

(PLEASE PRINT ALL REQUIRED INFORMATION)

EVENT DESCRIPTION	DATE	TIME	LOCATION	STATUS
...

CAUSE DESCRIPTION

PERSONNEL EXPOSURES

PERSONNEL INJURIES

OFFSITE CONSEQUENCES

LOSS OR DAMAGE TO FACILITY

PUBLICITY

ADDITIONAL FACTORS

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REPORT DATE: July 12, 1979

ABNORMAL OCCURRENCE 76-19A

OCCURRENCE DATE: June 17, 1976

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FORT ST. VRAIN NUCLEAR GENERATING STATION
PUBLIC SERVICE COMPANY OF COLORADO
P. O. BOX 361
PLATTEVILLE, COLORADO 80651

REPORT NO. 50-267/76-19A

Final

IDENTIFICATION OF
OCCURRENCE:

On June 17, 1976, one steam/water dump valve in each loop was open. This has been identified as an abnormal occurrence per the Fort St. Vrain Technical Specifications, Section 2.1, paragraph f.

CONDITIONS PRIOR
TO OCCURRENCE:

<u> </u>	Steady State Power	<u> </u>	Routine Shutdown
<u> </u>	Hot Shutdown	<u> </u>	Routine Load Change
<u> X </u>	Cold Shutdown	<u> </u>	Other (specify)
<u> </u>	Refueling Shutdown	<u> </u>	
<u> </u>	Routine Startup	<u> </u>	

The major plant parameters at the time of the event were as follows:

Power	RTR	<u> 0 </u>	MWth
	ELECT	<u> 0 </u>	MWe
Secondary Coolant	Pressure	<u> 1,000 </u>	psig
	Temperature	<u> 174 </u>	°F
	Flow	<u> 100,000 </u>	#/hr.
Primary Coolant	Pressure	<u> 340 </u>	psig
	Temperature	<u> 194 </u>	°F Core Inlet
		<u> 194 </u>	°F Core Outlet
	Flow	<u> * </u>	#/hr.

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CONDITIONS PRIOR
TO OCCURRENCE (continued):

*Circulators

1A 1,500 RPM on Feedwater
1B 1,500 RPM on Feedwater
1C 1,500 RPM on Feedwater
1D 1,500 RPM on Feedwater

DESCRIPTION OF
OCCURRENCE:

The reactor operator was making a routine check of the plant control boards and noticed that a steam/water dump valve in each loop was open and the alarm light was lit.

APPARENT CAUSE
OF OCCURRENCE:

<u>X</u>	Design	<u> </u>	Unusual Service Cond. Including Environment
<u> </u>	Manufacture	<u> </u>	Component Failure
<u> </u>	Installation/Const.	<u> </u>	Other (specify)
<u> </u>	Operator	<u> </u>	
<u> </u>	Procedure	<u> </u>	

ANALYSIS OF
OCCURRENCE:

Reference attached Figure 1 which shows two parallel dump valves in a loop and the trip signals which will open a dump valve. Loop 1 and Loop 2 dump valves discharge to a common steam/water dump tank. Figure 2 shows the interlocks which were required to be closed to open a steam/water dump valve. If a loop steam/water dump valve is open, its relay must be energized. The energized relay and position switches on the open valve interlock and should prevent automatic opening of either steam/water dump valve in the other loop.

The seal in circuit also insures that operator action is required to close an open valve by utilizing the hand switch.

The manual bypass can open a valve in each loop but this also requires operator action.

The steam water dump valves were tested on June 16, 1976, per approved surveillance test SR 5.3.1-Q.

CORRECTIVE
ACTION:

Approved test, T-46, tested the steam water dump valve circuitry. The relay logic system operated as specified and there was no explanation for the simultaneous opening of a steam/water dump valve in each loop.

Failure modes and effect analysis was performed. For the steam water dump circuit as it existed, the analysis did not identify any other unacceptable system consequences than were known to exist. These were (1) the potential for a concurrent dump of Loops 1 and 2 with the permissible number of moisture monitors out of service and tripped accompanied by an instrument bus failure, and (2) dump inhibit of Loops 1 and 2 due to single integrated circuit chip failures. For the proposed modified design, the analysis indicated both the unacceptable system consequences stated above were eliminated and no others were introduced. Based on the results of these analyses, it was concluded that the design modifications to the steam/water dump system satisfy all Plant Protective System requirements and are consistent with the original design basis of the plant.

The following describes the modifications resulting from various analysis of the Fort St. Vrain steam water dump system circuitry. The modifications are as follows:

1. Made the automatic trip upon moisture monitor system failure a manual action; and revised the logic to permit individual manual trip of the associated moisture monitor (as opposed to disabling by pairs). The moisture monitor trip outputs (reflected light) were revised to transmission logic. The alarms and indications have been reviewed to assure that the operator is advised of moisture monitor system failure and enable him to readily ascertain manually tripped channels.
2. Revised the relay interlocks to eliminate an undesirable single failure inhibit problem. See Reportable Occurrence Report No. 50-267/77-17(14)A.
3. Removed the temporary time delay relay modification.

The modified circuits have been functionally tested successfully.

The applicable operating procedure has been revised.

No further corrective action is anticipated or required.

FAILURE DATA/SIMILAR REPORTED OCCURRENCES:

None

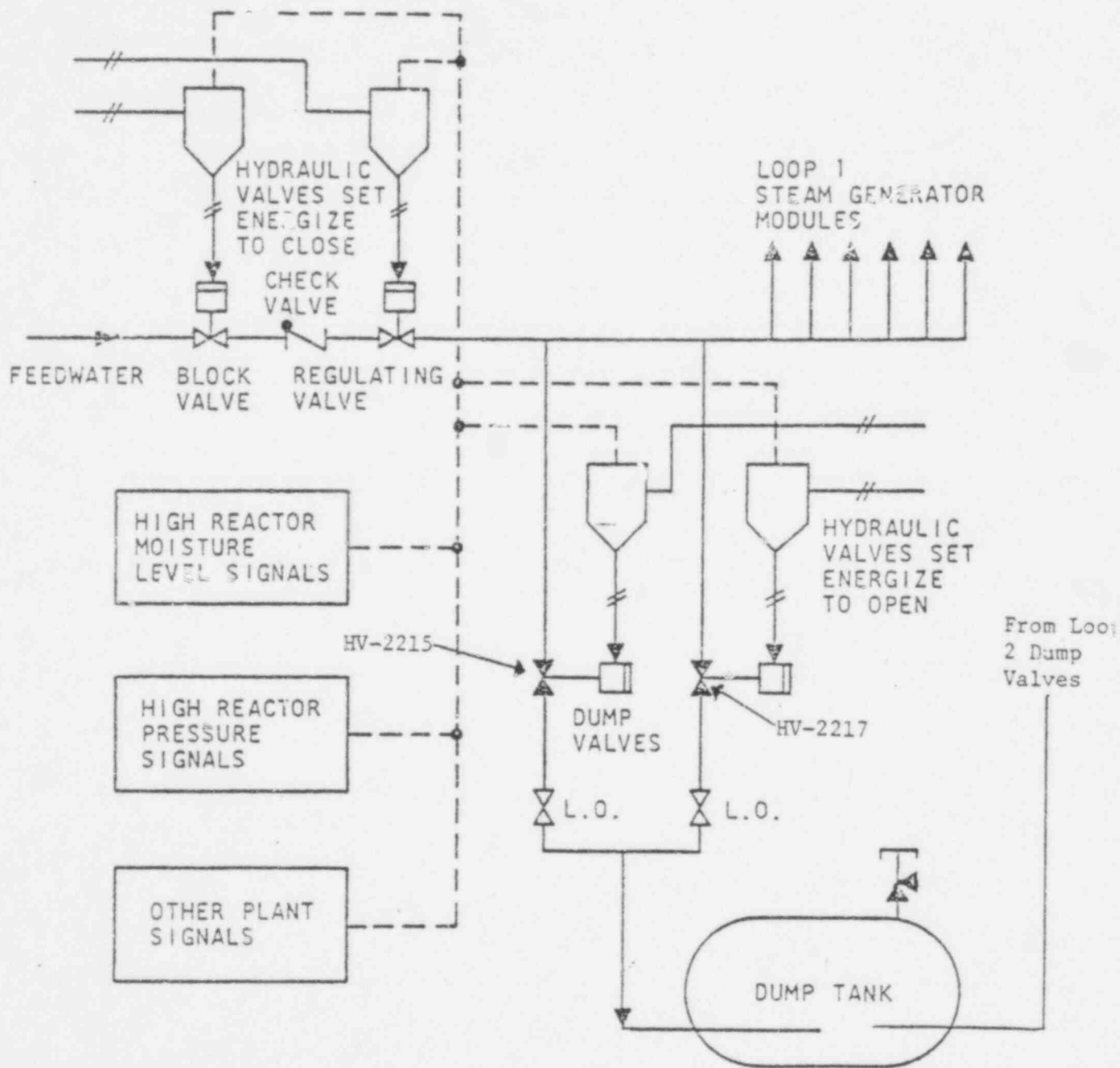
PROGRAMMATIC IMPACT:

None

CODE IMPACT:

None

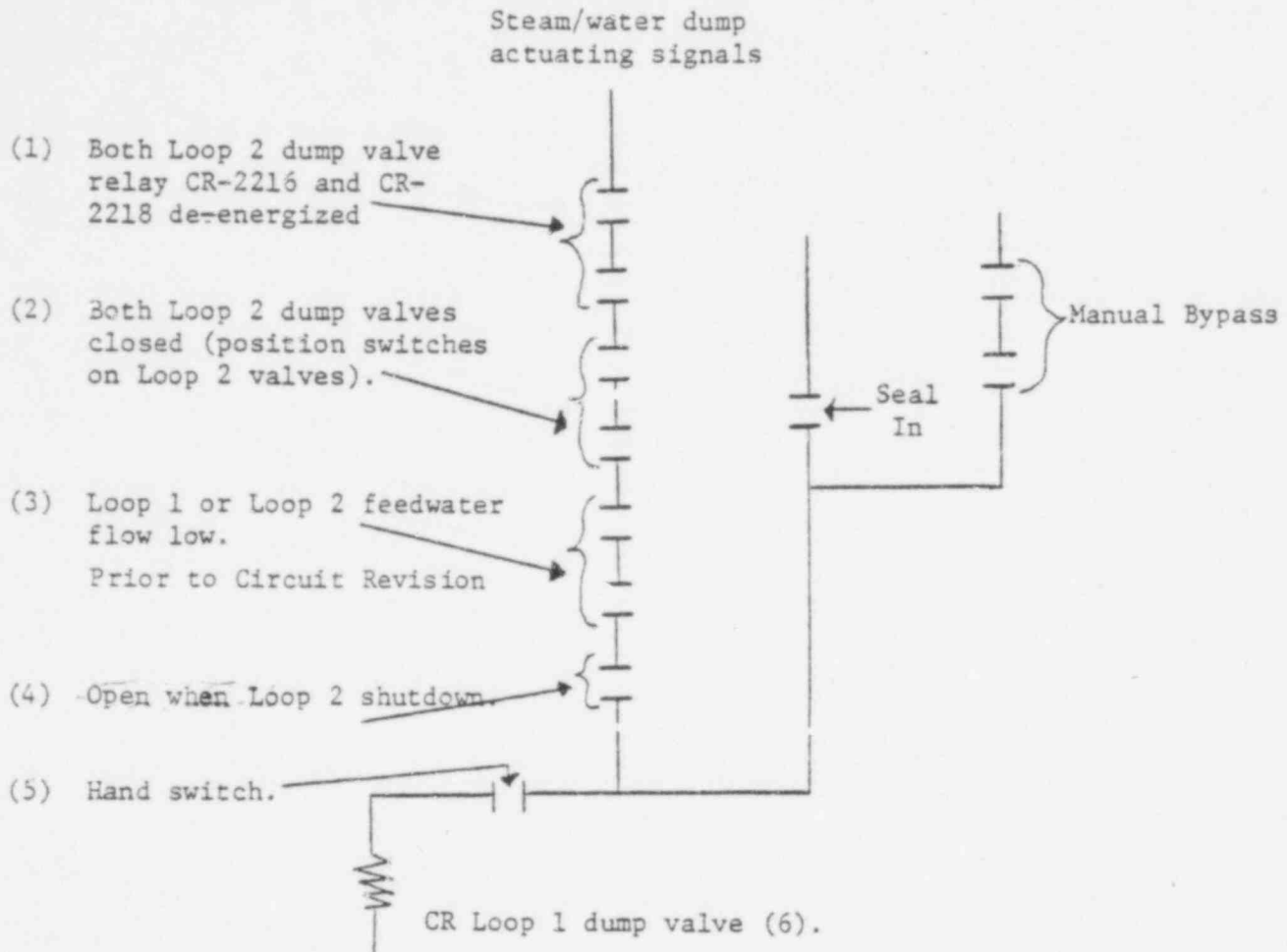
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Steam/water dump system (Loop 1)

FIGURE 1

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- (1) Relay contacts are open if the Loop 2 dump relay is energized; closed if de-energized.
- (2) Valve position switches are on each Loop 2 dump valve. Contacts open if valve is not fully closed, closed if valve is closed.
- (3) Contacts open if Loop 1 or Loop 2 feedwater flow is low.
- (4) Open if Loop 2 is shutdown by PPS.
- (5) Hand switch utilized to terminate a steam/water dump when required; contact normally closed.
- (6) Relay controlling one Loop 1 dump valve relay must energize to open a Loop 1 dump valve.

FIGURE 2

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