Florida Power
CORPORATION

May 4, 1984
3F0584-02

Mr. H. R. Denton, Director
Office of Nuclear Reactor Regulation
Attention: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72
Environmental Protection Agency 316 Study Information

Dear Mr. Denton:

Attached is one letter (dated April 30, 1984) which has been submitted to the Environmental Protection Agency and is hereby transmitted in accordance with Crystal River Unit 3 Technical Specifications, Appendix B, Part II, Section 3.2.

If there are any question concerning this information, please contact this office.

Sincerely,

G. R. Westafer

G. R. Westafer
Manager, Nuclear Operations
Licensing and Fuel Management

Attachments

DVH/ddl

cc: Mr. J. P. O'Reilly
Regional Administrator, Region II
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
101 Marietta Street, N.W., Suite 2900
Atlanta, GA 30303

C001
1/1

CR 316 Study

bcc: J. A. Hancock - A5A
W. S. Wilgus - A5C
H. A. Evertz - A5D
M. B. Foley - H8
G. R. Westerw/attachment - H
R. E. Parnelle
D. K. Voigts

Florida Power
CORPORATION

April 30, 1984

Mr. Charles H. Kaplan
United States Environmental Protection Agency
345 Courtland Street NE
Atlanta, GA 30365

Dear Mr. Kaplan:

Enclosed are two copies of the Notes of Conference from our meeting on Physical Studies which was held in your office on April 4, 1984.

Should you have any questions or comments concerning these Notes, feel free to contact me in St. Petersburg at (813) 866-5521.

Sincerely,

Paul J Behrens
Paul J. Behrens

PJB:lkb

Enclosure

cc: Del Hicks, EPA
Steven L. Palmer, FDER
Larry A. Olsen, FDER
Doug Farrell, FDER

NOTES OF CONFERENCE
MEETING WITH REGULATORY AGENCIES
CRYSTAL RIVER NPDES 316 (a) AND (b) STUDIES
FLORIDA POWER CORPORATION

J.O.No. 14498.01

Held in the Offices of
U.S. Environmental Protection Agency
Atlanta, GA
April 4, 1984

Present for:

Florida Power Corporation (FPC)

P. Behrens

U.S. Environmental Protection Agency (EPA)

C. H. Kaplan
J. T. Marlar

Florida Department of Environmental Regulation (DER)

S. L. Palmer

Stone & Webster Engineering Corporation (SWEC)

T. A. Biffar
D. P. Galya
D. W. McDougall

PURPOSE

The purpose of the meeting was to address concerns and answer questions raised by the EPA and DER concerning the physical studies being conducted at Crystal River.

DISCUSSION

1. The status of the physical data collection and processing was reviewed. All of the data from the insitu current meters and tide gauges has been interpreted and has been delivered to SWEC. The data from the August 1983 survey have been analyzed and are being used in model calibration. The short-term plume delineation data have been processed for both the August 1983 and January 1984 surveys, and a complete set of figures depicting both temperature and salinity will appear in the 3rd Quarterly Report.

2. A recently revised finite element grid was displayed together with a preliminary CAFE run performed with estimated boundary data. Approximately 300 elements are used in the grid. DPG indicated that the offshore boundary will be driven by tide heights and the north and south boundaries prescribed by the current flux. The oyster bar simulation was shown, and the preferred option described in the 2nd Quarterly Report has succeeded. The barge canal spoil islands are to be treated with reduced depths and increased bottom resistance in

appropriate elements. SLP said he had reviewed the oyster bar simulation scheme and agreed with the setup. CHK expressed concern about the treatment of Fisherman's Pass; DPG assured him that heat transport through the pass is included.

For finer resolution of isopleths near the point of discharge, a smaller element grid insert has been developed. If deemed necessary, this option may be employed.

3. The candidate near field models are presently (a) Jirka et al, Nov. 1981 ASCE J. Hydr. Div. - rigorously formulated, good for bottom detachment (and probably density induced surface departure), but often fails to cover the complete near field region, (b) Shirazi-Davis model - covers the complete near field region, but can fail in very shallow water, and (c) a layer entrainment relationship associated with Ellison and Turner and others - readily embedded into a model. The choices of near field modeling will depend on how effective the far field models simulate the plume near the discharge. DWMcD indicated that surface discharge models are not as advanced as other types of near field models. SLP reminded the group that these are steady state models; DWMcD reported that if the time scale to establish the steady state plume is short compared to the unsteady (viz., tidal) component, the model is still useful. Furthermore, near field analytical models include assumptions characterized by rather idealized or uniform conditions. The near field model is likely limited in extent by the presence of oyster bar interference, but it can be expected to show results for flows that follow the dredged channel.

   CHK inquired about the Univ. of Miami 3-D model which treats tidal flow. DPG is familiar with the model. A 3-D model is not necessarily a better choice, because it often requires much more detailed data to successfully operate it and may not as effectively simulate turbulent mixing at the interface where velocities are discontinuous.

   The size of the near field cannot be determined at this time. The near field is not defined by distance but rather by the extent of hydrodynamic influence. The procedure will be to examine how close to the point of discharge the far field model can be used successfully, and within that limit the near field model employed to better simulate the hydrothermal behavior.

4. The definition of ambient was explored. Ambient conditions should reflect only natural sources of heat exchange. The far field dispersion treats only the station induced sources of heat exchange. If a good simulation of total temperature under various operating conditions is sought, ambient conditions would have to be assigned during calibration by subtracting station induced heat from field temperature measurements.

   A discussion of the result of combining local ambient and station induced heat concentrations will be included in the quarterly meeting in May.

5. River inflows are rarely a major influence in current circulation patterns or as heat sources. Adequate field data has been gathered to introduce these effects. If ignored, the negligible influence will be demonstrated.

6. Stratification is seen in Basin 3 to the extent of no more than 1 to 2°C. It was already recognized that the far field models are vertically averaged, but it was emphasized that near field models typically describe a larger, perhaps discontinuous stratification. The examination of mild temperature gradients may be limited to inspection of field data. The inquiry of employing a physical hydrothermal model was made; such an undertaking would involve an undistorted, very large, and probitively expensive program of questionable value.

7. The model will be calibrated by a mixed tide condition from the August 1983 survey and verified by a semidiurnal tide condition from the January 1984 survey. Although routine, usually 1-dimensional, model results may be required to meet some previously specified acceptance criteria, the complexity of both geometry and scope of tidal circulation and dispersion models preclude this option. Nevertheless, a thorough evaluation of the validity of model results as well as the field data employed is necessary and will appear in the final report. A revised assessment of the recovery of insitu field data was reviewed. Where critical data is missing an interpolation scheme can often be employed.

8. CHK discussed plans for an infrared overflight which is scheduled to take place between June 1 and July 15, 1984. It was agreed that the overflight results could yield only an approximate independent verification of the model results. The absence of boundary current and tide data coincident with the time of the overflight rules out performing a complementary model run. However, the approximation will be more favorable if the overflight can take place at a time when as many parameters as possible are comparable to the August 1983 period when the calibration runs occurred. SWEC will examine 1984 tide tables and indicate time periods more likely to experience the mixed tide condition used for the model.

DWMcDougall:PBF