

9/15/82



## Omaha Public Power District

1623 HARVEY • OMAHA, NEBRASKA 68102 • TELEPHONE 536-4000 AREA CODE 402/

July 23, 1982

LIC-82-265

Mr. W. C. Seidle, Chief  
Reactor Project Branch 2  
U. S. Nuclear Regulatory Commission  
Region IV  
611 Ryan Plaza Drive, Suite 1000  
Arlington, Texas 76011

Reference: Docket No. 50-285

Dear Mr. Seidle:

### Detailed Emergency Exercise Scenario

As requested by your letter dated January 14, 1982, please find attached the detailed scenario for the Fort Calhoun Station emergency exercise to be conducted in September, 1982.

Sincerely,

W. C. Jones  
Division Manager  
Production Operations

### Attachment

cc: LeBoeuf, Lamb, Leiby & MacRae  
1333 New Hampshire Avenue, N.W.  
Washington, D.C. 20036

Mr. Brian K. Grimes, Director  
Division of Emergency Preparedness  
Office of Inspection and Enforcement  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

IE-35

Fort Calhoun Station Unit No. 1  
1982 Emergency Exercise  
Detailed Scenario

Initial  
Conditions:

1. Operation at 100% (1500 MWth) for 240 Effective Full Power Days.
2. Presently at 100%
3. 161Kv offsite AC power feedline is out of service and is projected to be out of service until approximately noon.
4. Equipment Status: HPSI pump SI-2C, out for service  
Charging pump CH-1A, out for service  
Auxiliary Building Ventilation  
Fans running: 3 exhaust  
2 supply
5. Weather Conditions: Wind Speed = 2 mph  
Wind Direction = 300°  
10 meter Temp. = 13°C (55°F)

Fort Calhoun Station Unit No. 1  
1982 EMERGENCY EXERCISE  
Detailed Scenario

prox. time (hr:Min)	EVENT DESCRIPTION	ANTICIPATED ACTION
1:00	Waste Gas Header Rupture in the gas compressor room.  <u>Control Room Operator Cue Card</u>  Annunciator Alarm  'Waste Disposal System Malfunction'	Notify Auxiliary Building Operator of alarm. Continue normal operational functions.
<hr/>		
	<u>Auxiliary Building Operator Cue Card</u>  Annunciator Alarm on AI-100  'Standby Gas Decay Tank Operating'  You enter Room 16 to isolate gas decay tank WD-29C and route flow to tank WD-29B. After closing valve WD-160 to isolate the tank, the line ruptures downstream (tank side) of check valve WD-161. Shrapnel from the ruptured line strikes you on the front of your right shoulder, cutting you and knocking you down. You fall and strike your head and are disoriented for approximately 2 minutes. You make your way out of the room and report the situation to the control room. The rupture cannot be isolated.	After the injured operator has reported the situation to the control room, the Rescue Squad should be summoned and someone sent to assist the injured operator.  These actions will demonstrate objective number 20.
1:03	<u>Control Room Operator Cue Card</u>  Annunciator Alarm  'Main Stack Gross Rad/Iodine High Radiation'	Check radiation monitor panel.
<hr/>		
	Radiation Monitor Alarm	

'RM-062 Alert'

RM-061 = 500 cpm

RM-062 = 2700 cpm

RM-052 = 1200 cpm

RM-060 = 140 cpm

RM-078 = 2 mr/hr

RM-076 = 1 mr/hr

0.06

#### Control Room Operator Cue Card

Radiation Monitor Alarm

'RM-062 High'

'RM-078 Alert'

RM-061 = 1100 cpm

RM-062 = 3000 cpm

RM-052 = 1500 cpm

RM-060 = 200 cpm

RM-078 = 4 mr/hr

RM-076 = 2 mr/hr

Annunciator Alarm

'Ventilation Isolation Command'

Declare a Notification of Unusual Event Emergency per EPIP-OSC-1, Item IV.1.b.1). Activate the Emergency Plan per EPIP-OSC-2. Respond to the Unusual Event classification per EPIP-OSC-3.

Respond per EP-11, High Radioactivity.

#### Special Control Room Operator Cue Card

If an operator attempts to shutdown the ventilation exhaust fans, the indicator lights will show that fans VA-40A and VA-40B have stopped. Operation of the switch for VA-40C will not give a Green light. The ammeter for VA-40C will indicate that the fan is running.

This sequence will demonstrate objective numbers 1, 2, and 9.

0.12

#### Control Room Operator Cue Card

Radiation Monitor Alarms if the ventilation system exhaust fans are running.

'RM-060 Alert'

'RM-061 Alert'

Initial Dose Assessment per EPIP-OSC-11 should begin in the OSC. Assessment of the impact of venting the Auxiliary Building to the atmosphere in an authorized controlled manner should also begin. The necessity of repairing the damaged vent header should be assessed.

'RM-052 Alert'

'RM-076 Alert'

RM-052 = 8600 cpm

RM-060 = 275 cpm

RM-062 = 12,000 cpm

RM-061 = 2300 cpm

RM-078 = 5 mr/hr

RM-076 = 3 mr/hr

These actions will demonstrate objectives numbered 11, 12 and 13.

Any initiation of vent header repair will demonstrate objective number 6.

1:30

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Control Room Operator Cue Card

No change in Primary System Parameters.

T<sub>HOT</sub> and T<sub>COLD</sub> are normal.

Pressurizer Level = 62%

VCT Level = 92%

RM-076 thru RM-079 = 6 mr/hr

RM-080 = 0.5 mr/hr

RM-081 = 1.0 mr/hr

RM-082 = 1.5 mr/hr

RM-083 = 0.2 mr/hr

RM-084 = 1.0 mr/hr

RM-085 thru RM-089 = normal background

RM-070 thru RM-075 = normal background

RM-091A/B = normal background

NOTE

When the Auxiliary Building Ventilation Exhaust fans have been shutdown, the stack monitor readings will decrease to background over a period of an hour.

2:00

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Control Room Operator Cue Card

No change in Primary System Parameters.  
All levels and pressures are normal.

ARM Readings

RM-070 thru RM-075 = normal background

Dose Assessment is continuing at the OSC per EPIP-OSC-11.

RM-091A/B = normal background

RM-078 = 6 mr/hr

RM-084 = 2 mr/hr

RM-088 = 0.75 mr/hr

RM-089 = 0.2 mr/hr

11:30

Control Room Operator Cue Card

Annunciator Alarm

'Reactor Coolant Gamma Activity High'

Respond per EP-23, Reactor Coolant System High Activity, which requires RC sampling and analysis.

Note: RC sampling and analysis will require approximately 1 hour.

Radiation Monitor Alarm

'RR-214 PRM-1 High'

'RR-214 PRM-2 Alert'

Declare Alert Emergency per EPIP-OSC-1, Item IV.2.a.2), Respond per EPIP-OSC-4.

Sound Nuclear Emergency Alarm to evacuate all non-essential personnel.

Incore detector 30 alarm then reset

Response to these alarms should demonstrate objectives 1, 2, 7, 9, 11 and 13.

Area Radiation Monitor readings are stable

Primary System levels temperatures and pressures are normal.

Stack PRMs read normal background.

11:36

Control Room Operator Cue Card

Incore detector 26 alarm then reset

11:45

Control Room Operator Cue Card

No change in RR-214 PRM-1 & 2 readings or Primary System parameters.

12:00

Control Room Operator Cue Card

RR-214 PRM-1 & 2 readings are stable. No changes in Primary System parameters.

Area Radiation Monitor (ARM) Readings:

RM-076 thru RM-079 = 4 mr/hr

RM-080 thru RM-084 = 3 mr/hr

RM-085 thru RM-088 = 2 mr/hr

RM-089 = normal background  
RM-091A/B = normal background  
RM-070 thru RM-075 = normal background  
Stack PRMs read normal background

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2:30

Control Room Operator Cue Card

RR-214 PRM-1 reading has gone off scale  
high

RR-214 PRM-2 has returned to normal

Initial Levels

Pressurizer Level = 62%

VCT Level = 92%

ARM Readings:

RM-070 thru RM-075 = normal background

RM-076 thru RM-084 = 3.5 mr/hr

RM-085 thru RM-088 = 3 mr/hr

RM-089 = 0.2 mr/hr

RM-091A/B = normal background

Stack PRMs read normal background

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3:00

Control Room Operator Cue Card

Pressurizer Level Indicators L-101X/Y  
read 61.5%

Pressurizer Pressure Indicators P-103  
X/Y read 2100 psia.

Primary System Temperatures are normal

VCT Level = 91%

ARM Readings

RM-070 = 151 mr/hr

RM-074 = 101 mr/hr

RM-091A = normal

RM-078 = 3.5 mr/hr

RM-084 = 3.5 mr/hr



RM-088 = 3.5 mr/hr

RM-089 = 0.2 mr/hr

Stack PRMs read normal background

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Cue Card to Chemist

RC Activity is as indicated on the computer printout of the isotopic analysis.

Chemists should notify the Control Room that RC activity is normal

Initiate electrical check of monitors to determine the cause of the alarms.

3.06

Control Room Operator Cue Card

VCT Level = 90.5%

Pressurizer Level = 61%

Pressurizer Pressure = 2100 psi

Letdown Flow = 36 gpm

NOTE

If the operators request a leak rate, the following information should be provided: Primary System leak rate is 1.5 gpm at this time.

3.18

Control Room Operator Cue Card

Pressurizer Level = 60.8%

Pressurizer Pressure = 2100 psi

VCT Level = 90%

Letdown Flow = 36 gpm

RM-050/051 = 5.5 E+04 cpm/4.0E+04 cpm  
(Containment position)

RM-070/074 = 151/101 mr/hr

NOTE

If the operators request a leak rate, the following information should be provided: Leak Rate at this time is 2 gpm if determination was started at time 3.0 hours.

Respond per EP-28, Reactor Cooling Leak

3.30

Control Room Operator Cue Card

Pressurizer Level = 60%

Pressurizer Pressure = 2099 psi

Primary System Temperatures are normal

VCT Level = 87.5%

Letdown Flow = 26 gpm

Containment humidity is above normal

ARM Readings

RM-070 = 152 mr/hr

Observe system behavior.

If the operators request a leak rate, the following information should be provided: Leak Rate is 3.5 gpm at this time.



RM-074 = 102 mr/hr

RM-091A = off scale low

PM-078 = 3.4 mr/hr

RM-084 = 3.4 mr/hr

RM-088 = 3.4 mr/hr

RM-089 = 0.2 mr/hr

Stack Monitors read normal background.

Auxiliary Building Operator Cue Card

Containment Sump Level Alarm on AI-100

Sump Level = 21" (90%)

1:42

Control Room Operator Cue Card

Observe system behavior.

Pressurizer Level = 59%

Pressurizer Pressure = 2097 psia

VCT Level = 83%

Containment humidity is increasing

If the operators request a leak rate, the following information should be provided: Leak Rate is 4.25 gpm at this time.

1:54

Control Room Operator Cue Card

Charging Pump CH-1C start

VCT Level = 76%

Letdown Flow = 26 gpm

Pressurizer Pressure = 2095 psi

If the operators request a Leak Rate, the following information should be provided: RCS Leak Rate is 6.5 gpm at this time.

2:00

Control Room Operator Cue Card

Respond to fire alarm per EP-10.

Fire Alarm in Service Building

Pressurizer Level = 61% and rising

Primary System Temperatures are normal

VCT Level = 66%

Letdown Flow = 36 gpm

Pressurizer Pressure = 2100 psi

RM-050/051 = 9.0E+04 cpm/4.4E+04 cpm

RM-070/074 = 325 mr/hr/150 mr/hr

If the operators request a leak rate, the following information should be provided: RCS Leak Rate is 7.5 gpm at this time.

Cue Card for Operator Investigating Alarm

Oil Fire in area of Auxiliary Boiler.

Activate Fire Brigade

Actions in response to the fire alarm will demonstrate objective number 3.

4:15

Control Room Operator Cue Card

Charging Pump CH-1C auto start

Pressurizer Level = 58%

Pressurizer Pressure = 2095 psi

RM-050/051 =  $9.5E+04/4.9E+04$  cpm

VCT Level = 60%

RM-070/074 = 500/200 mr/hr

If the operators request a leak rate, the following information should be provided: RCS Leak Rate is 12 gpm at this time.

4:21

Control Room Operator Cue Card

'VCT Low Level Alarm'

CH-11A Level = 86%

Pressurizer Level = 61.5%

Pressurizer Pressure = 2100 psi

VCT Level = 49%

Make up to VCT from Concentrated Boric Acid Tank CH-11A

4:30

Control Room Operator Cue Card

Pressurizer Level = 58%

Pressurizer Pressure = 2093 psi

Primary Systems Temperatures are normal

VCT Level = 90%

CH-11A = 65%

RM-050/051  $9.7E+04/4.8E+04$  cpm

Charging Pump CH-1C auto start

RM-070/074 = 500/200 mr/hr

If the operators request a leak rate, the following information should be provided: RCS Leak Rate is 25 gpm at this time.

Stop VCT makeup after VCT Level exceeds 90%.

4:45

Control Room Operator Cue Card

Pressurizer Pressure = 2085 psi

Pressurizer Level per L-101X/Y = 60% and rising slowly.

VCT Level = 54% and dropping fast

CH-11A Level is decreasing

If the operators request a leak rate, the following information should be provided: RCS Leak Rate is 33 gpm at this time.

Cue Card to the Fire Brigade Leader

Fire near Auxiliary Boiler has been extinguished.

Initiate clean up of the area of the fire.

14:48

Control Room Operator Cue Card

Annunciator Alarm

'VCT Level Hi-Lo'

VCT Level = 51.7%

CH-11A Level = 65%

Pressurizer Level is steady at 61%.

Check: 1) VCT Level and boric acid batching system.

Make up to VCT from CH-11A.

If the operators request a leak rate, the following information should be provided: RCS Leak Rate is 40 gpm at this time.

Declare Site Area Emergency per EPIP-OSC-1, Item IV.3.a.. Respond per EPIP-OSC-5. Dose Assessment per EPIP-EOF-6 should begin if not in progress.

15:00

Control Room Operator Cue Card

Annunciator Alarm: 'TM/Low Pressure Channel Pretrip.'

Primary System Temperatures are normal

Pressurizer Pressure = 1984 psi

Pressurizer Level = 54.5%

RM-050/051 =  $1.5E+05/7.5E+04$  cpm

RM-070/074 = 1000/450 mr/hr

Wind speed change from 2.0 mph to 6.5 mph.

If an operator asks for a leak rate, provide the following information: RCS Leak Rate is 55 gpm at this time.

Early Warning System sounded.

If VCT make up has been initiated, the VCT level equals 65%. If VCT make up has not been initiated, the VCT level equals 30% and is decreasing rapidly at 2.5% per minute.

CH-11A Level = 40% if making up to VCT

CH-11A Level = 65% if not making up to VCT

Response to these actions will demonstrate objectives numbered 1, 2, 4, 5, 9, 10, 11, 12, 13, 14 and 18.

15:09

Control Room Operator Cue Card

Annunciator Alarm

'TM/Low Pressure Channel Trip'

'Pressurizer Safety Injection Signal Lo-Lo Press'

'Reactor Trip'

'Safety Injection Command'

Respond per EP-1 and find:

- 1) All CEA's are on the bottom
- 2) Turbine isolation valves closed
- 3) Generator breakers are open

Check: 1) Pressurizer pressure and level, 2) SI pumps start, 3) Diesel Generators start and come up to speed.

'Turbine Trip'

If an operator asks, Transformer T-1 is available to backfeed offsite power.

'Diesel Auto Start Demand'

Pressurizer Pressure = 1585 psi

Activate the Media Release Center and prepare a public information broadcast.

Pressurizer Level = 38%

Primary System Temperatures are slowly decreasing

SI Pumps running

This action will demonstrate objective numbers 15 and 16.

Diesels are at speed and synchronized

VCT Level = 25% if make up not in progress

60% if make up is in progress

30

#### Control Room Operator Cue Card

Pressurizer Level and Pressure drop from 35% and 1495 psi to 0% and 100 psi in a period of 17 seconds.

Large LOCA is indicated.

Respond per EP-5.

Containment Pressure increase from 1 psig to 48 psig in a period of 20 seconds.

'Containment Pressure High Signal'

Containment Spray Command

Containment ARM's:

RM-070/074 =  $1.0E+04/5.0E+03$  mr/hr

RM-091A/B = off scale low

RM-050/051 High Alarms

RM-050/051 =  $1.0E+06/6.0E+05$  cpm

RM-078 = 3.1 mr/hr

RM-084 = 3.1 mr/hr

RM-088 = 3.1 mr/hr

RM-061/062 = 100/50 cpm

Containment Sump Level = 100%

Containment Sump Pumps are running.

45

#### Control Room Operator Cue Card

SIRWT Level = 60%

#### Special Contingency Cue Card for the Control Room Operator

If the operator is backfeeding through

RCS Pressure = 25 psia

Pressurizer Level = 0%

RM-070/074 =  $2.2E+05/9.3E+04$  mr/hr

RM-050/051 =  $>10^6$  cpm (off scale)

RM-091A/B = 90 R/hr

RM-061/062 = 100/50 cpm

Containment Pressure = 17 psig

T-1, initiate the following sequence with a cue card:

- 1) Breakers 3451-4/5 Tripped
- 2) Transformer T-1 winding temp. high
- 3) Transformer T-1 Oil Level Lo Oil Temp. High
- 4) Transformer T-1 Cooler Failure
- 5) Loss of offsite power is indicated

15

#### Control Room Operator Cue Card

Diesel #2 Annunciator Alarm

'Diesel Trouble'

Annunciator Alarm

'4160V Bus 1A4 Low Voltage'

'Recirculation Actuation Signal'

RM-050/051 =  $>10^6$  cpm (off scale)

RM-070/074 =  $1.0E+06/5.0E+05$  mr/hr

RM-091A/B =  $4.9E+2$  R/hr

RM-061/062 = 100/50 cpm

Containment Pressure = 15 psig

Declare General Emergency per EPIP-OSC-1, Item IV.4.a, b, and c. Respond per EPIP-OSC-6

Issue news release regarding escalation of the emergency class to General Emergency.

These actions will demonstrate objective numbers 1, 9, 10, 11, 13, 14, 15 and 16.

30

#### Control Room Operator Cue Card

Primary System Temperature =  $350^{\circ}\text{F}$

Primary System Pressure = 24 psia

Containment Pressure = 14 psig

Containment Sump Level = 100%

Containment Sump Post Accident Level = 245" on LIC-384.

RM-050/051 = off scale high

RM-070/074 =  $5.0E+06$  mr/hr

RM-091A/B =  $5.0E+03$  R/hr

RM-061/062 = 100/50 cpm

Offsite Radiological Monitoring is in progress

The Primary System is stable and Long Term Core Cooling Procedures are being implemented per EP-5B.

Dose Assessment projections are in progress to reflect current conditions inside containment.

Protective Actions for the general public will be recommended based upon Dose Assessment projections.

These actions will demonstrate objective numbers 4, 5, 10, 11, 12, 14, 16 and 18.

00

Control Room Operator Cue Card

Primary System Pressure = 24 psia

Primary System Temperature = 320°F

Containment Pressure = 12 psig

RM-050/051 = off scale high

RM-070/074 = 7.5E+06 mr/hr

RM-091A/B = 7.4E+03 R/hr

RM-061/062 = 100/50 cpm

Wind direction change from 300° to 320°

#1 Nebraska Aircraft Radiological Survey start.

30

Control Room Operator Cue Card

RCS Temperature equals 300°F.

Containment Pressure = 10 psig

RCS Pressure = 24 psia

RM-050/051 = off scale high

RM-070/074 = >10<sup>7</sup> mr/hr (off scale)

RM-091A/B = 1.0E+04 R/hr

RM-061/062 = 100/50 cpm

Radiological Monitoring is continuing.

Recovery Organization assessment and planning are in progress.

These actions are a continuing demonstration of objective numbers 5, 9, 10, 11, 12, 13 and 18.

00

Control Room Operator Cue Card

RCS Temperature = 280°F

RCS Pressure = 22 psia

Containment Pressure = 5 psig

RM-070/074 = 1.0E+07 mr/hr

RM-091A/B = 9.5E+03 R/mr

RM-050/051 = off scale high

RM-061/062 = 100/50 cpm

Shutdown Cooling System is on line.

50

Control Room Operator Cue Card

RCS Temperature = 260°F

RCS Pressure = 20 psia

Notify EOF that release conditions have been terminated.



Containment Pressure = 0 psig

RM-050/051 = off scale high

RM-070/074 =  $1.0E+07$  mr/hr

RM-091A/B =  $9.5E+03$  R/hr

RM-061/062 = 100/50 cpm

Recovery Organization activities continue to demonstrate objective numbers 6, 9, 10, 11, 12 and 13.

1:00

Control Room Operator Cue Card

RCS Temperature =  $240^{\circ}\text{F}$

Containment Pressure = 0 psig.

RCS Pressure = 15 psia

RM-050/051 = off scale high

RM-070/074 =  $9.8E+06$  mr/hr

RM-091A/B =  $9.4E+03$  R/hr

RM-061/062 = 100/50 cpm

Recovery Organization Activities continue.

Issue news release regarding "emergency" status change.

Radiological Monitoring Activities continue.

These actions will demonstrate objective numbers 6, 13, 18 and 19.

Recovery Manager Cue Card

De-escalate to Site Area Emergency if the situation warrants this action.

1:30

Control Room Operator Cue Card

Primary System is stable and cooling down.

#2 Aircraft Radiological Survey start.

2:00

Control Room Operator Cue Card

Primary System is stable and cooling down.

Results of #2 aircraft survey and ground surveys indicate radiation readings have returned to normal in the EPZ.

Recovery Manager Cue Card

Terminate the exercise when all objectives have been met.

Issue news release regarding termination of the "emergency".