

DUKE POWER COMPANY  
OCONEE UNIT 1

Report No.: UE-269/74-5

Report Date: October 7, 1974

Event Date: August 23, 1974

Facility: Oconee Unit 1, Seneca, South Carolina

Identification of Event: Acceptance criteria were not met during unit loss of electrical load test.

Conditions Prior to Event: Unit at 95 percent of full power

Description of Event:

On August 23, 1974, the "Unit Loss of Electrical Load" test was performed on Oconee Unit 1. The test was initiated from a reactor power level of 95 percent by opening power circuit breakers 20 and 21. This removed all but the auxiliary electrical load from the generator. The ensuing transient caused the Reactor Protective System to trip the reactor due to high reactor coolant pressure, approximately seven seconds after test initiation. The auxiliary electrical load was automatically transferred to startup transformer CT-1.

Designation of Apparent Cause of Event:

Analysis of data gathered during the test indicates that the generator electrical load was reduced immediately to 40 MWe and was maintained at this level, supplying only the unit auxiliary loads until the reactor tripped. Feedwater flow was immediately reduced by the Integrated Control System (ICS) to approximately 7 percent. The reactor maintained 95 percent full power for three seconds until the ICS initiated a power runback. The pressurizer spray valve began to open at 4 seconds after initiation of the test.

The apparent causes for the reactor trip were excessive time lag for the initiation of the runback, delay in opening of the pressurizer spray valve and the excessively fast runback of steam generator feedflow. This resulted in increasing reactor coolant temperature, with its associated expansion, without the early benefit of pressurizer spray to reduce the pressurizer pressure. The reactor tripped on a high reactor coolant pressure signal.

Analysis of Event:

The purpose of the Loss of Unit Electrical Load Test is to demonstrate the ability of the reactor to remain critical following a system blackout. It is not intended that it test the capabilities of safety-related emergency

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power sources. Although acceptance criteria were not met, operation of the unit remained within safety limits during the test. The Reactor Protective System functioned properly in tripping the reactor during the reactor coolant pressure transient. The auxiliary electrical load was maintained by transferring to startup transformer CT-1. All safety-related equipment performed as designed. The health and safety of the public was not affected.

Corrective Action:

A procedure is being prepared which will permit a determination of the specific parameters which prevented the achievement of the acceptance criteria for the "Loss of Unit Electrical Load" test. This test will be performed prior to Unit 1 shutdown for refueling. A study of the results of this test will determine if design changes are necessary to allow the pressurizer spray valve to open more quickly or if other modifications are required.