



FORT ST. VRAIN NUCLEAR GENERATING STATION
PUBLIC SERVICE COMPANY OF COLORADO

Page 1 of 2

NRC off-site

(NRC #2 Wagner)

7/19/85

EMERGENCY PROCEDURES

NO.	SUBJECT	ISSUE NUMBER	EFFECTIVE DATE
Intro		50	05-14-82
A	Moisture In-Leakage	52	08-14-84
B-1	Reactor Scram (Without Two Loop Trouble)	52	08-14-84
B-2	Two Loop Trouble Scram, With a Trouble Alarm in Operating Loop	51	08-14-84
C	Loop Shutdown	51	08-14-84
D-1	Single Circulator Trip or One Circulator Trip in Each Loop	52	06-27-85
D-2	Three Circulator Trips	51	08-14-84
E	Abnormal Reactor Power Change	52	07-19-85
F-1	Main Turbine	52	08-14-84
F-2	Low Condensor Vacuum Turbine Trip	52	08-14-84
F-3	Loss of Outside Power and Turbine Trip	52	06-27-85
F-4	Loss of Outside Power and Turbine Trip with Failure of One Diesel Generator Set to Start	51	08-14-84
G	Extended Loss of Active Core Cooling	51	08-14-84
H-1	Abnormal Radioactive Liquid Release From Plant	51	08-14-84
H-2	Abnormal Radioactive Gas Release From Plant	51	08-14-84
H-3	High Activity in the Plant	51	08-14-84
I	Fire	52	08-14-84
J	DELETED		05-14-82
K-1	Environmental Disturbances - Earthquake	53	06-27-85
K-2	Environmental Disturbances - Tornado	51	08-14-84

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EMERGENCY PROCEDURES

NO.	SUBJECT	ISSUE NUMBER	EFFECTIVE DATE
L	Loss of an Instrument Air Header	52	01-18-85
M	Loss of Hydraulic Power	51	08-14-84
N	Loss of an Instrument Bus	52	08-14-84
P	Loss of a D.C. Bus	51	08-14-84
Q	Steam Leak on Inadvertent Lifting of a Steam Relief Valve	50	05-14-82
R	Loss of Access to Control Room	51	08-14-84
S	Loss of HVAC to 480 Volt Switchgear Room	51	08-14-84
CLASS	Event and Emergency Classification Overview	3	06-27-85



TITLE: ABNORMAL REACTOR POWER CHANGE

FT. ST. VRAIN
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PORC 680 JUL 19 1985

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7-19-85

(E)
ABNORMAL REACTOR POWER CHANGE
SYMPTOM-ACTION MATRIX

Issue 52
Page 2 of 3

ACTIONS	SYMPTOMS			
	1.1 Reactivity Change within Compensating Ability of Reg. Rod	1.2 Reactivity Change Be- yond Compensating Ability of Reg. Rod	1.3 Slack Cable 101A, 4-3	1.4 Any Unexplained Reactivity Change Deemed Unsafe by Operator
<u>IMMEDIATE ACTIONS</u>				
2.1 Scram Reactor per EP "B-1".		XX		XX
<u>FOLLOWUP ACTIONS</u>				
3.1 Check for Moisture Ingress.	XX W	XX		XX
3.2 Check for Abnormal Control Rod Position Indications.	XX	XX	XX	XX
3.3 Check for Reserve Shutdown System or Hopper Actuation.	XX	XX		XX
3.4 Perform Slack Cable Check per SOP 12-01, Section 5.2.			XX	
3.5 Perform Orderly Shutdown, If Required.	XX	XX	XX	
3.6 If Required, Actuate Reserve Shutdown System.		XX		XX

(E)
ABNORMAL REACTOR POWER CHANGE

SYMPTOM-ACTION MATRIX

Issue 52
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ACTIONS	SYMPTOMS			
	1.1 Reactivity Change within Compensating Ability of Reg. Rod	1.2 Reactivity Change Be- yond Compensating Ability of Reg. Rod.	1.3 Slack Cable 103A, 4-3	1.4 Any Unexplained Reactivity Change Deemed Unsafe by Operator
<u>REPORTING/ACTIVATION</u>				
4.1 The event carries no reporting/activation requirements beyond what the Shift Supervisor deems appropriate.	XX			
4.2 The event, as written, is reportable as a "Non-Emergency Event." A One-Hour Report is required if shutdown is required per Technical Specifications. A Four-Hour Report is required if a scram is manually performed or if it occurs due to PPS action, or if the event is one which could have prevented the reactor from being placed in a safe shutdown condition (see Table 1.1-1, Item 3).		XX		XX
4.3 The event, as written, is reportable as a "Non-Emergency Event," to be reported as in 4.2 above, provided the alarm is authentic, and requires a scram. The event would escalate to a SITE AREA EMERGENCY if there was an inability to insert sufficient rods to maintain adequate shutdown margin, and a failure of the Reserve Shutdown System to operate adequately to maintain a .01Δp shutdown margin.			XX	

INTRODUCTION

Sudden changes in the reactivity status of the core which cannot be accounted for by control system or operator actions may be indications of potentially serious problems. Any such indications should receive immediate operator attention and should be fully investigated. The only credible source of significant changes in reactivity is the removal or insertion of control poisons. In this event, the operator may not have sufficient control to safely maintain the reactor at power. Thus, an immediate scram and shutdown of the power plant are appropriate.

The possible causes of the unintentional removal or insertion of control poisons are:

- 1) Withdrawal of one or more rods due to switching malfunction.
- 2) Control rod stuck:
 - a) Rod binding in channel due to a shift in the core or a ruptured or deformed absorber;
 - b) Jammed drive mechanism;
 - c) Failure of brake to release or brake hangup;
 - d) Faulty indicating devices; or,
 - e) Drive motor breaker trip or control system fuse blown.

Since a stuck rod could indicate a serious condition, such as a deformed or ruptured absorber, or a shift of the core, which might affect other rods similarly, continued operation may aggravate the situation.

With one or more rod pairs inoperable due to being immovable (i.e., not capable of being fully inserted) as a result of excessive friction or mechanical interference, immediately initiate a reactor shutdown and be in at least SHUTDOWN within 12 hours.

3) Control rod drop:

- a) Broken suspension cable or spine;
- b) Brake failure (probably electrical trouble); or,
- c) Electrical failure of motor.

A dropped rod causes changes in the core power distribution. If the core power demand, as determined by turbine generator load, remains unchanged and compensation is accomplished by withdrawing other rods, Technical Specification limits on inserted rods may be violated, and higher than normal temperatures may occur in some regions.

In addition, the remaining rod or portions of the rod pairs, may not be depended on to scram because of the possibility of cable entanglement.

- 4) Insertion of a small amount of reserve shutdown poison: If insertion of reserve shutdown poison occurred, and an attempt was made to compensate for it by withdrawal of control rods, a power tilt most certainly would exist, which would result in high fuel temperatures in some regions.

DISCUSSION OF SYMPTOMS

1.1 Reactivity change within compensating ability of regulating rod.

1.2 Reactivity change beyond compensating ability of regulating rod.

Unexplained reactivity change causing changes in reactor power level is a prime indicator that events are occurring without the operators knowledge and/or beyond his control. This situation requires immediate investigation and/or action dependent upon the magnitude of the reactivity change.

If the unexplained reactivity change is within the compensating ability of the regulating rod, an orderly investigation and corrective action as appropriate should be performed without delay.

If the unexplained reactivity change is beyond the compensating ability of the regulating rod, a significant change in reactivity has occurred and an immediate reactor manual scram is appropriate.

1.3 Slack cable I-03A, 4-3.

The slack cable alarm system's purpose is to detect a stuck rod situation which, in turn, could be the source of an abnormal reactivity change.

1.4 Any unexplained reactivity change deemed unsafe by operator.

This gives the operator license to scram the reactor any time he considers it necessary. This is done in recognition of the fact that written procedures cannot anticipate all possible problems and combinations of circumstances that might render further operation unsafe. The operator's judgement, training, knowledge, and experience form an important part of the overall safeguards system protecting the health and safety of the public.

DISCUSSION OF IMMEDIATE ACTION

2.1 Scram reactor per Emergency Procedure B-1.

This is the appropriate action when the reactivity change is greater than the regulating rod worth, or when the operator deems the situation unsafe.

DISCUSSION OF FOLLOWUP ACTION

3.1 Check for moisture ingress.

3.2 Check for abnormal control rod position indications.

3.3 Check for reserve shutdown system or hopper actuation.

These are the most probable causes of reactivity change and can be quickly checked out. If the reactor is scrammed, the control rod position indicators should be monitored during the scram.

If a questionable rod pair is identified and no slack cable alarm has sounded, its status can be determined while operating at power per the following steps:

- 1) Select affected rod pair drive with the individual rod select switches.
- 2) Record rod pair position (Digital and Analog).

- 3) With the individual rod actuate switch, jog the rod in, in increments of one-half (1/2) inch or equivalent time for a maximum of three (3) inches.
- 4) Determine status of rod pair by observing position indicators, rod limit lights, slack cable alarm, and, finally, reactivity change which backs up the direct rod positioning instrumentation.

3.4 Perform slack cable check per SOP 12-01, Section 5.2.

When the slack cable alarm has sounded, the status of the questionable rod pair is determined using the SOP.

3.5 Perform orderly shutdown if required.

When the situation warrants, or as required by the Technical Specification limits, an orderly shutdown, rather than a scram, should be implemented. Control indications must continue to be monitored and appropriate action, including scram instituted, if necessary.

3.6 If required, actuate reserve shutdown system.

This action should be taken if the control rods are unable to effectively shut down the reactor or if the shutdown margin with rods fully inserted is not considered adequate. Because of the additional work required to remove the reserve shutdown material from the core, this action should not be taken lightly. However, if there is any doubt in the operator's mind about the ability of the control rod system to shutdown the reactor and maintain an adequate shutdown margin, it is appropriate to activate the reserve shutdown system.

REPORTING/ACTIVATION

4.1 The event carries no reporting/activation requirements beyond what the Shift Supervisor deems appropriate.

The event, as written, carries no immediate reporting requirements, unless the reactivity anomaly is of the nature described in Item 3.F on Table 1.1-1 of EP-CLASS.

4.2 The event, as written, is reportable as a "Non-Emergency Event".

The event, if a result of necessitating manual or automatic scram, is reportable as a "Non-Emergency Event," and should be reported to the NRC within one hour if required per Technical Specifications, or within four hours otherwise, in accordance with RERP-CR.

- 4.3 The event, as written, is reportable as a "Non-Emergency Event," provided the alarm is authentic, and requires a scram. The event would escalate to a SITE AREA EMERGENCY if there was an inability to insert sufficient rods to maintain shutdown margin and a failure of the reserve shutdown system to operate adequately to maintain a .01Δp shutdown margin.

Verify that the slack cable alarm is authentic; if it is, this event would be reportable as a "Non-Emergency Event" as described in 4.1, in accordance with RERP-CR. If the event results in an inability to maintain a .01Δp shutdown margin at 220°F, then the event should be classified a SITE AREA EMERGENCY, and the RERP should be implemented according to RERP implementing procedure RERP-CR.



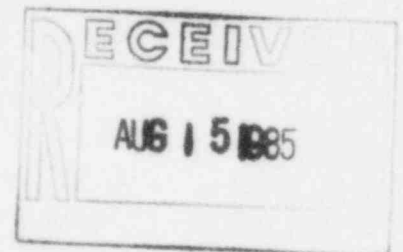
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August 6, 1985
Fort St. Vrain
Unit No. 1
P-85277

Regional Administrator
Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011



ATTN: Mr. E. H. Johnson

Docket No. 50-267

SUBJECT: Emergency Procedures

Dear Mr. Johnson:

We are transmitting herein revisions to Fort St. Vrain's Station Emergency Procedures for Mr. Phil Wagner's copy of the Emergency Procedures.

One copy of the Emergency Procedure, E, Issue 52 is being transmitted for filing. Attachments, data sheets, checklists, and control lists should immediately follow the procedure.

If difficulties or questions arise in filing this procedure, please contact Mr. M. H. Holmes at (303) 571-8409.

Sincerely,

J. W. Gahm
Manager, Nuclear Production

JWG/dal

Attachments

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