

DUKE POWER COMPANY
OCONEE NUCLEAR STATION - UNIT 1
UNUSUAL EVENT REPORT UE-269/73-8
MAIN STEAM RELIEF VALVE OPERATION

Introduction

During power ascension testing of Oconee Unit 1, main steam relief valves have lifted following reactor trips from power levels less than 40 percent full power. Section 7.2.3.3.4 of the Oconee Final Safety Analysis Report states that the combined actions of the control system and the turbine bypass valves permit a 40 percent load reduction or a turbine trip from 40 percent load without safety valve action. The turbine bypass valves and associated control systems have been tested extensively to determine the cause of this variance. Some corrective action has been taken, and further testing and evaluation are planned to determine the load rejection capability of this system.

Evaluation

During Hot Functional Testing on December 19, 1972, the Oconee Unit 1 main steam relief valves were set to the correct lifting pressure. During power ascension testing, it was noted that some of the valves were relieving at lower than setpoint pressures. On May 24, 1973, all 16 relief valves were retested. It was found that the relief setpoint of six valves had drifted such that the valves would relieve at a pressure lower than desired. These valves were readjusted to the proper setpoints.

Several tests were then performed to determine if the turbine bypass system was functioning as designed. Bypass capacity was tested by closing the turbine stop valves and then increasing reactor power. It was found that the system could bypass steam corresponding to 20.6 percent power with the bypass valves approximately 40 percent open, which confirmed the design capacity of the system. Several turbine trip tests were then performed. Results from these tests showed that the turbine bypass valve control system was functioning properly, and the maximum design force was being exerted by the pneumatic valve operator. However, the valves were not

opening fast enough to prevent lifting the main steam relief valves.

The results of these tests can be summarized as follows:

1. The first set of main steam relief valves are operating at the setpoint pressure.
2. The turbine bypass system has the capability to bypass its design (20 percent) capacity.
3. The turbine bypass valve control system is functioning properly.
4. The slow opening time for these valves is apparently due to the valve operator.

On October 22, 1973, the turbine bypass valves were tested using a 150 psi supply to a valve operator piston, instead of the normal 100 psi to increase the motive force. The valve opening time was significantly reduced.

Corrective Action

Further testing of the turbine bypass system, including a turbine trip test from 40 percent or higher, is planned for the very near future. The purpose of these tests will be to determine if the increased force from the valve operator will permit a 40 percent load reduction without main steam relief valve actuation. If this testing is successful, a permanent modification to supply increased motive force to the valves will be made. The Atomic Energy Commission will be kept advised of our progress in this regard.

Safety Analysis

The statements concerning loss-of-load considerations in Section 7.2.3.3.4 of the Oconee FSAR are directed toward operational implications. The safety aspects of various loss-of-load considerations are discussed in FSAR Section 14.1.2.8.2. The loss-of-load transient does not result in any fuel damage or excessive pressure on the reactor coolant system. At most, slow response of the turbine bypass system would result in slightly longer steam venting to the atmosphere through the relief valves. However, the doses received at the site boundary due to loss-of-load considerations are so small that

the doses due to any additional venting caused by slow operation of the turbine bypass system would be insignificant. There would be no resultant hazard to station operating personnel or to the public.