U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report Nos. 50-315/81-08; 50-316/81-12

Docket Nos. 50-315; 50-316 License Nos. DPR-58; DPR-74

Licensee: American Electric Power Service Corporation
Indiana and Michigan Power Company
2 Broadway
New York, NY 10004

Facility Name: Donald C. Cook Nuclear Power Plant, Units 1 and 2

Investigation At: Donald C. Cook Nuclear Power Plant, Bridgman, MI

Investigation Conducted: July 30-31 and August 11, 1980, and April 8, 1981

Investigator: C. H. Weil — Date: 5/28/81

Inspector: J. H. Neisler — Date: 5/28/81

(Accompanied by E. R. Swanson, July 30-31, 1980)

Reviewed By: J. F. Streeter, Acting Chief, Enforcement and Investigations Staff — Date: 5/29/81

D. W. Hayes, Chief, Reactor Projects Section 1B — Date: 5/28/81

Investigation Summary

Investigation on July 30-31 and August 11, 1980, and April 8, 1981 (Report No. 50-315/81-08; 50-316/81-12)

Areas Investigated: Special, unannounced investigation into allegations concerning the installation of fire stop foam in wall and ceiling penetrations

at the Donald C. Cook Nuclear Power Plant, Units 1 and 2. The investigation involved 20 investigative hours, both on and off site, by three NRC employees.

Results: One item of noncompliance with NRC requirements was identified during the course of this investigation. During the period of this investigation, a second item of noncompliance with NRC requirements was identified by the NRC Resident Inspector and was included in his inspection report.

REASON FOR INVESTIGATION

On July 28, 1980, Individual A contacted NRC Region III, and advised fire stop materials were not being properly installed at the Donald C. Cook Nuclear Power Plant. On July 30, 1980, Individuals A, B, and C provided eleven allegations concerning the installation of fire stop materials at the plant.

SUMMARY OF FACTS

Individuals A, B, and C provided eleven allegations to NRC Region III relating to the improper installation of fire stop material at the Donald C. Cook Nuclear Power Plant. Investigation of those allegations disclosed one item of noncompliance with NRC requirements: Plant Quality Control Inspectors were not properly documenting their inspection activities of fire stop installations. Independent of this investigation, but during the period of the investigation, the NRC Resident Inspector substantiated one additional allegation: the plant was not establishing firewatches in areas where fire stop material had been removed from penetrations. The latter item of noncompliance was incorporated into the Resident Inspector's inspection report.

DETAILS

1. Persons Contacted

Indiana and Michigan Electric Company

D. Shaller, Plant Manager
B. Svenson, Assistant Plant Manager
J. Stietzel, Quality Assurance Supervisor
E. Morse, Quality Control Supervisor
D. Ruth, Quality Control Inspector
W. Ketchum, Radiation Protection Technician
E. Klakus, Senior Stores Clerk

American Electric Power Service Corporation

J. Yuen, Cognizant Engineer

Individuals

Individuals A, B, and C

2. Receipt of Information

On July 28, 1980, Individual A contacted Nuclear Regulatory Commission Region III (RIII), Glen Ellyn, IL, and stated the fire stop materials were not being properly installed at the Donald C. Cook Nuclear Power Plant.

On July 30, 1980, Individuals A, B, and C were interviewed by RIII personnel and the following information was obtained:

The "technical specification" for fire stop installations was not done until October 1979. The fire stop inspection identified only 85 penetrations as being in noncompliance with the "technical specification." The "technical specification" was closed out prior to all penetrations being sealed. Examples of open penetrations could be found in the Unit 1 Reactor Control Tunnel, Unit 1 Waste Holdup Evaporation Tank Room, Unit 2 Boron Injection Tank Room, and the Intermediate Cable Vaults of Units 1 and 2.

The procedure for filling the penetrations with fire stop foam was not written until June 1980.

Material traceability, by lot and batch number, after the foam leaves the D.C. Cook receiving dock was not maintained. The foam cannot be traced to a specific penetration by the manufacturer's lot and batch number.

The Quality Control Section does not check the sealing materials on an "as-poured" basis.

Fire stop repair kits used by electricians have only a two hour fire rating instead of the required three hour fire rating. The repair kits are intended to be used for temporary repairs, but have been used for permanent repairs. Temporary repairs are required to be made permanent within thirty days.

On occasion the fire stop installers have used "duro-blanket" material, borrowed from the site electricians, as damming materials in preparing the penetrations. The "duro-blanket" materials have not been subjected to any fire testing and are not fire rated.

Specifications require the fire stop material to be poured to a depth of twelve inches. All installations of fire stop material in Unit 1 were poured to a six inch, depth instead of the twelve inch requirement, except for those penetrations presently being repaired.

"RTV" caulking is being used for repairs. "RTV" caulking is only authorized for surface repairs to a depth of 1/2 inch. Additionally, flammable caulk has been used in several instances.

Procedures do not exist for the pouring of lead. Since January 1980 in excess of 700 pounds of lead have been poured and the Quality Control Section has not done a density check of the lead. The Quality Control Section was not present at any time during the pouring of lead for air sampling devices being installed in the upper level of the Auxiliary Building.

Individual A observed flexible conduit had been used in several cable penetrations and was of the opinion the flexible conduit did not carry the necessary three hour fire rating.

Fire watches were not established after the seals on penetrations were opened.

3. RIII Investigation

On July 31 and August 11, 1980, and April 8, 1981, investigation by RIII personnel at the Donald C. Cook Nuclear Power Plant into the allegations made by Individuals A, B, and C disclosed the following:

Allegation:

The "technical specification" for fire stop installations was not done until October 1979. The fire stop inspection identified only 85 penetrations as being in noncompliance with the "technical specification." The "technical specification" was closed out prior to all penetrations being sealed. Examples of open penetrations could be found in the Unit 1 Reactor Control Tunnel, Unit 1 Waste Holdup Evaporation Tank Room, Unit 2 Boron Injection Tank Room, and the Intermediate Cable Vaults of Units 1 and 2.

Findings:

The sections of the plant's Technical Specifications dealing with the fire sealant of penetrations were prepared on March 30, 1976, for Unit 1 (page 3/4-7-51) and on December 23, 1977, for Unit 2 (section 3/4.7.10). The site inspection procedure for fire sealant (Procedure No. 12 QHP 4030.STP.001, "Surveillance Inspection of Seismic Gaps Silicone Fire Seals") was issued on September 19, 1979, and revised on December 4, 1979. Paragraph 1.0 of this procedure provides in part:

"The objective of this surveillance procedure is to verify every eighteen months by visual examination that the penetration fire barrier seals protecting safety related areas are functional as required by the Technical Specification..."

Paragraph 7.0 of Procedure No. 12 QHP 4030.STP.001 does not require the inspection of every penetration within the plant during the eighteen month examination. The procedure states, "prior to beginning this inspection, the group leader will identify the area of the plant he has chosen for inspection. This will be accomplished by utilizing the tables and drawings contained within this procedure."

On July 31, 1980, Derek Ruth, Quality Control Inspector, advised the most recent fire seal inspection was completed on October 22, 1979. The inspection took in excess of 3 1/2 weeks and 4,160 penetrations (8,320 penetration faces) were examined. Of the 8,320 penetration faces, 477 penetration faces were found to be deficient and were reported on Condition Report 12-9-79-404. The Condition Report was still open. Insulation Consultants and Management Services (ICMS) of Baroda, MI, was contracted to repair the deficent penetrations identified during the October 1979 inspection. ICMS was still under contract at the plant and was in the process of completing the identified penetration deficiencies.

Only two open penetrations, not previously identified, were discovered during the period of this investigation. These penetrations were discovered by the Senior Resident Inspector, and are addressed in his Inspection Report (50-315/80-19; 50-316/80-15), dated December 23, 1980.

Allegation:

The procedure for filling the penetrations with fire stop foam was not written until June 1980.

Findings

Four procedures dealing with fire stop foam in wall and ceiling penetrations were in effect at the plant. All four procedures were written prior to June 1980. These procedures were:

Procedure No. 12-QHP-4030.STP.001, "Surveillance Inspection of Seismic Gaps Silicone Fire Seals", dated September 19, 1979, and revised on December 4, 1979.

Procedure No. 12-MHP-5021.001.031, "Fire Barrier Penetration Seals," dated October 31, 1978, with temporary addition dated November 27, 1979.

Procedure No. 12-QHP-2270.QC.001, "QC Inspection on the Installation and Repair of Fire Barrier Penetration Seals," dated February 21, 1979.

Specification No. DCCFP101QCN, "Material and Application Specification - Initial and Repair Installations for Wall, Floor, Ceiling Openings, Fire Barrier and Air Seals," dated July 22, 1974, and revision number 6, dated October 18, 1979.

Allegation:

Material traceability, by lot and batch number, after the foam leaves the D.C. Cook reciving dock is not maintained. The foam cannot be traced to a specific penetration by the manufacturer's lot and batch number as required.

The Quality Control Section does not check the sealing materials on an as-poured basis.

Findings:

On July 31, 1980, the material certificates of conformance and receipt inspection records for fire seals were reviewed. A copy of the material certificate was available for all fire barrier materials previously installed, as well as for the materials currently being installed. The material certificates were identifiable by manufacturer's lot/batch numbers, and the certificates appeared to be receiving a timely review by the licensee's Quality Assurance Department. As an example, Dow Corning, "RTV Foam A&B," Lot Number 3-6548, was received at the plant on January 27, 1980, and the material certificate was reviewed by the licensee's Quality Assurance Department on February 8, 1980.

Two plant procedures dealing with the installation of silicone foam sealant were reviewed.

Procedure Number 12-MHP-5021.001.031 ("Fire Barrier Penetration Seals"), Revision 0, dated October 31, 1978, states in part,

"7.2.3 QC INSPECTION HOLD POINT - Notify QC Inspector so that the following inspections and tests can be completed as applicable...

7.2.3-2 Dispensing ratio test (to be performed at least once per shift) QC Inspector sign off on Attachment 1.

7.2.3-3 Foam density and quality test (to be completed for each penetration to be sealed). QC Inspector sign off on Attachment 1."

Procedure Number 12-QHP-2270.QC.001 ("QC Inspection on the Installation and Repair of Fire Barrier Penetration Seals"), Revision 0, dated February 21, 1979, states in part,

"7.0 DETAILS...

7.4 Perform dispense ratio test (as shown below) once per shift and sign off step 7.2.3-2 of the "Sign Off Sheet" is result is acceptable.

7.4.1 Dispense Ratio Test

7.4.1-1 Simultaneously dispense Part A and Part B silicone components into two separate cups and simultaneously remove them when the two cups are filled.

7.4.1-2 Weigh the cups individually and calculate the ratio by dividing the weight of component A by the weight of component B.

7.5 Perform foam density and quality test (as shown below) and sign off Step 7.2.3-3 of the "Sign Off Sheet" if result is acceptable.

7.5.1 Foam Density Test

7.5.1-1 Fill two sample cups with silicone rubber foam and allow material to set.

7.5.1-2 Trim one of the samples flush with the top of the cup, weigh the filled cup and subtract the average weight of the empty cup to determine the weight of the foam.

7.5.1-3 Divide the weight of the foam (in grams) by the volume of the cup (in ml) to get the density of the foam in grams per milliliter.

7.5.1-4 Identify the second sample with the material lot number, date of pour and pour location or penetration numbers where similiar material will be used. Set this sample aside for reference.

7.5.2 Foam Quality Test

7.5.2-1 Tear open the sample used for calculating foam density to determine if the color, cell structure, texture and tear meet the acceptance criteria.

7.6 Inspect finished seal and sign off applicable step of the Sign Off Sheet if finished seal is acceptable."

On July 31, 1980, during discussions with the Quality Control Inspectors, it was learned the inspectors utilized a "QC Log Sheet," Attachment Number Two to Procedure Number 12-QHP-2270-QC.001 (Exhibit No. I of this report) to record the "Dispense Ratio Calculation" and "Foam Density Calculation." The inspectors stated the samples of foam material were taken once each shift, unless a new batch of foam was prepared, and the calculations were made once each shift. The inspectors stated they had interpreted the entry, "Batch No" under the "Foam Density Calculation" to mean the number of the batch prepared for installation on a particular day and shift. The inspectors stated they were not recording the batch or lot number assigned to the foam material by its manufacturer. Also, the inspectors stated they were utilizing the same numbering system for the individual sample cups and were not recording the lot/batch number assigned to the material by its manufacturer.

Paragraph 7.5.1-4 of plant Procedure No. 12-QHP-2270.QC.001, "QC Inspection on the Installation and Repair of Fire Barrier Penetration Seals," provides in part, "Identify the second sample with the material lot number..." Failure to document the lot (batch) number is contrary to the provisions of Procedure No. 12-QHP-2270 and is considered an item of noncompliance.

On July 31, 1980, the quality control inspectors stated the "Sign Off Sheet," listed as Attachment Number One of the two plant procedures referenced above (Exhibit No. II of this report), was used as the inspection checklist for both in-process and final acceptance inspection of fire barrier seals. In reviewing the "Sign Off Sheet," it was noted the sheet did not provide a space for the date the inspection was actually performed. Two quality control inspectors (Earl Morse and Derek Ruth) stated the date of the inspection was not recorded. Ruth stated the "Sign Off Sheet" was not taken to the inspection site, but was later prepared in the quality control office. Morse estimated the "Sign Off Sheets" were prepared on a monthly to bimonthly basis. Ruth stated the Quality Control Section was provided with a listing of penetrations that had fire seals installed during the preceeding month. The listing of penetrations was prepared by the maintenance and construction departments and forwarded to Quality Control. Ruth further stated he would take the listing from maintenance/construction and from those lists he would prepare the "Sign Off Sheet" indicating he had inspected the penetration, performed the dispense,

foam density and quality acceptance tests, and had conducted the final acceptance tests. Ruth stated he would prepare the "Sign Off Sheet" on a biweekly or sometimes monthly basis. Additionally, Ruth stated he did not make field notes at the time of his inspections of the fire seals and he did not make notes of his inspection results after completing the inspection of the fire barriers.

Paragraphs 7.4 and 7.6 of Donald C. Cook Nuclear Power Plant Procedure No. 12-QHP-2270.QC.001, QC Inspection on the Installation and Repair of Fire Barrier Penetration Seals, provide,

"7.4 Perform dispense ratio test (as shown below) once per shift and sign off Step 7.2.3-2 of the "Sign Off Sheet" if result is acceptable.

7.6 Inspect finished seal and sign off applicable step of the Sign Off Sheet if finished seal is acceptable."

Failure to document the performance of the dispense ratio test "once per shift" and to record the inspection of finished seals at the completion of the inspection is contrary to the provisions of Procedure No. 12-QHP-2270, QC.001, and is considered an item of noncompliance.

Additionally, the "Sign Off Sheet" did not have provisions to record the batch/lot number of the material installed.

During the course of the interviews of the quality control inspectors, plant Specification No. DCCFP101QN ("Material and Application Specification - Initial and Repair Installations; Wall, Floor, Ceiling Openings, Fire Barriers and Air Seals"), Revision 6, October 18, 1979, was reviewed. This specification states in part:

"1.1 The term "Applicator" as used herein shall mean the Contractor making the initial installation or repairs, or I&M Power installation or repairs..."

"7.0 Application Documentation and Records

7.1 Applicator shall prepare a check sheet type form containing the following information:

7.1.1 Name of area in which sealing was accomplished.

7.1.2 Floor elevation of area.

7.1.3 Opening identification numbers (see 5.1).

7.1.4 Seal material (foam or caulk).

7.1.5 Depth of seal.

7.1.6 Lot/Batch number of seal material.

7.1.7 Foam Machine number.

7.1.8 Filled gun (Repair Kit) number.

7.1.9 Applicating person's name.

7.1.10 Accept or Reject indication.

7.1.11 Remarks.

7.1.12 Inspector's name.

7.2 The original of such forms shall be sent to and retained by the I&M QC Department. Copies are to be retained by the Applicator."

Both Morse and Ruth stated the information required in paragraph 7.0 of Specification Number DCCFP101QN was not available for review, as the required information was not being recorded. Neither Morse nor Ruth could provide an explaination for not recording the information specified in paragraph 7.0.

Individuals A and C stated they were not aware of any requirement for the Applicator to record the information specified in paragraph 7.0 of Specification Number DCCFP101QN. Each stated the only requirement to document information was contained in paragraph 7.2.3 of Procedure No. 12-MHP-5021-001.031 ("Fire Barrier Penetration Seals") which provided,

"7.2.3 QC INSPECTION HOLD POINT - Notify QC Inspector so that the following inspections and tests can be completed as applicable.

7.2.3-1 Penetration depth inspection - QC Inspector sign off on Attachment 1.

7.2.3-2 Dispensing ratio test (to be performed at least once per shift) QC Inspector sign off on Attachment 1.

7.2.3-3 Foam density and quality test (to be completed for each penêtration to be sealed). QC Inspector sign off on Attachment 1."

They stated they were specifically aware of the above provisions, as they were required to have a copy of Procedure No. 12-MHP-5021.001.031 in their immediate work area. Each stated they notified the Quality Control Section each time, usually at the beginning of the day, a new batch of fire sealing foam was prepared, and a Quality Control Inspector would come and take samples of the foam in styrofoam cups.

Failure to record and maintain the information required in paragraph 7.0 of Plant Specification DCCFP101QN is contrary to the provisions of that procedure and is considered an item of noncompliance.

On August 11, 1980, during a return visit to the plant it was noted the "Sign Off Sheet" for the penetrations currently being filled were kept at the work site. QC personnel advised they had adopted this procedure of keeping the "Sign Off Sheet" at the work site in order to assure the QC inspections were documented daily. Additionally, QC personnel advised they were in the process of revising the QC inspection criteria for fire seals to include the procedure of keeping the "Sign Off Sheet" at the work site.

Also, the quality control inspectors were recording the manufacturer's lot/batch number of the fire stop foam. The information required by paragraph 7.0 of Specification No. DCCFP101QN was being recorded and maintained.

Allegation:

Fire stop repair kits, used by electricians at the plant, have only a two hour fire rating, instead of the required three hour fire rating. The repair kits are intended to be used for temporary repairs, but have been used for permanent repairs. Temporary repairs are required to be made permanent within thirty days.

Findings:

On August 11, 1980, Earl Klakus, Senior Stores Clerk, Central Stores, advised the fire stop repair kits used by the electricians consisted of the two part Dow Corning foam and was the same material as that being injected into the penetrations by machine.

Paragraph 3.6 of Plant Procedure No. 12-MHP-5021.001.031, "Fire Barrier Penetration Seals," provides in part..."Approved sealant materials are as follows: 3.6.1 Silicone Rubber Foam - Dow Corning 3-6548. Paragraph 7.3 of the same procedure provides in part:

"7.3 Manual installation of silicone foam using kits

7.3.1 For sealing small openings or making repairs to existing seals, it may be advantageous to use a foam kit rather than the machine. The kit will normally contain the two parts of Dow Corning 3-6548 silicone foam in a tube separated by a foil barrier..."

Plant Specification No. DCCFP101QCN, Material and Application Specfication - Initial and Repair Installations; Wall, Floor, Ceiling Openings, Fire Barrier and Air Seals".

"2.0 Approved Sealant Materials

2.2 Two-part silicone foam made with Dow Corning 3-6548 components or equal produced by machines or repair kits. This material is compatible with the material in 2.1 above and has been tested and approved in ASTM-E119 and hose stream tests in accordance with the ANI test method."

Plant Procedure No. 12-MHP-5021.001.031, "Fire Barrier Penetration Seals," provides:

"7.5 Temporary Seal Installation

7.5.1 Fire barrier penetration seals which are non-functional (e.g. seal open for addition of cable, pipe or tubing) require a fire watch stationed. In the event that a penetration is to be temporarily open, a temporary seal may be installed in lieu of a fire watch, for a period not to exceed 30 days. Temporarily seals shall be made as follows:

7.5.1-1 Close opening with non-combustible materials. Pack fiber material into opening to provide seal and/or wedge board material into opening to close larger size space.

7.5.1-2 Apply "skin coat" or RTV over face of bulk fiber materials. Apply RTV seal around perimeter of board materials.

7.5.1-3 Initiate a supplemental job order to install permanent seal in the opening which has been temporarily sealed. The job order shall indicate when the 30 day limit expires for the temporary seal. Signoff on Attachment 1." (Exhibit II)

On July 31, 1980, a random review of "Sign Off Sheets" disclosed all had entries for Supplemental Job Orders, as provided for on the "Sign Off Sheet."

Allegation:

On occasion the fire seal installers have used "duro-blanket" material borrowed from the site electricians as damming materials in preparing the penetrations. The "duro-blanket" materials have not been subjected to any fire testing and are not fire rated.

Findings:

Paragraph 3.6.4 of Plant Procedure No. 12-MHP-5021.001.031, "Fire Barrier Penetration Seals," provides:

"Forming and Damming materials which must be removed following sealing operation once the sealant is cured:

a. duct tape
b. corrugated cardboard
c. wood
d. foam plastic
e. paper
f. mineral wool
g. fiberglass

Visual inspection of numerious fire seals at the plant on July 31 and August 11, 1980, and April 8, 1981, disclosed all flammable damming materials had been removed from these finished fire seals.

Allegation:

Specifications require the fire stop material to be poured to a depth of twelve inches. All installations of fire stop material in Unit 1 were poured to a depth of only six inches. A retrofit program does not exist to bring the depth of the fire stop material to the twelve inch requirement, except for those penetration that are presently being repaired.

Findings:

Plant Procedure No. 12-QHP-4030.STP.001 requires the inspection of fire seals in selected areas of the plant once every eighteen months. Paragraph 8.0 of the procedure provides in part:

"8.0 ACCEPTANCE CRITERIA

Seals that do not contain any of the following deficiencies can be considered acceptable:

8.8 In addition to noting seal degradation characteristics as outlined above, the inspector shall note deviations from installation specifications called out in **12 MHP 5021.001.031 and D. C. Cook Plant Fire Protection Specification DCC FP 101 QCN."

Paragraph 7.1.3 of Plant Procedure No. 12-MHP-5021.001.031, "Fire Barrier Penetration Seals," provides in part:

"Silicone foam sealed penetrations must be sealed to a minimum depth of 12 inches. If necessary, a noncombustible collar, such as angle iron, shall be installed around the penetration to achieve the required depth."

On August 11, 1981, John Yuen, Cognizant Engineer, American Electric Power Service Corporation, was interviewed and provided the following information:

At the time of construction of Unit 1 the requirement for the depth of fire foam installation was six inches. Six inches was the established depth, as it was determined to be sufficient at the time of construction of Unit 1. Subsequently, it was determined the optimum depth of the fire sealant should be twelve inches and Plant Procedure No. 12-MHP-5021.001.031, "Fire Barrier Penetration Seals," was written to include the requirement for the twelve inch depth. The plant does not have a retrofit program, as such. Rather, the eighteen month inspection of selected areas of the plant has been used to identify the fire seals not meeting the twelve inch depth. Also, all new fire seals are being installed to the twelve inch depth.

Allegation:

RTV caulking is being used for repairs. RTV caulking is only authorized for surface repairs to a depth of 1/2 inch. Additionally, flammable caulk has been used in several instances.

Findings:

Plant Procedure No. 12-MHP-5021.001.031, "Fire Barrier Penetration Seals," provides for instances where RTV caulking can be used for permanent repairs in excess of 1/2 inch in depth. These provisions are:

"7.4 Seal Repairs by Caulking

7.4.1 Whenever possible, silicone foam shall be used for seal repairs to the twelve inch depth required. However, in many cases insufficient space exists for complete seals to be installed as specified in sections 7.2 and 7.3. In those instances caulking shall be used to complete the seals as follows:

7.4.2 Sleeves for conduit, pipe or instrument tubing shall be sealed to the maximum extent possible using silicone foam. If the twelve inch depth requirement cannot be satisfied, one end of the sleeve shall be caulked with an approved silicone caulking material to obtain a gas or air seal.

7.4.2-1 QC INSPECTION HOLD POINT

Notify QC Inspector when seal is complete so that a final inspection can be performed. QC Inspector signoff on Attachment 1. (Exhibit II)

7.4.3 Space around cable trays and ducts which cannot be sealed with silicone foam shall be packed with refractory fiber or felt to a nine inch depth followed by a one inch depth of silicone caulk to the face of the wall or floor to obtain maximum gas of air seal possible.

7.4.3-1 For cable trays which are touching, apply caulking between the trays from the top and bottom joint to the extent possible. This caulking should extend out twelve inches from the face of the penetration.

7.4.3-2 QC INSPECTION HOLD POINT

Notify QC Inspector when seal is complete so that a final inspection can be performed. QC inspector sign off on Attachment 1." (Exhibit II)

On August 11, 1980, Earl Klakus, Senior Stores Clerk, Central Storeroom, advised the only caulking material used at the plant was General Electric RTV 133 silicone caulk. Visual inspection of the central storeroom, by RIII personnel, disclosed the only caulking material to be General Electric RTV 133. Site Specification No. DCCFFP101QCN, "Material and Application Specification - Initial and Repair Installations for Wall, Floor, Ceiling Openings: Fire Barrier and Air Seals," provides in part:

"2.0 Approved Sealant Materials

2.1 Machine injected four-part silicone foam (BISCO SF 20) used in the initial sealing and for repair sealing as tested and approved in ASTM-E119-73 and hose stream tests.

2.2 Two-part silicone foam made with Dow Corning 306548 components or equal produced by machines or repair kits. This material is compatible with the material in 2.1 above and has been tested and approved in ASTM-E119 and hose stream tests in accordance with the ANI test method.

2.3 Caulking materials shall be compatible with the above silicone foam. The following materials meet this requirement:

2.3.1 Dow Corning 96-081 RTV silicone rubber, flame retardant adhesive/sealant.

2.3.2 Dow Corning 732 RTV (BISCO SA273) silicone rubber, flame retardant adhesive/sealant.

2.3.3 General Electric RTV 124, flame retardant adhesive/sealant. (No longer available)

2.3.4 General Electric RTV 133 Silicone Rubber Adhesive Sealant."

Allegation:

Procedures do not exist for the pouring of lead. Since January 1980 in excess of 700 pounds of lead have been poured at the plant and the Quality Control Section has not done a density check of the lead. The Quality Control Section was not present at any time during the pouring of lead for air sampling devices being installed in the upper level of the Auxiliary Building.

Findings:

This was determined to be a non-safety related system. Additionally, William Ketchum, Radiation Protection Technician, advised requirements did not exist to have the density of lead pouring monitored.

Allegation:

Individual A observed flexible conduit had been used in several cable penetrations and was of the opinion the flexible conduit did not carry the necessary three hour fire rating.

Findings:

Regulatory Guide 1.120, "Fire Protection," requires conduit of less than four inches in diameter and less than five feet in length be filled with fire retardant material. On July 31 and August 11, 1980, and April 8, 1981, visual inspection by RIII personnel disclosed flexible conduit of less than four inches diameter had been installed at the plant. The visual inspections did not disclose any instances where the installation of the flexible conduit did not meet the requirements of Regulatory Guide 1.120. Further, items made from steel (i.e. conduit and flexible condiut) are accepted as is and do not require a fire rating.

Allegation:

Fire watches were not established after the seals on penetrations have been opened.

Findings:

On July 31 and August 11, 1980, and April 8, 1981, visual inspection by RIII personnel of wall and ceiling penetrations at the plant did not disclose any open penetrations.

On November 24, 1980, the RIII Senior Resident Inspector discovered two open penetrations in the cable vault. These penetrations were open for a minimum of two days without a firewatch being established. The Senior Resident Inspector's observations were recorded in IE Report No. 50-315/80-19; 50-316/80-15 (Exhibit III).

A review of RIII files disclosed: During the period April 17-20, 1978, an open penetration was found in the control room panel area and a firewatch had not been established. This was recorded in IE Inspection Report No. 50-315/78-09; 50-316/78-07. A copy of this inspection report and the licensee's reply are attached as Exhibit IV.

4. Discussions with D.C. Cook Nuclear Power Plant Management

On July 31 and August 11, 1980, and April 8, 1981, the progress and results of this investigation were discussed with Mr. D.V. Shaller, Plant Manager, and members of his staff.

EXHIBITS:
I. Copy of "QC Log Sheet," Plant Procedure 12-QHP-2270-QC.001.
II. Copy of "Sign Off Sheet," Plant Procedure 12-QHP-2270-QC.001.
III. Copy of IE Inspection Report 50-315/80-19; 50-316/80-15.
IV. Copy of IE Inspection Report 50-315/78-09; 50-316/78-07.

12 QHP 2270 QC.001
ATTACHMENT NO.2

Q.C. LOG SHEET

WEIGHT OF 10 EMPTY CUPS=_____GRAMS ÷ 10= _____AVERAGE WT. OF 1 CUP

VOLUME OF 10 DIFFERENT CUPS=_____ML.÷ 10= _____AVERAGE VOL. OF 1 CUP

DATE _____ Q.C. INSP_____

NOTE: REPEAT ABOVE IF CUP STYLE, SUPPLIER, ETC. CHANGES

DISPENSE RATIO CALCULATION

PART A WEIGHT (GRAMS)		PART B WEIGHT (GRAMS)		RATIO	DATE	TIME	SIGN.
	÷		=			/	
	÷		=			/	
	÷		=			/	
	÷		=			/	
	÷		=			/	
	÷		=			/	
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FOAM DENSITY CALCULATION

COMBINED WEIGHT (GRAMS)		AVERAGE CUP WEIGHT (GRAMS)		FOAM WEIGHT (GRAMS)		AVERAGE CUP VOLUME (ML.)		DENSITY (GMS/ML)	BATCH NO.	DATE	SIGN.
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EXHIBIT I

SIGN OFF SHEET

Step 3.2 Penetration No. _____

Bldg. _____ Elevation _____ ☐ Wall ☐ Floor

Description of Location _____

_____

_____

Step 7.3 Radiation Work Permit No. _____

Step 3.7 Training Completed (Maintenance Supervisor) _____

Step 3.8 Supplemental Job Order Initiated _____

Step 5.1 Compliance Requirements Met (SOE) _____

Section 7.2 Machine Installation of Silicone Foam

Step 7.2.3-1 Penetration Depth Inspection Accepted (QC Inspector) _____

7.2.3-2 Dispense Ratio Test (once per shift) Accepted (QC Inspector) _____

7.2.3-3 Foam Density and Quality Test Accepted (QC Inspector) _____

7.2.4-4 Final Inspection Floor Penetration Accepted (QC Inspector) _____

7.2.5-4 Final Inspection of Wall Penetration Accepted (QC Inspector) _____

Section 7.3 Manual Installation of Silicone Foam Seals using Foam Kits

7.3.2 Penetration Depth Inspection Accepted (QC Inspector) _____

7.3.5-4 Final Inspection of Floor Penetration Accepted (QC Inspector) _____

7.3.6-4 Final Inspection of Wall Penetration Accepted (QC Inspector) _____

Section 7.4 Seal Repairs By Caulking

7.4.2-1 Final Inspection of Repair Accepted (QC Inspector) _____

7.4.3-2 Final Inspection of Repair Accepted (QC Inspector) _____

Section 7.5 Temporary Seal Installation

7.5.1-3 Supplemental Job Order Initiated _____

Step 7.6 Inspection of Completed Seal and Work Area (Maintenance Supervisor) _____

Step 7.7 Maintenance Supervisor Signoff for Completed Procedure _____ Date _____

Step 7.8 Maintenance Superintendent Signoff for Review of Entire Procedure _____ Date _____

EXHIBIT II