

ENCLOSURE

SEQUOYAH NUCLEAR PLANT UNITS 1 AND 2 METAL SHAVINGS IN VALVE OPERATORS

NCR 1354
FINAL REPORT

Description of Deficiency

The deficiency is in the hydraulic operators of the discharge pressure control valves of the motor driven auxiliary feedwater pumps; valves 1-PCV-3-122, 1-PCV-3-132, 2-PCV-3-122, and 2-PCV-3-132. Each valve operator has a separate self contained hydraulic system. The valves, complete with operators, were procured from Mason-Neilan, who obtained the operators from M.E.A., Incorporated, 2600 American Lane, Elk Grove Village, Illinois 60007. Apparently, the deficiency has two elements, either or both of which may have caused the two failures to date, or, if not corrected, could have resulted in failures at a later date. One element is that the hydraulic systems as received at the site contained metal shavings, apparently from the tapping of threaded holes in the systems valving manifolds. The shavings were found in the operating cylinders and filters, and so could be present in most of the components of the systems. The other element is in a fail-safe transfer feature actuated by a push-pull knob which can be inadvertently positioned in a mid position. Operation of the manual pump (on the operator) with the knob in the mid position, possibly in conjunction with malfunctions caused by the metal shavings, permitted overpressurization of the hydraulic cylinder to the point where failure of the cylinder anchoring bolts occurred. This malfunction occurred before preoperational testing and affected two of the four operators at Sequoyah Nuclear Plant.

Safety Implications

If the deficiency had not been detected and corrected, one or more trains of the auxiliary feedwater system could have been rendered inoperable at any time during plant operation. Since the auxiliary feedwater system is an essential safety system, the deficiency would have jeopardized the health and safety of the public. Similar operators are installed in the corresponding system at Watts Bar Nuclear Plant, and it is possible that similar deficiencies exist in operators supplied to other utilities' nuclear plants.

Corrective Actions

A representative of M.E.A., Inc., was called to Sequoyah Nuclear Plant to evaluate the problem, and two of Watts Bar Nuclear Plant's valves were shipped to Sequoyah Nuclear Plant to replace the damaged ones. The metal shavings were removed or will be removed from all hydraulic systems before preoperational test, and the two damaged operators are to be repaired before shipment of the valves to Watts Bar Nuclear Plant. All

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of this work is under the supervision of the M.E.A., Inc., representative. The cylinder overpressurization problem will be corrected by eliminating the manual push-pull knob on the fail-safe transfer feature. Solenoid actuation will be substituted, as is standard on later M.E.A., Inc., valve operators. The transfer will be automatic upon a power loss. Thus, no external control circuits are required.

At Sequoyah Nuclear Plant, this work will be completed before startup after the first unit 1 refueling outage. Administrative controls will be imposed to prevent the placing of the push-pull mechanism in an intermediate position, during the first unit 1 fuel cycle.