

SEQUOYAH NUCLEAR PLANT UNITS 1 AND 2
FAILURE OF BACK DRAFT DAMPER
IN MAIN CONTROL ROOM AIR HANDLING UNIT

FINAL REPORT

Description of Deficiency

The failure of the backdraft damper in one of the two trains of the Main Control Room (MCR) air handling units (AHU) was discovered during a routine modification of the system. The failure of the subject damper was the loss of all the blades from the damper. The cause of damper blade failures was excessive wear of the nylon damper blade bearing due to oscillatory motion. The oscillatory motion was probably caused by poor balance of the damper blades. There have not been similar failures of backdraft dampers up to this time at any of TVA's other nuclear plants. The backdraft damper in the other train of the MCR AHU's has been inspected and it has lost one of its damper blades. It appears that even though the failure of this latter damper is not as severe, the failure mode is similar to the failure experienced by the first backdraft damper.

Safety Implications

If this damper failure had remained uncorrected, a single failure (power loss in the affected MCR AHU train, for this case) would permit the air operated suction damper in that train to open. The ductwork is arranged so that in this situation a partial short circuit of the air flow from the opposite train would occur. See Sequoyah FSAR Figure 9.4-2 for further details. This short circuit situation would reduce the supply of cooling air available to the MCR. Partial loss of cooling to the MCR could lead to unreliable operation of the instrumentation in the MCR. Unreliable operation of MCR instrumentation could place in jeopardy the safe operation of the plant.

Corrective Action

TVA has replaced the two failed backdraft dampers. They were replaced with high pressure dampers equipped with steel ball bearings. After installation of the new backdraft dampers, functional testing of them was performed with engineers from TVA Division of Engineering Design observing the test. No harmful oscillations were observed in either damper. Each damper closed tight when its associated air handling unit was off and opened to the proper position and held that position with a minimum of movement when the air handling unit was in operation.

The air handling units for the Main Control Room at Watts Bar Nuclear Plant are similar in design to those at Sequoyah. However, the backdraft dampers are of different, heavier construction with bearings made of metal instead of nylon.

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