Public Service Company of Colorado

16805 WCR 19 1/2, Platteville, Colorado 80651

50-267

June 11, 1984
Fort St. Vrain
Unit #1
P-84170

Mr. Eric H. Johnson, Chief
Reactor Project Branch 1
Region IV
Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

SUBJECT: Fort St. Vrain
Radiological Emergency
Exercise - 1984

REFERENCE:
1) Letter, Warembourg to Collins, dated May 18, 1984 (P-84150)
2) Letter, Byrne (DODES) to Cook (FEMA), dated March 22, 1984 (G-84094)
3) Letter, Warembourg to Collins, dated April 10, 1984 (P-84106)
4) Letter, Warembourg to Collins, dated May 4, 1984 (P-84129)

Dear Mr. Johnson:

Please find enclosed the complete package for the 1984 Fort St. Vrain Radiological Emergency Exercise (FOSAVEX-84). This consists of the following attachments:

Scope and Objectives (Reference 1)	- Attachment A
Narrative Summary and Sequence of Events	- Attachment B
Conduct of the Exercise	- Attachment C
Observer/Prompter Packages	- Attachment D

A005
1/1

It should be noted that provisions made in the Scope and Objectives and Conduct of the Exercise for offsite participation are based on the State of Colorado's request for recommendation of exemption to FEMA (Reference 2) and Public Service Company's corresponding request from NRC (References 3 and 4). Your immediate attention to this matter is greatly appreciated as we would like to consider exercise preparations finalized. In light of the State not participating, emphasis during the exercise will be placed on on-site incident evaluation and response actions, rather than offsite responses.

If you have any questions concerning FOSAVEX-84, please contact Mr. Chuck Fuller at (303) 785-2223.

Very truly yours,

Don W. Warembourg
Manager, Nuclear Production

Attachments

cc: Pat Byrne, DODES
Rick Holtz, DODES
Lea Eckman, Weld County
Jim Montgomery, Region IV

DWW/dkh

Attachment A

SCOPE AND OBJECTIVES

Attachment A

FORT ST. VRIAN

FOSAVEX-84

PURPOSE:

The purpose of FOSAVEX-84 is to test the Radiological Emergency Response Plan and Implementing Procedures as tools for use by personnel when responding to a radiological emergency at Fort St. Vrain.

DATE:

FOSAVEX-84 has been scheduled as a one-day exercise to be held on July 25, 1984.

SCOPE:

1. The exercise will be an unannounced off-hours emergency exercise, with participation by the licensee only.

2. The scenario begins as an initiating event which increases in severity to a "SITE AREA EMERGENCY". Actual meteorological conditions will be used for simulated radiological assessment during the exercise.

3. Separate from the emergency exercise itself, activation of the Early Warning Alert system shall be exercised.

4. All Emergency Response Facilities actively participated in by the licensee will be activated. State and local authorities will activate communications links and will participate in a limited manner from the Weld County and the State Emergency Operations Center.

5. Personnel not participating in the exercise shall report to normal work locations and shall perform normal duties.

OBJECTIVES:

1. Demonstrate that response center personnel can be alerted and notified during non-working hours to man the emergency response centers.

2. Demonstrate that the emergency response facilities can be manned and operational in a timely fashion.

3. Demonstrate that accountability printouts from the Security computer system are used to aid in accurately determining personnel accountability of those personnel on-site at the onset of the exercise.

4. Demonstrate that the incident assessment staff can perform the assigned tasks related to assessment and that timely decisions and appropriate response can be made concerning the incident category.

5. Demonstrate that the telecommunications system can be manned and operated in a timely manner and that the system is adequate to handle anticipated traffic during site emergency conditions.

6. Demonstrate that emergency monitoring teams and damage control teams, if needed, can be assembled and dispatched from the Personnel Control Center in a timely manner and can adequately perform assigned functions at their appointed destinations. Demonstrate also that the teams are adequately briefed of applicable plant conditions and required protective clothing, dosimetry and respiratory protection prior to being dispatched from the Personnel Control Center.

7. Demonstrate that plant operations and support personnel respond to the emergency situation utilizing emergency procedures to mitigate the consequences of the incident.

8. Demonstrate the capability of emergency personnel to follow and use emergency procedures, checklists, and data sheets.

Attachment B

NARRATIVE SUMMARY

and

SEQUENCE OF EVENTS

Attachment B

FOSAVEX-84 Narrative Summary

(NOTE: Numbers in parentheses refer to points on schematic.)

The initiating event is a leak in the A Train Helium Purification Cooler (E-2301) (1). The leaking primary coolant enters the cooling water system where it rises to the cooling water system surge tank (T-4701) (2). High pressure in the tank is not alarmed, however, as the pressure indicator and alarm are cleared out for calibration (3).

The cooling water loop remains functional, however, as the pressure in the line remains below 92 psig (precluding automatic isolation) and the pump (4) does not show sign of cavitation.

The valve stem on the valve bypassing the surge tank is broken, keeping the valve in the open position (5), allowing the surge tank to vent to the gas waste system. The loop seal (6) is lost, and primary coolant enters the gas waste vacuum tank (T-6301) (7).

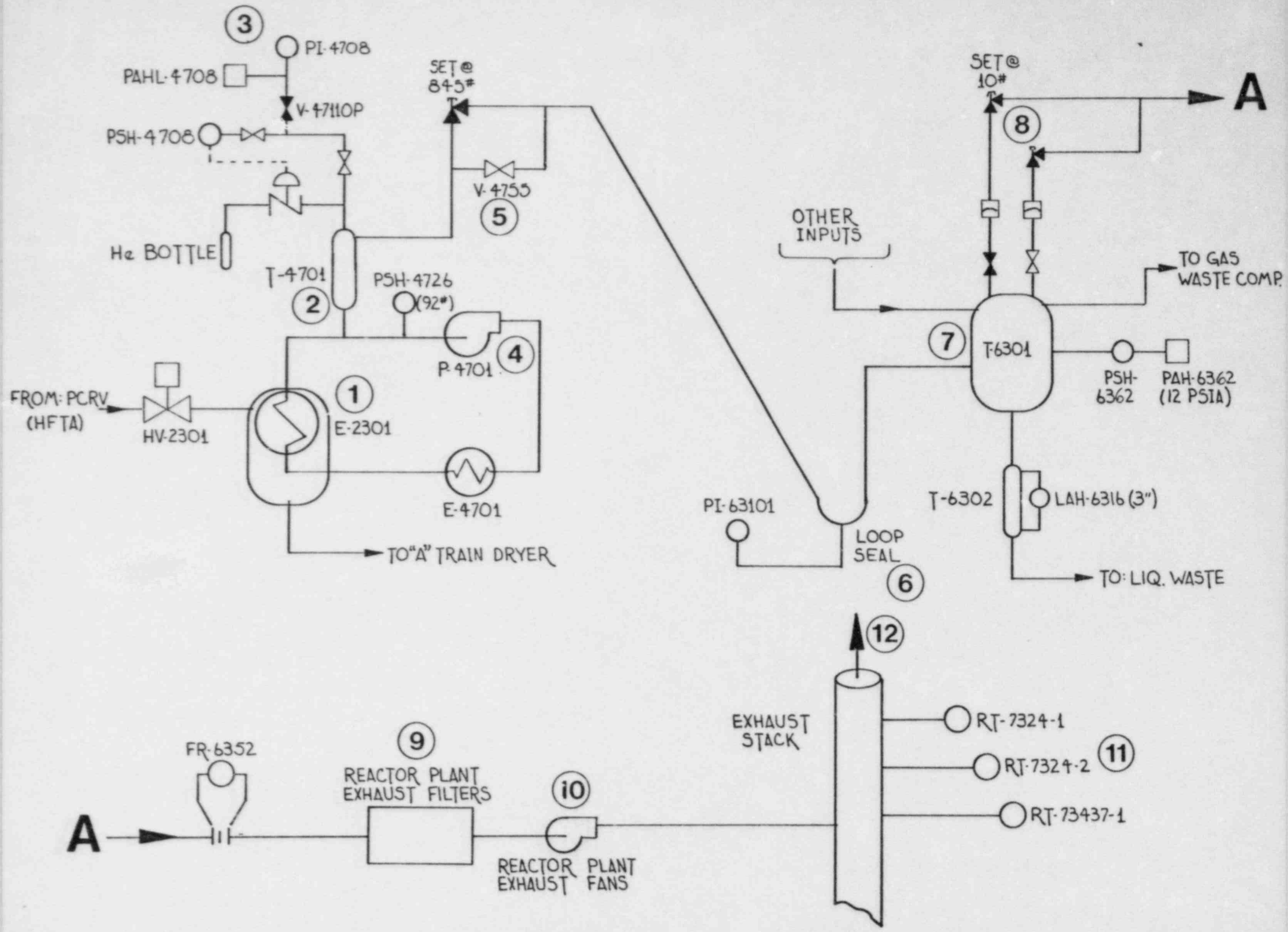
The gas waste vacuum tank pressure rises rapidly to its alarm setpoint of 12 psia. The corresponding alarm in the Control Room is the first indication to the operators that there is a problem. Since there are no indications of problems in the cooling water system, it is not evident what pressurization of the tank is due to, and more obvious possibilities will probably be investigated.

The standby gas waste compressor starts in addition to the one normally running to attempt to alleviate the pressure rise in the vacuum tank. The tank pressure continues to rise and the rupture disk blows and the safety valve lifts (8), releasing the gas waste vacuum tank contents to the exhaust ventilation filters (9), exhaust fans (10), past the radiation monitors (11), and out the plant stack (12). The pressure in the vacuum tank is high enough that, should rupture disks be swapped, the other will also rupture.

Radioactive release rates are such that a SITE AREA EMERGENCY is declared.

The source of in-leakage to the gas waste system is eventually diagnosed to be the leak in the Helium Purification cooler. The leak is not isolable, however, as the helium inlet valve to the cooler, (HV-2301), is not able to be closed. Cooling water loops may not be swapped due to a faulty breaker, and B Purification Train may not be used due to regeneration and a frozen low temperature adsorber.

The release continues until the PCRV is depressurized, either due to the leak or due to depressurization through the A Train.


3
PI-4708
PAHL-4708
V-4711OP
PSH-4708
SET @ 845#
V-4755
5
He BOTTLE
T-4701
2
PSH-4726 (92#)
P-4701
4
FROM: PCRV (HFTA)
HV-2301
1
E-2301
E-4701
TO "A" TRAIN DRYER
SET @ 10#
A
8
OTHER INPUTS
TO GAS WASTE COMP.
7
T-6301
PSH-6362
PAH-6362 (12 PSIA)
T-6302
LAH-6316 (3")
PI-63101
LOOP SEAL
6
TO: LIQ. WASTE
12
EXHAUST STACK
RT-7324-1
RT-7324-2
RT-73437-1
11
FR-6352
9
REACTOR PLANT EXHAUST FILTERS
10
A
REACTOR PLANT EXHAUST FANS

Attachment B

FOSAVEX-84 - PLANNED SEQUENCE OF EVENTS

Approximate Time (minutes)	Event
T=-10	Control Room operators are informed of plant conditions at the start of the drill. Those pertinent to the scenario include: • Reactor power steady at 70% • A Helium Purification Train in service • B Helium Purification Train regenerating Helium Dryer (LTA assumed frozen) • Loop I System 47 in service • Gas Waste release of "A" surge tank in progress since 0300 hours; Gas Waste "B" surge tank pressure is 150# • PI-4708 (Pressure Indicator Loop I System 47 surge tank) out-of-service on PTR. V-47110P is main clearance point.
T=0	A leak occurs in E-2301, the Helium Purification Cooler on A Train. Control Room operators are alerted to high gas waste vacuum tank pressure. Both gas waste compressors will be running, and recurring spikes in the stack flow will be indicated on Control Room flow recorder, FR-6352.
T=30	Stack radiation indications begin increasing.
T=5	High stack radiation alarms RT-7324-1 and 7324-2 alarm in the Control Room. The gas waste release automatically terminates, and effluents that normally vent directly to the exhaust filters automatically transfer to the gas waste vacuum tank.
T=0 to 15	Stack radiation monitor readings continue to increase. (See Table 1 for monitor readings.)

PLANNED SEQUENCE OF EVENTS (cont.)

Approximate Time (minutes)	Event
T=0 to 45	Operators attempt to locate source of in-leakage to gas waste vacuum tank . Anticipated operator actions and results of these actions are given in the CR prompter package.
T=15 to 30	Due to high stack monitor readings, a SITE AREA EMERGENCY should be declared.
T=30	Low Reactor Pressure Alarm sounds at 20 psi below normal pressure. If the reactor is not manually scrammed at this point, an automatic scram will occur at 50 psi below normal (at T=60 min).
T=15 to 45	Release rates remain relatively constant until the reactor is scrammed. After the reactor is scrammed, release rates decrease until T=360.
T=60	Automatic reactor scram on low reactor pressure, if manual scram has not already been performed.
T=45 to 90	The source of the leak into the gas waste vacuum tank is determined to be a non-isolable leak in the A Train Helium Purification Cooler. Operators may begin depressurization of the PCRV.
T=90 to 360	Release rates continue to decrease.
T=360	Radiation levels are decreasing, with release rates at the EAB being approximately background. Transition to a recovery phase is performed, and the exercise is terminated.

Attachment B

Table 1

Radiation Monitor Readings

(after Reactor Scram)

Time (min)	7324-1 (CPM)	7324-2 (CPM)	73437-1 (CPM)	Classification & EAB Dose Rate (mrem/hr)	
T = 0	26	42	7	N/A	Bkgd
T = + 30 sec.	41	42	"	UNUSUAL EVENT (if classification made)	Bkgd
T = + 1 min.	100	48	"	"	"
T = + 2 min.	1,000	60	"	"	"
T = + 3 min.	3,000	180	"	"	"
T = + 4 min.	15,000	900	"	"	"
T = + 5 min.	40,000	2,400	"	"	"
T = + 6 min.	90,000	5,500	"	"	"
T = + 7 min.	170,000	10,000	"	"	"
T = + 8 min.	300,000	18,000	10	"	"
T = + 9 min.	500,000	30,000	50	"	"
T = + 10 min.	700,000	45,000	100	ALERT	(N/G only)
T = + 11 min.	900,000	54,000	150	"	"
T = + 12 min.	1,200,000	73,000	200	"	0.2
T = + 13 min.	1,350,000	82,000	250	"	0.6
T = + 14 min.	1,500,000	91,000	300	"	3.0
T = + 15 min. to Rx scram	1,800,000	110,000	350	SITE AREA EMERGENCY (N/G only)	8.0

Attachment B

Table 1

Radiation Monitor Readings

(after Reactor Scram)

Time (min)	7324-1 (CPM)	7324-2 (CPM)	73437-1 (CPM)	Classification & EAB Dose Rate (mrem/hr)	
Rx Scram	1,800,000	110,000	350	SAE (N/G only)	400
Scram + 15	1,350,000	82,000	"	ALERT	350
Scram + 30	900,000	55,000	"	"	200
Scram + 45	675,000	41,000	"	"	150
Scram + 60	450,000	27,000	"	UNUSUAL EVENT	100
Scram + 75	337,000	21,000	"	"	80
Scram + 90	225,000	13,500	"	"	60
Scram + 105	170,000	10,500	"	"	40
Scram + 120	113,000	7,000	"	"	30
Scram + 150	55,000	3,500	"	"	20
Scram + 180	27,000	1,700	"	"	10
Scram + 210	13,000	850	"	"	5
Scram + 240	6,500	420	"	"	2.5
Scram + 270	3,300	210	"	"	1.5
Scram + 300	1,600	100	"	"	0.7
Scram + 330	800	50	"	"	Bkgd
Scram + 360	400	25	"	"	"

Attachment C

CONDUCT OF THE EXERCISE

Attachment C

CONDUCT OF THE EXERCISE

1. Activity released and doses received are designed to be significant enough to escalate the event to a Site Area Emergency. The release is not intended to be realistic in terms of actual available inventory.

2. Actual meteorological conditions will be utilized.

   a. Field monitoring teams will be provided with pre-determined field measurement data (via prompter cards). The field monitoring teams will be dispatched to track the plume. In the event that the meteorological stability category would preclude a plume from being detected (from a radiological standpoint), the field monitoring teams will continue to use the pre-determined data to demonstrate plume tracking capability.

   b. Depending upon the meteorological conditions during the exercise, the Personnel Control Center may have to be relocated. If this becomes necessary, in the judgement of the Technical Support Center Director, the Personnel Control Center will be moved only once to the other onsite location, for purposes of demonstrating the capability.

3. An extra crew of shift operating personnel will be used as the operating crew for the exercise. The regularly scheduled operating crew will perform their normal functions for the plant conditions at the time.

4. Since this will be an off-hours exercise, it will be well underway prior to normal work arrival of personnel. In this respect there will be no effort made to involve personnel arriving for normal work schedule. These personnel will be processed routinely through the Search & ID facility.

5. Deliveries and routine visitation to the plant will be allowed during the exercise so as to minimize impact on operations and schedules of non-company personnel.

6. The Visitor's Center will likewise be operating routinely with no involvement in the exercise.

7. There will not be a great deal of interface with the Executive Command Post (ECP). Therefore the Director of the ECP may, at his discretion, reduce the normal compliment of the ECP after personnel accountability and initial establishment of the Command Post and communication system.

8. Likewise, without State participation, activities at the State EOC will be very limited. PSC involvement at the State EOC may be terminated after initial manning and communication checks.

9. As in last year's exercise, the new meteorological/dose assessment model will be utilized.

10. Certain operator actions may have to be pre-empted in order to prevent the premature termination of the exercise.

11. The Early Warning Alert (EWA) system will be exercised separately from the drill.

Attachment D

OBSERVER/PROMPTER PACKAGES

Attachment D

Control Room Packet

Control Room Observer/Prompter Instructions:

- Supply cards at specified times. Be aware of "T=Scram"; cards may need to be supplied out of given sequence.

- A plot is supplied to give the following plant parameters if requested:

  Reactor Pressure
  Core inlet temperature
  Average region outlet temperature
  Total Feedwater Flow and Total Helium Flow

- The following are operator actions that are anticipated and the prompter responses for each:

  Operator Action: Verify that FV-6351 has closed upon automatic termination of gas waste release on high activity.

  Response: FR-6351 still shows 20 acfm.

  Operator Action: Change rupture disk on GWVT.

  Response: Pressure in tank is sufficient to blow other rupture disk.

  Operator Action: Scram reactor manually before T=15 minutes.

  Response: Elevate radioactive release to maximum values.

  Operator Action: Isolate Core Support Floor leakage by isolating V-111063.

  Response: PAH-1194 (I-13C 3-2) will reset.

  Operator Action: Isolate MM penetration vents.

  Response: Vents isolate as expected.

  Operator Action: Put HS-2301 to close.

  Response: Red light on HS remains on (valve still open).

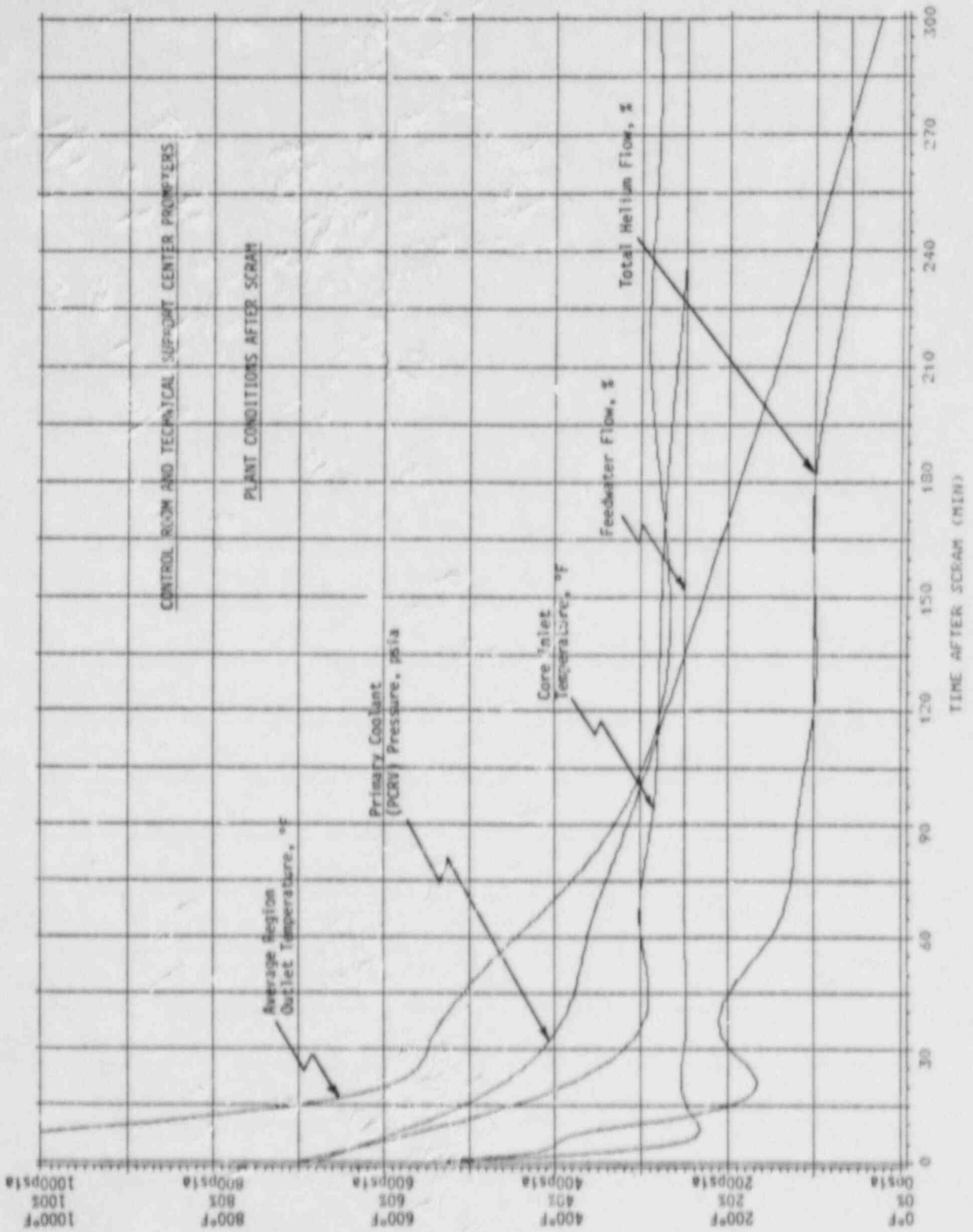
Control Room Packet

Operator Action: Attempt to swap system 47 loops.

Response: Faulty breaker on P-4702 prevents pump from being started (disagreement light on I-01 at handswitch).

Operator Action: Replace faulty breaker.

Response: For purposes of the drill, the breaker may not be replaced. This action would normally enable P-4702 to be started, and would provide a mechanism to terminate the release.


CONTROL ROOM AND TECHNICAL SUPPORT CENTER PROMPTERS
PLANT CONDITIONS AFTER SCRAM
Total Helium Flow, %
Feedwater Flow, %
Core Inlet Temperature, °F
Primary Coolant (PCRV) Pressure, psia
Average Region Outlet Temperature, °F
TIME AFTER SCRAM (MIN)
0
30
60
90
120
150
180
210
240
270
300
0°F
0%
0psia
200°F
20%
200psia
400°F
40%
400psia
600°F
60%
600psia
800°F
80%
800psia
1000°F
100%
1000psia

Attachment D

Control Room Packet

Time	CR Card No.	Description	Recipient
T = -10	1	Initial Conditions	SS/WRO/ERO*
T = 0	2	I-01 Alarm (Gas Waste Vacuum Tank)	WRO
T = 0	3	Flow Recorder Indication	WRO
T = 30 sec - 4 min.	4	Optional (if requested) - Stack Radiation Monitor Readings	WRO
T = 5	5	Alarms-Stack Radiation	WRO
T = 6	6	Stack Monitor Readings	Post on I-14
•	•	•	•
•	•	•	•
•	•	•	•
T = 15	15	Stack Monitor Readings	Post on I-14
T = 30	16	Alarm-Low Reactor Pressure	WRO
T = 60	17	Reactor Plant Exhaust Filters Monitor Readings	Post on I-14
T = 60	17a	Automatic Low Reactor Pressure Scram	WRO

* SS = Shift Supervisor
WRO = West Reactor Operator
ERO = East Reactor Operator

Attachment D

Control Room Packet

Time	CR Card No.	Description	Recipient
T = Scram	18	Stack Monitor Readings	Post on I-14
•	•	•	•
•	•	•	•
•	•	•	•
T = Scram + 360	34	Stack Monitor Readings	Post on I-14

Attachment D

SHIFT SUPERVISOR AND REACTOR OPERATOR'S INITIAL CONDITIONS

CR Card 1 T=-10 Minutes

1. Reactor power steady at 70% for entire month.
2. All controls in remote auto.
3. All three boiler feed pumps in service.
4. B Purification Train regenerating (dryer being purged).
5. Gas Waste release of "A" Surge Tank started at 0300 hours; "B" Surge Tank pressure is 150 psi.
6. The following equipment is out of service:
   a. Bearing water pump 1D (P-2102S) - motor removed for repairs.
   b. Hydraulic pump 1C (P-9102X) - low discharge pressure.
   c. Turbine water removal pump 1A (P-2103) - impeller replacement.
   d. Loop 2 backup bearing water - tagged out at V-21458 to repair leak on PV-2192.
   e. Buffer helium recirculator 1C (C-2106) cleared out.
   f. The following instrumentation is cleared out:
      - PI-4708 cleared out for calibration at V-47110P
      - PIC-6364 out of service
      - FT-6375 transmitter cleared out
7. Stack monitors have the following indications:

RT-7324-1	30 CPM
RT-7324-2	30 CPM
RT-73437-1	10 CPM

8. Annunciator alarms are up per attached.

Attachment D

LIST OF ALARMS AT T=-10 MINUTES

I-01A

3-1 Liquid Waste Receiver 1A Level High

I-01B

5-1 Regeneration Knockout Drum Water Level High-Low

I-01C

2-8 HP Helium Supply Tank Pressure High-Low

I-02A

None

I-02B

5-6 Turbine Water Drain Tank Level High-Low

I-03A and I-03B

None

I-05A

None

I-05B

4-3 Loop 1 Hydraulic Oil/Gas Differential Pressure Low

I-05C

3-5 Water Turbine Pressurizing Nitrogen Header Pressure Low

I-05D

5-5 Circulator Pelton Drain Cavity Level High

I-06A

5-7 "B" Hydraulic Reservoir Oil Level 100 Gallons

I-06B

None

Attachment D

LIST OF ALARMS AT T=-10 MINUTES

I-06C

None

I-06D

4-11 "B" Hydraulic Reservoir Oil Level 75 Gallons

I-06E

None

I-06F

None

I-06G

1-4 Main Cooling Tower Fan 1A Vibration High

I-06H

None

I-06I

None

I-09

4-4 Chemical Building

I-13A

None

I-13B

None

I-13C

3-2 Core Support Floor Columns Vent Pressure High

5-6 Reactor Building Sump Level High

CR Card 1 T=Throughout Exercise

Post on I-14

RT-7312 reads background on all 5 sampling points

CR Card 2 West RO T=0 (0400)

The following alarm has sounded:

"Hi Vacuum Tank Pressure" I-01A 1-3

CR Prompter T=0 (0400)

CR Card 3 (optional)

FR-6352 is showing recurring spikes

CR Prompter — T=30sec-4min

CR Card 4 (optional) — (0400-0404)

T(min)	7324-1(cpm)	7324-2(cpm)
30 sec	15	background
1	100	6
2	1,000	60
3	3,000	180
4	15,000	900

RT-73437-1 indicates background

CR Card 5 West RO T=5 (0405)

The following alarms have sounded:

"Vent Exhaust Gas Activity 1 High" I-01C 1-1

"Vent Exhaust Gas Activity 2 High" I-03A 1-7

Readings: RT-7324-1: 40,000 cpm

RT-7324-2: 2,400 cpm

RT-73437-1: background

CR Card 6 Post on I-14 T=6 (0406)

RT-7324-1: 90,000 cpm
RT-7324-2: 5,500 cpm
RT-73437-1: background

CR Card 7 Post on I-14 T=7 (0407)

RT-7324-1: 170,000 cpm

RT-7324-2: 10,000 cpm

RT-73437-1: background

CR Card 8 Post on I-14 T=+8 min

RT-7324-1: 300,000 cpm

RT-7324-2: 18,000 cpm

RT-73437-1: 10 cpm

CR Card 9 Post on I-14 T=9 min

RT-7324-1: 500,000 cpm

RT-7324-2: 30,000 cpm

RT-73437-1: 50 cpm

CR Card 10 Post on I-14 T=10 min

RT-7324-1: 700,000 cpm

RT-7324-2: 45,000 cpm

RT-73437-1: 100 cpm

CR Card 11 Post on I-14 T=11 min

RT-7324-1: 900,000 cpm

RT-7324-2: 54,000 cpm

RT-73437-1: 150 cpm

CR Card 12 Post on I-14 T=12 min

RT-7324-1: 1,200,000 cpm

RT-7324-2: 73,000 cpm

RT-73437-1: 200 cpm

CR Card 13 Post on I-14 T=13

RT-7324-1:	1,350,000 cpm
RT-7324-2:	82,000 cpm
RT-73437-1:	250 cpm

CR Card 14 Post on I-14 T=14

RT-7324-1:	1,500,000 cpm
RT-7324-2:	91,000 cpm
RT-73437-1:	300 cpm

CR Card 15 Post on I-14 T=15 to Reactor scram

RT-7324-1: 1,800,000 cpm

RT-7324-2: 110,000 cpm

RT-73437-1: 350 cpm

CR Card 16 West RO T=30 (0430)

The following alarm has sounded:
"Reactor Pressure Low" I-03A 2-5

Cr Card 17 Post on I-14 T=60 (0500)

RT-93251-1 (reactor plant exhaust filters)
reads 20 mR/hr from T=60 throughout the
remainder of the exercise

CR Card 17a West RO T=60 (0500)

(If scram not already manually performed)

Low Pressure Reactor Scram Occurs

CR Card 18 Post on I-14 T=scram

RT-7324-1: 1,800,000 cpm
RT-7324-2: 110,000 cpm
RT-73437-1: 350 cpm

CR Card 19 Post on I-14 T=Scram + 15

RT-7324-1:	1,350,000 cpm
RT-7324-2:	82,000 cpm
RT-73437-1:	350 cpm

CR Card 20 Post on I-14 T=Scram + 30

RT-7324-1: 900,000 cpm
RT-7324-2: 55,000 cpm
RT-73437-1: 350 cpm

CR Card 21 Post on I-14 T= Scram + 45

RT-7324-1: 675,000 cpm
RT-7324-2: 41,000 cpm
RT-73437-1: 350 cpm

CR Card 22 Post on I-14 T= Scram + 60

RT-7324-1: 450,000 cpm
RT-7324-2: 27,000 cpm
RT-73437-1: 350 cpm

CR Card 23 Post on I-14 T= Scram + 75

RT-7324-1: 337,000 cpm
RT-7324-2: 21,000 cpm
RT-73437-1: 350 cpm

CR Card 24 Post on I-14

T= Scram + 90

RT-7324-1: 225,000 cpm
RT-7324-2: 13,500 cpm
RT-73437-1: 350 cpm

CR Card 25 Post on I-14 T= Scram + 105

RT-7324-1: 170,000 cpm
RT-7324-2: 10,500 cpm
RT-73437-1: 350 cpm

CR Card 26 Post on I-14 T= Scram + 120

RT-7324-1: 113,000 cpm
RT-7324-2: 7,000 cpm
RT-73437-1: 350 cpm

CR Card 27 Post on I-14 T= Scram + 150

RT-7324-1: 55,000 cpm
RT-7324-2: 3,500 cpm
RT-73437-1: 350 cpm

CR Card 28 Post on I-14 T= Scram + 180

RT-7324-1: 27,000 cpm
RT-7324-2: 1,700 cpm
RT-73437-1: 350 cpm

CR Card 29 Post on I-14 T= Scram + 210

RT-7324-1: 13,000 cpm
RT-7324-2: 850 cpm
RT-73437-1: 350 cpm

CR Card 30 Post on I-14 T= Scram + 240

RT-7324-1: 6,500 cpm
RT-7324-2: 420 cpm
RT-73437-1: 350 cpm

CR Card 31 Post on I-14 T= Scram + 270

RT-7324-1: 3,300 cpm
RT-7324-2: 210 cpm
RT-73437-1: 350 cpm

CR Card 32 Post on I-14 T= Scram + 300

RT-7324-1: 1,600 cpm
RT-7324-2: 100 cpm
RT-73437-1: 350 cpm

CR Card 33 Post on I-14 T= Scram + 330

RT-7324-1: 800 cpm
RT-7324-2: 50 cpm
RT-73437-1: 350 cpm

CR Card 34 Post on I-14 T= Scram + 360

RT-7324-1: 400 cpm
RT-7324-2: 25 cpm
RT-73437-1: 350 cpm

Attachment D

PCC PROMPTER

TIME	CARD NO.	DESCRIPTION	RECIPIENT
Upon Establishing PCC	1	PCC Radiation Readings	HP Technician at PCC
After PCC Established	2	PCC Habitability	Person Performing Habitability

PCC Card 1	HP Tech Performing Habitability	T=upon establishing PCC

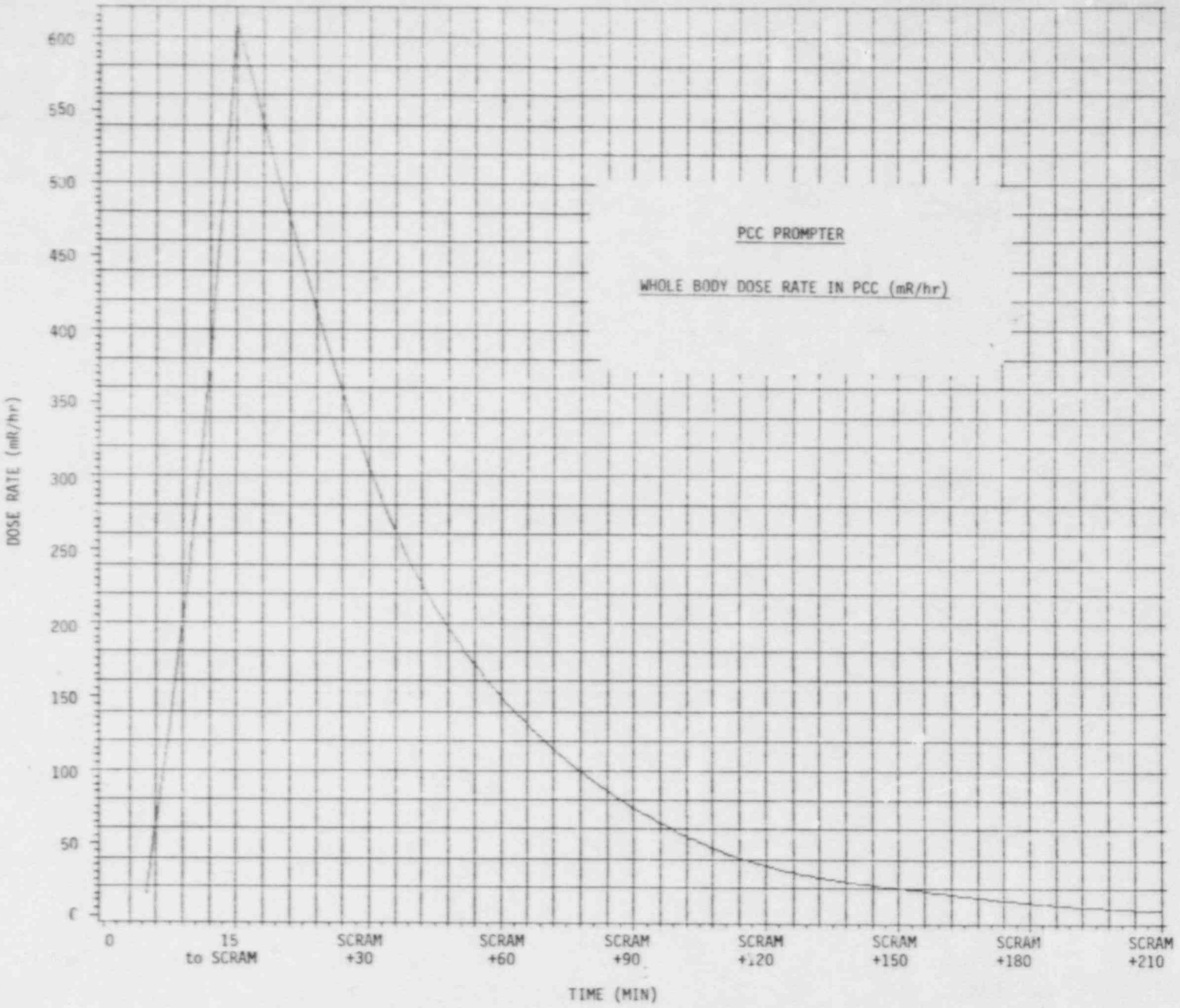
Radiation readings at PCC are background

PCC Card 2	HP Technician Performing Habitability	T= After PCC is Established

After the PCC is established, and if the PCC is in the plume, the person performing habitability shall be informed of the dose rate in the PCC per the attached graph. Note that, for T=15 to the time of reactor scram, the maximum value shown (610 mR/hr) should be used.

If the PCC is <u>not</u> in the plume, readings are background and the PCC is habitable.

545336

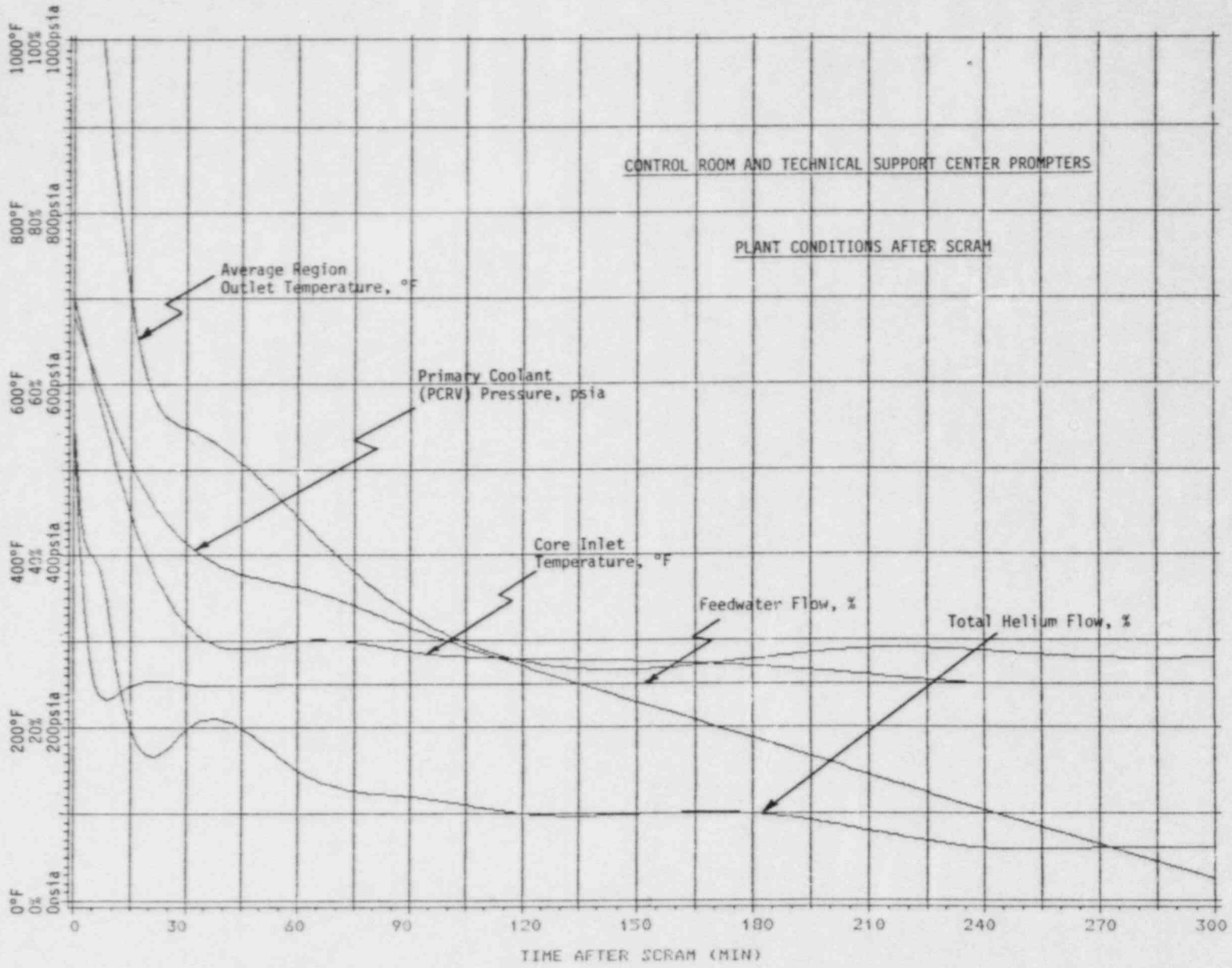

PCC PROMPTER
WHOLE BODY DOSE RATE IN PCC (mR/hr)
DOSE RATE (mR/hr)
600
550
500
450
400
350
300
250
200
150
100
50
0
0
15 to SCRAM
SCRAM +30
SCRAM +60
SCRAM +90
SCRAM +120
SCRAM +150
SCRAM +180
SCRAM +210
TIME (MIN)

Attachment D

TSC PROMPTER

1. Information from the attached "Effluent Monitoring Cards" is to be provided to the Radiological Assessment Individual at the times indicated.

2. When requested by the Technical Services Engineering Supervisor/Senior Plant Engineer, the PCRV pressure, average region outlet temperature, core inlet temperature, primary coolant flow, and secondary coolant flow, are to be provided per the attached graph. For any other information that is requested, refer the Engineer to the Technical Advisor in the Control Room.


CONTROL ROOM AND TECHNICAL SUPPORT CENTER PROMPTERS
PLANT CONDITIONS AFTER SCRAM
Average Region Outlet Temperature, °F
Primary Coolant (PCRV) Pressure, psia
Core Inlet Temperature, °F
Feedwater Flow, %
Total Helium Flow, %
1000°F 100% 1000psia
800°F 80% 800psia
600°F 60% 600psia
400°F 40% 400psia
200°F 20% 200psia
0°F 0% 0psia
0 30 60 90 120 150 180 210 240 270 300
TIME AFTER SCRAM (MIN)

Effluent Monitoring Card 1 T=10 (0410) .

RT-7324-1: 700,000 cpm
RT-7324-2: 45,000 cpm
RT-73437-1: 100 cpm

Effluent Monitoring Card 2

T=15 (0415)
to Reactor Scram

RT-7324-1:	1,800,000 cpm
RT-7324-2:	110,000 cpm
RT-73437-1:	350 cpm

Effluent Monitoring Card 3

T=Scram +15

RT-7324-1: 1,350,000 cpm
RT-7324-2: 82,000 cpm
RT-73437-1: 350 cpm

Effluent Monitoring Card 4 T=Scram + 30

RT-7324-1:	900,000 cpm
RT-7324-2:	55,000 cpm
RT-73437-1:	350 cpm

Effluent Monitoring Card 5

T=Scram + 45

RT-7324-1:	675,000 cpm
RT-7324-2:	41,000 cpm
RT-73437-1:	350 cpm

Effluent Monitoring Card 6 T=Scram + 60

RT-7324-1:	450,000 cpm
RT-7324-2:	27,000 cpm
RT-73437-1:	350 cpm

Effluent Monitoring Card 7 T = Scram + 75

RT-7324-1:	337,000 cpm
RT-7324-2:	21,000 cpm
RT-73437-1:	350 cpm

Effluent Monitoring Card 8 T= Scram + 90

RT-7324-1:	225,000 cpm
RT-7324-2:	13,500 cpm
RT-73437-1:	350 cpm

Effluent Monitoring Card 9 T= Scram +105

RT-7324-1:	170,000 cpm
RT-7324-2:	10,500 cpm
RT-73437-1:	350 cpm

Effluent Monitoring Card 10 T=Scram + 120

RT-7324-1:	113,000 cpm
RT-7324-2:	7,000 cpm
RT-73437-1:	350 cpm

Effluent Monitoring Card 11 T=Scram + 150

RT-7324-1:	55,000 cpm
RT-7324-2:	3,500 cpm
RT-73437-1:	350 cpm

Effluent Monitoring Card 12

T=Scram + 180

RT-7324-1:	27,000 cpm
RT-7324-2:	1,700 cpm
RT-73437-1:	350 cpm

Effluent Monitoring Card 13 T=Scram + 210

RT-7324-1:	13,000 cpm
RT-7324-2:	850 cpm
RT-73437-1:	350 cpm

Effluent Monitoring Card 14 T=Scram + 240

RT-7324-1: 6,500 cpm
RT-7324-2: 420 cpm
RT-73437-1: 350 cpm

Effluent Monitoring Card 15 T=Scram + 270

RT-7324-1: 3,300 cpm
RT-7324-2: 210 cpm
RT-73437-1: 350 cpm

Effluent Monitoring Card 16

T=Scram + 300

RT-7324-1:	1,600 cpm
RT-7324-2:	100 cpm
RT-73437-1:	350 cpm

Effluent Monitoring Card 17 T=Scram + 330

RT-7324-1: 800 cpm
RT-7324-2: 50 cpm
RT-73437-1: 350 cpm

Effluent Monitoring Card 18 T=Scram + 360

RT-7324-1: 400 cpm
RT-7324-2: 25 cpm
RT-73437-1: 350 cpm

Attachment D

EAB TEAM PROMPTER

On all attached EAB Team cards, "Centerline" refers to locations that are directly downwind of the predominant wind direction at the time of the survey.

"Off-Centerline" values should be provided at approximately 1/4 mile from the centerline sampling location. At 1/2 mile or more from centerline, the whole body dose rate is <1 mR/hour.

EAB Team Card 1 T=30(0430)

WB

Centerline: 400 mR/hr

Off-centerline: 100 mR/hr

SAM-2 reading: < MDA

EAB Team Card 2 T=45(0445)

Whole Body:

Centerline: 350 mR/hr

Off-Center: 80 mR/hr

SAM-2: < MDA

EAB Team Card 3 T=60(0500)

Whole Body:

Centerline: 200 mR/hr

Off-Center: 50 mR/hr

SAM-2: < MDA

EAB Team Card 4 T=75(0515)

Whole Body:
Centerline: 150 mR/hr
Off-Center: 40 mR/hr
SAM-2: < MDA

EAB Team Card 5 T=90(0530)

Whole Body:

Centerline: 100 mR/hr

Off-Center: 25 mR/hr

SAM-2: < MDA

EAB Team Card 6 T=105(0545)

Whole Body:
Centerline: 80 mR/hr
Off-Center: 20 mR/hr
SAM-2: < MDA

EAB Team Card 7 T=120(0600)

Whole Body:

Centerline: 60 mR/hr

Off-Center: 15 mR/hr

SAM-2: < MDA

EAB Team Card 8 T=135(0615)

Whole Body:

Centerline: 40 mR/hr

Off-Center: 10 mR/hr

SAM-2: < MDA

EAB Team Card 9 T=150(0630)

Whole Body:

Centerline: 30 mR/hr

Off-Center: 8 mR/hr

SAM-2: < MDA

EAB Team Card 10 T=165(0645)

Whole Body:
Centerline: 25 mR/hr
Off-Center: 7 mR/hr
SAM-2: < MDA

EAB Team Card 11 T=180(0700)

Whole Body:
Centerline: 20 mR/hr
Off-Center: 5 mR/hr
SAM-2: < MDA

EAB Team Card 12 T=195(0715)

Whole Body:
Centerline: 15 mR/hr
Off-Center: 4 mR/hr
SAM-2: < MDA

EAB Team Card 13 T=210(0730)

Whole Body:
Centerline: 10 mR/hr
Off-Center: 3 mR/hr
SAM-2: < MDA

EAB Team Card 14 T=225(0745)

Whole Body:

Centerline: 7.5 mR/nr

Off-Center: 2 mR/hr

SAM-2: < MDA

EAB Team Card 15 T=240(0800)

Whole Body:
Centerline: 5 mR/hr
Off-Center: 1 mR/hr
SAM-2: < MDA

EAB Team Card 16 T=255(0815)

Whole Body:

Centerline: 4 mR/hr

Off-Center: 1 mR/hr

SAM-2: < MDA

EAB Team Card 17 T=270(0830)

Whole Body:
Centerline: 2.5 mR/hr
Off-Center: 0.6 mR/hr
SAM-2: < MDA

EAB Team Card 18

T=285(0845)

Whole Body:

Centerline: 2 mR/hr

Off-Center: 0.5 mR/hr

SAM-2: < MDA

EAB Team Card 19

T=300(0900)

Whole Body:

Centerline: 1.5 mR/hr

Off-Center: 0.4 mR/hr

SAM-2: < MDA

EAB Team Card 20 T=315(0915)

Whole Body:
Centerline: 1 mR/hr
Off-Center: 0.2 mR/hr
SAM-2: < MDA

EAB Team Card 21

T=330(0930)

Whole Body:

Centerline: 0.7 mR/hr

Off-Center: 0.2 mR/hr

SAM-2: < MDA

EAB Team Card 22

T=345(0945)
until end of
exercise

All readings = background

Attachment D

EPZ TEAM PROMPTER

On all attached EPZ Team Cards, "Centerline" refers to locations that are directly downwind of the predominant wind direction at the time of the survey. All readings are given at a distance of a 5 mile radius from the plant.

"Off-Centerline" values should be provided at approximately 1/4 mile from the centerline sampling location. At 1/2 mile or more from centerline, the whole body dose rate is <1 mR/hour.

EPZ Team Card 1

T=30(0430)

Whole Body:

Centerline: 30 mR/hr

Off-Center: 8 mR/hr

SAM-2: < MDA

EPZ Team Card 2 T=45 (0445)

Whole Body:

Centerline: 25 mR/hr

Off-Center: 7 mR/hr

SAM-2: < MDA

EPZ Team Card 3 T=60 (0500)

Whole Body:

Centerline: 15 mR/hr

Off-Center: 4 mR/hr

SAM-2: < MDA

EPZ Team Card 4 T=75 (0515)

Whole Body:
Centerline: 11 mR/hr
Off-Center: 3 mR/hr
SAM-2: < DA

EPZ Team Card 5 T=90 (0530)

Whole Body:

Centerline: 8 mR/hr

Off-Center: 2 mR/hr

SAM-2: < MDA

EPZ Team Card 6 T=105 (0545)

Whole Body:
Centerline: 6 mR/hr
Off-Center: 1.5 mR/hr
SAM-2: < MDA

EPZ Team Card 7 T=120 (0600)

Whole Body:
Centerline: 4 mR/hr
Off-Center: 1 mR/hr
SAM-2: < MDA

EPZ Team Card 8 T=135 (0615)

Whole Body:
Centerline: 3 mR/hr
Off-Center: 0.8 mR/hr
SAM-2: < MDA

EPZ Team Card 9 T=150 (0630)

Whole Body:
Centerline: 2 mR/hr
Off-Center: 0.5 mR/hr
SAM-2: < MDA

EPZ Team Card 10 T=165 (0645)

Whole Body:

Centerline: 1.5 mR/hr

Off-Center: 0.4 mR/hr

SAM-2: < MDA

EPZ Team Card 11 T=180 (0700)

Whole Body:
Centerline: 1 mR/hr
Off-Center: 0.3 mR/hr
SAM-2: < MDA

EPZ Team Card 12

T=195 (0715)

Whole Body:

Centerline: 0.8 mR/hr

Off-Center: 0.2 mR/hr

SAM-2: < MDA

EPZ Team Card 13 T=210 (0730)

Whole Body:
Centerline: 0.5 mR/hr
Off-Center: 0.1 mR/hr
SAM-2: < MDA

EPZ Team Card 14 T=225 (0745)

Whole Body:

Centerline: 0.4 mR/hr

Off-Center: 0.1 mR/hr

SAM-2: < MDA

EPZ Team Card 15 T=240 (0800)

Whole Body:

Centerline: 0.3 mR/hr

Off-Center: 0.1 mR/hr

SAM-2: < MDA

EPZ Team Card 16

T=255 (0815)

Whole Body:

Centerline: 0.2 mR/hr

Off-Center: 0.1 mR/hr

SAM-2: < MDA

EPZ Team Card 17 T=270 (0830)

Whole Body:
Centerline: 0.1 mR/hr
Off-Center: < 0.1 mR/hr
SAM-2: < MDA

EPZ Team Card 18

T=270 (0830)

until end of exercise

All readings background after T=270

Attachment D

HP ACCESS AREA PROMPTER

The information on the following cards is to be given to the HP Technician taking samples or checking monitor readings in the reactor building, as required.

HP Access Area Prompter 1 T=Throughout Exercise

* * INFORMATION CARD * *

If air samples are taken in the reactor building and counted in the HP Access Area, particualte filter reads 14,000 cpm net; silver zeolite reads background (this corresponds to ~3.8E-8μci/cc). Half life, if performed, is 28 minutes.

* * DO NOT VOLUNTEER THIS INFORMATION * *

HP Access Area Prompter 2 T=Throughout Exercise

All reactor building and turbine building area monitors remain at background through out exercise except RT-93251-1 (reactor plant exhaust filters) which reads 20 mR/hr from T=60 to end

HP Access Area
Prompter 3

T=10(0410) Throughout Exercise

Beta Monitor - Reactor Level 11

500 cpm/min, "ALERT" lit

Level remains constant until scram +60, then decreases gradually to background. "ALERT" clears at T=Scram + 90.

HP Access Area
Prompter 4

T=10(0410) Throughout Exercise

CAM - Reactor Level 7

Noble Gas - background

Iodine - background

Particulate - 500 cpm/minute

Levels remain constant until T=120 and then decrease gradually to background.

HP Access Area T=10(0410) Throughout Exercise

Prompter 5

CAM - Reactor Level 9

Noble Gas - background

Iodine - background

Particulate - 50 cpm/minute above background

Levels remain constant until T=120 and then all gradually decrease to background.

Attachment D

PLANT EQUIPMENT CARDS

The attached cards are to be hung on plant equipment for purposes of the drill. This information contained on the cards would only be obtained by equipment operators and would not be indicated by instrumentation in the Control Room.

Plant Card 1 V-4755

** THIS IS A DRILL **

This valve is in the open position.
The stem is broken off and the valve may not be manipulated.

** THIS IS A DRILL **

Plant Card 2

PI-63101
(on Loop seal)

** THIS IS A DRILL **

This pressure indicator reads 2 psig.

** THIS IS A DRILL **

Plant Card 3 HV-2301

* * THIS IS A DRILL * *

This valve is broken in the open position.

* * THIS IS A DRILL * *