



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

AOP-B  
Issue 57  
Page 1 of 2

ORC1

TITLE: REACTOR SCRAM

RESPONSIBLE FOR	<i>M. E. Johnston</i>			
AUTHORIZED BY	<i>[Signature]</i>			
PORC REVIEW	PORC 8 7 7 APR 11 1990			EFFECTIVE DATE 4-19-90
DCCF NUMBER (S)	90-0136			

**FT. ST. VRAIN  
NON-CONTROLLED  
COPY**

VERIFY ISSUE STATUS  
WITH SITE DOCUMENT  
CONTROL CENTER PRIOR  
TO USE

9005100025 900427  
PDR ADOCK 05000267  
P PDR

(B)  
REACTOR SCRAM  
SYMPTOM-ACTION MATRIX

ACTIONS	SYMPTOMS					
	1.1 Startup Count Rate High (RMS- Not in RUN) 1-03B 4-4, 5-4, 6-4		1.2 Neutron Flux Rate of Change High (ISS-Start Up) 1-03B 4-3, 5-3, 6-3		1.3 Loss of Plant Power 1-03E 4-2, 5-2, 6-2	
<u>OPERATOR ACTION</u>						
2.1 Insert manual scram.	XX		XX		XX	
2.2 Ensure reactor internal maintenance terminated.	XX		XX		XX	
2.3 Ensure all PCRV openings closed.	XX		XX		XX	
2.4 Monitor Critical Safety Functions per EOP's.	XX	XX	XX	XX	XX	XX



## INTRODUCTION

Reactor scram is the ultimate defense against any circumstance or condition that threatens to damage the reactor core and release radioactive fission products. Reactor scram is initiated automatically by the Plant Protective System (PPS) in a number of situations described in the following discussion of symptoms.

The specific PPS actions that are initiated by reactor scram are as follows:

1. The control rod brakes are de-energized.
2. Power to Rod Drive Motor Control Centers (N-9225, East and N-9226, West) are interrupted (K49-51 and K48-50 green lights on - Board I-10).
3. First-in scram annunciator and indicating light are actuated, indicating which logic channels have tripped, A, B, or C.

## DISCUSSION OF SYMPTOMS

### SYMPTOMS

#### 1.1 Startup Count Rate High (RMS Fuel Loading) I-03B 4-4, 5-4, 6-4

This scram is actuated when either source range nuclear channel equals or exceeds a neutron count rate of  $1.0E+5$  counts/second with the Reactor Mode Switch not in the RUN position. The scram action is initiated by 1 of 2 logic trip by the Nuclear Start-up Channels I or II.

#### 1.2 Neutron Flux Rate of Change High (ISS Start-Up) I-03B 4-3, 5-3, 6-3

This scram is actuated as a result of Wide Range Nuclear Channels III, IV or V equaling or exceeding a neutron flux rise of 5 DPM.





1.3 Loss of Plant Power I-03B 4-2, 5-2, 6-2

Undervoltage detectors sense the voltage on all three phases of all three essential buses. Detection of voltage loss persisting for 30 seconds by 2 of the 3 detectors on 2 of the 3 busses will produce 2 of 3 scram channel trips, causing a reactor scram.

The accident of concern is the loss of outside power, and failure of one diesel generator to start. A scram is required to allow for heat removal with less than a normal complement of plant equipment.

DISCUSSION OF OPERATOR ACTION

2.1 Insert manual scram.

Insert manual scram following automatic scram as a backup to the PPS to insure a full scram. A manual scram can be inserted by operating the scram handswitch to the scram position, by depressing two of three push buttons on I-49, or by placing the RMS (Reactor Mode Switch) to the off position. Inward rod motion and decreasing flux are observed to verify that the scram is having the desired effect.

2.2 Ensure reactor internal maintenance terminated

The operator should advise any personnel involved in operations from the refueling floor that a scram has occurred and that further operations should be terminated until it is determined to be safe to proceed.

2.3 Ensure all PCRV openings closed

Openings through the PCRV should be closed as soon as possible to prevent the out leakage of primary coolant and potential release of activity.

2.4 Monitor Critical Safety Functions per EOP's.

If the operator verifies that any critical safety function is not being met, the operator will proceed to appropriate EOP.