

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

85 JAN 22 P 1: 53 January 17, 1985

WBRD-50-391/83-48

U.S. Nuclear Regulatory Commission
Region II
ATTN: James P. O'Reilly, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Mr. O'Reilly:

WATTS BAR NUCLEAR PLANT UNIT 2 - INSTALLATION OF FLOW SWITCHES AND
SENSING LINES - WBRD-50-391/83-48 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector Linda Watson on August 10, 1983 in accordance with 10 CFR 50.55(e) as NCR WBN NEB 8321. This was followed by our final report on unit 1 on September 8, 1983 and our revised final for unit 1 on October 19, 1983. Enclosed is our final report for unit 2.

If you have any questions, please get in touch with R. H. Shell at FTS 858-2688.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

David L. Lambert

J. W. Hufham, Manager
Licensing and Regulations

Enclosure

cc (Enclosure):

Mr. Richard C. DeYoung, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

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ENCLOSURE
WATTS BAR NUCLEAR PLANT UNIT 2
INSTALLATION OF FLOW SWITCHES AND SENSING LINES
10CFR50.55(e) REPORT NO. 3 (FINAL)
NCR WBNNEB8321

Description of Deficiency

Sensing lines for system 30 (ventilation) flow switches were not installed in accordance with TVA drawing 47A900-58 R2. Affected sensing lines were extended into the airflow in the duct at various angles, thereby giving erroneous pressure readings. The affected flow switches are listed in Table 1. Additionally, the sensing lines for the fuel handling area (FHA) exhaust, the general exhaust, and the upper compartment coolers were improperly located in the discharge side of the fans. The set points of the affected flow switches in all cases had been incorrectly determined to correspond to the total fan pressure instead of the static pressure in the duct. These set points were shown in TVA's 47B601-30 series drawings for WBN. This condition was first identified on preoperational test deficiency PT-162 for certain switches listed in Table 1. This condition also existed in flow switches other than those identified in PT-162 as is shown in the table.

TVA has determined the root cause of the improperly installed sensing lines to be that drawing 47A900-58 did not clearly show where within the duct the field-routed sensing lines were to terminate. Construction personnel interpreted the drawings to indicate a pit tube arrangement. Consequently the sensing lines had been extended into the duct rather than being flush mounted at the duct wall as required to sense static pressure.

The sensing lines which were improperly located in the discharge side of the fans were initially not shown on TVA drawings 47W900-10 and 47W920-17. Later revisions of these drawings showed these lines on the discharge side of the fan. They should have been located on the intake side to match the static pressure range of the switch. This error and the incorrect determination of set points was due to inadequate drawing review and/or review procedures.

Safety Implications

If this deficiency had remained uncorrected, it could have adversely affected the proper operation of the fans and/or coolers in the safety-related systems listed in Table 1. Additionally, the extension of the sensing lines into seismic ductwork had not been seismically analyzed. This condition could have adversely affected the safe operation of the plant.

Corrective Action

The corrective action for all affected items, which are listed in Table 1, consists of:

1. Cutting off the sensing lines inside the duct at the wall with a +1-inch tolerance.
2. Taking pressure readings to determine the proper set points.
3. Revising set points in conjunction with steps (1) and (2) above.
4. Revising detail drawings to clarify the proper installation of the sensing lines.
5. Relocating sensing lines on the FHA exhaust, upper compartment coolers, and the general exhaust systems to a position upstream of the fan. The relocation will match the range of the switch with the expected static pressure range of the fan.

TVA issued engineering change notice (ECN) 4112 to accomplish the identified corrective actions. All redesign and drawing revisions for this item have been completed. All necessary construction modifications have been completed except for that work associated with the reactor building upper compartment coolers.

TVA has revised drawing 47A900-58 to clarify that field routed sensing lines are to terminate at the duct wall. Also, since the occurrence of this deficiency, TVA has issued engineering procedure (EP) 4.25, "Design Review and Interface Coordination of Detailed Construction and Procurement Drawings." EP 4.25 will ensure that drawing review procedures will be more closely followed by technical personnel to prevent future inaccuracies. EP 1.28, "Control of Documents Affecting Quality," now requires that the design of safety-related plant features be reviewed by an independent reviewer who cannot be the designer or his supervisor. These actions will prevent recurrence of this deficiency.

All corrective actions for this item will be completed by June 1, 1985.

TABLE 1

<u>Flow Switch</u>	<u>Flow Switch No.</u>
Fuel Handling Area Exhaust	0-FS-30-136** -139**
*Spent Fuel Pit Pump Coolers	0-FS-30-192-A -193-B
Sample Room Exhaust Fan	1-FS-30-66 -283 -284
	2-FS-30-67 -285
General Supply Fan	1-FS-30-102** -103**
	2-FS-30-104** -105**
General Exhaust Fan	1-FS-30-159** -162**
	2-FS-30-274** -278**
*Penetration Room Coolers El. 713 and 737	1-FS-30-194-A -195-B -196-A -197-B
	2-FS-30-194-A -195-B -196-A -197-B
*Penetration Room Coolers El. 692	1-FS-30-186-A -187-B
	2-FS-30-186-A -187-B
*CCW and Auxiliary Feedwater	1-FS-30-190-A** -191-B**
*Pipe Chase Coolers	1-FS-30-201-A -202-B
	2-FS-30-201-A -202-B

<u>Flow Switch</u>	<u>Flow Switch No.</u>	
*Diesel Generator Building Exhaust	1-FS-30-447-A	
	-449-B	
	-451-A	
	-453-B	
	2-FS-30-448-A	
	-450-B	
	-452-A	
	-454-B	
	*Air Return Fan	1-FS-30-38
		-39
2-FS-30-38		
-39		
*Boric Acid and Auxiliary Feedwater	2-FS-30-184-A**	
	-185-B	
*EGTS Coolers	2-FS-30-200-A	
	-207-B	
*ABGTS Fans	1-FS-30-146-B	
	2-FS-30-157-A	
Reactor Building Coolers	1-FS-30-80A/B-A	
	-80B/A-A	
	-83A/B-B	
	-83B/A-B	
	-88A/B-B	
	-88B/A-B	
	-92A/B-A	
	-92B/A-A	
	-95	
	-97	
	-99	
	-100	
	2-FS-30-67	
	2-FS-30-80A/B-A	
	-80B/A-A	
	-83A/B-B	
	-83B/A-B	
	-88A/B-B	
	-88B/A-B	
	-92A/B-A	
	-92B/A-A	
	-95	
-97		
-99		
-100		

*Safety-related.
 **Switches identified on PT-162.

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