



**Commonwealth Edison**

72 West Adams Street, Chicago, Illinois  
Address Reply to: Post Office Box 767  
Chicago, Illinois 60690 - 0767

September 22, 1986

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Subject: Braidwood Station Unit 1  
Fire Protection August 1986  
Audit - Resolution of Issues  
NRC Docket No. 50-456

Dear Mr. Denton:

The purpose of this letter is to provide a list of Commonwealth Edison Company responses to the open items identified during the August 1986 Braidwood Unit 1 Fire Protection Audit. These items were discussed with members of your staff on September 12, 1986.

Also included is data on obstructed sprinkler heads for approximately one half of the sprinkler system in the Unit 1 Auxiliary Building at Braidwood Station. The data which your staff requested consists of:

- (1) A technical justification for leaving the sprinkler head located as is, or
- (2) Indicate how the sprinkler head will be moved to avoid the obstructions.

Marsh and McLennon personnel have completed the review of several systems in the Auxiliary Building and have provided their report which is attached to this letter. The M&M letter provides technical justification for leaving some obstructed heads in their present locations and also provides recommendations for the relocation of 12 sprinkler heads. The M&M review letter only provides comments on the sprinkler heads which they found to be obstructed. All other sprinkler heads on these reviewed systems were found to be unobstructed and hence were not mentioned in the review letter. CECO has reviewed the M&M data and agrees with the technical justification and recommendations for action proposed by M&M. CECO will implement these sprinkler head relocations prior to exceeding 5% power pending agreement by the NRC.

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Mr. H. R. Denton

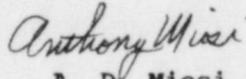
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September 22, 1986

Should you have any questions concerning this matter, please contact this office.

One signed original and fifteen copies of this letter and the enclosures are provided for your review.

Very truly yours,



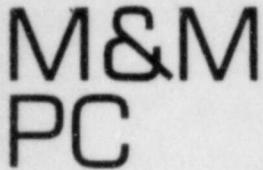
A. D. Miosi  
Nuclear Licensing Administrator

lm

Enclosure

cc: J. Stevens - NRR

2139K



**M&M Protection Consultants**

A Resource of Marsh & McLennan

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September 19, 1986

Mr. D. Elias  
Project Engineer  
Commonwealth Edison Company  
P.O. Box 767  
Chicago, Illinois 60690

RE: BRAIDWOOD NUCLEAR STATION  
FIRE PROTECTION PROGRAM REVIEW  
AUXILIARY BUILDING SPRINKLER SYSTEMS

Dear Mr. Elias:

As a result of the NRC Fire Protection Audit of the Braidwood Nuclear Station, on August 18 through August 22, 1986, and subsequent tele-conferences, concerns have been raised regarding obstructions of sprinklers on the sprinkler systems installed in the Auxiliary Building.

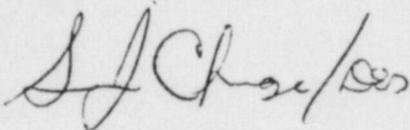
We have started our re-review of the systems in question in accordance with the requirements of Chapter 4 of NFPA 13, "Standard for the Installation of Sprinkler Systems". At the present time, we have completed the review of Protection Area 1-GG, Auxiliary Building Waste Oil Tank and Protection Area 1-LL, Auxiliary Building Containment Pipe Penetration Area 5. The results of this re-review are contained in the attached document.

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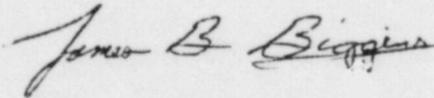
September 19, 1986  
Page 2

If you have any questions or comments concerning our review,  
please contact us.

Sincerely,



S. J. Chingo  
Fire Protection Consultant



James B. Biggins  
Fire Protection Associate

SJC/JBB/smn

Enclosure

cc: J. Deress  
M. Pietraszewski  
C. Diaz  
E. Fitzpatrick  
T. Meyer  
D. Shamblin  
R. Rakowski  
J. Bruciak  
C. Tomashek  
R. Williams  
R. Rakowski  
R. Smith, Jr.  
M. Balster  
G. Jones  
B. Treece  
R. Salsbury  
M. Rybak  
E. Crass  
M. Smith

(JB3/26)

BRAIDWOOD NUCLEAR STATION  
 FIRE PROTECTION PROGRAM REVIEW

SYSTEM:

Protection Area 1-GG, Auxiliary Building Waste Oil Tank; elevation 401'-0"; Auxiliary Building.

DESCRIPTION:

Protection Area 1-GG, Auxiliary Building Waste Oil Tank on elevation 401'-0" Auxiliary Building is protected by an automatic wet-pipe sprinkler system consisting of four (4) - ½" upright sprinklers (three (3) at the ceiling and one (1) located under the tank) rated at 212°F. The system is hydraulically designed for a 0.30 gpm/sq. ft. density over the entire hazard area as referenced on Viking design drawing 49.

Sprinkler	Obstruction	Comment/Resolution
#1	The deflector is located approximately 3½" laterally and 7½" above the bottom of a beam.	Lower the sprinkler so that the deflector is at or below the bottom of the beam.
#2	The sprinkler deflector is approximately 10" laterally and 8" above the bottom of the beam.	Lower the sprinkler head so that the deflector is at or below the bottom of the beam.
#3	The deflector of the sprinkler is located approximately 30" and 38" laterally from two beams and 8" above the bottom of the beams.	Based upon the repositioning of sprinklers #1 and #2, which are 48" away laterally, sufficient overlapping spray patterns will be provided from the adjacent heads and therefore, repositioning of this sprinkler is not necessary. (Note - The beams located between the sprinklers will effectively act as cross baffles for sprinklers spaced less than 6' apart.)

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SYSTEM:

Protection Area 1-LL, Auxiliary Building Pipe Penetration Area 5, elevation 364'-0", Auxiliary Building.

DESCRIPTION:

This is an automatic wet-pipe sprinkler system designed using the ordinary-hazard pipe schedule for pipe sizing and spacing, with a maximum spacing of 130 sq. ft. per sprinkler. Twenty (20) 212°F rated sprinklers are utilized in this system as shown on Viking design drawing 94. Construction changes, especially those in regard to permanent seismic supports, have occurred since our original review of this sprinkler system on February 19, 1986, and as a result, additional obstructions have occurred other than those which were noted at that time.

<u>Sprinkler</u>	<u>Obstruction</u>	<u>Comment/Resolution</u>
#1	This sprinkler is located approximately 21" laterally from the trolley track beam and 18" above the bottom of this beam.	Lower the sprinkler so that the top of the deflector is at or below the bottom of the beam.
#2	This sprinkler is obstructed by a 2" angle iron support and a 4" seismic support.	Relocate the sprinkler to a position 12" from these supports.
#4	This sprinkler is obstructed by a 1½" angle iron support.	Relocate the sprinkler to a position 12" from the support.
#6	This sprinkler is obstructed by a 1½" angle iron support and the deflector is located above the bottom of the trolley track beam.	Reposition the sprinkler head to a position closer to the beam and to a height where the top of the deflector is not above the bottom of the beam.

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Sprinkler	Obstruction	Comment/Resolution
#10	This sprinkler is obstructed by the trolley track beam, a second beam and is also obstructed by a 3" seismic support.	This sprinkler can be left as is based upon sufficient overlapping spray patterns of surrounding sprinklers. Sprinkler #8 is located 8' laterally and sprinkler #11 is located 10' laterally from sprinkler #10 and therefore, repositioning of this sprinkler is not necessary.
#11	This sprinkler is located above the trolley track beam.	Lower this sprinkler to a position so that the top of the deflector is at or below the bottom of the beam.
#12	This sprinkler is located above the trolley track beam.	This sprinkler may be left as is based upon sufficient overlapping spray patterns from adjacent sprinklers. Sprinkler #11 is located 4' laterally in the direction of the obstruction and therefore, repositioning of sprinkler # 12 is not necessary. (Note - The trolley track beam will act as an effective cross-baffle between sprinklers #11 and #12.)
#13	This sprinkler is obstructed by a 3" seismic support.	Reposition the sprinkler so that it is located 12" from the seismic support.

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Sprinkler	Obstruction	Comment/Resolution
#14	This sprinkler is located above the trolley track beam and is also partially obstructed by a 3" seismic support.	This sprinkler may be left as is based upon sufficient overlapping spray patterns of adjacent sprinklers. Sprinkler #11 is located 10' laterally from sprinkler #14, sprinkler #12 is located 9' laterally from sprinkler #14, and sprinkler #13 is located 8' laterally from sprinkler #14 and therefore, repositioning of this sprinkler is not necessary.
#15	This sprinkler is obstructed by an 18" cable tray and a 4" seismic support.	Relocate the sprinkler to a position 12" from the seismic support. Sprinkler #13 is located 9' laterally away from sprinkler #15 in the direction of the obstruction from the cable tray. This provides an adequate overlapping spray pattern in the obstructed area.
#16	This sprinkler is located above the trolley track beam and is adjacent to a 6" pipe.	This sprinkler may be left as is based upon sufficient overlapping spray patterns from adjacent sprinklers. Sprinkler #13 is located 11½' laterally and sprinkler #15 is located 12' laterally from sprinkler #16, and therefore, repositioning of this sprinkler is not necessary.
#17	This sprinkler is located above a 4" seismic support.	Reposition the sprinkler to a position below the support.
#18	This sprinkler is located above the trolley track beam.	Lower the sprinkler to a position at or below the bottom of the beam.
#19	This sprinkler is obstructed by a large steam pipe.	Relocate the sprinkler to a position 2' to the east.

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<u>Sprinkler</u>	<u>Obstruction</u>	<u>Comment/Resolution</u>
#20	This sprinkler is located above the trolley track beam.	This sprinkler may be left as is based upon sufficient overlapping spray patterns from adjacent sprinklers. Sprinkler #18 is located 8' laterally from sprinkler #20, and therefore, repositioning of this sprinkler is not necessary.

NRC Open Items from Braidwood Fire Protection  
Inspection in August 1986  
and CECO Responses as Agreed to in a  
Meeting with the NRC on September 12, 1986

K-3 Sprinkler system around the hatchway at elevation 426' in the Auxiliary Building outside the Laundry room was not considered adequate. Also hatchway does not have a draft curtain.

CECo Response - CECO will use one of several options for this hatchway. The options are: (1) New sprinklers will be added at the hatchway opening prior to exceeding 5% power and draft stops will be added to the hatchway no later than 6 months after Fuel Load. (2) The hatchway will be covered by steel plates that are caulked into place prior to exceeding 5% power.

K-7 Steel plates over equipment hatches in the curved wall area of the Auxiliary Building at elev. 426' are not sealed to prevent the passage of hot gases.

CECo Response - Gaps or openings in the existing steel plates will be sealed prior to exceeding 5% power. Plates will be caulked into place with a fire resistant type of caulk.

K-9           Need proof of structural steel fireproofing adequacy.  UL listing and test data.

CECo Response - Data on our design using Pyrocrete 102 given to the NRC for their evaluation.  The NRC informed CECO that they have closed this item.

K-11           Spare conduit seals are not adequate.

CECo Response - CECO will seal spare conduits with a fire resistant material to form an acceptable three (3) hour fire barrier.  (A Test Report to support 3 hr. rating is on file).  The sealing of the spare conduits will be completed consistent with other sealing work for Unit #1.  Any seals not completed prior to Fuel Load will be monitored with hourly roving fire watches.

K-12           NRC questioned the adequacy of the seals in the floor of the Upper Cable Spreading Room.

CECo Response - Data was given to the NRC concerning these seals at the time of the audit.  The NRC informed CECO that they have closed this item.

K-15        The NRC indicated that we are required to have detectors in the main control panels in the Control Room.

CECo Response - The NRC informed CECo that our installation with duct detectors in the ducts leading from the control panels is acceptable, but is conditional upon CECo submittal of specific details of the design. The following design information will be provided:

- 1a. Detailed design description of the duct detector installation.
- b. Size and volume of the panels served per duct detector.
2. Confirmation that the duct detectors are installed per the vendor's instructions and velocity limitations.
3. Description of cabinet construction.

Design information will be forwarded to the NRC by 9-25-86.

K-17 The NRC questioned whether all security doors could be used in the event a fire in some zone renders doors inoperable.

CECo Response - The NRC has reviewed design details of security doors with respect to fires and they have found our procedures are adequate. Design and procedure details are safeguard information.

K-18 The NRC considered the sprinkler installation around the stairwell and hatchway in the Auxiliary building at elev. 364' inadequate.

CECo Response - We will add sprinklers around these stairwells prior to exceeding 5% power and draft stops will be added no later than 6 months after Fuel Load. For the hatchway our response is the same as for the hatchway described in item #K-3.

K-19 The NRC did not consider our justification for the separation of redundant RHR pumps and coolers adequate. The NRC feels that our repair procedures are not an adequate compensatory measure for the separation afforded the RHR pumps. This has been identified as Appendix R deviation A.8.

CECo Response - CECo will upgrade the W-line wall between the redundant RHR pumps to a wall with a 1 1/2 hour fire rating. The upgrade of the wall will be complete prior to exceeding 5% power unless material procurement difficulties preclude meeting that date. Should difficulties like that arise the NRC will be notified and CECo will implement compensatory measures (such as hourly roving fire watches) to provide protection.

K-21 The NRC questioned the fire protection measures to be used for the propane gas line used to provide gas for burners in the rad-chem labs in the Aux. Bldg.

CECo Response - CECo will abandon this gas line and system in place by Fuel Load. The NRC informed CECo that this is acceptable.

K-22 The NRC questioned the adequacy of our sprinkler systems in various areas of the Aux. and Turbine Buildings due to physical obstructions.

CECo Response - M&M will review one half of the obstructed sprinkler heads in the Auxiliary Building and provide additional justification for these sprinklers by 9-22-86. Added justification for the second half of the obstructed sprinklers will be sent to the NRC by 9-30-86. A schedule for any necessary changes to sprinklers will be established subsequent to NRC disposition of our technical justifications. Further evaluation of Turbine building sprinkler obstructions will be made prior to the end of the first refueling for Braidwood Unit #1.

K-24

The NRC questioned the adequacy of fire protection measures for the Chemical Storage rooms adjacent to the Aux. Boiler Room.

CECo Response - M&M has reviewed this chemical storage area and has concluded that due to the substantial fire resistant construction that conforms with NFPA 30, no further fire protection features will need to be installed above the current design. A fire hazards analysis for the storage area was given to the NRC on 9-11-86. The NRC informed CECo that our installation was acceptable.

K-25 There are no hose stations in the valve rooms in the Main Steam tunnels. The NRC considers detectors and hand extinguishers inadequate protection.

CECo Response - CECO will provide additional hose at a hose station which can be used for one of the valve rooms prior to exceeding 5% power. S&L has verified that adequate pressures and flow will be available for the hose station (with the added hose) to fight a fire in the valve room. The other valve room can be served by a hose from an outside hose house. Operating will revise their pre-fire plans to account for the use of the hose stations prior to exceeding 5% power. The NRC informed CECO that this will be acceptable.

A-1 The NRC questioned the adequacy of the drains for the charcoal filters in case of an activation of the deluge system without the control room operators knowledge. This was considered because of the fact that the NAMCO limit switches on the deluge valves are not UL listed for fire protection service.

CECo Response - The drains for the charcoal filters have already been found to be inadequate by another recent NRC inspection (see NRC item #456/86001-18). As a result of that item CECO has committed to implement administrative actions to insure that the drains do not become overloaded during a deluge for a fire. The procedure changes necessary will be made prior to exceeding 5% power. The NRC informed CECO that this will be acceptable.

A-11 There are several instances throughout the plant where hose stations and sprinklers protecting an area are fed from a common fire main header. This is a violation of BTP requirements.

CECo Response - M&M has reviewed all instances of this arrangement in the plant. Compensatory measures which include the use of adjacent hose stations outside of the area under consideration will have to be implemented. Some additional hose from the portable fire brigade hose cart may have to be added to hose stations used as a compensatory measure. Pre-fire plans will be changed as necessary to account for these cases prior to exceeding 5% power. The only exception to the above is the case in the Containment where the hose stations and the charcoal filter deluge is on the same header. By agreement during our meetings the NRC considers the situation in the Containment to be acceptable as is.

T-1 The NRC considers the use of jumpers to attain hot standby as a violation of the regulations regarding the implementation of actions to achieve hot standby.

CECo Response - CECo will have the draft of a procedure and a narrative describing the proposed actions by September 22, 1986 in time for the Byron Fire Protection audit. The proposed procedure should eliminate the need for jumpers in the case of a spurious SI actuation due to a fire in the Aux. Elec. Equip. room.

T-3 In implementing NRC Generic Letter 86-10 S&L studied spurious operation for all high-low pressure interface points except at the head vent valves. The NRC wants to see that analysis.

CECo Response - S&L will provide the analysis to the NRC by September 30, 1986. The schedule for any changes that are needed as a result of this analysis will be established after NRC review of the analysis.