically, thermal discharge effects are most prominent at plants with once-through cooling systems. HNP employs a closed-cooling system designed specifically to mitigate thermal discharge effects.

The staff reviewed the information submitted by SNC in its ER for license renewal and additional information. SNC collected extensive field data from 1975 through 1980. This data included continuous monitoring of the discharge at the end of the permitting zone and demonstrated conformance to the permitted thermal discharge temperature limits. The thermal discharge limits for HNP have been set by GADNR EPD in the plant’s National Pollution Discharge Elimination System (NPDES) Permit. In addition, SNC modeled the discharge plume using a Motz-Benedict Model and performed field verifications of that modeling using 24 field surveys, 12 of which were conducted after Unit 2 had commenced operation. The staff acknowledges that several of the field surveys conducted after the start of Unit 2 were not well suited for validation purposes. However, the model results were properly verified using the remaining studies. Moreover, as stated in the NRC’s Final Environmental Statement (FES) for HNP (NUREG-0417, March 1978), the model results for two-unit operation were also validated by a second predictive model recommended by the staff. Thus, two sources were used to validate the results of the model and both confirmed the acceptability of the modeled results when decisions were made regarding the initial operating license.

No new and significant information with respect to thermal effects has been submitted to the NRC. There is no data, empirical or anecdotal (e.g., from the State of Georgia), that indicates any adverse effect on river biota due to thermal discharges from the facility. Additionally, there has been no reported heat shock mortality to fishes in over twenty (20) years of operation at this facility. Based on previous staff review of HNP, industry operating experience, and the information submitted by SNC, the NRC staff continues to rely on its conclusion that the basis for the original licensing decision is still valid and no additional validation of the model is necessary and considers this matter closed.

S. Tucker

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If you have any questions concerning these responses, please contact Andy Kugler at (301) 415-2828 or Gregory Suber at (301) 415-1124. In addition, questions regarding the NPDES Permit for HNP and entrainment and mortality monitoring should be directed to GADNR.

Sincerely,

/RA/

P.T. Kuo, Program Director
License Renewal and Environmental Impacts Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-321 and 50-366

cc: See next page

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Mary Ann Parkhurst (maryann.parkhurst@pnl.gov)

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Edwin I. Hatch Nuclear Plant

cc:

Mr. Ernest L. Blake, Jr.
Shaw, Pittman, Potts
and Trowbridge
2300 N Street, NW.
Washington, DC 20037

Mr. D. M. Crowe
Manager, Licensing
Southern Nuclear Operating
Company, Inc.
P. O. Box 1295
Birmingham, Alabama 35201-1295

Resident Inspector
Plant Hatch
11030 Hatch Parkway N.
Baxley, Georgia 31531

Mr. Charles H. Badger
Office of Planning and Budget
Room 610
270 Washington Street, SW.
Atlanta, Georgia 30334

Harold Reheis, Director
Department of Natural Resources
205 Butler Street, SE., Suite 1252
Atlanta, Georgia 30334

Steven M. Jackson
Senior Engineer - Power Supply
Municipal Electric Authority
of Georgia
1470 Riveredge Parkway, NW
Atlanta, Georgia 30328-4684

Charles A. Patrizia, Esquire
Paul, Hastings, Janofsky & Walker
10th Floor
1299 Pennsylvania Avenue
Washington, DC 20004-9500

Chairman
Appling County Commissioners
County Courthouse
Baxley, Georgia 31513

Mr. J. D. Woodard
Executive Vice President
Southern Nuclear Operating
Company, Inc.
P. O. Box 1295
Birmingham, Alabama 35201-1295

Mr. P. W. Wells
General Manager, Edwin I. Hatch
Nuclear Plant
Southern Nuclear Operating
Company, Inc.
U.S. Highway 1 North
P. O. Box 2010
Baxley, Georgia 31515

Mr. L. M. Bergen
Resident Manager
Oglethorpe Power Corporation
Edwin I. Hatch Nuclear Plant
P. O. Box 2010
Baxley, Georgia 31515