



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:

ADDITIONAL INFORMATION REGARDING THE NITROGEN GAS SERVICES SYSTEM -  
CLINCH RIVER BREEDER REACTOR PLANT

Enclosed is a marked-up Preliminary Safety Analysis Report (PSAR) page providing additional information on nitrogen gas services. This information will be placed into Chapter 9 of the PSAR in a future amendment.

Any questions regarding the information provided may be addressed to Mr. D. Robinson (FTS 626-6098) or Mr. S. Mitchell (FTS 626-6183) of the Project Office Oak Ridge staff.

Sincerely,

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

Enclosure

cc: Service List  
Standard Distribution  
Licensing Distribution

*Dool*

While one of the loops of this unit operates, the other loop is regenerated by flowing mixed argon-5% hydrogen gas through the molecular sieve dryer and then through the copper bed to reduce copper oxide. The water produced by this purge and reaction is removed by the unit vacuum pump to CAPS.

## 9.5.2 Nitrogen Distribution System

### 9.5.2.1 Design Basis

Nitrogen is to be supplied for (1) cooling and inerting the atmospheres of the cells and pipeways containing radioactive sodium and the Control Rod Drive Mechanism, (2) actuating pneumatically-operated valves in the Inerted cells, (3) cover gas for the Dowtherm tanks in the chilled water system, (4) purging the IHTS steam generators and evaporators in the event of a sodium-water reaction, (5) primary Na removal and autoclave operations, (6) purging of the RAPS and CAPS cold boxes, (7) a cover gas for the Sodium Water Reaction Pressure Relief System (SWRPRS), and (8) miscellaneous handling and maintenance services.

The SGB nitrogen supply for the sodium-water reaction purge is sized to provide 250 scfm of nitrogen for a maximum of 12 hours.

The SGB nitrogen supply rate to be available for the RCB and RSB cell purge requirements is to be 250,000 scfd.

The oxygen content of a nitrogen inerted cell is to be limited to 0.5 to 2.0%, and the water vapor concentration to less than 1000 vppm. The oxygen limits are chosen to provide enough oxygen to prevent nitriding of the steel, and yet not exceed a fire-limiting concentration of oxygen. The water vapor is limited in order to assure early detection in the event of a small sodium leak.

To meet these limits the nitrogen subsystem contains two sampling and analysis units, one for the RSB and the other for the RCB which periodically samples the gas in each nitrogen-inerted cell and analyzes its atmospheres for radioactivity, oxygen, and water vapor content. The cell is purged automatically by fresh nitrogen whenever the oxygen level exceed 2% or the water vapor concentration exceed 1000 vppm (one of these, by operator selection) as monitored by the respective sampling and analysis unit. If, as the result of purging to reduce the water vapor level, the oxygen concentration falls below 0.5%, dry oxygen from a gas supply bottle will be introduced manually into the affected cell at a tap provided for this purpose. The RSB sampling unit causes the cell exhaust gases to be diverted to CAPS if they are radioactive, or to be diverted to heating and ventilating if they are not radioactive. All RCB inerted cells are normally exhausted to CAPS, and an alarm is sounded when a high amount of radioactivity is detected.

*Local accumulators shall be provided to supply nitrogen for the operation of pneumatic valve operators requiring nitrogen to meet their safety function. These accumulators, the distribution piping to the valve operator, and redundant automatic isolation valves shall meet ASME Section III, Class 3 and Seismic Category 1 criteria.*