



BROOKHAVEN NATIONAL LABORATORY  
ASSOCIATED UNIVERSITIES, INC.

Upton, New York 11973

Department of Nuclear Energy

(516) 345- 2144

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Mr. Robert L. Ferguson  
Chemical Engineering  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

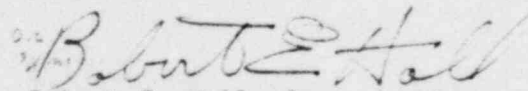
RE: Peach Bottom, Fire Protection Review, Items 3.1.1, 3.1.2A(1, 2, and 3), 3.1.11(1), 3.2.4(2), 3.2.5, 3.2.6, and 3.2.7.

Dear Bob:

Attached is Brookhaven National Laboratory's input regarding the Peach Bottom facility. The following items were included in this fire protection review.

- |                         |                             |
|-------------------------|-----------------------------|
| Item 3.1.1              | - Fire Detection Systems    |
| Item 3.1.2A (1, 2, & 3) | - Water Suppression Systems |
| Item 3.1.11(1)          | - Control of Combustibles   |
| Item 3.2.4(2)           | - Water Suppression Systems |
| Item 3.2.5              | - Gas Suppression System    |
| Item 3.2.6              | - Fire Doors                |
| Item 3.2.7              | - Interior Hose Stations    |

Respectfully yours,

  
Robert E. Hall, Group Leader  
Reactor Engineering Analysis

REH:EAM:sd  
attachment

cc.: V. Benaroya      wo/att.  
      W. Kato                "  
      M. Levine             "  
      E. MacDougall

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## PEACH BOTTOM

### Fire Protection Review

#### Item 3.1.1 - Fire Detection Systems

Item 3.1.1 of the Peach Bottom SER lists the areas in which the licensee proposes to install fire detectors as follows:

1. Residual Heat Removal Pump Rooms
2. Reactor Core Isolation Cooling Pump Rooms
3. Core Spray Pump Rooms
4. Refueling Floor of the Reactor Buildings
5. Enclosed Rooms within the Control Room Complex
6. Cable Spreading Room
7. Diesel Generator Rooms
8. Diesel Generator Auxiliary Room
9. High Pressure Service Water Pump Room to replace the existing heat detectors
10. Battery Rooms

Under their cover letter dated February 21, 1980, Philadelphia Electric Company included their attachment 1 which described the general criteria used in designing the detection systems and the specific factors considered for each area. The general criteria considered included: combustible loading, ventilation characteristics, room size/geometry and room congestion.

Based on a review of the design information and drawings submitted, the licensee's proposed modification of installing ionization type fire detectors in the following areas is considered acceptable:

1. Residual Heat Removal Pump Rooms
2. Reactor Core Isolation Cooling Pump Rooms
3. Core Spray Pump Rooms
5. Enclosed Rooms within the Control Room Complex
8. Diesel Generator Auxiliary Room
9. High Pressure Service Water Pump Room to replace the existing heat detectors
10. Battery Rooms.

Item 6, the Cable Spreading Room, according to the submittal will be provided with twenty-one ionization type fire detectors in addition to the two existing ones. Experience has shown that most ionization type fire detectors are relatively slow in responding to incipient fires involving some types of plastic cable insulation. The cabling used for control and power circuits at Peach Bottom consists of cross-linked polyethylene insulation with a flame retardant neoprene jacket essentially equal to cable construction capable of passing IEEE-383-1974. Because of the inherent fire resistance of the cabling, it is expected that an electrically initiated fire in the cabling will not propagate and involve large quantities of adjacent cabling although an exposure fire involving transient combustible materials could.

The proposed placement of the new fire detectors is acceptable, although the selection of ionization type detectors is not fully acceptable. We recommend that the licensee select a detector for the cable spreading room that will provide early warning from a fire originating in the cables or in transient combustible materials. Ionization type detectors probably will respond quickly to a fire involving transient combustibles but it may not to incipient cable fires. Therefore, the licensee should reassess their selection of the detectors for the cable spreading and choose a type shown by tests to be sensitive to smoke given off by a fire involving both cabling of the type used at Peach Bottom and the anticipated transient combustibles.

Item 7, the Diesel Generator Rooms, were originally proposed to be provided with early warning type fire detectors to replace the existing thermal type fire detectors. In their submittal, however, the licensee stated that they had reevaluated this proposed modification and had concluded that the existing 4 rate of rise/fixed temperature fire detectors in each diesel generator room were adequate. They based this determination on the assumption that a fire in these rooms would be fast developing, involving diesel fuel and would be readily detected by the existing thermal fire detectors. Their objection to installing smoke type detectors in this area was because unnecessary operation problems would be encountered due to false alarms caused by smoke generated during diesel start-up and operation.

A fire involving diesel fuel such as a fuel line break would produce a fast developing, high heat output fire that would probably be quickly detected by the existing thermal detectors. It is also possible, however, that a fire could originate involving other in situ or transient combustibles that would start small and gradually build up until the fuel supply is involved. In this scenario the fire would not be detected by the existing thermal detectors and significant damage to the equipment in the room could occur before the event is discovered. Other power plants have installed early warning fire detectors in the diesel generator rooms and have not experienced false alarm problems to the best of our knowledge. Therefore, based on the discussion above, the licensee's decision not to provide early warning detectors in the diesel generator rooms is not acceptable. Early warning fire detectors of a type less sensitive to the operating emissions from diesel engines than ionization type detectors should be provided in the diesel generator rooms as originally indicated in item 3.1.1(4) of the SER.

Item 4 of this modification indicates that smoke detectors would be provided at the refueling level of the reactor building. In their response dated February 16, 1979 the licensee indicated they had reevaluated their position on this item. Based on the low combustible loading in this area, improved administrative procedure to minimize the transient combustibles and because safe shutdown can be performed even with the loss of all the equipment in this area, the licensee has concluded that early warning smoke detectors are not necessary.

There is no safety-related equipment on this elevation, however, there is a hatchway in the floor of this elevation and although the hatch is normally closed, an unmitigated fire could spread to a lower elevation, causing damage to safety-related equipment there. Because of the potential damage to safety-related equipment in adjacent areas, we recommend that early warning detectors as originally proposed be installed.

### Item 3.1.2A (1, 2, and 3) - Water Suppression Systems

Item 3.1.2A of the Peach Bottom SER indicates that the licensee will install fire suppression systems at:

1. Elevation 116' of the Turbine building for protection of anti-contamination clothing stored in this area. An acceptable alternative is to permanently relocate the anticontamination clothing to an area separated from safe shutdown equipment by a 3-hour fire barrier.
2. Recirculation pump motor generator set lube oil pump rooms.
3. Baling area of the radwaste building.

Attachment 2 of Philadelphia Electric Company's February 21, 1980 submittal, responds to this item. They indicated that they chose the alternative listed in item 1 and permanently removed the anti-contamination clothing from the area indicated in the SER item. They also intend to install early warning fire detectors in this area.

Based on the above, item 3.1.2A(1) is satisfactory and we recommend that the staff accept this part of the item. The licensee indicated that item 2 would be implemented by the installation of a pre-action sprinkler system having a design density of 0.3 gpm/sq. ft. over the diked area of the recirculation pump motor generator set lube oil pump rooms. The system will be actuated by two smoke detectors located over each diked area. The licensee also submitted preliminary drawing M-1341-0 which gives further design information.

We recommend that the licensee's submittal on item 3.1.2A(2) be conditionally accepted with the provision that manual actuation of the pre-action sprinkler system be provided from outside the protected rooms.

Item 3 calls for the installation of a suppression system to protect the Radwaste Baling area. Their submittal indicates that this has already been provided. A wet-pipe automatic sprinkler system with a design density of approximately 0.20 gpm/sq. ft. was installed. Operation of the system will annunciate an alarm via the station fire alarm system. Drawing M-572, M45-82-2 showing details of the installation were included with the submittal.

The submittal for SER Item 3.1.2A(3) is satisfactory and we recommend that it be accepted.

### Item 3.1.11(1) - Control of Combustibles

Item 3.1.11(1) of the Peach Bottom SER indicates the licensee's proposal of providing a curb to prevent the flow of combustible liquids under the doors between the diesel generator rooms. In attachment 4 of Philadelphia Electric Company's submittal of February 21, 1980 they provided information pertaining to this modification including drawing no. M-35G. The proposed curb will be of 2-inch steel angle with appropriate caulking for oil retention.

Based on the description and drawing of the proposed modification, the submittal for SER item 3.1.11(1) is satisfactory and we recommend that the staff accept 3.1.11(1).

#### Item 3.2.4(2) - Water Suppression Systems

Item 3.2.4(2) of the Peach Bottom SER requires that the licensee evaluate the adequacy of fire protection in fire zones 4C and 12C which contain the motor-generator sets for the recirculation pumps.

Attachment 5 of Philadelphia Electric Company's submittal of February 21, 1980 responded to this item. It indicates that the M-G set fluid drives contain approximately 1100 gallons of hydraulic fluid. Dikes will be placed around the fluid pipes to contain any hydraulic fluid associated with a pipe rupture or leak. A pre-action water spray system will be installed with directional nozzles to protect the diked area. The system will be actuated by the existing ionization type fire detectors located above the M-G sets.

The licensee's submittal on this item is conditionally acceptable with the provisions that the design density is at least 0.30 gpm/sq. ft., the installation conforms to NFPA 13 and 15, and actuation of the system transmits an alarm signal in the control room.

We recommend that the staff accept this item based on the above provisions.

#### Item 3.2.5 - Gas Suppression System

Item 3.2.5 of the Peach Bottom SER requires the licensee to evaluate the practicality and need for automatic actuation of the CO<sub>2</sub> system in the cable spreading room.

In their February 1980 submittal, the licensee agreed to convert the existing system from manual to automatic action. Their submittal does not, however, give any details of the proposed change.

We recommend that the licensee's proposed modification for converting the existing CO<sub>2</sub> system in the cable spreading room to automatic actuation be accepted with the provisions that the applicable provisions of NFPA 12 are followed.

#### Item 3.2.6 - Fire Doors

Part 1 of item 3.2.6 of the Peach Bottom SER states the licensee will evaluate the modifications which are necessary to insure that fire doors are electrically supervised or otherwise maintained closed.

The licensee responded to this item in their submittal dated February 16, 1980 in which they indicate that all fire doors at the plant are electrically supervised except for 29 doors. The licensee evaluated the consequences of a fire in the vicinity of these unsupervised doors and proposed actions for upgrading the status of doors. These proposed actions to upgrade the status of the presently unsupervised fire doors consist of:

- a. install self closing mechanism on the 4 conventional fire doors lacking this equipment.

- b. they claim that their administration controls are successful in maintaining watertight doors in the closed position with the exception of doors #230 and 233 between the turbine building and the radwaste building. These two doors will be provided with electrical supervision or doors with self closing mechanisms will be installed,
- c. all 29 fire doors listed will be posted with signs stating: "Fire Door - Keep Closed,"
- d. instructions to maintain fire doors in the closed position except when required to accommodate the movement of personnel and equipment, will be provided in the General Employee Training program and administrative procedures,
- e. fire doors will be inspected semi-annually to verify that self closing mechanism and latches are in good working order. (Previous commitment to PF-28a).

The licensee's proposed modifications for upgrading the status of the unsupervised fire doors is satisfactory and we recommend that it be accepted. Attached is Table 1 which lists the locations of the doors along with the proposed actions for each door.

#### Item 3.2.7 - Interior Hose Stations

Item 3.2.7 of the Peach Bottom SER states that the licensee will evaluate:

1. The need for additional hose stations and access ladders in the torus compartments.
2. The feasibility of installing variable gallonage nozzles at stations servicing the control room complex, cable spreading room, and emergency switchgear rooms.

In their submittal dated February 16, 1979 the licensee responded to item 1 by stating:

"Portable fire extinguishers are mounted in the torus compartment and adjacent pump rooms. Considering the low combustibile levels, accessibility of the cables, and additional fire protection proposed for the cable trays, we believe that more than sufficient fire fighting capabilities presently exist."

The response to this item is unsatisfactory. We recommend that the licensee provide the capability for hose stream application at all areas of the torus compartment.

In their submittal dated December 20, 1978 the licensee responded to item 2 by stating:

"All of the Peach Bottom hose stations are equipped with Alfco Fog nozzles. It is our considered opinion that this type represents the best industrial type nozzle available for use in the use of a variable gallonage nozzle, use of this type of nozzle would reduce the fire fighting

effectiveness of the fire brigade, and would pose a serious personnel safety hazard. Many years of experience with the Alfco Fog nozzle has demonstrated it to be very effective in fighting many types of fires. We agree that the installation of a ball type shutoff valve has merit, and such a device will be added to each hose nozzle."

The licensee's proposal to install ball shut-off valves in front of their existing Alfco fog nozzles is considered an acceptable modification for this item.

TABLE 1

Fire Doors Without Electrical Supervision

Elev.	Door No.	Beam Coordinates	Unit	Location	Proposed Action
91'6"	9	18-H	2	Core spray rm, sump pp. rm	V
91'6"	48	23-H	3	Core spray rm, sump pp. rm	V
91'6"	7	19-G	2	HPCI to RCIC	V
91'6"	50	22-G	3	HPCI to RCIC	V
91'6"	23	20-C	-	Chem. Waste tank room	III
91'6"	26	20-C	-	Stairwell to radwaste	II
91'6"	32	20-J	-	Turb. bldg to radwaste bldg	VI
116'	65	8-B	2	RHR to RHR	III
116'	142	33-B	3	RHR to RHR	III
116'	130	20-C	-	Stairwell to radwaste	II
116'	134	20-J	-	Turb. bldg to radwaste bldg	VI
116'	135	20-F	-	Cond. tank to cond. pp	II
116'	136	20-J	-	Cond. tank to cond. pp	II
135'	230	20-C	-	Stairwell to radwaste	II
135'	233	20-J	-	Turb. bldg to radwaste bldg	II
135'	228	21-J	-	Decontam. to filter rm	III
135'	229	21-H	-	Decontam. to filter rm	II
135'	217	19-L	2	Batt. rm to Batt. rm	I
135'	256	22-L	3	Batt. rm to Batt. rm	I
135'	216	19-L	2	E bus to E bus rm	II
135'	223	20-L	2	E bus to E bus rm	II
135'	258	20-L	3	E bus to E bus rm	II
135'	262	21-L	3	E bus to E bus rm	II
165'	305	18-G	2	MG fan rm	II
165'	356	23-G	3	MG fan rm	II
116'	9	-	-	Pump structure	IV
127'	31	-	-	D-G bldg	II
127'	32	-	-	D-G bldg	II
127'	33	-	-	D-G bldg	II

Proposed Action

- I. Electrical supervision under security system.
- II. Self closing mechanism presently installed. Establish additional administrative controls (see note 1).
- III. Self closing mechanism will be installed. Establish additional administrative controls (see note 1).
- IV. Water tight doors. Present administrative controls effective in maintaining door in closed position.
- V. Water tight doors. Install electrical supervision, or provide fire door with self closing mechanism.

Note 1: Procedural controls, GET training, label doors, semi-annual inspection program.