

CONTROL BLOCK:

0780-110 045

REPORT DATE: September 27, 1983
Determined
OCCURRENCE DATE: January 20, 1981

REPORTABLE OCCURRENCE 81-008
ISSUE 2
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FORT ST. VRAIN NUCLEAR GENERATING STATION
PUBLIC SERVICE COMPANY OF COLORADO
16805 WELD COUNTY ROAD 19 1/2
PLATTEVILLE, COLORADO 80651

REPORT NO. 50-267/81-008/03-X-2

Final

IDENTIFICATION OF
OCCURRENCE:

Routine surveillance testing of the primary coolant programmed pressure scram revealed that the three pressure transmitters were out of calibration and could have allowed operation with trip setpoints less conservative than required by LCO 4.4.1, Table 4.4-1.

| This was reportable per Fort St. Vrain Technical Specification AC 7.5.2(b)1 and AC 7.5.2(b)2.

EVENT
DESCRIPTION:

| While the reactor was in a shutdown condition, instrument personnel performing the annual calibration of the primary coolant pressure scram channels observed that the three pressure transmitters were out of calibration in the nonconservative direction. This could have resulted in the low pressure scram trips occurring at lower pressures than allowed by the LCO requirements.

See Figure 1. The output voltage from the pressure element ① goes to the pressure transmitter ② which supplies a measured signal to the pressure switch high ③ and the pressure switch low ④.

The high and low pressure bistables ③ and ④ are programmed by circulator inlet temperature through the actioneer circuit ⑤ and bistable setpoint programmers ⑥.

The high pressure bistable ③ provides a trip signal to both loop shutdown and steam/water dump (2 of 3) circuitry ⑧ and a scram to the appropriate channel ⑨. (Channel "A" in Figure 1) This trip circuitry is designed to provide protection in the event that moisture monitor trip circuitry fails to operate a loop trip steam/water dump and scram on high moisture levels, resulting from a rupture of the secondary coolant system.

The low pressure bistable ④ provides a scram function only ⑨.

The programmed pressure temperature curve is shown in Figure 2. The high output voltage from the pressure transmitters could have resulted in the low pressure trips occurring below the allowable low pressure curve (line (B) (B)). The high pressure trips would have occurred below the high pressure trip curve (line (A) (A)) in a conservative direction.

See Table 1 for "As Found", "As Left" data and equivalent pressures.

Table 2 lists the equivalent pressure (psia), the "As Found" output of each of the three pressure transmitters (PT's) and the differential pressure between the expected output and the "As Found" output of each of the three PT's.

TABLE 2

Pressure PSIA	PT "As Found" Output Voltage - Equivalent Pressure (PSIA)			ΔP		
	1108	1109	1110	1108	1109	1110
412	417	406	415	1	1	1
512	521	521	519	+9	+9	1
550	560	561	560	+10	+11	+10
612	622	624	628	+10	+12	+16
621	632	634	632	+11	+13	+11
661	670	676	671	+9	+15	+10
712	723	728	729	+11	+16	+17
720	731	736	735	+11	+16	+15
*740	751	*759	744	+11	*+19	1
812	823	825	818	+11	+13	1

① Not applicable - PT's in tolerance.

*See Example

With the circulator inlet temperatures reading correctly, then the low reactor pressure trip curve would be line (B) (B) Figure minus the ΔP of the particular transmitter.

For Example:

Pressure = 740 psia

PT-1109 "As Found" Voltage/Equivalent Pressure = 759 psia

PT-1109 ΔP = +19

Line (B) (B) , Figure 2, approximately equal to 627 psia.

Then, $627 - 19 = 608$ psia for a low pressure, scram to occur from PT-1109.

Although the low pressure trips could have occurred at a value less conservative than that established in the Technical Specifications, they would not prevent the fulfillment of the functional requirements of the system.

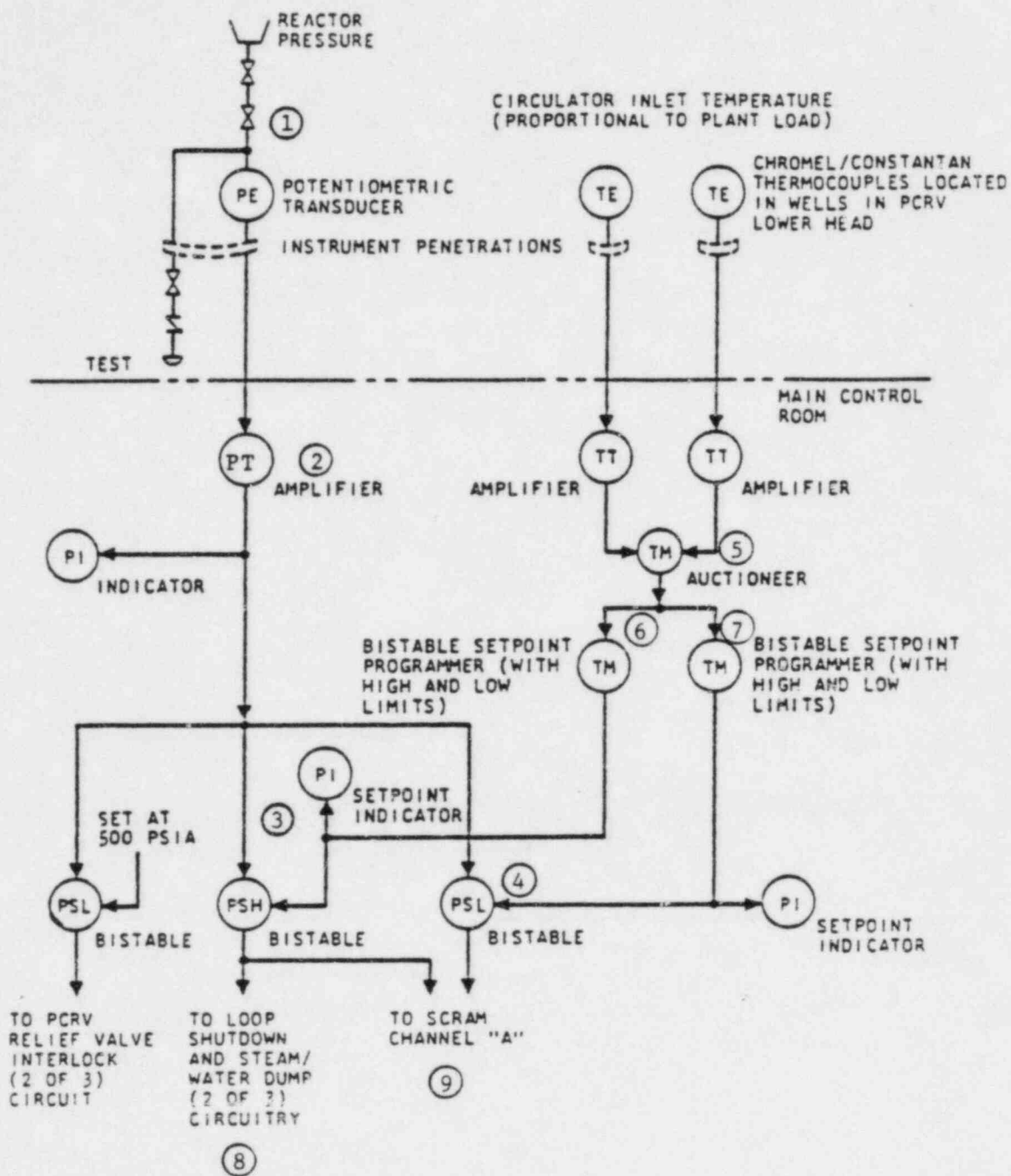
CAUSE
DESCRIPTION:

The high output voltages from the pressure transmitters were due to instrument drift of the pressure transmitters.

CORRECTIVE
ACTION:

The pressure transmitters were calibrated during the procedure, returned to service, and the Surveillance Test was successfully completed.

- | Once a month (while the reactor was pressurized above 400 psia), the pressure transmitter voltage outputs were checked against reactor pressure to determine if further instrument drift was occurring.
- | On April 22, 1981, two of the three pressure transmitters were out of calibration. This was reported as Reportable Occurrence 81-030.
- | On August 3, 1981, one of the three pressure transmitters were out of calibration. This was reported as Reportable Occurrence 81-055.
- | Since September, 1981, neither the monthly checks nor the two annual calibrations have revealed any further instrument drift of the pressure transmitters.
- | Commencing with October, 1983, the monthly Reactor Pressure Transmitter Check (SR-RE-18-M) will be discontinued. The Primary Coolant Pressure Scram Calibration (SR 5.4.1.1.9c-R) will continue as per normal schedule.
- | No further corrective action is anticipated or required.



Reactor pressure instrument channel (typ. for channels B&C)

FIGURE 1

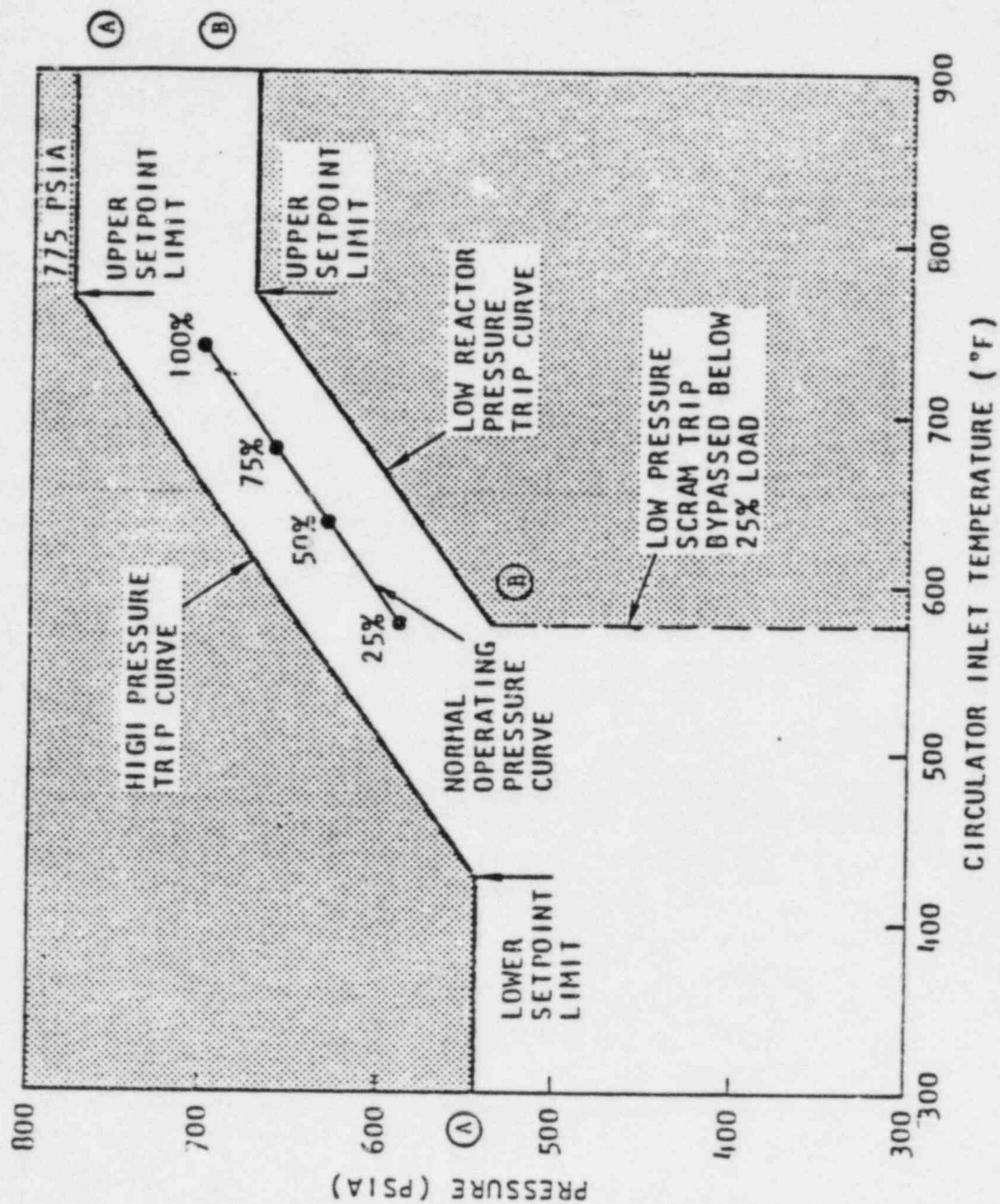


FIGURE 2

Fig. 7.1-14--Programmed reactor pressure high-low trip points

PRESSURE TRANSMITTER CALIBRATION DATA

APPLIED PRESSURE PSIG (.5)	EXPECTED OUTPUT VDC (.075)	EQUIVALENT ABSOLUTE PRESSURE (PSIA) (0.5)	PT 1108		PT 1109		PT 1110	
			AS FOUND VDC	AS LEFT VDC	AS FOUND VDC	AS LEFT VDC	AS FOUND VDC	AS LEFT VDC
400	4.124	412	4.171	4.077	4.061	4.084	4.151	4.121
500	5.124	512	5.215*	5.109	5.212*	5.093	5.190	5.142
538	5.504	550	5.604*	5.493	5.610*	5.481	5.595*	5.490
600	6.124	612	6.225*	6.102	6.245*	6.102	6.283*	6.148
609	6.214	621	6.321*	6.201	6.338*	6.194	6.323*	6.201
649	6.614	661	6.703*	6.611	6.761*	6.606	6.713*	6.650
700	7.124	712	7.236*	7.108	7.277*	7.111	7.288*	7.152
708	7.204	720	7.310*	7.182	7.357*	7.189	7.355*	7.249
728	7.404	740	7.514*	7.385	7.595*	7.399	7.438	7.421
800	8.124	812	8.235*	8.113	8.249*	8.120	8.185	8.063

* Readings which were out of limits.

TABLE 1

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