UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of SOUTH CAROLINA ELECTRIC & GAS COMPANY (Virgil C. Summer Nuclear Station, Unit 1)	Docket No. 50-395

MEMORANDUM AND ORDER DISMISSING CONTENTIONS A6 and A7

The NRC Staff filed a motion dated October 3, 1978 with supporting affidavits for summary disposition with respect to Contentions A6 and A7. Staff asserts that the affidavits and Intervenor Bursey's responses to discovery demonstrate that there are no genuine issues of material fact worthy of adjudication and moves the Board to dismiss the contentions as a matter of law. The motion is based upon 10 CFR §2.749.

In a Memorandum and Order dated November 7, 1978 the Board notified Intervenor Bursey, who appears in this proceeding pro se, that, without an answer from him, the Board favors granting the motion and would do so unless he files and prevails on the issues pursuant to §2.749.

Mr. Bursey filed a response dated November 22, 1978 in opposition to the Staff's motion. The Applicant, on December 4, 1978, filed its "Answer to NRC Staff's Motion for Summary Disposition." Applicant's answer supported Staff's motion and included affidavits and other factual material. Functionally, Applicant's filing was itself a motion for summary disposition, even though it was styled as an "Answer." Mr. Bursey did not respond to Applicant's "Answer."[1/]

In our order below the Board grants Staff's motion to dismiss Contentions A6 and A7.

CONTENTION A6

> Contention A6 The State of South Carolina has duly issued a certificate for Summer pursuant to Section 401 of the FWPCA, and has duly issued an NPDES permit under Section 402 of the FWPCA. The thermal effluents and the cooling system intake velocities presumably will comply with South Carolina's FWPCA standards. Even so, the thermal discharge from the Summer plant will result in a depletion of oxygen and a corresponding degradation of water quality downstream from the Monticello Reservoir. The thermal effluents will also adversely affect plankton and the spawning

1/ The Intervenor may not have been aware of his opportunity to respond to Applicant's affirmative support of the motion for summary disposition. This is not controlling. Staff's motion and supporting affidavits alone require the decision sought.

> of landlocked striped bass in the Congaree River downstream from the Summer plant. Intake velocities in the cooling system will exceed 0.5 f.p.s. thus causing excessive mortalities of indigenous aquatic life. These impacts have not been adequately considered in the over-all cost-benefit analysis required by NEPA.

In accepting this statement of the contention in its Prehearing Conference Order of April 24, 1978 the Board limited the consideration of cooling system discharges to those effects arising from discharges which meet state water quality standards and the NPDES permit issued to the applicant under Section 402 of the Federal Water Pollution Control Act Amendment of 1972. These standards specify that the average monthly temperature rise above the ambient temperature of Monticello Reservoir as measured at a depth of 1 foot in the Fairfield pump storage intake shall be no more than 3°F.

The Staff submitted the affidavit of Paul Kanciruk, a behavioral ecologist employed at Oak Ridge National Laboratory. This affidavit specifically addressed three prime concerns in the contention which are: (1) that the thermal discharge from the nuclear plant will result in depletion of oxygen and a corresponding water quality degradation downstream from Monticello Reservoir in the Broad-Congaree River system, (2) that the thermal effluent will adversely affect plankton and spawning of striped bass in the Congaree River downstream from the plant, and (3) that intake

velocities in the cooling system will exceed 0.5 fps and thereby cause excess mortalities of aquatic life. We will now address these three concerns in the order given above.

Oxygen Depletion and Water Quality

The more conservative of 2 analyses presented dealing with dissolved oxygen depletion assumes that (1) water passing through the Summer plant will lose 40% of its oxygen, and (2) then it moves without mixing or re-aeration as a surface flow across the reservoir to the Fairfield facility intake channel. This intake is 60 feet deep and the thermal effluent from the plant when discharged during the 7.5 hour Fairfield generating cycle would be represented as the upper 4.8 feet of the 60 foot water column. Water in the intake below the thermal effluent but above an assumed thermocline depth of 20 feet is assumed to be aerated and have a normal oxygen content. Since the plant intake removes water from the zone above the thermocline only the upper 4.8 of 20 feet or 24% of the aerated water discharged through the Fairfield facility is directly affected by the plant. Thus the percentage reduction in oxygen by the plant considering only the aerated strata is 40% of 24% or 9.6%. The oxygen content of the 40 foot thick layer beneath the thermocline

(20 foot depth) which passes into the discharge is assumed to be zero (Kanciruk, p. 2). The Staff's analysis does not attribute any of the oxygen depletion of the layer below the thermocline to the thermal stability imparted to the reservoir by the plant's heat discharge which may in turn influence the positioning of the thermocline or the timing of thermocline formation.

The Staff model of oxygen depletion predicts that further dilution by aerated water of Parr Reservoir will leave a 5.4% reduction in oxygen, and dilution by the Saluda River and other tributaries will leave a 2.4% reduction in oxygen attributable to the plant discharge at the spawning site of striped bass in the Congaree River. This analysis is conservative because it does not take credit for any re-aeration of the effluent during its passage through the Fairfield facility or during movement down the Broad River system to the Congaree (Kanciruk, Appendix A, P. A 2).

The Staff affidavit does not present data on oxygen concentrations and daily fluctuation in concentration in dissolved oxygen at the striped bass spawning sites in the Congaree, but data from a site upstream in the Broad River show that levels are high and that there are large monthly fluctuations (Kanciruk, Table II). The Staff concludes that

the small reduction from the plant discharge (2.4%) is within the range of daily and monthly fluctuations in the Congaree and therefore will not have a measurable adverse effect upon reproduction of striped bass or plankton (Kanciruk, p.4). On the basis of this evidence which we find to be probative and finding no contrary evidence in either the Intervenor's response to the Staff summary disposition dated November 11, 1978 or in the Intervenor's deposition on June 13, 1978 the Board accepts this conclusion.

Thermal Effluents

The Staff affidavit presents two analyses of thermal effluents. The more conservative analysis permits a temporary release of water, with a temperature rise 50% greater than the NPDES Permit limit, to 4.5°F. The analysis also assumes that there is no thermocline in the Fairfield discharge and that water entering the discharge is uniformly at the elevated temperature. It also assumes no conductive or evaporative cooling in moving downstream through Parr Reservoir (Kanciruk, Appendix E). These assumptions add considerable conservatism to the model. This analysis predicts a maximum increase in temperature in the Congaree of 1.1°F. from the plant's thermal discharge (Kanciruk, p.6).

Daily temperature fluctuations in the Congaree during the spawning season can range from 2.7 to 4.5°F. with a monthly range of 18°F. Thus the Staff concludes that the temperature rise from the plant effluent at the nearest bass spawning site (35 miles downstream) will have no significant adverse effect.

In response to the Staff motion for summary disposition of November 11, 1978 the Intervenor contends that the Applicant's original temperature rise of 4.3°F. has been lowered to 3.0°F. to meet state requirements. However the temporary 50% increase (to 4.5°F.) allowed in the Staff model exceeds the 4.3°F. value. Thus the Staff analysis based upon a temporary value higher than that originally proposed by the Applicant provides no evidence of significant adverse effects. The Board accepts the Staff's analysis and concludes that even when conservative assumptions are used that are above the state's temperature requirements, that there is no evidence that there will be adverse effects from the plant discharges upon plankton and striped bass spawning in the Congaree River.

Intake Velocities

The Staff affidavit presents calculations which show that the intake velocities under normal conditions as

measured between the trash rack and travelling screen will average 0.48 fps (Kanciruk, Table VI, Appendix D). They will exceed 0.5 fps only at the low water stage in Monticello (0.51 fps) and under the unusual circumstance of an emergency drawdown (0.55 fps). The Staff affidavit presents data (Kanciruk, Table VII, Appendix D) showing that the projected intake velocities are not excessive compared to those at other operating power plant facilities in the southeastern U.S., and also states that low intake velocities are not in and of themselves a guarantee of low fish impingement. A precise assessment of the impingement mortality must await data upon species composition of fish fauna. This as yet is not defined (Kanciruk, p.8). The Staff concludes that the design intake velocities for the Summer station are not excessive and are within guidelines for similar generating facilities. The Board accepts this conclusion.

The Staff's analysis of intake velocities was not controverted in the Intervenor's response to the Staff Motion for Summary Disposition of Contentions dated November 11, 1978. In his deposition before the Board on June 13, 1978 the Intervenor acknowledged that he knew no information regarding impacts on indigenous species in

neighboring water bodies assuming intake velocities in excess of 0.5 fps.

Intervenor's Response

Mr. Bursey's response to the Staff on Contention A6 is as follows:

> In regards to Contention A-6, the discrepancy in the temperature of effluents being returned to natural waters must be further explored. The Applicant's original figures of 4.3 degrees above ambient for returning effluents has been lowered to 3.0 to coincide with State requirements. The Applicant has not demonstrated what different means will be employed to reduce the temperature effluents to meet the NPDES permit stipulations. Until this discrepancy is clarified, Contention A-6 should be retained for consideration by the Board.

In our Special Prehearing Conference Order of April 14, 1978 the Board declined to accept Intervenor's similar theory of his water quality contention. Citing Southern California Edison Company (San Onofre Nuclear Generating Plant, Units 2 and 3), ALAB-308, 3 NRC 20,30 (1976), we held that it was for the State, not us, to enforce its permits. We assume administrative regularity, and Mr. Bursey has advanced no basis to suggest that South Carolina will not enforce its own permit.

Accordingly, based upon the merits of the Staff's motion and, upon the additional independent basis of Mr. Bursey's default in addressing the issue according

to the provisions of 10 CFR §2.749(b), the Board concludes that Contention 6A should be dismissed.

CONTENTION A7

> Contention A7 The Applicant's ability to anticipate, detect or mitigate the impact of accidental releases of radioactive materials to the Broad River is inadequate to protect the potability of the water supply for the municipalities of Columbia and West Columbia.[2/]

In support of its motion, the Staff submitted the affidavit of Philip G. Stoddart, which addresses liquid radioactivity releases that might derive from the Summer facility. Such releases are characterized either as expected or anticipated operational occurrences or as accidental releases. The former fall in the category of Class 1 and 2 events, and the latter in the category of Class 3 through 9 events.[3/]

The anticipated occurrences denote minor events such as upsets, leaks and spills that result from design deficiencies, construction inadequacies, equipment malfunctions, or operator errors. Consistent with the guidance given in

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2/ The phrase, "especially during extreme low flow conditions" was deleted from Contention A7 at Tr. 273.

3/ Proposed Annex to Appendix D, 10 CFR Part 50, 36 F.R. 22851, Dec. 1, 1976, later incorporated into Part 51.

NUREG-0017,[4/] the Applicant -- in Section 11 of the FSAR and Section 3.5 of the ER -- has analyzed the potential for such operational releases and found them to be well within the guidelines of 10 CFR Part 20. Mutually consistent assumptions of the Applicant and the Staff show an average annual liquid effluent release of 0.15 Ci to the environment, consistent with reported operating data for operational nuclear power plants.[5/]

Releases resulting from accidents are considered to have a lower probability of occurrence than those discussed above, but offer the potential of exposures to the general population in excess of the limits set forth in 10 CFR Part 100. The only such postulated accident that might conceivably contaminate a drinking water supply with radioactive liquids would be the complete rupture of a liquid holdup tank that is located outside of the containment building. The Applicant -- in Section 2.4.13.3 -- has analyzed the complete accidental release of a design basis inventory from such a tank, including the breakup of its foundation and any structure surrounding it. Such an accidental total release has been calculated to result in

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4/ "Calculation of Releases of Radioactive Materials in Gaseous and Liquid Effluents from Pressurized Water Reactors (PWR-GALE Code)," April 1976.

5/ Stoddart, pp. 3, 4.

radioactivity concentrations in the river at the nearest municipal water intake below those specified in 10 CFR Part 20. The Staff independently concurs in this analysis.[6/]

The affidavit of Stoddart addresses the various measures and provisions documented by the Applicant to anticipate, detect, and mitigate liquid releases of radioactivity to the Monticello Reservoir, the Fairfield Storage Facility and to the Broad River. The Staff has concluded that such measures and provisions are adequate, that "as low as reasonably achievable" dose criteria will be met, and that radioactivity concentrations at release points and at any downstream municipal water intake points will be a small fraction of the drinking water limits of 10 CFR Part 20.[7/]

Intervenor's Response

We turn now to Mr. Bursey's response to the Staff's Motion, quoted here in its entirety regarding Contention A-7:

6/ Id., pp. 4, 5. Additionally, while not relying for our decision upon the Applicant's answer to the Staff's Motion for Summary Disposition, the Board notes that the Affidavit of William R. Baehr, submitted by Applicant, states (pp. 4, 5) that state and city officials have indicated a sufficient municipal storage capacity to permit isolating the municipal supply from the river while a radioactive release is allowed to pass by the municipal intake point.

7/ Stoddart, pp. 5-9.

> In regards to both Contentions A-6 and A-7, the intervenor asserts that there are genuine issues of material fact yet to be determined in the Applicant's ability to mitigate accidents that could result in the release of radioactivity above permissible levels into the Broad River. The Applicant's emergency apparatus (designed to mitigate the severity of accidents) within the reactor containment, has never been tested under stress conditions. Some calculations used to determine a design basis event in the Applicant's FSAR have proven erroneous. In September, 1978, there was an earthquake at the Summer Site that was below the projected maximum intensity, but surpassed the maximum projected ground acceleration anticipated by the Applicant. The ability of tanks to withstand earthquakes (see Section 3 of the Staff motion to dismiss, page 14) must be reevaluated.

We cannot agree that the earthquake resistance of the Applicant's holdup tanks must be reevaluated, since the analysis of the impacts of accidental radioactive liquid releases assumes complete tank failure, regardless of the cause of said failure. The unsupported and vague statement about an alleged error in the FSAR cannot be afforded weight to militate against the Staff's Motion. Further, there is no requirement that the Applicant's "emergency apparatus" be tested under stress conditions; it is of the nature and type shown by operating experience with other reactors to be satisfactory. In short, Mr. Bursey has not met his

burden of showing the existence of material facts at issue, and Contention A7 does not present a litigable contention.

ORDER

The Staff's motion for summary disposition is granted. Contentions A6 and A7 are dismissed.

IT IS SO ORDERED.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

G A Linenberger
Gustave A. Linenberger, Member

FRANK F. HOOPER by I.W.S
Dr. Frank F. Hooper, Member

Ivan W. Smith
Ivan W. Smith, Chairman

Dated at Bethesda, Maryland
this 9th day of April, 1979.