



Public Service

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August 2, 1991
Fort St. Vrain
Unit No. 1
P-91247

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop P1-37
Washington, D.C. 20555

DOCKET NO: 50-267

SUBJECT: ABNORMAL OPERATING PROCEDURE DISTRIBUTION

Gentlemen:

We are transmitting herein the following:

Issue 58 of Abnormal Operating Procedure AOP-L

Two copies of this procedure have also been transmitted to Region IV, Emergency Response Coordinator, in accordance with 10CFR50.54(q) (Reference P-91249).

In accordance with 10CFR50.54(q), we have determined that the changes in this issue do not decrease the effectiveness of the Fort St. Vrain Emergency Plans and the plans, as changed, continue to meet the intent of 10CFR50.47(b) and 10CFR50 Appendix E.

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If difficulties or questions arise in filing this procedure, please contact Mr. M. H. Holmes at (303) 480-6960.

Sincerely,



Charles H. Fuller
Manager, Nuclear Production
Fort St. Vrain Nuclear
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CHF/bj

Attachments

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MKC
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ABNORMAL OPERATING PROCEDURES

NO.	SUBJECT	ISSUE NUMBER	EFFECTIVE DATE
AOP INTRO	Abnormal Operating Procedures Introduction	56	02-13-91
AOP-A	Moisture In-Leakage	58	02-13-91
AOP-B	Reactor Scram	58	02-13-91
EP B-2	DELETED		01-09-88
AOP-EP C	Loop Shutdown	57-Last	03-28-90
AOP D-1	Single Circulator Trip	56	02-13-91
AOP-EP D-2	Three Circulator Trips	54-Last	03-21-90
AOP-EP E	Abnormal Reactor Power Change	56-Last	03-28-90
AOP-F	Restoration of Essential Electric Power	1	11-05-90
AOP-EP F-1	Main Turbine Emergencies	58-Last	03-28-90
AOP-EP F-2	Low Condenser Vacuum Turbine Trip	55-Last	03-28-90
AOP-EP F-3	Loss of Outside Power and Turbine Trip	55-Last	03-28-90
AOP-EP F-4	Loss of Outside Power and Turbine Trip with Failure of One Diesel Generator Set to Start	55-Last	03-28-90
AOP-EP G	Loss of Active Core Cooling	56-Last	03-28-90
AOP-H-1	Abnormal Radioactive Liquid Waste From Plant	58	03-27-91
AOP-H-2	Abnormal Radioactive Gas Release From Plant	58	03-27-91
AOP-H-3	High Activity in the Plant	58	03-27-91
AOP-I	Discussion of Fire	56	08-01-90
AOP-I-2	Chemical Spill Response	1	01-16-91



ABNORMAL OPERATING PROCEDURES

NO.	SUBJECT	ISSUE NUMBER	EFFECTIVE DATE
J	DELETED		05-14-82
AOP-K-1	Environmental Disturbances - Earthquake	60	03-27-91
AOP-K-2	Environmental Disturbances - Tornado	57	04-10-91
AOP-L	Loss of an Instrument Air Header	58	07-31-91
AOP-EP M	Loss of Hydraulic Power	56-Last	03-21-90
AOP-N	Loss of an Instrument Bus	57	03-27-91
AOP-P	Loss of a D.C. Bus	58	03-27-91
AOP-EP Q	Steam Leak or Inadvertent Lifting of Steam Relief Valve	57-Last	04-25-90
AOP-R	Loss of Access to Control Room	55	03-20-91
AOP-EP S	Loss of HVAC to 480 Volt Switchgear Room	54-Last	03-28-90
AOP-V	Restoration of PCRV Integrity	1	11-05-90
EP CLASS	Event and Emergency Classification Overview	8	03-29-91



TITLE: LOSS OF AN INSTRUMENT AIR HEADER

RESPONSIBLE FOR:	<i>M. E. Davidson</i>	AUTHORIZED BY:		
AUTHORIZED BY:	<i>David Swan</i>			
PORC REVIEW	PORC 9 4 4 JUL 2 4 1991			EFFECTIVE DATE 7.31.91
DCCF NUMBER (S)	90-1648			

(L)
 LOSS OF AN INSTRUMENT AIR HEADER
 SYMPTOM-ACTION MATRIX

ACTIONS	SYMPTOMS			
	1.1 Inst. Air Pressure Low I-06H, 2-6	1.2 Inst. Air Header "A" Pressure Low I-06 (PI-8212)	1.3 Inst. Air Header "B" Pressure Low I-06 (PI-8254)	1.4 Loss of both Inst. air headers
OPERATOR ACTIONS				
2.1 Terminate Defueling Activities				XX
2.2 Ensure standby compressor starts and alignment to affected header	XX	XX	XX	
2.3 If 60 PSIG and decreasing, set the helium circulator brake and seals.			XX	
2.4 Dispatch operators to identify leak source and isolate, if possible		XX	XX	
2.5 Isolate portions of affected header and determine if header pressure is regained		XX	XX	
OPERATOR ACTIONS				
a) Close V-8265 and V-82884 to isolate Reactor Building "A" header		XX		
b) Close V-8254 and V-82885 to isolate Reactor Building "B" header			XX	

(1)
 LOSS OF AN INSTRUMENT AIR HEADER
 SYMPTOM-ACTION MATRIX

ACTIONS	SYMPTOMS			
	1.1 Inst. Air Pressure Low 1-06H, 2-6	1.2 Inst. Air Header "A" Pressure Low 1-06 (PI-8212)	1.3 Inst. Air Header "B" Pressure Low 1-05 (PI-8254)	1.4 Loss of both Inst. air headers
c) Close V-8264 and V-82883 to isolate Turbine Building "A" header		XX		
d) Close V-8255 and V-82886 to isolate Turbine Building "B" header			XX	
2.6 If header pressure is regained, leave portion containing leak isolated		XX	XX	
NOTE: THE FOLLOWING ACTIONS ARE REQUIRED ONLY IF CONTROL VIA THE AFFECTED AIR HEADER HAD BEEN LOST				
OPERATOR ACTIONS				
2.7 Shutdown auxiliaries, including bearing water pumps and isolate surge tank level valves			XX	
2.8 Put reactor building sump pumps in PULL-TO-LOCK			XX	
2.9 Refer to TABLES L.3 and L.4 for effect of loss of air and valves backed with nitrogen		XX	XX	

INTRODUCTION

Each loop in this plant has a complete instrument air supply system consisting of an instrument air compressor, air aftercooler, air accumulator, air dryer, and distribution header. In addition, there is a spare instrument air compressor that should start automatically and furnish air for either loop in case the primary compressor is shutdown because of trouble or for maintenance. The service air compressor may also be used to furnish instrument air to either loop of the instrument air system. The service air can be introduced into either system just ahead of the system air accumulator, ahead of the system air dryers, or downstream of the system air dryers in case these components are also out of service.

Instrument air header "A" furnishes air to the Loop 1 instruments and header "B" furnishes air to the Loop 2 instruments.

DISCUSSION OF SYMPTOMS

ALARMS AND INDICATIONS

1.1 Instrument Air Pressure Low, I-06H, 2-6

When the pressure in either instrument air header drops below 70 psig, the alarm sounds and the window in the alarm panel lights.

NOTE: Operators, in most cases, will have been alerted to trouble prior to reaching this pressure.

1.2 Instrument Air Header "A" Pressure Low, I-06 PI-8212

1.3 Instrument Air Header "B" Pressure Low, I-06 PI-8254

In order to identify which header has the low pressure, the meters on the control board must be checked.

DISCUSSION OF OPERATOR ACTION

2.1 Terminate Defueling Activities

Until instrument air headers are restored, terminate defueling activities and close all openings to PCR.V.



2.2 Ensure standby compressor starts and alignment to affected header.

At 85 psig, ensure backup Instrument Air Compressor starts. Operator should then ensure compressor is delivering to the affected header by observing the pressure indicators on I-06, and placing HS-8219 or HS-8220 in the proper position.

2.3 IF 60 psig and decreasing, set helium circulator brake and seals.

At 60 psig and still decreasing pressure, control will soon be lost to most of the controllers in the affected loop. At 50 psig the Service Air backup will automatically be isolated from the affected air header. Some of the more critical control services have backup operating media which will last for a limited period of time. The proper action, therefore, is to isolate the coolant loop serviced by the affected header. Loop #2 is isolated by HS-93334 and HS-93336. The helium circulator brake and seal are set to prevent primary coolant leakage and moisture inleakage.

2.4 Dispatch operators to identify the leak source and isolate if possible.

With below normal air header pressure, the source of the problem should be determined and corrected if possible.

CAUTION: THE FOLLOWING STEPS ARE TO BE PERFORMED ONLY IF; AIR HEADER PRESSURE HAS BEEN LOST, AND THE LOOP ISOLATED.

The remainder of this abnormal procedure assumes there has been a major breach in an air header line. As such the remaining steps deal with leak source identification and isolation.

2.5 Isolate portion of affected header and determine if header pressure regained.

a) Close V-8265 and V-82884 to isolate reactor building "A" header.



- b) Close V-8254 and V-82885 to isolate reactor building "B" header.
- c) Close V-8264 and V-82883 to isolate turbine building "A" header.
- d) Close V-8255 and V-82886 to isolate turbine building "B" header.

2.6 If header pressure regained, leave portion containing leak isolated.

Closing air header isolation valves should be an effective means of locating the portion of the header containing the leak and also an effective means for isolation. There are local pressure gauges at each of the isolation valves. Isolation of a portion of the header containing the leak will minimize subsequent operator actions required for control of the plant.

NOTE: THE FOLLOWING ACTIONS ARE REQUIRED ONLY IF CONTROL VIA THE AFFECTED AIR HEADER HAS BEEN LOST.

The following steps of this abnormal procedure are necessary only to the degree instrument air for control of the equipment has been lost. This will depend upon the air header affected and that portion which has been isolated.

2.7 In affected loop, shutdown auxiliaries, including bearing water pumps and isolate surge tank level valves.

Control of the loop has been lost with loss of the associated instrument air supply.

2.8 Put reactor building sump pumps in PULL-TO-LOCK.

HV-7204-1 is on "B" header and fails open. The Reactor Building Sump Pumps should be put in pull-to-lock to avoid filling the liquid waste system.

2.9 Refer to Tables L.3 and L.4 for effect of loss of air and valves backed with nitrogen.

These tables provide a listing of these controllers which are affected by a loss of air pressure, their failure modes, emergency backup provisions, and those controllers which have backup emergency nitrogen supply

TABLE L.3

LOSS OF AN INSTRUMENT AIR HEADER

FUNCTION	EFFECT OF LOSS ON "A" INST. AIR HEADER	EFFECT OF LOSS ON "B" INST. AIR HEADER	NOTES
NOTE: (FO) = Fails Open (FC) - Fails Closed			
Normal Bearing Water System	LV-2135-1 (FO) LV-2135-2 (FC) Has backup air for 1 hour and manual shutoff valves.	LV-2136-1 (FO) LV-2136-2 (FC) Has backup air for 1 hour and manual shutoff valves.	Shut down bearing water pumps and isolate level control valves on loss of backup air supply.
	Recycle valve FV-21297 (FO)	Recycle valve FV-21298 (FO)	Produces helium circulator trip (Loss of bearing water due to simultaneous failure of backup bearing water supply.
Bearing Water Accumulators	PDV-21285-1 (FO) PDV-21285-2 (FO) Backup air for 5 minutes.	PDV-21286-1 (FO) PDV-21286-2 (FO) Backup air for 5 minutes.	Failure of normal and backup bearing water fires the accumulator.
Buffer Helium Supply	HV-2366-1 (FO)	PDV-23111 (FC) Has backup air for 13 hours HV-2366-2 (FC)	
	PDV-2367-1 (FC) Backup air		
Low Pressure Separator Drains	Lose normal drain LV-21115 (FC) Drain to turbine water drain tank.	Water drains to turbine water drain tk. LV-21119 (FO)	

TABLE L.3
LOSS OF AN INSTRUMENT AIR HEADER

FUNCTION	EFFECT OF LOSS ON "A" INST. AIR HEADER	EFFECT OF LOSS ON "B" INST. AIR HEADER	NOTES
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NOTE: (FO) = Fails Open (FC) = Fails Closed

Turbine Water Drain Tank	LV-21130 (FO) Has backup air for 1 hour and handjack.	LV-21114 (FO) Turbine water removal pumps cycle. LV-21130 operates normally (opens on high level). PV-21120 (FO) Has backup air for 1 hr and handjack.	
Flash Tank Drain System	LCV-3218 (FC) LCV-3217-1 (FC) LCV-3217-2 (FC) Because XEP-3217 loses supply air. LCV-3251-1 (FO) LCV-3251-2 (FO)	LCV-3217-2 (FC) HV-3220-1 (FC) HV-3220-6 (FC)	On loss of either header operation is via emergency drain path. On loss of "A" header only controlling valve is HV-3250.
150 psig HDR Valves	PCV-5201 (FO) HV-5202-2 (FO) HV-5211-1 (FO) HV-5211-2 (FO)	PCV-5214-1 (FO) PCV-5214-2 (FO) PCV-5214-3 (FO) (Flow to Close) HV-5202-1 (FO) HV-5203-1 (FO) HV-5203-2 (FO)	Loss of "A" HDR requires local manual control if aux boiler is on. Loss of "B" HDR requires local manual control of 5214 valve station.

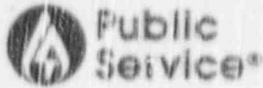


TABLE L.4

VALVES BACKED UP WITH NITROGEN

Valve Number	Function	Failure Mode
HV-2187-1	Circulator 1A Bearing Service Isolation	Open
HV-2187-2	Circulator 1A Bearing Service Isolation	Open
HV-2187-3	Circulator 1A Bearing Service Isolation	Open
HV-2187-4	Circulator 1A Bearing Service Isolation	Open
HV-2187-5	Circulator 1A Bearing Service Isolation	Open
HV-2187-6	Circulator 1A Bearing Service Isolation	Open
HV-2187-7	Circulator 1A Bearing Service Isolation	Open
HV-2187-8	Bearing Water Accumulator Circulator 1A	Open
LV-21303	Circulator 1A HP Separator DR (Manual)	Closed
HV-2188-1	Circulator 1C Bearing Service Isolation	Open
HV-2188-2	Circulator 1C Bearing Service Isolation	Open
HV-2188-3	Circulator 1C Bearing Service Isolation	Open
HV-2188-4	Circulator 1C Bearing Service Isolation	Open
HV-2188-5	Circulator 1C Bearing Service Isolation	Open
HV-2188-6	Circulator 1C Bearing Service Isolation	Open
HV-2188-7	Circulator 1C Bearing Service Isolation	Open
HV-2188-8	Bearing Water Accumulator Circulator 1C	Open
LV-21304	Circulator 1C HP Separator DR (Manual)	Closed
HV-2189-1	Circulator 1B Bearing Service Isolation	Open
HV-2189-2	Circulator 1B Bearing Service Isolation	Open
HV-2189-3	Circulator 1B Bearing Service Isolation	Open
HV-2189-4	Circulator 1B Bearing Service Isolation	Open
HV-2189-5	Circulator 1B Bearing Service Isolation	Open
HV-2189-6	Circulator 1B Bearing Service Isolation	Open
HV-2189-7	Circulator 1B Bearing Service Isolation	Open
HV-2189-8	Bearing Water Accumulator Circulator 1B	Open
HV-2190-1	Circulator 1D Bearing Service Isolation	Open
HV-2190-2	Circulator 1D Bearing Service Isolation	Open
HV-2190-3	Circulator 1D Bearing Service Isolation	Open
HV-2190-4	Circulator 1D Bearing Service Isolation	Open
HV-2190-5	Circulator 1D Bearing Service Isolation	Open
HV-2190-6	Circulator 1D Bearing Service Isolation	Open
HV-2190-7	Circulator 1D Bearing Service Isolation	Open
HV-2190-8	Bearing Water Accumulator Circulator 1D	Open
LV-2135-1	Makeup Bearing Water Surge Tank 1A	Open
LV-2135-2	Drain Bearing Water Surge Tank 1A	Closed
LV-2136-1	Makeup Bearing Water Surge Tank 1B	Open
LV-2136-2	Drain Bearing Water Surge Tank 1B	Closed
LV-21130	TWDT Drain to Reactor Building Sump	Open

TABLE L.4
VALVES BACKED UP WITH NITROGEN

<u>Valve Number</u>	<u>Function</u>	<u>Failure Mode</u>
PDV-21285-1	Loop 1 Bearing Water Accumulator	Open
PDV-21285-2	Gas Pressurizer 1A Outlet	Open
PDV-21286-1	Loop 2 Bearing Water Accumulator	Open
PDV-21286-2	Gas Pressurizer 1B Outlet	Open
HV-21277-1	Equalizing Line T-2110	Closed
HV-21277-2	Equalizing Line T-2110	Closed
HV-21277-3	Equalizing Line T-2110, Vent	Open
HV-21415-1	Loop 1 Accumulator Gas Pressure	Closed
HV-21415-2	Loop 1 Accumulator Purge Block	Closed
HV-21416-1	Loop 2 Accumulator Gas Pressure	Closed
HV-21416-2	Loop 2 Accumulator Purge Block	Closed
PV-21120	Turbine Water Drain Tank Vent	Open
LV-21130	Turbine Water Drain Tank Level Valve To Keyway	Open
PDV-2367-1	Buffer Makeup from Helium Storage	Closed
PDV-23111	Helium Purification Flow	Closed
LCV-3175-1	Deareator Level Control	Open
PV-22153	Loop 1 Stm/Gen Depress (Manual)	Closed
PV-22154	Loop 2 Stm/Gen Depress (Manual)	Closed
DV-73453	Rx Plant Exhaust Fan 1A In (Manual)	Closed
DV-73454	Rx Plant Exhaust Fan 1B In (Manual)	Closed
DV-73455	Rx Plant Exhaust Fan 1C In (Manual)	Closed
DV-73456	Rx Plant Exhaust Fan 1A Out (Manual)	Closed
DV-73457	Rx Plant Exhaust Fan 1B Out (Manual)	Closed
DV-73458	Rx Plant Exhaust Fan 1C Out (Manual)	Closed