DUKE POWER COMPANY
POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

TELEPHONE: AREA 704
373-4083

July 31, 1981

Mr. James P. O'Reilly, Director
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street
Atlanta, Georgia 30303

Re: Oconee Nuclear Station
Docket No. 50-269

Dear Mr. O'Reilly:

On June 30, 1981, the resident inspector at Oconee Nuclear Station was informed of an incident involving steam voiding in the Unit 1 Reactor Coolant System (RCS) "A" hot leg during decay heat removal cooldown. Although this event does not constitute a reportable occurrence, this report is provided for your information.

At approximately 1200 hours on June 29, 1981, a steam void was formed in the Unit 1 RCS "A" loop hot leg while pressurizer cooldown was being performed. The incident occurred with the Low Pressure Injection (LPI) in operation removing core decay heat.

The reactor coolant pumps were secured due to low RC system pressure caused by a flow control problem with 1HP-355. RCS conditions of 100 inches in the pressurizer prior to stopping the last RC pump were not met.

The LPI System was started for core decay heat removal before the last RC pump was secured. When the pressurizer level was lowered to establish the 100-inch level, the outsurge elevated the "A" Loop T hot to approximately 350°F. Efforts to cool the "A" hot leg by feedwater addition to the "A" OTSG through the main feedwater nozzles slowly decreased the T hot to approximately 315°F.

An evaluation was done concerning repressurizing and re-starting a reactor coola pump to cool the hot leg. This method was not used due to consideration of the stresses on the OTSG tubes and other RCS components. RCS cold leg temperatures were in the range of 160°F to 170°F at 0800 hours on June 29, 1981. Also, the starting of a reactor coolant pump may have caused a crud burst due to sudden RC temperature changes.

Steam voiding occurred in the "A" hot leg when the pressurizer heaters were de-energized in order to reduce RCS pressure and slow the leakage from the "B" Loop instrument root valve. The hot leg temperature increase from 315°F to approxim 360°F during the pressurizer insurge indicates that hotter areas existed in the upper regions of the "A" loop above the hot leg Resistance Temperature Device.

Pressurizer level increased rapidly after the heaters were de-energized. The evidence of RCS steam voiding was recognized and the heaters were re-energized to repressurize and stop the pressurizer level increase. Pressurizer level had increased from 185 inches to 277 inches. This is equivalent to approximately 300 cubic feet voiding or approximately a ten feet drop in hot leg level. Subsequent repressurization refilled the hot leg within the next two hours.

The LPI System maintained reactor core cooling throughout the incident. Incore temperatures indicated 180°F to 190°F at all times during the hot leg steam voiding.

RCS pressure was maintained at approximately 120 psig. until the hot leg temperature was reduced to 240°F. This cooling was accomplished by feeding the "A" OTSG with feedwater through the auxiliary nozzles.

The steam voiding in the "A" hot leg did not affect the ability to remove decay heat from the reactor core in that the elevation difference between the core and the top of the "A" hot leg assured that the core remained covered during this incident. The LPI System being in service also provided total assurance of the ability to maintain the core in a safe condition. Therefore, the health and safety of the public were not affected.

The immediate corrective action to cease the hot leg steam voiding was to energize the pressurizer heaters and increase TCS pressure. This action decreased the pressurizer level and refilled the hot leg.

In order to improve the unit shutdown procedures for minimizing the possibility of steam voiding in the RCS, the procedures will be changed to accomplish the following:

a) Identify the initial RCS conditions for pressurizer cooldown and the symptoms of TCS voiding should it occur. This will include RC pump/LPI pump piggy-back operation to cool the RCS hot legs to less or equal to 165°F prior to securing the RC pumps.

b) Add procedure steps required to prevent pressurizer outsurge after the RC pumps are secured.

c) In the event of a pressurizer outsurge, procedural control of how to maintain the hot leg subcooled and decrease the temperature with feedwater flow to the auxiliary feedwater nozzles.

A work request has been issued to repair the seat leak on valve 1HP-355.

All licensed personnel will be trained regarding this event and these corrective actions. This training will be conducted by the Shift Technical Advisors. Present and future RO and SRO license classes will be instructed in how to prevent and correct RCS voiding. The procedure changes and shift training will be completed by August 28, 1981.

Very truly yours,

William O. Parker, Jr.

JLJ:krh

cc: Director
Office of Management & Program Analysis
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Mr. F. Jape
Resident Inspector
Oconee Nuclear Station

Mr. Bill Lavallee
Nuclear Safety Analysis Center
P. O. Box 10412
Palo Alto, California 94303