

Public Service Company of Colorado

P. O. Box 361, Platteville, Colorado 80651

April 18, 1975



Mr. E. Morris Howard, Director
Nuclear Regulatory Commission
Region IV
Office of Inspection & Enforcement
611 Ryan Plaza Drive
Suite 1000
Arlington, Texas 76012

Dear Mr. Howard:

REF: Facility Operating License
No. DFR-34

Docket No. 50-267

Enclosed please find a copy of Unusual Event Report No. 50-267/75/5,
preliminary, submitted per the requirements of the Technical Specifications.

Very truly yours,

H. Larry Brey

H. Larry Brey
Superintendent-Operations
Fort St. Vrain Nuclear
Generating Station

HLB:11

cc: Mr. Angelo Giambusso

8311020349 760621
PDR ADOCK 05000267
S PDR

*50-267
inquiry*

4595

COPY SENT REGION IV

<u>Addressee</u>	<u>Monthly Letter</u>	<u>Unusual Events and Abnormal Occurrence Reports</u>	<u>Unusual Occurrence Reports</u>	<u>Operating Cost Reports</u>
San Francisco Operations Office				
ERDA				
1333 Broadway				
Oakland, California 94612				
Attn: Manager	2	2	2	-
Finance & Budget	-	-	-	4
Calif. Patent Group	1	1	-	-
Division of Reactor Research and Development				
ERDA				
Washington, D. C. 20545				
Attn: Director	1	1	1	-
Asst. Dir. for LMFER Programs	-	-	1	-
Asst. Dir. for Gas Cooled Reactor Project	2	2	2	-
Asst. Dir. for Engrg. and Technology	1	1	1	-
Asst. Dir. for Reactor Safety	1	1	1	-
ERDA -SCRPO-SD	1	1	1	1
P. O. Box 81325				
San Diego, California 92138				
W. Soule', Project Engr.	1	1	-	-
ERDA -SCRPO				
P. O. Box 1446				
Canoga Park, California 91304				
Address --> Director	1	1	1	-
Letter --> ERDA -SCRPO				
to --> P. O. Box 1446				
--> Canoga Park, California 91304				
Technical Information Center	3	3	-	-
ERDA				
P. O. Box 62				
Oak Ridge, Tennessee 37830				
John W. Landis, President, Power Systems Co.	10	10	2	-
General Atomic Company				
P. O. Box 81608				
San Diego, California 92138				
Barbara Blick	1	1	1	
Bob Clark	1			
R. Walker	1	1		
F. Swart	1	1	1	
L. Brey	1	1		
D. Rodgers	1			
E. Hill	1			
F. Mathie	1			
W. Hillyard	1	1		
D. Alexander	1			
J. Liebelt	1			
K. Stannard	1			
NRC, Director of Regulations, Washington, D.C. 20545		1		
(Chairman, NFSC)				
A. Giambusso		1 (copy of Howard letter & xerox of maillog)		
Oscar Lee	1	1	1	
Control Room	1			
D. Warembourg		1		
E. Howard		1 (letter) copy of letter to Giamb		
R. Ayres (FPLG letter)		1	1	
M. J. Cooney	1			
FORC Committee		1		
Philadelphia Electric Company				
2301 Market St.				
Philadelphia, Pa. 18101				

REPORT DATE: April 18, 1975

UNUSUAL EVENT

OCCURRENCE DATE: March 23, 1975

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

REPORT NO. 50-267/75/5

Preliminary

IDENTIFICATION OF
OCCURRENCE:

A situation occurred while testing the helium circulator backup bearing water system which resulted in "A" and "B" circulators automatically tripping off and the buffer indication on "C" and "D" circulators to drop resulting in operator action to set the brake and seal.

This is identified as an Unusual Event, per Technical Specification definition AC 7.6c.3.

CONDITIONS PRIOR
TO OCCURRENCE:

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

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>N/A</u>	psig
	Temperature	<u>N/A</u>	°F
	Flow	<u>N/A</u>	#/hr.
Primary Coolant	Pressure	<u>85</u>	psig
	Temperature	<u>~200</u>	°F Core Inlet
		<u>~200</u>	°F Core Outlet
	<u>Helium circulator self turbinning</u>		

DESCRIPTION OF
OCCURRENCE:

The Emergency Feedwater header had been isolated via V-21453 in order to repair the pressure control for valve PV-21105. Upon completion of this repair, pressurization of the emergency feedwater header was initiated by slowly opening the isolation valve V-21453. The following events then occurred:

1. "A" and "B" helium circulators tripped on negative buffer/mid buffer.
2. HV-2366-1 and 2 changed from supplying buffer to the helium circulators via the purified helium header to the helium storage system. At a PCR pressure of 85 psig helium density is barely sufficient to place the purified helium compressors in service. Loss of a major helium user such as "A" and "B" buffers caused the purified helium compressor to trip and the automatic controls switched to the high pressure helium storage system.
3. The bearing water surge tank pressure in both loops went up to 140 psi, causing the buffer return flows to drop to 0 on the remaining circulators. "C" buffer went 10" negative but didn't trip. "D" buffer dropped low but didn't go negative. The operator set the brake and seal on both of these circulators because of the return flow being low. The Rix recovery compressors were then set up to vent to atmosphere in order to get the bearing water surge tank pressure down. When surge tank pressure equalled reactor vessel pressure "C" and "D" helium circulators were re-started.

APPARENT CAUSE
OF OCCURRENCE:

<input checked="" type="checkbox"/> Design	<input type="checkbox"/> Unusual Service Cond. Including Environment
<input type="checkbox"/> Manufacture	<input type="checkbox"/> Component Failure
<input type="checkbox"/> Installation/Const.	<input type="checkbox"/> Other (specify)
<input type="checkbox"/> Operator	_____
<input type="checkbox"/> Procedure	_____

The increased pressure in the surge tanks due to the water inflow displaced helium from these tanks thereby increasing the buffer helium recirculation suction pressure. This reduced the buffer return flow from the helium circulators causing them to trip on buffer/mid-buffer.

ANALYSIS OF
OCCURRENCE:

It appears that PC-21105 failed to control as did PCV-2191 and PCV-2192. With these valves not operating while V-21453 was being opened, there was no control of the Backup bearing water flow. The large amount of flow into the bearing H₂O surge tanks causes a displacement of the helium from the surge tanks (due to a level increase). This helium flows back the equilization line to the suction of the buffer helium recirculators thus reversing the buffer helium flow from the helium circulators. This is the loss of buffer/mid-buffer and, consequently a trip.

The level increase would not occur under normal circumstances because when the normal bearing water pumps are tripped, (and thus backup bearing water initiated), the feedforward signal from the control system opens the surge tank drain valves. This eliminates the possibility of high rate of change in the surge tank level, and thus the reduction of return helium flow from the circulator.

CORRECTIVE
ACTION:

The ability of the backup bearing water control systems to properly respond is currently undergoing review and testing.

FAILURE DATA/
SIMILAR REPORTED OCCURRENCES:

Unusual Event No. 50-267/75/3. A review of the failure of PV-21105-1 in the backup bearing water system which occurred on 4/10/75 is attached to this report for your information.

PROGRAMMATIC IMPACT:

None

CODE IMPACT:

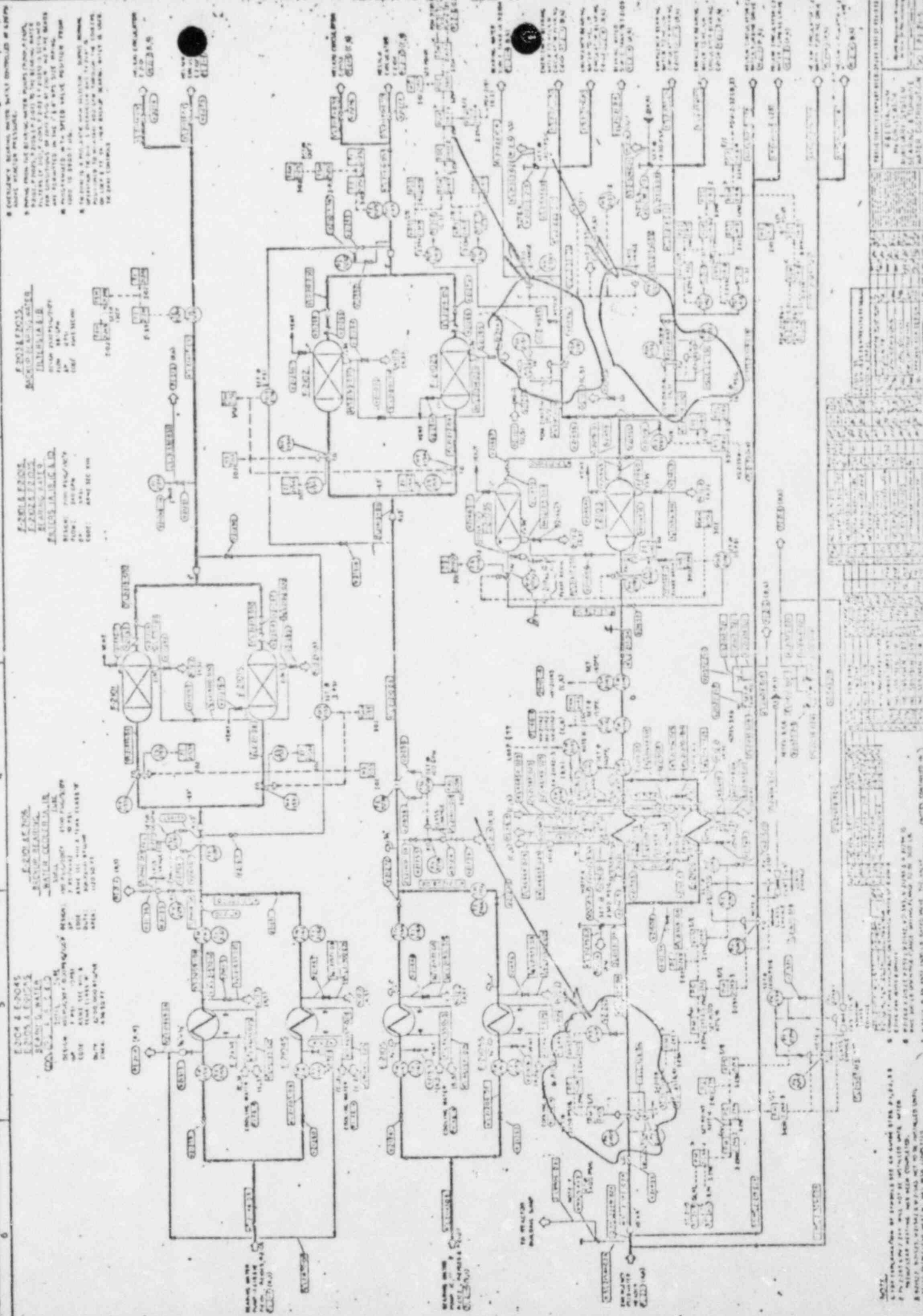
None

Recommended: H. Larry Brey

H. Larry Brey
Superintendent-Operations
Fort St. Vrain Nuclear Generating Station

Approved: Frederic E. Swart

Frederic E. Swart
Superintendent Nuclear Production
Public Service Company of Colorado



FAILURE OF PV21105-1

DESCRIPTION OF
OCCURRENCE:

On April 10, 1975, while testing the helium circulator backup bearing water system a pressure control valve (PV21105-1) experienced a mechanical failure requiring shutdown of the emergency feedwater header and loss of the backup bearing water system.

This valve is a pneumatically operated Valtek Mark Two valve with 1" internal trim.

The failure occurred in the following manner:

Emergency Feedwater Header pressure pushing up against the valve plug was approximately 4,000 psig. The yoke clamp failed, causing the plug assembly to push upward lifting the operator assembly, packing spacers and packing retainer (not shown in attached drawing). This allowed high pressure water to blow out of the stem guide area.

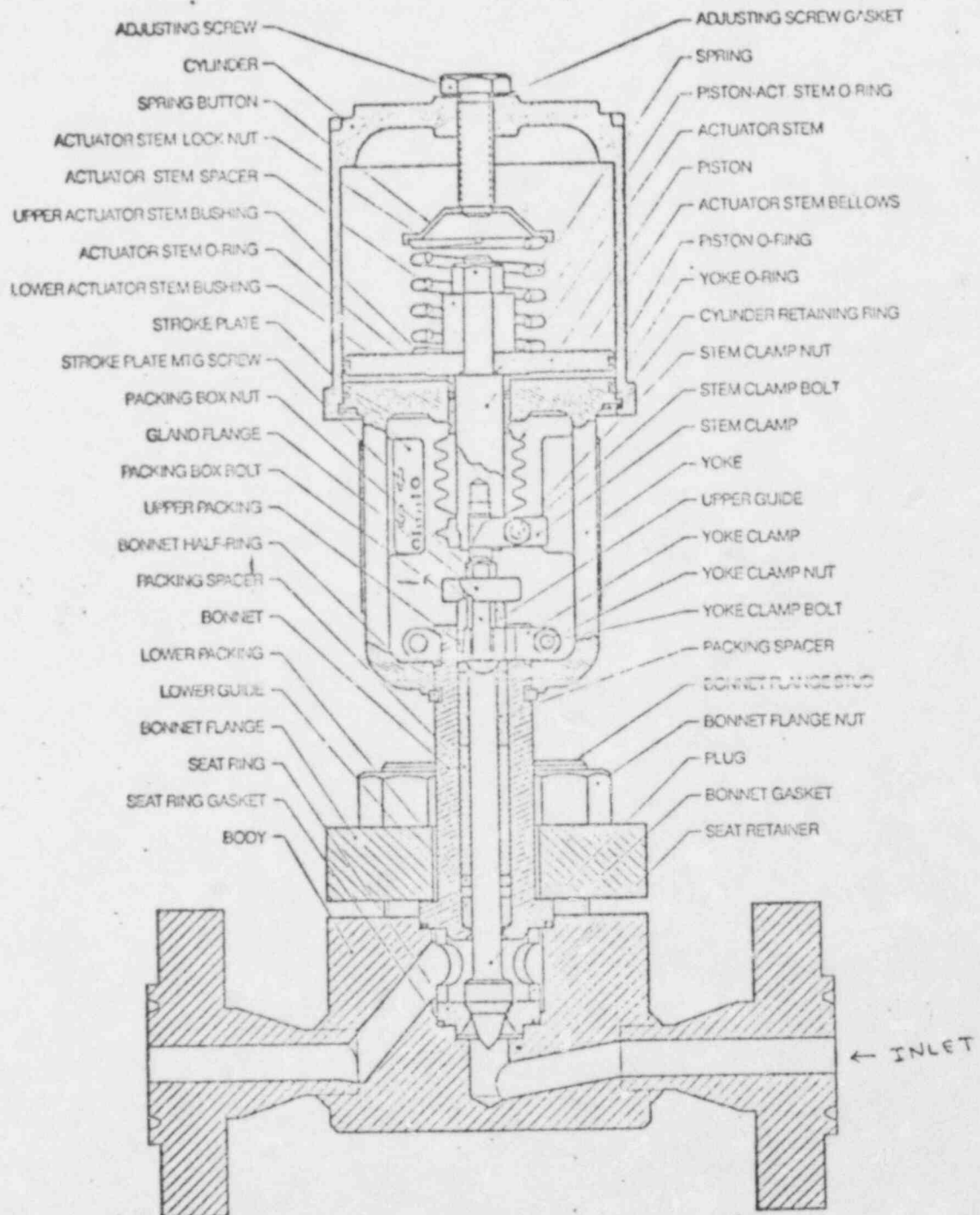
ANALYSIS OF
OCCURRENCE:

Examination of the yoke clamp revealed a fractured area. This fractured area appeared to have existed for a considerable time, as evidenced by discolored surfaces in the fracture.

CORRECTIVE ACTION:

A manufacturer's representative investigated the failure on April 11, 1975. Damaged parts were replaced and this valve (PV-21105-1) along with two other Valtek valves (PDV-2191-1, 2192-1) were disassembled and inspected. All yoke clamps were dye penetrant checked. The pressure containing components on PV-21105-1 were also radiographed or dye penetrant checked.

As a follow-up a review of the piping and valves making up this system is in process to verify pressure capabilities, surge responses, relief valve capacities, and proper supports and hangers.



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND ARE AFTER PLATING TOLERANCES		CR BY: R. C. ST. 10-17-74	VALTEK		PROVO UTAH
DECIMALS	± .01	CHK BY:	ASSEMBLY MARK TWO INLINE		REV
XX ± .03		ENGR			
XXX ± .05		NEXT ASSEMBLY	PARTS LIST		
ANGLES	± 1°	MATERIAL			
MACHINE FINISHES	✓	FINISH			
FILLET RADIUS		MICROFILMED			
BREAK SHARP EDGES AND REMOVE ALL BURRS		DATE		CODE IDENT. NO.	SIZE
				D	0894C
				CR. NO.	0894C

REPORT DATE: April 18, 1975

UNUSUAL EVENT

OCCURRENCE DATE: March 23, 1975

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

REPORT NO. 50-267/75/5

Preliminary

IDENTIFICATION OF
OCCURRENCE:

A situation occurred while testing the (helium circulator backup bearing water system which resulted in "A" and "B" circulators automatically tripping off) and the buffer indication on "C" and "D" circulators to drop resulting in operator action to set the brake and seal.

This is identified as an Unusual Event, per Technical Specification definition AC 7.6c.3.

CONDITIONS PRIOR
TO OCCURRENCE:

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

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>N/A</u>	psig
	Temperature	<u>N/A</u>	°F
	Flow	<u>N/A</u>	#/hr.
Primary Coolant	Pressure	<u>85</u>	psig
	Temperature	<u>~200</u>	°F Core Inlet
		<u>~200</u>	°F Core Outlet

Helium circulator self turbinning

4322

DESCRIPTION OF
OCCURRENCE:

The Emergency Feedwater header had been isolated via V-21453 in order to repair the pressure control for valve PV-21105. Upon completion of this repair, pressurization of the emergency feedwater header was initiated by slowly opening the isolation valve V-21453. The following events then occurred:

1. "A" and "B" helium circulators tripped on negative buffer/mid buffer.
2. HV-2366-1 and 2 changed from supplying buffer to the helium circulators via the purified helium header to the helium storage system. At a PCRV pressure of 85 psig helium density is barely sufficient to place the purified helium compressors in service. Loss of a major helium user such as "A" and "B" buffers caused the purified helium compressor to trip and the automatic controls switched to the high pressure helium storage system.
3. The bearing water surge tank pressure in both loops went up to 140 psi, causing the buffer return flows to drop to 0 on the remaining circulators. "C" buffer went 10" negative but didn't trip. "D" buffer dropped low but didn't go negative. The operator set the brake and seal on both of these circulators because of the return flow being low. The Rix recovery compressors were then set up to vent to atmosphere in order to get the bearing water surge tank pressure down. When surge tank pressure equalled reactor vessel pressure "C" and "D" helium circulators were re-started.

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>	

The increased pressure in the surge tanks due to the water inflow displaced helium from these tanks thereby increasing the buffer helium recirculation suction pressure. This reduced the buffer return flow from the helium circulators causing them to trip on buffer/mid-buffer.

ANALYSIS OF
OCCURRENCE:

It appears that PC-21105 failed to control as did PCV-2191 and PCV-2192. With these valves not operating while V-21453 was being opened, there was no control of the Backup bearing water flow. The large amount of flow into the bearing H₂O surge tanks causes a displacement of the helium from the surge tanks (due to a level increase). This helium flows back the equilization line to the suction of the buffer helium recirculators thus reversing the buffer helium flow from the helium circulators. This is the loss of buffer/mid-buffer and consequently a trip.

The level increase would not occur under normal circumstances because when the normal bearing water pumps are tripped, (and thus backup bearing water initiated), the feedforward signal from the control system opens the surge tank drain valves. This eliminates the possibility of high rate of change in the surge tank level, and thus the reduction of return helium flow from the circulator.

CORRECTIVE
ACTION:

The ability of the backup bearing water control systems to properly respond is currently undergoing review and testing.

FAILURE DATA/
SIMILAR REPORTED OCCURRENCES:

Unusual Event No. 50-267/75/3. A review of the failure of PV-21105-1 in the backup bearing water system which occurred on 4/10/75 is attached to this report for your information.

PROGRAMMATIC IMPACT:

None

CODE IMPACT:

None

Recommended: H. Larry Brey
H. Larry Brey
Superintendent-Operations
Fort St. Vrain Nuclear Generating Station

Approved: Frederic E. Swart
Frederic E. Swart
Superintendent Nuclear Production
Public Service Company of Colorado

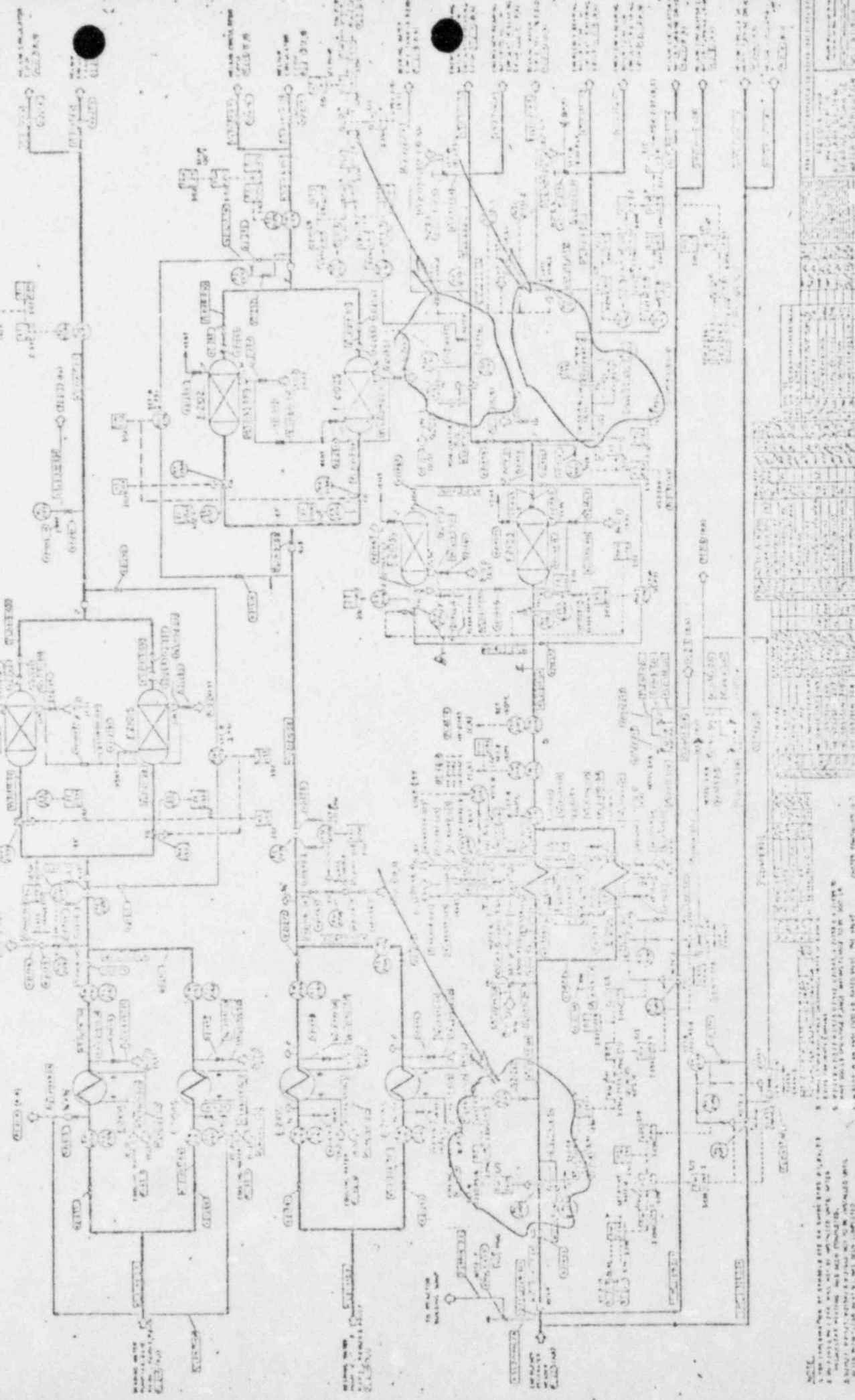
1. 200-1000
2. 200-1000
3. 200-1000
4. 200-1000
5. 200-1000
6. 200-1000
7. 200-1000
8. 200-1000
9. 200-1000
10. 200-1000

1. 200-1000
2. 200-1000
3. 200-1000
4. 200-1000
5. 200-1000
6. 200-1000
7. 200-1000
8. 200-1000
9. 200-1000
10. 200-1000

1. 200-1000
2. 200-1000
3. 200-1000
4. 200-1000
5. 200-1000
6. 200-1000
7. 200-1000
8. 200-1000
9. 200-1000
10. 200-1000

1. 200-1000
2. 200-1000
3. 200-1000
4. 200-1000
5. 200-1000
6. 200-1000
7. 200-1000
8. 200-1000
9. 200-1000
10. 200-1000

1. 200-1000
2. 200-1000
3. 200-1000
4. 200-1000
5. 200-1000
6. 200-1000
7. 200-1000
8. 200-1000
9. 200-1000
10. 200-1000



FAILURE OF PV21105-1

DESCRIPTION OF OCCURRENCE:

On April 10, 1975, while testing the helium circulator backup bearing water system a pressure control valve (PV21105-1) experienced a mechanical failure requiring shutdown of the emergency feedwater header and loss of the backup bearing water system.

This valve is a pneumatically operated Valtek Mark Two valve with 1" internal trim.

The failure occurred in the following manner:

Emergency Feedwater Header pressure pushing up against the valve plug was approximately 4,000 psig. The yoke clamp failed, causing the plug assembly to push upward lifting the operator assembly, packing spacers and packing retainer (not shown in attached drawing). This allowed high pressure water to blow out of the stem guide area.

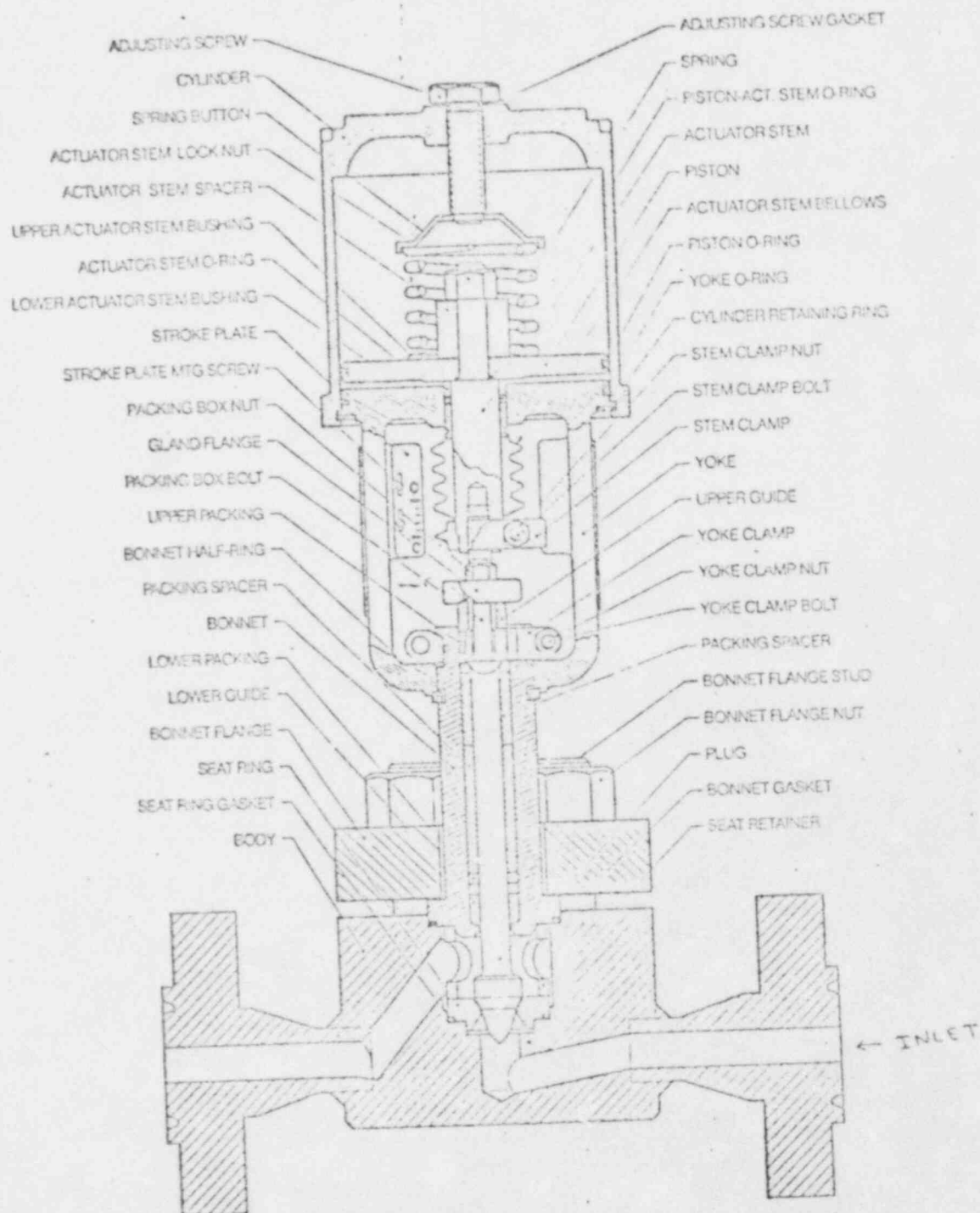
ANALYSTS OF OCCURRENCE:

Examination of the yoke clamp revealed a fractured area. This fractured area appeared to have existed for a considerable time, as evidenced by discolored surfaces in the fracture.

CORRECTIVE ACTION:

A manufacturer's representative investigated the failure on April 11, 1975. Damaged parts were replaced and this valve (PV-21105-1) along with two other Valtek valves (PDV-2191-1, 2192-1) were disassembled and inspected. All yoke clamps were dye penetrant checked. The pressure containing components on PV-21105-1 were also radiographed or dye penetrant checked.

As a follow-up a review of the piping and valves making up this system is in process to verify pressure capabilities, surge responses, relief valve capacities, and proper supports and hangers.



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND DECIMALS XX = .01 XXX = .010 ANGLES = 1°		DR BY CHK BY ENGR NEXT ASSEMBLY PARTS LIST MATERIALS FINISH MFG. DISPOSITION	VALTEK VALVE & ACTUATOR DIV. 1000 S. 1000 E. SALT LAKE CITY, UTAH 84143 (801) 466-1000	PROVD UTAH
MACHINE FINISHES <input checked="" type="checkbox"/>		ASSEMBLY MARK TWO INLINE		
INLET: 8" DIA. BREAK ASSEMBLY AND REM. USE ALL BUREAU		CODE IDENT. NO. D SIZE 0894C		