Duke Power Company
Oconee Unit 3

Report No: AO-287/74-4

Report Date: October 22, 1974

Occurrence Date: October 7, 1974

Facility: Oconee Nuclear Station, Unit 3

Identification of Occurrence: Excess Reactor Coolant-System flow indicated by flow instrumentation

Conditions Prior to Occurrence: Reactor at hot shutdown

Description of Occurrence:

At approximately 1100 on October 7, 1974, a Reactor Coolant System flow imbalance of approximately 2.6 percent between the A and B loops was noticed on the control room flow indicators and the plant computer. The total RC System flow measured by the ΔP instrumentation was approximately 111 percent of design flow. The flow imbalance then began to decrease and finally became nearly zero after about 8 hours; however, the indicated total system flow remained relatively high (between 110 and 112 percent of design value). A calculation of the system flow, using Unit 3 performance data indicated that the system flow began to increase at 1700 hours on September 14, 1974. At this time the reactor was at hot shutdown condition and the RC flow was 110.14 percent of design flow.

Designation of Apparent Cause of Occurrence:

At first, it was thought that the high flow and flow imbalance indications were due to instrumentation problems, and an investigation was initiated. It was found that (1) calibration of the instrumentation had been verified, (2) there were no leaks on the instrumentation impulse lines, (3) the instrument transmitters were zeroing properly when the reactor coolant pumps were stopped, and (4) the instrument lines had been blown down. Consequently, it was concluded that instrumentation was not the problem.

The Reactor Coolant System flow was measured with reduced voltage on the reactor coolant pump buses to determine whether changing taps on the reactor coolant pumps power supply transformers had any affect on reactor coolant flow. This reduction in voltage did not produce any significant change in the system flow. On October 10, 1974, a program of calculating the core bypass flow was developed to determine whether the indicated excess flow was due to an open internal vent valve. The core bypass flow was calculated by measuring the loop and core ΔT's at power levels of 15,20,25,30 and 40 percent power. The calculated core bypass flow was within design values, and therefore the possibility of an open vent valve was ruled out.

There is in process now a comprehensive procedure for determining whether the indicated excess flow is real. The program consists of (1) verifying loop ΔP transmitter readings by using a different type transmitter (2) calculating RC primary flow by obtaining precide heat balance at 40 and 75 percent power, and (3) monitoring loose parts monitor and neutron noise analysis instrumentation for