



# THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

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MURRAY R. EDELMAN

VICE PRESIDENT  
NUCLEAR

May 3, 1985  
PY-CEI/NRR-0234 L

Mr. B. J. Youngblood  
Licensing Branch No. 1  
Division of Licensing  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Perry Nuclear Power Plant  
Dockets Nos. 50-440; 50-441  
Fire Protection CMEB BTP 9.5-1  
Section C.5.a.(3), Penetrations

Dear Mr. Youngblood:

One of the open items resulting from your Fire Protection Audit (joint Region III and NRR during the week of 3/18/85) of PNPP addressed conduit penetration seals through fire walls. Attached for your review are criteria established by CEI, with assistance from our consultants, for sealing inside electrical conduit penetrations less than 4 inches in diameter.

## Background

During the audit, the Region III inspector identified that Perry construction practices did not conform with the Standard Review Plan in CMEB BTP 9.5-1 for sealing inside electrical conduit. Section C.5.a.(3) states:

"Openings inside conduit larger than 4 inches in diameter should be sealed at the fire barrier penetration. Openings inside conduit 4 inches or less in diameter should be sealed at the fire barrier unless the conduit extends at least 5 feet on each side of the fire barrier and is sealed either at both ends or at the fire barrier with non-combustible material to prevent the passage of smoke and hot gases."

CEI identified that all electrical conduit penetrations larger than 4 inches in diameter were sealed inside at the fire walls. No penetrations less than 4" were sealed either at the wall or at termination points.

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Our prior commitments for penetration sealing were made in the FPER comparison to the Standard Review Plan APCSB 9.5-1, page 5-19, which addressed sealing around penetrations. APCSB 9.5-1 stated:

"Cable and cable tray penetrations of fire barriers (vertical and horizontal) should be sealed to give protection at least equivalent to that fire barrier."

This criteria did not address sealing inside conduit. As a result, CEI proposed to evaluate the concern and prepare criteria for sealing critical penetrations for submittal to you. After our evaluation of the recommendations of CMEB BTP 9.5-1, it was determined that protection of safe shutdown or safety related equipment and their related fire walls as identified in Section C.5.a.(1) should form the basis of the attached sealing criteria.

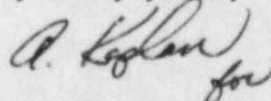
#### Implementation

These proposed criteria, when implemented, will meet the intent of BTP 9.5-1. This program will result in the re-examination of fire walls and the sealing performed of conduit penetrations necessary to achieve safe shutdown protection. The program will be administered by our Fire Protection Engineer who will assure that actual implementation meets the intent of BTP 9.5-1.

Our intent is to have a single criteria that can be consistently followed and applied. This criteria is being implemented into the construction program for both Units 1 and 2. Completion of this activity will be scheduled prior to exceeding 5% power for Unit 1.

We understand that Region III personnel will be in consultation with you on this subject. A copy of this criteria has been submitted for Region III review and concurrence. We would appreciate a response by 5/10/85 on this matter. Should you have any questions, please contact us.

Very truly yours,



Murray R. Edelman  
Vice President  
Nuclear Group

MRE:njc

#### Attachments

cc: Jay Silberg, Esq.  
John Stefano (2)  
J. Grobe  
J. Ulie, Region III

Sealing Criteria for Inside Electrical  
Conduit Penetrations Through Fire Barriers

BASIS

The primary objective for this criteria is preventing the passage of hot gases or smoke through fire barriers which could cause damage to redundant safe shutdown electrical equipment on the non-fire sides of the barrier (BTP CMEB 9.5-1, C5 [3]). This criteria therefore applies only to fire zones/areas that contain either safe shutdown or safety related equipment as identified in the FSAR and FPER. Application of this criteria will be monitored by the Fire Protection Engineer to assure appropriate use of the criteria.

In developing these criteria the following basic premises were established:

- o All conduit installed at PNPP is of schedule 40 type steel construction. This type of conduit is heavy construction and would be resistant to fire or mechanical damage and would remain intact during postulated fires.
- o Sealing at one end of conduit penetrations would be acceptable when considering the heavy schedule of conduit. Sealing of only one end would prevent the transmission of smoke and hot gases, which is the intent of the BTP position. The conduit end exposed to the lowest fire loading would be selected for sealing, which would provide the smallest exposure fire or would be on the opposite side of the wall from a large fire.
- o Fire loading in most areas of concern is very low and would not be expected to provide considerable smoke exposure to other areas. All areas of heavy combustible loading associated with safe shutdown equipment is protected by automatic suppression. Automatic fire protection suppression equipment is extensively utilized at the PNPP site and is considered an effective fire control method. The amount of smoke generated in these protected areas would be significantly less than in areas without suppression.
- o Most conduit penetrations are filled with wiring significantly reducing the free space for smoke/gas transmission. In the event of a fire, supply HVAC would be deactivated, and exhaust air would draw smoke out of the area. There would not be available a "driving force" through room pressurization to push the smoke to an adjacent area.
- o Damage to safety related or safe shutdown equipment from hot gases or smoke is primarily limited to electrical equipment instrumentation, excluding cabling and mechanical equipment such as valves and pumps.

CRITERIA

JUSTIFICATION

1. Openings inside conduit larger than 4 inches in nominal diameter shall be sealed at the fire barrier penetration.
2. Openings inside conduit 4 inches or less in nominal size shall be sealed at one end except:

- a. Where sprinkles and/or CO<sub>2</sub> systems are installed on both sides of the fire barrier; or
- b. Where the safe shutdown method on both sides of the fire barrier is the same or
- c. Where area/zones on both sides of the fire barrier contain no safe shutdown equipment, and
  - (1) no safety related equipment in either or,
  - (2) the safety related equipment (electrical equipment excluding cabling) in both areas is part of the same division,
- d. Where one side of the fire barrier is the exterior of the plant; or
- e. Where the sum of the inside areas of the conduits passing through the fire barrier is less than or equal to one 3 inch, schedule 40 conduit.

A fire of significant size to present a major concern (damaged conduit) is unlikely and would be rapidly extinguished by automatic suppression systems. Fires generating smoke and little heat would not damage conduit.

With the same shutdown method (A or B) equipment on each side of the wall, the passage of hot gasses or smoke through the wall does not present a safe shutdown hazard as the redundant method would be utilized in another area.

The inability to achieve safe shutdown is not threatened and redundant trains of safety related equipment are available.

Considering that the opening area inside the conduit is diminished by the amount of cabling, this represents a very small opening. Room pressurization is not anticipated to provide a driving force through the opening. Allowable clearances under fire doors or leakage through dampers would be of equivalent or greater area. The Fire Protection Engineer would monitor this practice to assure safe shutdown is not compromised.