January 11, 1996

Mr. Percy M. Beard, Jr.
Senior Vice President,
Nuclear Operations (NA2I)
Florida Power Corporation
ATTN: Manager, Nuclear
Licensing
15760 W Power Line Street
Crystal River, Florida 34428-6708

SUBJECT: CRYSTAL RIVER NUCLEAR GENERATING PLANT UNIT 3 -REQUEST FOR ADDITIONAL INFORMATION MAKEUP TANK PRESSURE (TAC NO. M93236)

Dear Mr. Beard:

The staff is continuing its effort to resolve the questions regarding the makeup tank pressure curve. To help us close the technical issue we request that you be prepared to discuss the enclosed questions at a meeting in January 1996.

If you have any questions regarding this matter, please contact me at (301)415-1494.

Sincerely,

(Original Signed By)

George F. Wunder, Project Manager
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-302

Enclosure: As stated

cc w/enclosure: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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Mr. Percy M. Beard, Jr.
Florida Power Corporation

Crystal River Unit No. 3
Generating Plant

cc:
Mr. Rodney E. Gaddy
Corporate Counsel
Florida Power Corporation
MAC-A5A
P.O. Box 14042
St. Petersburg, Florida 33733

Mr. Bruce J. Hickle, Director
Nuclear Plant Operations (NA2C)
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

Mr. Robert B. Borsum
B&W Nuclear Technologies
1700 Rockville Pike, Suite 525
Rockville, Maryland 20852

Mr. Bill Passetti
Office of Radiation Control
Department of Health and
Rehabilitative Services
1317 Winewood Blvd.
Tallahassee, Florida 32399-0700

Attorney General
Department of Legal Affairs
The Capitol
Tallahassee, Florida 32304

Mr. Joe Myers, Director
Division of Emergency Preparedness
Department of Community Affairs
2740 Centerview Drive
Tallahassee, Florida 32399-2100

Chairman
Board of County Commissioners
Citrus County
110 North Apopka Avenue
Inverness, Florida 34450-4245

Mr. Larry C. Kelley, Director
Nuclear Operations Site Support
(SA2A)
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

Senior Resident Inspector
Crystal River Unit 3
U.S. Nuclear Regulatory Commission
6745 N. Tallahassee Road
Crystal River, Florida 34428

Mr. Gary Boldt
Vice President - Nuclear Production
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta Street N.W., Suite 2900
Atlanta, Georgia 30323

Mr. Kerry Landis
U.S. Nuclear Regulatory Commission
101 Marietta Street, N.W. Suite 2900
Atlanta, Georgia 30323-0199

ENCLOSURE

1. Give a brief history of the design basis of MUV-64. Please begin with an explanation of why the valve was originally designed to shut on an ESFAS signal and walk through the changes to the valve configuration (removing the ESFAS signal and subsequently removing power). Please be prepared to explain the rationale for any configuration changes.

2. During the recirculation phase of post LOCA recovery the suction for the HPI pumps would be switched to the LPI pumps discharge (piggy back) for continued high pressure injection for some LOCA events. The LPI pumps provide a discharge pressure to the HPI pumps suction of about 200 psia. Reverse flow of radioactive sump water to the depressurized make up tank was formerly prevented by closing MUV-64 and a check valve. These valves would isolate the safety and non-safety portions of the makeup system. Is the current configuration with MUV-64 blocked open consistent with the licensing basis including operator dose and reactor building inventory calculations? Discuss how single failure of ECCS systems was considered. Discuss how blocking open MUV-64 affects your response to TMI action item III.D.1.1.

3. Please describe compliance with Appendix R for MUV-64 and the reasons for choosing to lock the valve open as the best means for complying with the regulation, considering that this configuration and method for compliance is somewhat unique.

4. Please be prepared to discuss the specifics of the calculational methods and the confidence in the calculational inputs used to determine an acceptable level vs. pressure curve. Be prepared to answer the following questions;

a. During a LOCA the HPI pumps are protected against failure from ingestion of makeup tank cover gas by operational limits on makeup tank pressure as a function of level. The upper limit of makeup tank pressure (design limit) was calculated by evaluating pressure losses through the ECCS system piping from the BWST to the HPI pumps. These calculations involved use of handbook values for the flow losses through the piping runs and fittings. These were derived from standard generic values. Justify that flow losses used are appropriate for the actual piping and fittings installed in the plant. Evaluate the uncertainty in the values used. Consider uncertainties derived from interpolating in handbook tables and nomographs. Consider any data on the actual components supplied by the manufacture or any tests on installed equipment.

b. The calculation of pressure losses in the ECCS lines during a LOCA is dependant on the flow rates assumed for the HPI, LPI and building spray pumps. Justify that the values used in your calculations are conservative for this purpose. Discuss how the flow rates assumed relate to various break size and location of possible LOCA events. FPC document M94-0053 referenced 16 combinations of HPI, LPI, and building spray flow rates. Identify the scerarios that were considered in terms of break size and location and equipment failure. Evaluate the margin to makeup tank draining for each case.

c. The design limit curve for makeup tank pressure vs level appears to be based on one train operation of an HPI, LPI and building spray pump. FPC document M94-0053 states that " a second HPI pump per train can be used for emergencies as long as it is secured before reaching a BWST level of 25.5 ft". Provide and justify the margin to makeup tank draining during 2 HPI pump operation. Justify that assumed pump flow rates and ECCS piping pressure losses used are conservative for that purpose.

d. We understand that alarms are provided in the control room to alert operators if the design limit makeup tank pressure curve is being approached. The alarms provide additional margin to prevent complete draining of the makeup tank during a LOCA and ingestion of the cover gas into the HPI pumps. Provide the basis of the alarm settings. Discuss the margin provided by the alarms in terms of pressure below the design limit as the makeup tank drains during a LOCA and reaches its minimum level during a LOCA. What are uncertainties associated with the alarm limits?

5. Please be prepared to discuss the adequacy of procedural guidance with regard to preventing two high head safety injection pump operation on one header below 25.5' in the BWST. It appears that the procedures do not preclude two pump operation on one suction header, yet the procedures do not require the operators remove one pump from service before reaching 25.5' in the BWST.

6. Is the design limit curve adequate considering that there is virtually no margin supplied by the curve? We understand that as makeup tank pressure is increased alarms are provided first by a computer and then by control room annunciators. Discuss operational restrictions on operating at pressures above the computer or the annunciator alarm. Are there any conditions for which operation above the alarm set points would be acceptable?

7. As the pressure is reduced in the makeup tank during normal operation the ability to devolve hydrogen gas within the makeup tank is reduced. Dissolved hydrogen is important in reactor coolant system chemistry. Justify that the reactor system will be adequately protected from corrosion during operation with the current limits on makeup tank pressure.