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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Morton B. Margulies, Chairman
Gustave A. Linenberger, Jr.
Dr. Oscar H. Paris

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In the Matter of

GEORGIA POWER COMPANY, et al.

(Vogtle Electric Generating Plant,
Units 1 and 2)

Docket Nos. 50-424 (OL)
50-425 (OL)

ASLBP 84-499-01-OL

December 24, 1985

MEMORANDUM AND ORDER
(Ruling on Motion for Summary Disposition
of Joint Intervenor's Contention 12 (Cooling Tower Drift))

Introduction and Background

Contention 12 of Joint Intervenor's Campaign for a Prosperous Georgia (CPG) and Georgians Against Nuclear Energy (GANE) (Intervenor's) alleges that Applicants have not properly assessed the amount of salt and chlorine gas that will be released from the cooling towers of the Vogtle Electric Generating Plant (VEGP) nor the extent of the environmental impact of such releases. On July 11, 1985 Applicants filed "Applicants' Motion for Summary Disposition of Joint Intervenor's Contention 12 (Cooling Tower Drift)" (Motion for Summary Disposition). The NRC Staff (Staff) filed "NRC Staff's Response to Applicants' Motion for Summary Disposition of Joint Intervenor's Contention 12 (Cooling Tower Drift)" (Staff Response) on August 2, 1985, in which they

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supported the Applicants. Intervenor's did not respond to the Motion for Summary Disposition.

Applicants' Motion for Summary Disposition was supported by "Applicants' Statement of Material Facts As To Which No Genuine Issue Exists To Be Heard Regarding Contention 12 (Cooling Tower Drift)" (Applicants' Statement of Material Facts) and affidavits of Nora A. Blum (Blum Affidavit), Morton I. Goldman (Goldman Affidavit), and Daniel H. Warren (Warren Affidavit). The Staff Response was supported by affidavits of James E. Fairbent (Fairbent Affidavit), Germain LaRoche (LaRoche Affidavit), and Robert B. Samworth (Samworth Affidavit).

When initially proposed by Intervenor's, Contention 12 alleged that Applicants had not adequately evaluated the amount of salt and hydrochloric acid to be released from the cooling towers and the resulting environmental consequences in the vicinity of the plant. In their response to the Contention Applicants noted that any hydrochloric acid produced by chlorination of the circulating water would be rapidly neutralized by the alkaline tower water and hence could not be released from the towers. Prior to the Special Prehearing Conference held on May 30, 1984, CPG amended its proposed contention to delete the references to hydrochloric acid and to substitute chlorine gas. Amendment to Supplement to Petition for Leave to Intervene and Request for Hearing (May 25, 1984), at 25. GANE joined in the amendment at the Prehearing Conference. Tr. 87. Contention 12 as revised by Intervenor's was admitted by the Board in our order of September 5, 1984. Georgia

Power Co. (Vogtle Units 1 & 2), LBP-84-35, 20 NRC 887, 908 (1984).

Revised Contention 12 states as follows:

The applicant has not properly assessed the amount of salt and chlorine gas release from the cooling towers and the extent of consequent adverse agricultural and environmental damage in the area of Plant Vogtle.

LPG-84-35, 10 NRC 887, 908 (1984). In admitting the Contention, the Board noted that Staff was still in the process of reviewing Applicants' revised estimates of maximum drift deposition rates and expressed a desire for a more definitive estimate of drift deposition rate and for more information on the effects of chlorine. Id. at 910. Subsequent to the admission of the Contention, the parties undertook and completed discovery on the Contention.

Discussion

The standards governing summary disposition and relevant NRC case law have been reviewed by us in earlier orders and need not be repeated here. (See: Memorandum and Order (Ruling on Motion for Summary Disposition of Contention 8 re: Vogtle Quality Assurance), October 3, 1985).

Contention 12 was originally predicated on the estimated salt deposition rate of 305 pounds per acre per year contained in VEGP's Construction Permit Stage Environmental Report (CP-ER). Campaign for a Prosperous Georgia Supplement to Petition for Leave to Intervene and Request for Hearing (April 11, 1984) at 27; Georgians Against Nuclear Energy Supplement to Petition for Leave to Intervene and Request for Hearing (April 11, 1984) at 29. The NRC Staff's estimate at the CP

stage, however, was 2.3 pounds per acre per year. LaRoche Affidavit at ¶ 3. Several unrealistic assumptions caused Applicants' estimate in the CP-ER to be overly conservative. Warren Affidavit at ¶ 16. In response to questions from the Staff concerning the Operating License Stage Environmental Report (OL-ER), Applicants reevaluated their estimate of maximum drift deposition to obtain estimates of 17 pounds per acre per year on-site and 15 pounds per acre per year off-site. Blum Affidavit at ¶¶ 8-10. These estimates were calculated by a different methodology based on drift deposition rates predicted for four other nuclear plants and observed deposition rates for an operating plant. Id. at ¶¶ 5-7. In addition, new information from the tower supplier caused Applicants to use a drift rate of 0.008% in the reevaluation, rather than the 0.015% used in the first set of estimates. Id. at ¶¶ 8-11. The second set of estimates did not result from an actual modeling of the drift deposition rate for the VEGP cooling towers, however; it was intended to provide an upper bound for the deposition rates that would be experienced at VEGP. Id. at 11; Warren Affidavit at ¶ 21.

Applicants' Statement of Material Facts lists twenty-two alleged material facts as to which no genuine issue exists to be heard. Statement 1 reviews the gravamen of the Contention and Statements 2 and 3 describe the operation of VEGP's cooling towers. Statements 4 through 6 deal with a new estimate of drift deposition rate calculated for Applicants by the NUS Corporation using its FOG computer model. Statements 7 through 12 review the earlier estimates used in the CP-ER and in the OL-ER. Statements 13 through 17 deal with the allegation

that chlorine will be released from the cooling towers, and Statements 18 and 19 assess the effect that chlorination of the cooling water will have on drift deposition. Finally, Statements 20 through 22 concern the effect that the predicted drift deposition will have on the environment and on agriculture in the vicinity of the plant.

The foregoing alleged statements of material facts are based upon affidavits from Applicants' affiants who are fully qualified to give the information they provided. The facts as given are undisputed, and we find them to be material facts of record. The Board likewise finds that the statements given by Staff's affiants, who are also qualified affiants, are undisputed and constitute material facts of record. We further find that the statements of Applicants and Staff are all encompassing on the issues raised in the Contention.

FOG Code Estimates. Subsequent to the admission of Contention 12 by the Board the Applicants retained NUS Corporation to conduct a modeling study of the actual drift deposition rates that would be experienced from the VEGP cooling towers. Warren Affidavit at ¶ 22. NUS Corporation used its FOG computer code to calculate the release, plume rise, transport, and deposition of drift from VEGP's natural draft cooling towers. Goldman Affidavit at ¶ 10. The assumptions required and calculational procedures utilized by the FOG code were discussed in detail in paragraphs 11 through 13 of the Goldman Affidavit. The FOG predictions for VEGP were calculated from two years of detailed meteorological data collected at the site. Fairbent Affidavit at ¶ 10.

The FOG code has been evaluated independently by Dr. William E. Dunn, a principal contributor to the development of the most current computer models for predicting cooling tower plume and drift behavior. Id. at ¶ 5 ; Goldman Affidavit at ¶ 14. Dunn concluded that the FOG model falls into a category of drift deposition models which can be classified as "better performing". Fairobent Affidavit at ¶ 3. Staff affiant Fairobent believes that the FOG computer model represents a reasonable approach to simulating atmospheric dispersion of drift droplets as a result of complex atmospheric processes. Id. at ¶ 4. Moreover, the FOG code was used to predict drift deposition in the Palo Verde OL proceeding, where the Staff found the model's predictions to be reasonable. Id. at ¶ 16; Fairobent Affidavit at ¶ 7.

Utilizing the FOG model, the NUS study predicted that the maximum mineral deposition rate at the VEGP site, which would occur to the east of the cooling towers at the site boundary, would be 1.7 pounds per acre per year during the typical representative year of record. During the less typical year of record, the predicted pattern of deposition was changed somewhat and the deposition rate dropped to about 1 pound per acre per year. Even the most conservative of four runs of the FOG model produced a maximum total mineral deposition rate off-site of less than 2 pounds per acre per year. Goldman Affidavit at ¶ 27. These values are well below the lowest reported values for damage to vegetation and the highest reported values for no effects, with respect to both total dissolved solids and NaCl. Blum Affidavit at 20. The NRC's "Environmental Standard Review Plans for the Environmental Review of

Construction Permit Applications for Nuclear Power Plants" states that deposition of salt drift (NaCl) at rate of 1 to 2 kg/ha/mo (= 10.7 to 21.4 pounds per acre per year) is generally not damaging to plants. NUREG-0555, Section 5.3.3.2 (1979). Thus even the conservative drift rate used in the VEGP OL-ER, 17 pounds per acre per year, falls within the range where adverse environmental effects would be unlikely. LaRoche Affidavit at ¶ 7; Blum Affidavit at ¶ 15.

Chlorine Gas Emission. As we indicated, supra, the Intervenor also postulated damage to the environment resulting from the release of chlorine gas from the plant's cooling towers. Chlorine will be added to the circulating water in aqueous solution. It is a well established scientific fact that under the operating conditions (with respect to temperature and pH) of the cooling towers, the chlorine will be totally hydrolyzed within about 1 second. Samworth Affidavit at ¶ 6; Goldman Affidavit at ¶¶ 28-29, 32. The time required for the chlorinated water to reach the cooling towers following the addition of the chlorine gas will far exceed the time for hydrolysis of the chlorine to be complete. Id. at ¶¶ 3-31, 33. Thus the water in the cooling towers will contain no measurable chlorine gas and consequently chlorine gas will not be emitted from the towers. Id. at ¶ 33; Samworth Affidavit at ¶ 6. Nor will chlorination of the cooling tower water significantly increase drift deposition at VEGP. When the chlorination contribution to drift deposition is added to the chloride ion component from river water, the total estimated chloride deposition is 1.06 pounds per acre per year.

This amount is well below a level that will damage vegetation. Blum Affidavit at ¶¶ 15-17; Goldman Affidavit at ¶ 43.

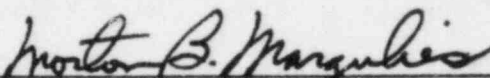
Conclusion

The Licensing Board finds that the undisputed material facts of record establish that the Applicants have properly assessed the amount of drift deposition and chlorine gas to be released from the VEGP cooling towers; moreover, the possible extent of consequent agricultural and environmental damage has been shown to be without significance. The Board concludes that there is no genuine issue of material fact remaining in Contention 12 and that the Contention is without merit. As a matter of law, therefore, it should be dismissed.

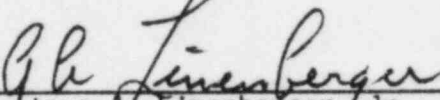
ORDER

Upon consideration of the entire record in this matter, it is hereby ordered that Applicants' Motion for Summary Disposition of Joint Intervenor's Contention 12 (Cooling Tower Drift) is granted and Contention 12 is dismissed.

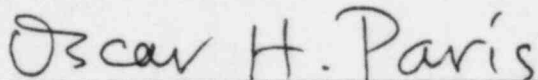
THE ATOMIC SAFETY AND LICENSING BOARD



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