

5/16/82

PHILADELPHIA ELECTRIC COMPANY

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SHIELDS L. DALTROFF
VICE PRESIDENT
ELECTRIC PRODUCTION

May 20, 1982

Docket Nos. 50-277
50-278

Mr. R. C. Haynes
Administrator
Region I
U. S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Dear Mr. Haynes:

Attached for your review is the detailed scenario for the Peach Bottom Atomic Power Station 1982 full scale emergency exercise on June 16, 1982. This detailed scenario supplements the scenario submitted to you on May 11, 1982.

To provide further scenario details and exercise information, a briefing will be held for NRC observers on June 15, 1982 at 9:00 a.m. at the Peach Bottom Atomic Power Station President's Utility Building (PUB).

To ensure access by NRC observers to various plant locations, the observers must be properly badged. Please provide a list of NRC observers, their probable observation locations, and their PBAPS badge status to facilitate the badging process. This list will be used to arrange processing for NRC observers requiring authorized access to PBAPS protected area.

Due to the length of the exercise, the post-exercise critique has been scheduled for June 17, 1982 at 2:00 p.m. at the PBAPS PUB. The FEMA/NRC post-exercise public critique is scheduled for June 18, 1982 at 10:00 a.m. at the PECO. Muddy Run News Center.

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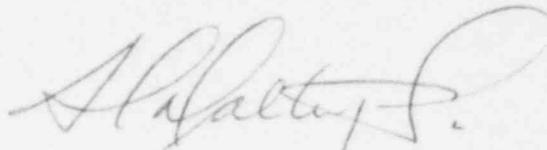
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Mr. R. C. Haynes

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Please forward the requested list of observers to R. A. Kankus. Should you have any questions concerning the planned exercise or the scenario, please contact R. A. Kankus (215) 841-5465 or W. J. Knapp (215) 841-5164.

Very truly yours,

A handwritten signature in cursive script, appearing to read "R. A. Kankus".

cc: C. J. Cowgill

PEACH BOTTOM ATOMIC POWER STATION
NRC/FEMA OBSERVED EMERGENCY EXERCISE
June 16, 1982

Detailed Scenario

Initial Conditions

Both units are operating at continuous full power. Unit 2 is approaching a refueling outage while Unit 3 has recently completed its refueling outage.

Unit 3 core spray pump "B" has excessive seal leakage and a maintenance crew is repairing it. On Unit 2, safety relief valve (SRV) "C" is leaking and heating the torus water at the rate of 1 degree F per day. Torus water temperature is 90 degrees F. All other power generation and safety system equipment is operable.

The following information relates to events occurring on Unit 2.

Initial control rod positions are all fully extracted except that rods 22-31 and 38-31 are at position 24 and 30-23 and 30-39 are at position 28.

Meteorological conditions are representative of Stability Class II and the average wind velocity is 10 mph from the west (270 degrees).

<u>CLOCK</u> <u>TIME</u>		<u>SCENARIO</u> <u>TIME</u>
0615	0 hr. 0 min.	Core plate differential pressure is 18 psid and air ejector off-gas monitor reading is 45 mr/hr.
0630	0 hr. 15 min.	Differential pressure reading on recirculation jet pump #6 flow indicator falls to zero. Air ejector monitor reading has increased to 300 mr/hr.
0645	0 hr. 30 min.	Core plate differential pressure has risen to 20 psid. Total core flow has decreased by 10%. Reactor power and main steam flow have also decreased 10%. APRM's indicate 2% power decrease. Main steam line monitor reading has increased 10%. Air ejector off-gas monitor now reading 700 mr/hr.
***	UNUSUAL EVENT	Should be declared. *** EP-101 Item 10.a.1. Air ejector off-gas monitor readings increased more than 500 mr/hr in 30 minutes.
0700	0 hr. 45 min.	Reports from local jet pump instruments in cable spreading room are that:

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#6 jet pump reading zero
#7 and #8 jet pump reading 60% normal
#13 and #14 jet pump reading 130% normal
#15 jet pump reading 160% normal
All other jet pumps reading 100% normal.

0715 1 hr. 30 min. Main steam line flow and reactor power have declined to 75% of full power values.

Reactor vessel head temperature constant at 550 degrees F.

Reactor vessel bottom head drain temperature has dropped from 520 degrees F to 510 degrees F.

Air ejector off-gas monitor now reading 1200 mr/hr.

Main steam line radiation monitors reading 40% above normal full power.

Core plate P has risen to 21 psid.

0745 1 hr. 30 min. Operators continue power reduction to 50% power but main steam line radiation level reaches 3 times normal full power reading and reactor scrams.

Air ejector off-gas monitor now reading 9000 mr/hr.

Recirculation pumps trip.

Group I, II, and III containment isolation occurs.

All neutron detectors confirm that reactor is subcritical.

Reactor water level shrinks rapidly to -10 inches.

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Reactor pressure rises immediately to 1100 psig and safety relief valves (SRVs) open to control pressure.

0746 1 hr. 31 min. Three control rods (10-19, 22-59, 38-23) did not insert at all on scram. Seventeen rods are inserting slowly.

0747 1 hr. 32 min. Eleven of the slow rods have completely inserted, but:

control rod	02-31	is stuck at notch	38
"	"	14-43	" " " 17
"	"	22-07	" " " 26
"	"	38-51	" " " 14
"	"	50-19	" " " 23
"	"	54-39	" " " 32

0750 1 hr. 35 min. Operators take manual control of HPCI after HPCI initiated to maintain reactor level between +15 and +30 inches. Packing leak on MOV 23-15 in drywell.

Operators open isolation valves on nitrogen supply lines to instrument nitrogen system to re-establish manual control of SRVs.

Torus water temperature has increased to 95 degrees F and two RHR pumps are put into torus cooling mode.

0815 2 hrs. 0 min. Torus water temperature has leveled off at 110 degrees F.

Reactor pressure has dropped off to 1030 psig but SRV-C remains open despite efforts to close it.

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Reactor vessel head temperature has increased to 560 degrees F.

Reactor vessel bottom head drain temperature has dropped to 500 degrees F.

Core plate differential pressure is 2 psig.

- 0845 2 hrs. 30 min. Control rods 14-43, 38-51, and 50-19 have been fully inserted and work continues on the other three.
- Alarm is received indicating containment pressure has increased to 1.5 psig.
- Drywell temperature is 135 degrees F.
- Core plate differential pressure has risen to 4 psid.
- Reactor pressure has fallen to 950 psig.
- Reactor vessel head temperature has risen to 580 degrees F.
- SBLC initiated.
- 0900 2 hrs. 45 min. Reactor pressure has fallen to 850 psig and SRV-C is successfully closed.
- Reactor vessel head temperature is 590 degrees F.
- Reactor vessel bottom head drain temperature has dropped to 490 degrees F.
- 0915 3 hrs. 0 min. Reactor pressure has leveled off at 950 psig.

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Containment pressure reaches 2 psig.

Drywell radiation level starts increasing rapidly and presently reads 50 R/hr on the containment hi-range area monitors.

Core plate differential pressure is 6 psid.

Drywell temperature has started increasing at the rate of 10 degrees F per hour.

Reactor vessel head temperature is 600 degrees F.

Reactor vessel bottom head drain temperature is 480 degrees F.

Emergency Diesels start, E3 diesel shuts down due to fuel line clogged. E32 bus failure due to phase-to-phase ground problem.

0930 3 hrs. 15 min. Containment radiation level is 500 R/hr.

0945 3 hrs. 30 min. Containment radiation level is 6000 R/hr.

Operators decide to reduce reactor pressure by using SRVs (A&B) in order to minimize leakage to drywell and place condensate pumps in service.

Reactor level is maintained at +30 inches.

Torus water temperature is down to 105 degrees F.

Drywell temperature is 140 degrees F.

Drywell pressure is 2.5 psig.

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1000 3 hrs. 45 min. Containment radiation level is 10,000 R/hr.

 Reactor pressure is 700 psig.

*** ALERT Should be declared. ***

 EP-101 Item 4.b.3.

 Containment high range area monitor readings greater than 10,000 R/hr.

1015 4 hrs. 0 min. Reactor pressure is 600 psig.

 One of the remaining 3 stuck control rods (54-39), is fully inserted. The other 2 remain frozen in their partially inserted position. Three control rods (10-19, 22-59, 38-23) are still fully extracted.

1030 4 hrs. 15 min. Core plate differential pressure is 9 psid.

 Reactor pressure remains 600 psig.

 Reactor vessel head temperature pegged at 600 degrees F (Temperature reading is 630 degrees F).

 Reactor vessel bottom head drain temperature is 460 degrees F.

1045 4 hrs. 30 min. Message received that someone claiming to be a television newsreporter attempts to gain entrance. She says she has an appointment with Mr. Conley, the

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director of the Emergency Support Center.

Containment radiation level is 25,000 R/hr.

Core plate differential pressure is 12 psid.

1105 4 hrs. 50 min. Medical emergency for supervisory personnel.

1115 5 hrs. 0 min. Core plate differential pressure is 13 psid.

Torus temperature is 100 degrees F.

Drywell temperature is 155 degrees F.

Drywell pressure is 3 psig.

Reactor vessel head temperature >600 degrees F (640 degrees F is measured with potentiometer).

Reactor vessel bottom head drain temperature is 430 degrees F.

Reactor pressure is 450 degrees psig.

Core Spray B and D loop injection valve (MOV 14-12B) fails to open.

"A" Core Spray pump breaker trips. Breaker racked out and racking mechanism fails.

Fire in the 2A Instrument nitrogen compressor motor which requires about 3 hours to repair.

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1215	6 hrs. 0 min.	Reactor pressure is 425 psig, level is +30 inches. Containment radiation level is 40,000 R/hr. Core plate differential pressure is 14 psid. Reactor vessel head temperature - 660 degrees F (reads > 600). Reactor vessel bottom head drain temperature is 420 degrees F. Drywell temperature is 165 degrees F. Drywell pressure is 4 psig. Torus temperature is 100 degrees F. Reactor building general area 50 mr/hr.
1245	6 hrs. 30 min.	Core plate differential pressure is 16 psid. Containment radiation level is 50,000 R/hr. Drywell temperature is 170 degrees F. Drywell pressure is 4.5 psig. Reactor vessel head temperature is 670 degrees F. Reactor vessel bottom drain temperature is 400 degrees F. Reactor building general area 100 mr/hr.
1300	6 hrs. 45 min.	Waste collector surge tank low level alarm received. Investigation reveals that the tank is draining through a

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broken feed line. HP reports rising airborne radiation levels and recommend evacuation. Site evacuation should be called since two buildings are inaccessible. Airborne levels in the Radwaste building are 1N7 at the 91'6" elevation. Radwaste building general area is 100 mr/hr.

1315	7 hrs. 0 min.	Reactor core plate differential pressure is 19 psid. Reactor vessel head temperature is 680 degrees F. Reactor vessel bottom head drain temperature is 380 degrees F. Containment radiation level is 75,000 R/hr. Drywell temperature is 175 degrees F. Drywell pressure has leveled off at 4.5 psig. Status lights indicate nitrogen purge isolation outboard valve is not fully closed. Main stack effluent releases have risen to 0.1 Ci/sec of noble gases.
1325	7 hrs. 10 min.	SAR team finds one missing man contaminated and injured.
1345	7 hrs. 30 min.	Drywell temperature remains at 175 degrees F and pressure is constant at 4.5 psig.

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Reactor building airborne activity is negligible.

Containment radiation level is 110,000 R/hr.

*** SITE EMERGENCY Should be declared.

EP-101 Item 4.c.3

Containment high range area monitor readings greater than 100,000 R/hr.

1400 7 hrs 45 min. Core plate differential pressure is 23 psid.

Reactor vessel head temperature is 700 degrees F.

Reactor vessel bottom head drain temperature is 350 degrees F.

1415 8 hrs. 0 min. Report from personnel checking nitrogen purge isolation valves is that the inboard valve is fully closed, but leaking. Outward valve is partially open. They estimate six hours to repair.

1430 8 hrs. 15 min. Instrument nitrogen compressor 2A is returned to service.

High pressure service water pump "A" trips out. In a short time, a hi-radiation alarm is received from the corresponding service water effluent monitor. Monitor reads 100,000 cpm for

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several minutes before the situation is corrected.

- 1500 8 hr. 45 min. Reactor pressure is 450 psig, core spray pumps B and D start. Core plate differential pressure starts falling.
- 1515 9 hrs. 0 min. Reactor pressure is 350 psig.
Core plate differential pressure is 18 psid.
Drywell pressure has fallen to 4 psig.
Torus temperature is 110 degrees F.
Word is received of a potentially serious radiation exposure. A plant operator has fallen into very contaminated waste collector surge tank water at the 91'6" elevation. Radwaste building. External contamination of at least 250,000 cpm and internal contamination due to swallowing about one cup (250 ml) of water in the range of 1N3 to 1N4. Offsite medical and RMC assistance required.
- 1545 9 hrs. 30 min. Containment radiation level has increased to 500,000 R/hr.
Stack releases have increased to 2 Ci/sec. Analysis indicate about 300:1 noble gas to iodine ratio.
Reactor pressure is 270 psig.
Core plate differential is 14 psid.
Containment hydrogen level is 0.5%.

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*** GENERAL EMERGENCY Should be declared.

EP-101 Item 4.d.3

Containment high range area monitor readings greater than 1,000,000 R/hr.

1630 10 hrs. 15 min. Wind direction shifts although wind speed and stability class remain the same. Wind direction is now from 315 degrees.

1700 10 hrs. 45 min. Reactor pressure is 270 psig.

Core plate differential pressure is 9 psid.

Containment hydrogen concentration is 1.5%.

Reactor vessel head temperature is 520 degrees F.

Drywell pressure is 4 psig.

Reactor vessel bottom head drain temperature is 360 degrees F.

1730 11 hrs. 15 min. SGTs fan trips out on high differential pressure across filter "A". Filter "B" is placed in service and no differential pressure noted although flow is 110% of rated.

Releases increases to 800 Ci/sec of which about 3% is iodine.

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1800 11 hrs. 45 min. Word is received that a member of the team sent to investigate the problem with the SGTS filters was injured and contaminated. Off-site medical assistance is required.

Reactor vessel head temperature is 480 degrees F.

Reactor vessel level is +35 inches.

Reactor pressure is 260 psig.

Drywell pressure is 4 psig.

1900 12 hrs. 45 min. Reactor vessel head temperature is 400 degrees F.

Reactor vessel level is +60 inches.

Reactor pressure is 250 psig.

Torus temperature is 100 degrees F.

Drywell temperature is 140 degrees F.

Drywell pressure is 3.5 psig.

Drywell radiation level is 2×10 R/hr.

1930 13 hrs. 15 min. Successful closure of nitrogen purge isolation valves terminates release.

*** DE-ESCALATION TO SITE EMERGENCY POSSIBLE.
RECOVERY PHASE DISCUSSION IS BEGUN.

2000 13 hrs. 45 min. Exercise is terminated.