



Department of Energy
Washington, D.C. 20545

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Dr. J. Nelson Grace, Director
CRBR Program Office
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Dr. Grace:

CLINCH RIVER BREEDER REACTOR PLANT (CRBRP) SHUTDOWN HEAT REMOVAL WITH
LOSS OF BULK ALTERNATING CURRENT (AC) POWER

The purpose of this letter is to address the Advisory Committee on Reactor Safeguards' (ACRS) questions regarding the capability of CRBRP to continue shutdown heat removal on natural circulation, with a loss of bulk AC power, for greater than 2 hours. The capability for shutdown heat removal by natural circulation during a loss of bulk AC power for 2 hours has been previously presented to the Nuclear Regulatory Commission and is documented in section 5.7.5 of the Preliminary Safety Analysis Report.

During a presentation to the ACRS on February 11, 1983, the project was asked what would happen in the plant should the postulated loss of bulk AC power continue beyond the 2-hour period. The response given at that time indicated the capability to continue natural circulation with manual control of the Steam Generator Auxiliary Heat Removal System (SGAHRs) turbine and the Auxiliary Feed Water (AFW) flow control valves. The project was then requested to further review that capability. This letter provides the results of that further review.

1. On a nominal basis, the Protected Air Cooled Condensers (PACC) would be expected to be capable of removing all shutdown heat at the end of 2 hours with natural circulation on the air side (no power to fans) as well as natural circulation on the water side (normal mode of operation during shutdown). No makeup feedwater for venting would be necessary and the only feedwater required would be makeup for leakage. The leakage would be quite small, on the order of 20 gallons per hour for all 3 loops, and, with a steam drum inventory of approximately 8,000-10,000 gallons (3 loops) a time period on the order of 18 days would be available before makeup would be required.

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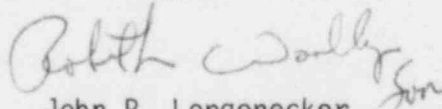
Upon loss of AC power, the PACC louvers fail in the fully opened position. As the plant cools down, at some time after 2 hours into the event, it may be necessary to manually adjust the louvers to control the rate of cooldown. Access to the louver manual controls is provided in the design layout of the system.

2. Should additional venting be required to remove shutdown heat at the end of a 2-hour loss of bulk AC power, the SGAHRS turbine is capable of manual control at the turbine steam inlet. This valve, plus the AFW flow control valves to each steam drum and the vent valves, are physically accessible for manual operation. The steam drums have sight glasses for level determination. Therefore, manual operation would be possible if required. Increasing temperatures due to lack of ventilation and the absence of general lighting in the areas of the valves, PACC louvers, and the sight glasses would present significant obstacles to personnel safety and effectiveness. Overall, continued operation would be possible but difficult.

In summary, continued shutdown heat removal using the PACC's with air side and water side natural circulation would be expected to be satisfactory. Should venting and resultant feedwater makeup be required, that capability does exist, but continued operation would be difficult.

Any questions regarding this letter may be addressed to Mr. D. Florek (FTS 626-6188) or Mr. A. Meller (FTS 626-6355) of the Project Office Oak Ridge staff.

Sincerely,



John R. Longenecker
Acting Director, Office of
Breeder Demonstration Projects
Office of Nuclear Energy

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