

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

5N 157B Lookout Place

APR 02 1987

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of) Docket Nos. 50-327
Tennessee Valley Authority) 50-328

SEQUOYAH NUCLEAR PLANT - INSTRUMENT SENSING LINE SLOPE QUESTIONS

Reference: Your letter to S. A. White dated January 15, 1987, "Request for Additional Information Related to Instrument Sensing Line Slope Deficiencies for Sequoyah, Units 1 and 2"

The following comments apply to items 1 through 3 of the referenced letter.

The slope requirements for static liquid-filled sensing lines per installation drawing 47W600-24 R17 are one inch per foot nominal and 1/8-inch per foot minimum. The justification for the minimum 1/8-inch value is based on supplemental tests recently run by TVA's Norris Laboratory and reported in test report WR28-1-85-124. These recent tests verified that entrapped air bubbles would migrate along an instrument sense line if the slope were 1/8-inch per foot. The tests also showed that small air bubbles could be trapped at in-line fittings for the 1/8-inch per foot slope or in small horizontal sections of sense lines. However, these smaller bubbles do not affect the instrument accuracy, and sufficient bubble volumes cannot be entrapped in the sense lines to cause an instrument system error.

The report described above is a supplement to Norris Laboratory test report WR28-1-85-122 (enclosure 1) which concluded that 1/4-inch per foot should be the minimum slope based on a minimum velocity for bubble migration and bubbles not migrating through fittings. Minimum velocity is not a criterion since velocity only dictates the time required to ensure that all bubbles have migrated from a sense line. The supplemental tests (WR28-1-85-124) actually checked the sensitivity of the instruments to air bubbles caught in fittings or in horizontal sections and found a negligible effect.

The supplemental test results justify the minimum slope requirement for instrument sense lines of 1/8-inch per foot. The supplemental test report WR28-1-85-124 is being prepared and will be available by the end of March 1987. TVA will send a copy of Norris Laboratory's supplemental report to NRC when the report becomes available.

8704070482 870402
PDR ADOCK 05000327
P PDR

Ado
11

U.S. Nuclear Regulatory Commission

APR 02 1987

Four separate groups, Nuclear Safety Review Staff (NSRS), Generic Concern Task Force (GCTF), Division of Nuclear Engineering (DNE), and Employee Concern Task Group (ECTG), have performed evaluations of instrument line slope, which included sense line walkdown and review of work and maintenance requests. All groups concluded that deviations in minimum line slope do exist; however, there is no history of functional problems under normal operating conditions that would require modification of existing sense lines. Those sense lines that did experience air entrapment were backfilled per maintenance instruction IMI-118 (enclosure 2) or modified per the CAQ/ECN process. New detailed maintenance instructions, MI-19.1.1 through MI-19.1.15, for technical specification transmitters are being prepared as a restart item and will address sense line backfilling. Enclosure 3 is a list that identifies the technical specification transmitters associated with the new MI-19.1.1 through MI-19.1.15 currently being written by TVA. These new instructions will include flow rates for backfilling as defined in Norris Laboratory Test Report WR28-1-85-121 (enclosure 4). In addition, Surveillance Instruction (SI)-604 will establish criteria for channel checks of essential instrument operability before mode 4. SI-604 will require instruments displaying problems associated with an entrapment to have the sense lines backfilled per the applicable maintenance instruction.

Outgassing of sense lines for those devices required to operate during and after a Design Basis Accident (DBA), as addressed in ECTG Report 17301, is being evaluated, and appropriate corrective action plans will be developed by restart.

The following item numbers correspond to the items listed in your January 15, 1987 letter:

- (4) Enclosure 5 to this letter is a copy of P. R. Wohld's memorandum to MEB Files dated November 17, 1978.
- (5) Enclosure 6 to this letter is a copy of J. P. Vineyard's memorandum to H. B. Rankin dated December 20, 1985.
- (6) Enclosure 2 (IMI-118) addresses the sense line backfilling methodology and applicability; however, backfilling accomplished prior to restart will be covered by the new procedures MI-19.1.1 through MI-19.1.15 which supplement IMI-118.

U.S. Nuclear Regulatory Commission

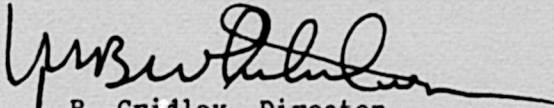
APR 02 1987

- (7) Enclosure 4 to this letter, Norris Laboratory Test Report entitled "Sensing Line Air Bubble Migration Tests for Watts Bar Nuclear Plant," Report Number WR28-1-85-121, is information regarding flow rates during backfilling procedure.

TVA commitments to NRC on this issue are listed in enclosure 7.

Very truly yours,

TENNESSEE VALLEY AUTHORITY


R. Gridley, Director
Nuclear Safety and Licensing

Enclosures

cc (Enclosures):

Mr. G. G. Zech, Director
Regional Inspections
Division of TVA Projects
Office of Special Projects
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Sequoyah Resident Inspector
Sequoyah Nuclear Plant
2600 Igou Ferry Road
Soddy Daisy, Tennessee 37379

ENCLOSURE 1

SEQUOYAH NUCLEAR PLANT

INSTRUMENT SENSING LINE SLOPE QUESTIONS

BUBBLE MIGRATION IN SENSING LINES

SLOPED AT SMALL ANGLES

REPORT NO. WR28-1-85-122