

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-440/85074(DRS)

Docket No. 50-440

License No. CPPR-148

Licensee: Cleveland Electric Illuminating
Company
Post Office Box 5000
Cleveland, OH 44101

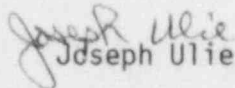
Facility Name: Perry Nuclear Power Plant, Unit 1

Inspection At: Perry Site, Perry, OH

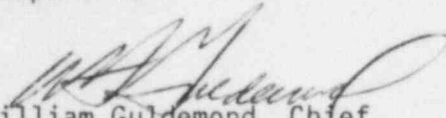
Inspection Conducted: October 21-25, 1985, November 19-22, 1985, and
December 5, 1985.

Inspectors: 
Jeffrey Holmes

12-20-85
Date


Joseph Ulie

12-20-85
Date

Approved By: 
William Guldmond, Chief
Operational Programs Section

12-20-85
Date

Inspection Summary

Inspection on October 21-25, 1985, November 19-22, 1985, and December 5, 1985
(Report No. 50-440/85074(DRS))

Areas Inspected: Routine, announced inspection of outstanding fire protection issues including a continuing assessment of the licensee's fire protection program, and a review of allegations received by the NRC relative to penetration seals. The inspection involved a total of 340 inspector-hours onsite and in-office by two NRC inspectors and their consultants including 61 inspector-hours onsite during off-shifts.

Results: In the areas inspected, no violations were identified.

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PDR ADOCK 05000440
Q PDR

DETAILS

1. Persons Contacted

Cleveland Electric Illuminating Company

***W. Avery, Quality Engineer
***C. Bangerter, Associate Engineer Technician
***L. Beck, GSE
*D. Birku, Senior Engineer Technician
*B. Burns, Operations Consultant
*W. Colvin, Operations Engineer
*T. Feldman, Responsible Engineer
**B. Ferrell, Licensing Engineer
***R. Fobell, Electrical Engineer
**M. Gmynek, Senior Operating Coordinator
***M. Haynor, Licensing Engineer
**T. Heatherly, Compliance Engineer
***E. Herrmann, Engineering Aide
*J. Ioannidi, Site Project Manager
***P. Kiel, Fire Protection Specialist
*M. Kritzer, Unit Supervisor
**B. Liddell, Operations Engineer
**R. Luse, Support Services Supervisor
*M. Lyster, Manager
***T. Mahon, General Supervisor
***M. Makar, Fire Protection Engineer
*R. McNabb, Electrical Project Engineer
***E. Mead, SPE
*E. Ortalan, System Engineer
***J. Pelcik, Lead Station Quality Engineer
***W. Peterson, System Test Engineer
***W. Peters, Responsible Engineer
*E. Riley, General Supervisor
**R. Salkiewez, Construction Engineer
**D. Steiner, Quality Engineer
***R. Stratmen, GSE
*R. Vondrasek, GSE
*E. Willman, Senior Engineer
***J. Waldron, Plant Manager

*Denotes persons in attendance at the exit meeting of October 25, 1985 only.

**Denotes persons in attendance at the exit meeting of November 22, 1985 only.

***Denotes persons in attendance at the exit meetings of October 25 and November 22, 1985.

The inspector also contacted other licensee personnel including members of the training and operations departments.

2. Action on Previous Inspection Findings

(Open) Open Item (440/85056-01(DRP)): The inspector noted that gypsum board fire walls contained penetrations for mounting area temperature monitors, plant paging system hand sets, and other equipment. These penetrations potentially violate the fire resistance rating of the wall and are not representative of the fire wall design contained in submittals to the Office of Nuclear Reactor Regulation (NRR) which described the walls as intact.

In response to this concern, the licensee provided a section of Underwriters' Laboratory Incorporated Fire Resistance Directory (January 1984), addressing penetrations in walls and partitions. In addition, the licensee provided the following information:

- a. "Analysis of Penetrations into Gypsum Board Fire Walls"
- b. "Unistrut Analysis"

In the "Analysis of Penetrations into Gypsum Board Fire Walls", it states, "As a guideline for analyzing the existing conditions of the gypsum board walls in Perry Plant, the guidelines in the General Design Information Section of the Underwriters' Laboratories Fire Resistance Director January 1984 were referenced. Page 13 indicates that penetrations into or through the wall can significantly affect the hourly rating. Metallic outlet and switch boxes may be used in steel stud walls with ratings not exceeding two hours if the surface area of any box does not exceed 16 sq. in. and the aggregate surface areas of the boxes does not exceed 100 sq. in. over a 100 sq. ft. area. Boxes on opposite sides of the wall should be separated by 24 in.

At Perry Plant, there are no large equipment panels inset into the walls. Only security card readers, 3 x 5 in. boxes, are inset into the walls at some locations.

Other equipment mounted on the gypsum board walls is attached to unistrut supports rather than directly to the wall. The unistruts are about one inch wide and of various lengths and depths, and are generally attached to the surface of the wall with fasteners into the studs.

A walkdown was made of the gypsum board walls which are utilized as rated barriers providing separation of safe shutdown or safety-related equipment as described in the FPER. The results of the walkdown revealed that the problem of imbedding the unistrut supports in the gypsum board wall occurred mostly in the bullet-resistant walls."

The "Analysis of Penetrations into Gypsum Board Fire Walls" also indicated "Other areas where the unistrut is mounted into the wall occur at the control complex 638 cable spreading room, where three, 15-inch lengths of unistrut are imbedded for communication equipment, and in the Division 2 D.C. equipment room where about 20 sq. in. of unistrut are imbedded in the north wall.

In both instances, the amount of exposure caused by the unistrut is within the 100 sq. in. of imbedded area per 100 sq. ft. of wall surface area limits. The unistruts are also not directly opposite each other on opposing faces. The above-mentioned areas do not have penetrations into the wall to the extent that barrier performance is degraded.

Future modifications to the fire barriers will be done via the plant Design Control Program. As part of the program, proposed changes are evaluated for their fire protection impact. Included in this review are proposed modifications to fire walls (see Attachment 1). Mounting of equipment will be evaluated to identify any possible violation of barrier integrity including new penetrations and cut-outs."

In the Unistrut Analysis, the licensee states in part ". . . as the walls are upgraded as discussed in our letter of September 12, 1985 (PY-CEI/NRR-342L), we will minimize the amount of exposure caused by these openings (over 16 square inches) by filling in the unistruts with a fire retardant (pyrocrete) material to maintain individual items within the U. L. criteria".

The inspector requested that the licensee provide justification that the pyrocrete can be utilized in the configuration proposed. This item will remain open pending review and acceptance of the licensee's response.

(Closed) Open Item (440/85010-06(DRS)): During the Plant Operations Review Committee (PORC) Meeting No. 85-22, PORC recommended approval of Plant Administrative Procedure PAP-1917, Revision 2, "Fire Protection Training Programs". Branch Technical Position CMEB 9.5-1, "Guidelines for Fire Protection at Nuclear Power Plants," Sections C.1.a(4)(d)v. and vi. recommend the implementation of training programs for indoctrination of personnel in appropriate administrative controls implementing the fire protection program and emergency procedures relative to fire protection. Procedure PAP 1917, Revision 2, only required General Employee Training (GET) to include response to a fire emergency.

Subsequently, the licensee implemented Plant Administrative Procedure PAP-1913, covering the "Control of Transient Combustibles" which administratively limits the amount of transient combustibles that can be brought into in a safety-related area to a one day's supply. Further, the industrial and fire safety modules of the GET program expound on general and fire safety topics, emergency notification including fire protection, and other related topics. The inspector did note that instruction on the proper handling of accidental events such as leaks or spills of flammable materials that are related to fire protection could be strengthened.

Other Plant Administrative Procedures that have been established for fire protection purposes include PAP-1920, "Periodic Fire Inspections", PAP-1915, "Fire Report", and PAP-1918, "Fire Drills". This complete package of procedures is adequate to satisfy the above-referenced NRC guidelines.

(Open) 10 CFR 50.55 (e) Item (440/85002-EE): The licensee was advised by Region III to put forth sufficient engineering effort regarding fire dampers failing to close under normal duct pressure so that any necessary modifications can take place prior to fuel load.

Licensee internal memorandum dated August 20, 1985 from H. Reppert/J. Cichello to H. Dieckmann stated in part that "... fire dampers shall be tested under air flow conditions to ensure acceptable closure." An attachment to that memorandum identifies fire dampers (130) which shall be tested under air flow conditions. The selection of fire dampers to be tested was based on the following:

- a. Common sized dampers
- b. Highest velocity for dampers in each common size
- c. Each mounting style for each common size
- d. When like dampers (i.e., same size, velocity, and mounting) are in reportable barriers and nonreportable barriers, the fire damper in the reportable barrier is tested.

The "Unit 1 and Common Fire Dampers Evaluation" (Revision 2) and "Unit 1 and Common Fire Damper Test Size Sort (In Order of Descending Velocity)" indicate the damper identification numbers, actual damper sizes, number of damper sections, smallest section of given damper, design velocity (air velocity in feet per minute (FPM) through smallest section of damper assuming total duct air flow through that smallest damper section), the Ruskin test velocity, and other parameters used during the test. The "Summary of Unit 1 and Common Fire Damper Evaluation" (Revision 2), indicates whether dampers passed or failed. In all cases where a damper failed, corrective comments were noted. The inspector requested a summary of the corrective actions taken for the dampers that failed and the test results for the corrective actions. The licensee agreed to provide this summary.

The licensee provided the inspector with Damper Test Procedure "In Flow Fire Damper Functional Test" No. GEN-M-037 Revision 0 dated August 26, 1985 which provides detailed instructions on functionally testing fusible link fire dampers with system air flow. The inspectors requested that several dampers be tested under air flow conditions. Horizontal Dampers FO 594, FO 611, and FO 614 were tested and closed and latched under air flow conditions.

This item remains open pending NRC review of documentation establishing the acceptability of those dampers which failed to close under air flow conditions. This item must be closed prior to fuel load.

(Closed) Open Item (440/85015-01(DRS)): Procedural revision is needed for the repair contemplated in achieving cold shutdown involving cutting two low voltage signal wires to prevent a spurious signal to the RHR pump start interlock circuit. This repair is only required for some fires outside of the control room and is accomplished in a relay cabinet located in the control room. This repair is allowable under the guidelines used for Appendix R (cold shutdown). The licensee provided Off Normal Operating Instruction ONI-P54, Revision 2 which lists the steps required to disable the RHR pump trip on an incomplete suction path by lifting the appropriate leads for RHR pumps A and B, thus satisfying the inspector's concern.

(Open) Open Item (440/85015-02(DRS)): The licensee provided a list of proposed hardware and procedure modifications for various fire areas which are necessary if the plant is to comply with the requirements of 10 CFR 50, Appendix R, Section III.G.2 in the following areas:

- Steam Tunnel
- ESW Pumphouse
- Diesel Generator Building
- Radwaste Building
- Intermediate Building
- Auxiliary Building
- Control Complex

These modifications and actions consist of proceduralizing certain local operations, wrapping cable raceways, rerouting certain cables and conduits, installing/extending sprinkler systems, and installing heat shields.

During the October and November inspection visits, the inspectors selected several modifications to inspect and determine their completeness .

Of the areas inspected requiring cable wrap or radiant energy heat shields, no deficiencies were observed, although additional cable pulling work was on-going causing certain equipment previously wrapped to be undone and thereby requiring rework to be performed.

The inspectors verified that the following cable and conduit reroutes had been performed: cable IE51-F063 and fan units cabling or conduits numbered OM26, K070A, K050A, and OM25. The inspectors verified through the review of drawings and by visual inspection that a newly installed sprinkler system had been installed in the Intermediate Building, elevation 620' over safety-related cables in Zone IB-3, between Column IB1 and IB3 and Columns IBA and IBP and that an existing sprinkler system in the Control Complex, elevation 574' 10" covering fire zones CC-1a, CC-1b, and CCC-1c had been extended to provide suppression coverage over certain safe shutdown components of one train.

The portion of the open item dealing with proceduralizing certain local operations is closed in Open Item (440/85015-01(DRS)).

As discussed below for open item 440/85015-03(DRS), installation of radiant heat shields in the containment is on-going. Completion of that activity will be tracked under this open item which must be resolved prior to fuel load.

In addition, open items 440/85015-08 and 09 regard wrapping other cables, components, and devices for spurious operations and common enclosure concerns. Installation of the required wraps will be tracked under this open item.

(Closed) Open Item (440/85015-03(DRS)): The installation of radiant energy shields in the containment building was not complete because fabrication and welding were in progress. This item is being consolidated into open item (440/85015-02(DRS)).

(Closed) Open Item (440/85015-04(DRS)): The licensee provided the following procedures to the inspectors for review:

- OM4B ONI-C61 - Off normal instruction for evacuation of the control room (C61), Revision 1.
- OM4A IOI-11 - Integrated operating instruction to shutdown from outside the control room.

These procedures were both in draft form at the time of initial review; however, they were found to contain all the necessary steps to accomplish safe shutdown from outside the control room. The inspectors determined that the procedures are straight forward, requiring a minimum of manual operations, and no repairs are required for achieving hot shutdown. After leaving the control room, one operator proceeds directly to the remote shutdown panel to commence shutdown, while another operator insures rod insertion, turbine trip, and local start of the Division 1 Diesel Generator if required. All other operations required for achieving and maintaining hot shutdown can be accomplished at the remote shutdown panel.

The approved procedures were provided by the applicant at the start of the October 21-25 inspection visit. They were reviewed and discussed with CEI personnel and found to contain an orderly sequence of procedural steps to accomplish a safe shutdown from outside the control room.

A walk-through of procedure IOI-11 was accomplished with three operators, each one accompanied by a member of the inspection team. One operator remained at the remote shutdown panel while the other two operators walked through the following procedural steps: control room isolation (4.10.1), local control of the control complex chiller (4.10.2), and Division 1 Diesel Generator Startup (4.11).

During the walkdown the operators exhibited familiarity with the procedural steps and location of instruments and controls. Communication between the operators was maintained with portable UHF radios and repeaters. The walk-through demonstrated that the applicant could achieve stable hot shutdown and proceed to cold shutdown outside of the control room within the 72 hours as required by Appendix R.

(Closed) Open Item (440/85015-05(DRS)): It was noted that the local control panel for the Division 1 Emergency Diesel Generator, which provides emergency alternative shutdown power, was not electrically isolated from the control room. Isolation is required for the transfer switch, voltage regulator and speed control circuits. Two engineering change notices (ECNs) were initiated to provide electrical isolation from the control room.

These two ECN's numbered 27102-86-1502, Revision M, and 28301-86-2112, Revision B, were verified to have been implemented and satisfactorily completed.

(Closed) Open Item (440/85015-06(DRS)): The inspectors reviewed the licensee's associated circuit analysis for common bus concerns (circuits where there is a common power source with shutdown equipment and the power source is not electrically protected from the circuit of concern). Draft "Appendix R re-evaluation: Safe Shutdown Capability Report" listed a number of circuits which were uncoordinated and were supplied by class 1E, 480V buses. To comply with 10 CFR 50, Appendix R, III.G.2, the licensee was to wrap the redundant divisions which pass through a common fire area. The analysis supporting this approach was incomplete at the time of the inspection and the required wraps were not installed.

The licensee analyzed circuit coordination for the uncoordinated circuits and was successful in reducing the number of affected circuits. This was accomplished by changing to the 600 amp taps on the circuit breakers for motor control centers (MCCs) EF1A08, EF1B08, EF1C08, and EF1D08. The circuits which remain uncoordinated are as follows: IM23F4B, IM23F3A, IM26F3A, IM26F2B, IM26F1A, and IM26F7B and these are wrapped with fire barrier material. The inspectors found the licensee's analysis to be adequate.

(Closed) Open Item (440/85015-07(DRS)): The licensee had not completed an analysis for current transformer (CT) secondaries. They had identified circuits of concern and had made inquiries of the manufacturer of the CT's to determine the impact of damage to them as the result of a fire. Official response from the manufacturer was not available during the initial audit; therefore a complete evaluation could not be conducted.

During the October inspection visit the inspectors were provided documentation from the manufacturer (Brown Boveri, Inc.) of the CT's showing the impact of fire damage to the CT's to be satisfactory.

(Closed) Open Item (440/85015-08(DRS)): The licensee proposed to wrap cables, components and devices which may induce spurious operation. This item is being consolidated into open item (440/85015-02(DRS)).

(Closed) Open Item (440/85015-09(DRS)): A common enclosure concern is found when redundant circuits are routed together in a raceway or enclosure and are not electrically protected, or a single fire can destroy both circuits.

At the time of the inspection the licensee stated that redundant divisions and non-safety circuits are run in dedicated separate trays and fault protection is provided. Some class 1E and non-class 1E circuits do not have adequately coordinated circuit breaker protection. The licensee has proposed to wrap these cables with fire wrap material. This modification does provide minimum compliance with Appendix R, Section III.G.2 requirements. Installation of the wrapping on cable raceways will be tracked with Open Item (440/85015-02(DRS)).

(Closed) Open Item (440/85015-10(DRS)): Communications required to assist in effecting post fire safe shutdown had not been established at the time of the initial inspection. The inspectors observed the plant radio system being utilized during the procedure walk-through and determined the plant radio system to be satisfactory.

(Closed) Open Item (440/85015-11(DRS)): 10 CFR 50, Appendix R, Section III.J requires emergency lighting units with at least an eight hour battery power supply be provided in all areas needed for operation of safe shutdown equipment and in access and egress routes to those areas. In discussions between the licensee and inspection team at a meeting in Bethesda, Maryland on March 14, 1985, the licensee's staff indicated that since the safe shutdown analysis had not been finalized, the permanent location of the required emergency lighting units had yet to be determined.

To determine the location of the eight hour emergency lighting units, a walkdown was performed by a human factors specialist and a Plant licensed operator. Utilizing the safe shutdown procedure, the team walked the paths of all areas requiring tasks to be performed, identifying any inadequacies and the corrective actions needed. Of primary concern during these walk-throughs was illumination adequacy. The licensee provided the inspector with ECN 27179-33-4773 showing additional lighting units were to be installed based on the human factors walkdown; lighting unit test results performed according to Procedure No. 1R71-P-001 showing that Quality Control inspectors witnessed certain steps performed throughout the eight hour discharge test of certain battery packs; and the proposed "Self-Contained Emergency Lighting Monthly Functional Test". This procedure and other lighting documentation were found to be satisfactory.

Further, regarding the Control Room emergency lighting system, the licensee requested a deviation from Section C.5.g of BTP CMEB 9.5-1 by letters dated June 12, 1985 and October 3, 1985 to the extent that it requires emergency lighting units be equipped with eight hour battery power packs in the control room. The control room lighting fixtures are fed from two lighting panels. One of the two lighting panels (R71-P083) is fed from the Division 1 safety-related power system. The second lighting panel (R71-P085) is fed from the auxiliary, non-class 1E, power system. Upon a loss of offsite power, the second lighting panel (R71-P085) will be transferred to receive power from the Division 2 safety-related power system.

Lamps over the primary plant operating area in the control room are separated into two redundant groups. One group is connected to one lighting panel. The remaining group is connected to the other panel. Either lighting group provides sufficient light to perform safe shutdown operations. In addition, there is two hour battery supplied lighting for the control room that also provides lighting sufficient to safely shutdown the plant.

The AC lighting fixtures in the primary plant operating area of the control room can be powered from either of the two lighting panels and supplied from the redundant divisions of class IE AC power systems supplied by the diesel generators. Therefore, the AC powered lighting can be relied upon to function after a fire.

NRR concluded that the existing control room emergency lighting arrangement was an acceptable deviation.

(Closed) Open Item (440/85015-12(DRS)): The Perry Nuclear Power Plant Fire Protection Evaluation Report (FPER) (Revision 3) Section 5, entitled, "Point-by-Point Comparison of Appendix A" stated that, "the underground yard fire main loop is installed in accordance with NFPA 24." The inspectors requested that the licensee provide valid documentation that the underground main has been installed per NFPA 24 for anchorage, depth of frost, and hydrostatic test.

The licensee provided the inspector with the Attachment Specification for the "Installation of Underground Fire Protection Water, Potable Water, and Miscellaneous Steel Piping". In section 1:04 titled Applicable Codes and Standards it indicates that all work including design, material, installation, and workmanship shall comply with the National Fire Protection Association (NFPA) Standard Number 24, "Outside Protection" 1973 edition as well as several other codes. The inspector was also provided with the line specifications for the underground fire main which indicates that NFPA-24 was the design code.

a. Anchorage of Underground Fire Main

The inspector reviewed drawings D-928-005 Revision D and E-303-003 Revision Q which indicated that the piping was welded or provided with special approved restraining joints as described in NFPA-24. Based on the information provided, this portion of the item is considered closed.

b. Depth of Frost

The inspector reviewed drawings 4549 E-303-002, Revision U; 4549E-303-005, Revision P; 4549E-303-010, Revision F; 4549D-728-001, Revision C; 4549E-744-044, Revision L; 4549D-928-005 Revision D; 4549D-928-008 Revision B; KE878, Revision 4. The licensee also provided the inspector with two survey points of the grade that indicated that portions of the underground fire main reviewed were located at least one foot below the frost line as required by NFPA-24.

Based on the information provided to the inspector, this portion of the item is considered closed.

c. Hydrostatic Test

The licensee provided the inspector with drawing No. 55A which indicated the test boundaries for each hydrostatic test and the contractor's material test certificates for the underground fire main. The licensee also provided Test Report Forms that were completed by the contractors after completing the scope of work detailed in a document entitled "Installation of Underground Fire Protection Water, Potable Water, and Miscellaneous Steel Piping". Procedure No. SP-146-4549-00 Section 1:05.4 entitled "Pressure Testing" indicated that all underground piping should be hydrostatically tested to 225 psig for two hours and that all testing of the fire protection system shall be in accordance with NFPA-24 and witnessed by the site organization. Based on the information provided to the inspector, this portion of the item is considered closed.

(Closed) Open Item (440/85015-13(DRS)): The licensee was requested to provide a complete test package including a field acceptance test for the diesel fire pump.

The inspector verified that the licensee had a complete test package which included the Diesel Fire Pump Field Acceptance Test. The inspector reviewed the Diesel Fire Pump Field Acceptance test results and noted that the pump appeared to be operating satisfactory when compared to the shop test.

(Open) Open Item (440/85015-14(DRS)): The licensee was requested to provide a complete diesel generator CO₂ fire protection test result package. This was provided and the results appeared to be satisfactory except as discussed below.

The inspectors requested a puff test for the Emergency Diesel Generator CO₂ system Unit 1, Division 1 (Room 5); however, the licensee indicated to the inspectors that the HVAC for this system was tagged out in the control room. The inspectors then requested that the Emergency Diesel Generator CO₂ system for Unit 1, Division 2 be tested. The licensee indicated that the ventilation system fan trip for the Emergency Diesel Generators CO₂ system was miswired between the Unit 1, Division 2 (Room 7) CO₂ system and Unit 1, Division 3 (Room 6) CO₂ system. The inspectors requested that a puff test be conducted on Unit 1, Division 2 (Room 7) without the fan trip. The inspectors observed the CO₂ system puff test in Room Number 7 and indicated to the licensee that corrective action is needed in this area. The licensee indicated to the inspectors that corrective action will be taken on all three CO₂ systems. The inspectors requested that when the work is completed, for the licensee to forward puff test results for the Emergency Diesel Generator CO₂ system for Unit 1 Division 2 (Room 7) to Region III. In addition, the licensee was requested to verify that the proper CO₂ nozzles were installed. Resolution of this issue is required prior to fuel load.

(Closed) Open Item (440/85015-15(DRS)): The licensee was requested to provide the concentration test and the manufacturer's test for halon fire protection test results packages OP54-A-008, OP54-A-009 and OP54-A-010.

The licensee provided the inspectors with the requested information and based on the information received this item is considered closed.

(Closed) Open Item (440/85015-16(DRS)): Regarding the Eight Hour Incipient Firefighting Program the following comments were generated:

- a. Further clarification is needed to indicate whether individuals will be allowed to use the 1-1/2 inch fire hose stations to fight incipient type fires. According to the licensee, individuals in this program are provided both classroom and practical instruction on the proper use of 1-1/2 inch hose, portable fire extinguishers, and other equipment to support the fire brigade. An inspector witnessed a portion of the hands-on training provided personnel in this program and found it to be adequate.
- b. In the outline for this program no mention is made that training for fighting fires in energized electrical equipment will be provided. Lack of such training could result in damaging vital equipment. According to the licensee, participants in this program are instructed not to approach energized electrical equipment that is on fire until the equipment is de-energized except when using a Class C rated fire extinguisher. This is considered adequate.
- c. Attachment A (Unit No. 6) of this program indicates that hands-on fire training will occur on Class D (combustible metals) fires; however, in Attachment B, the equipment listed as being needed for the hands-on portion of the program does not include Class D equipment. According to the licensee, referencing training on fighting Class D fires was an error. The inspector verified that this reference was removed from the program text and from Attachment A and is no longer considered part of the hands-on training program.

(Closed) Open Item (440/85015-17(DRS)): The inspector raised the following two questions regarding the fire brigade training program:

- a. Paragraph (e) of Unit 10, "Fixed Protection Systems", indicates that hands-on fire training will occur on all four classes of fire and references Unit 26, "Extinguishment". No mention is given to an energized grid for practicing on energized electrical type fires (class C) or combustible metals (class D). Further clarification is needed regarding this discrepancy.

The inspector learned that hands on training for Classes C and D fires is not provided, although classroom instruction is provided to show how to approach these two types of fires. Paragraph (e) of Unit 10 has been corrected and verified by the inspector.

- b. Unit 25, "Radiation Hazards, Hazardous Materials", provides insufficient information in the areas of exposure and contamination control.

The licensee provided the inspector with additional information concerning Unit 25 training. The Health Physics Department provides the instruction for Radiological Controls Training and Respiratory Protection Equipment Training. The inspector did not attend either of these training programs, although discussions between the inspector and the licensee's staff indicated the information being provided in these programs meets NRC guidelines. In addition, the fire brigade training program provides hazardous materials training including practical exercises in the proper firefighting approach to take in handling plant specific hazardous materials.

(Closed) Open Item (440/85015-18(DRS)): The inspector made the following three comments regarding the fire protection portion of the General Employee Training Program (GET):

- a. The program does not list emergency numbers to call in case of a plant emergency. The industrial safety (Module 5) portion of GET now lists emergency numbers and also provides instruction on the types of communication systems available to notify the Control Room in case of fire and the proper action to take when discovering a fire.
- b. Two references are made to the use of carbon dioxide fire extinguishers on class A (ordinary combustibles) type fires. General employees should not use carbon dioxide fire extinguishers on class A type fires as carbon dioxide is expelled out of the extinguisher at approximately 850 PSI and this could spread the burning combustibles.

The licensee has corrected these two references and no longer recommends the use of carbon dioxide fire extinguishers on Class A type fires.

- c. The GET program contained little detail on the amount of combustibles allowed in safety-related areas, training in the handling of and limitation on the use of combustibles, flammable and explosive hazards, controlling transient fire loads, the proper handling of accidental events such as leaks or spills of flammable materials, and administrative and emergency procedures. Plant Administrative Procedure PAP-1913, Revision 0, has been established to limit the amount of transient combustibles that can be brought into a safety-related area. Step 6.4.1 of the procedure indicates no more transient combustibles than a one day's supply is allowed within designated storage areas.

The fire protection portion of the GET program now includes training in the transient combustible procedure (PAP-1913) and identifies the use of the Work Order process if flammables or combustibles such as bottled gases are required to be brought into the plant. Further,

PAP-1920 establishes "Periodic Fire Inspections" so as to ensure the plant is in a fire safe condition, including observations for the accumulation of combustible materials and the improper storage of combustible or flammable materials.

(Closed) Open Item (440/85015-19(DRS)): The inspectors questioned whether safety-related systems training for qualifying security personnel assigned to the fire brigade was adequate. The licensee's lesson plans and other related information were reviewed and found adequate.

(Closed) Open Item (440/85015-20(DRS)): The licensee was requested to revise the fire damper surveillance test procedure (GEN-M-031, Revision 1) to include the use of a heat gun to trip the fire damper instead of removing the fusible link(s) S-hooks. Further, the fire damper surveillance test procedure failed to verify that once a horizontal fire damper has closed, the latching device latches.

The inspectors reviewed the "Fusible Link Fire Damper Test" procedure numbered GEN-M-031, Revision 2, which required the use of an electric Heat Gun or an equivalent heat source to release the blade package by melting the fusible link and verifying that it closed. As discussed with the licensee, an equivalent heat source is not an open flame device. The procedure states, "Damper has closed properly if there is no direct see through between the blades and the frame; horizontal dampers are provided with primary and secondary latches, both of which are required to be engaged to consider the damper/section fully closed." This is acceptable for closure of this item.

During the inspector's on-site and in-office review, concerns related to fire damper installations were raised as follow:

- (1) The size of ganged and individual damper sections should be verified to not exceed approved tested configurations.
- (2) Installation of fire sealant material should not compromise the design expansion capability of damper assemblies as specified in the manufacturer's installation instructions on listings of damper assemblies.

Regarding number (1), the licensee indicated to the inspector that there were three oversized dampers located in fire barrier walls. The licensee provided an engineering analysis for each of the dampers which has been reviewed by NRR. As discussed with NRR, the dampers have been accepted based on the information received from the licensee.

Regarding number (2), according to the licensee, fire sealant material is not installed which will compromise the design expansion capability of damper assemblies as specified in the manufacturer's installation.

(Closed) Open Item (440/85015-21(DRS)): During discussions between the licensee's staff and the inspector it was determined that the licensee was not planning on sealing the inside of conduits that penetrate rated fire barriers or penetrations in accordance with NRC guidelines.

On March 21, 1985, the licensee's staff and the NRR fire protection reviewer met to discuss the inspector's concerns in this area. At this meeting the licensee committed to seal penetration openings inside conduit larger than four inches in diameter at the fire barrier penetrations. For conduit four inches or less in diameter, the licensee proposed to submit to NRR a report detailing how the licensee planned to meet their commitments.

By letter dated May 3, 1985, the licensee proposed sealing criteria for conduit four inches or less in diameter. By letter dated June 10, 1985, NRR informed the licensee that the proposed sealing criteria were not acceptable.

By letters dated June 26, 1985 and August 1, 1985, the licensee submitted revised sealing criteria and provided the results of fire tests on conduits sealed in accordance with the proposed criteria exposed to the ASTM E-119 standard time-temperature curve. The proposed sealing criteria, which apply only to conduits four inches or less in diameter, are delineated in Exhibit 1 to the licensee's August 1, 1985 letter and will be included in a future FPER revision. The proposed sealing criteria permit unsealed conduits where automatic area-wide fire suppression systems are provided on both sides of the fire barrier and where there is no threat to redundant safe shutdown components. Where a potential exposure to redundant safe shutdown trains exists, conduits will be sealed at the barrier or the first opening on one or both sides of the barriers depending on the diameter and length of the conduit.

The fire test demonstrated that the conduits sealed and/or configured in accordance with the licensee's proposal prevented smoke and hot gas propagation throughout the three-hour test period. None of the unexposed side thermocouples exceeded the temperature acceptance criteria specified by either ASTM, ANI, or IEEE for the three-hour fire rating of the barrier.

Based on evaluation and review of the test results, NRR concluded that the licensee's proposed sealing criteria for conduits four inches or less in diameter will provide an equivalent level of protection to that achieved by compliance with Section C.5.a(3) of BTP CMEB 9.5-1 and that the licensee's conduit sealing proposal was an acceptable deviation from Section C.5.a(3) of BTP CMEB 9.5-1.

(Closed) Open Item (440/85015-22(DRS)): The inspector requested the licensee's consultant and Bisco site personnel to revise the three Bisco installation procedures numbered SP505-A, SP505-1, and SP505-2 to reflect the as tested flexible boot seal configuration. By letter dated March 21, 1985, Bisco advised the licensee that the inconsistencies would be corrected.

Step 7.2.2 of Bisco Flexible Boot installation procedure (SP505) has been revised to more clearly reflect the as tested boot seal configuration. Procedures SP505-1 and SP505-02 were incorporated into SP505. Inspection Report No. 85015-22 misidentified Bisco Procedure SP505 as not existing and a typographical error referenced a review of SP505-A. Bisco Procedure SP505 does exist as the Flexible Boot Seal Installation procedure.

Regarding the boot overlap axial seam calculations, the inspector reverified that for a fire seal, Bisco Test Procedure and Report No. 748-112 utilizing the Bisco Fabrication Procedure were the correct supporting documents including Test Report and Procedure 748-178. For a pressure seal, the licensee referenced Bisco Test Report and Procedures Numbered 748-201D and 748-124.

(Closed) Open Item (440/85015-23(DRS)): On March 20, 1985, during a plant tour of the facility, the inspectors observed numerous fire door assemblies which were not labeled or listed by a nationally recognized testing laboratory as specified in BTP CMEB 9.5-1, Section C.5.a. According to the NRR reviewer, the licensee verbally committed to have each fire door assembly labeled and listed or tested in accordance with NFPA 252.

On October 23, 1985, an inspector, accompanied by members of the licensee's staff and their consultant, performed a walkdown of certain fire doors. Two doors failed to have a label demonstrating the listing of these doors. The licensee provided construction Quality Section Inspection Reports for these two doors showing that a label had been on these doors at the time of original inspection. Additionally, the licensee provided an Underwriters Laboratories (U.L.) letter dated March 27, 1985, showing that a U.L. inspection at the site of these doors indicated missing labels. Based on the walkdown of the sampled fifty two fire doors and their approved assemblies this item is considered closed.

During the inspectors' walkdown, four of the fifty two doors were found inoperable in that they did not latch. These doors were numbered as Control Complex (CC) CC-521 and CC-517; and Intermediate Building (IB) IB 218 and IB 217. This is considered an open item (440/85074-01(DRS)) pending inspector followup. The inspector informed the licensee that a final walkdown by the inspector prior to fuel load is necessary to verify the operability of all required fire doors.

During a subsequent walkdown by the inspectors, two other observations were made in the Cable Spreading Room, Unit 1, as follows: (1) several unsealed penetrations were observed in the fire rated barriers, and (2) a sprinkler head was observed to have been covered with pyrocrete material which could cause a delayed activation of the sprinkler head. This is considered an open item (440/85074-02(DRS)) pending inspector followup of the licensee's actions.

(Closed) Open Item (440/85015-24(DRS)): In Fire Zone 1AB.3b, the inspectors observed cable tray concentrations of greater than six trays without automatic sprinkler protection. The licensee verbally committed to install automatic sprinkler protection throughout this area.

Attachment 1 of a letter dated May 21, 1985 from M. Edelman/CEI to B. Youngblood/NRR (PY-CEI/NRR-0243L) states:

"Status

Revision 4 of the FPER will identify the addition of partial area automatic sprinkler protection. Specifically, automatic suppression will be provided in the area over concentrated cable trays. The partial area coverage was identified acceptable during the audit. Partial suppression will be identified as a deviation in our Deviation letter which will be forthcoming in response to Issue No. 7 of the Audit Report."

The November 1985 SER dated June 12, 1985, indicates that the licensee identified this partial protection as a deviation from NRC guidelines. The SER later states, in part, "that the installation of partial automatic suppression systems in the Auxiliary Building fire area composed of Fire Zones 1AB-1e and 1AB-3b and the Auxiliary Building fire area composed of Fire Zones 1AB-1c and 1AB-2 is an acceptable deviation from section C.5.b.(2) of BTP CMEB 9.5-1."

The inspector was provided with an ECN entitled, "Additional Fire Suppression System", dated August 7, 1985. Attachment 1 of ECN 27752-68-63 indicated for the Auxiliary and Intermediate Buildings-Elevation 620'-04" that:

- a. Each area is to have a new system with a new riser fed from the existing header in the area.
- b. Fire Suppression System Design is to be similar to the suppression system provided in the Intermediate Building at elevation 599'.0".

Based on the information provided to the inspector, this item is considered closed.

(Closed) Open Item (440/85015-25(DRS)): The licensee was requested to verify that the new gypsum board wall configuration is consistent with the configuration reviewed and approved in the SER No. 4.

In the November 1985 SER it states, "By letter dated May 15, 1985, the applicant informed us that these walls were restored to the approved configuration. We find this acceptable." In addition, the SER indicated that the bullet resistant gypsum wall board walls and ceilings are adequate fire barriers for the fire areas and zones listed in table C of the SER.

Based on NRR's evaluation of the gypsum wall board design, this item is considered closed.

(Open) Open Item 440/85015-26(DRS)): Information was unavailable during the audit to verify that the fire alarm system had been installed in accordance with NFPA 72D. The licensee was requested to verify that the

fire alarm system has been designed and installed in accordance with NFPA 72D.

Attachment 2 of the letter dated May 21, 1985 PY-CEI/NRR-0243L from Mr. Edelman/CEI to B. J. Youngblood/NRC, stated: "The fire alarm system, a Honeywell Delta 1000 Proprietary System, is Factory Mutual approved, with components as described in the 1984 edition of the Factory Mutual Approval Guide. In the original FPER, CEI committed to design and install the fire alarm system to NFPA 72D. An evaluation of the system shows it meets the requirements of NFPA 72D 1985, with the exception of the following sections:

2-6.2.3 Secondary Power Supply

The secondary power supply for the alarm system is in accordance with part (b) except for the capacity of the storage batteries. The arrangement of the secondary supply was described in CEI's letters dated March 12, 1982 under Topic 10. The conditions of the 15 min. battery supply and effects of the LOCA signal were described in this submittal. The staff had requested that the transfer from battery to standby diesel be made automatically. The existing standby supply is arranged to transfer automatically to the diesel. In addition the battery capacity is now at least 1 hour rather than 15 minutes. The present arrangement meets the other conditions described in our previous submittal and accepted in the SER and in the SER supplements.

3-6.2.2 Trouble

The signals from automatic suppression systems consist of a single circuit per system. This circuit can transmit an alarm and a trouble signal to the Control Processing Unit (CPU). The alarm signal will indicate that the suppression system has operated due to fire or spurious actuation. A distinct alarm signal will be received.

All supervisory signals (i.e. valve position, panel trouble, etc.) will be indicated as a supervisory alarm via the trouble circuit. Response to the initiating panel will enable the type of trouble to be determined and cleared. Since the intent of any of the above supervisory signals is to initiate corrective action to restore the system to normal conditions, the supervisory signal provides a distinct trouble alarm.

3-6.4.6 Fire Pumps Supervision

PNPP fire pump supervision has been evaluated in accordance with NFPA 20, Edition 1980 as follows:

Diesel drive controller

- 1) Engine running - not provided.
- 2) Main switch to "off" or "manual" position - provided
- 3) Trouble on controller or engine - provided
- 4) Failure to start automatically - not required but provided

Electric drive controller

- 1) Motor running - provided by CEI
- 2) Loss of power (line side of motor starter, any phase - provided by CEI)

For the diesel drive controller a change has been initiated to connect feature #4 to #3 group and use this circuit to report feature #1. Upon completion of this modification which is scheduled for start-up, the fire pump supervision will comply with NFPA 20."

The Safety Evaluation Report dated November 1985 stated, "By letter dated May 21, 1985 (M. R. Edelman to B. J. Youngblood), the applicant confirmed that the plant fire alarm system is Factory Mutual approved and that the system components are listed in the 1984 edition of the Factory Mutual Approved Guide. The staff finds this issue resolved.

During the inspector's review of this information, the licensee indicated that an off-normal instruction (ONI-P54) will be rewritten to require the secondary alarm station operator to inform the shift supervisor or the unit supervisor of the location of any fire alarm received.

The inspectors recommended to the licensee that the fire brigade members assemble at the nearest fire brigade station during an initial alarm. Should the alarm be a confirmed fire, the firebrigade would be readily available to fight the fire in its initial stages.

This item will remain open pending NRC review of the licensee's response.

(Closed) Open Item (440/85015-27(DRS)): The licensee was requested to provide drainage for accumulation of water in each Switchgear Room in accordance with NFPA 92M.

Section 9.5.1.6.4 of the SER dated May 21, 1985, states, "the firefighting water can be removed from the switchgear rooms through open doorways in accordance with Chapter 4 of NFPA 92M. In the event of a fire in either switchgear room, firefighting water would be directed from the room into the corridor and down the control complex northwest stairwell and into drains located outside the switchgear room." Based on the evaluation by NRR that found the protection against water damage in the switchgear room in accordance with NFPA 92M, this item is considered closed.

(Closed) Open Item (440/85015-28(DRS)): In the original SER dated May 1982, NRR indicated that the control room complex (PGCC) had been installed and protected in accordance with NEDO 10466, Revision 2 dated March 1978 (previously approved by NRR). During the inspector's tour, the NRR reviewer noticed that all the cable installed in the PGCC was not Tefzel as previously committed. The use of cable other than Tefzel in the PGCC would require the existing manual CO₂ extinguishing system to be upgraded to be an automatic system. The licensee was requested to justify the use of a manual fire extinguishing system or upgrade the system to be automatic.

By letter dated May 21, 1985, the licensee informed NRR that approximately 17 percent of the PGCC cabling is non-Tefzel insulated, and referenced a series of full scale fire tests of PGCC floor sections conducted by General Electric (GE) (Appendix F to NEDO-1466-A and GE letters dated February 28, 1985 and May 1, 1985) which showed that for PGCCs with up to 20 percent non-Tefzel insulated cable, introduction of a fire suppressant within six minutes of ignition will extinguish the fire before deep seated burning of the non-Tefzel cable insulation occurs. In the event of a fire in a floor section, the early warning fire detectors would alert the operators who would extinguish the fire with portable extinguishers or through actuation of the carbon dioxide system. NRR concluded that the manually actuated carbon dioxide fire suppression system provides an adequate level of fire protection for the PGCC floor sections and is, therefore, acceptable.

(Closed) Open Item (440/85015-29(DRS)): NRR requested that the licensee identify the reason why three of seven dampers failed to close during a test conducted during the inspection and provide verification that all fire dampers have been installed and tested in accordance with manufacture's recommendations.

In the licensee's internal memorandum dated April 19, 1985 from H. R. Reppert to G. H. Gerber, the licensee states that engineering evaluation of the damper failures has determined that the causes are generic in nature.

- a. Damper failure to close properly has been attributed to the incorrect alignment of the damper blades in the reloading operation. In the open position, the blades are cocked in the housing and binding can occur.
- b. Damper failure to latch properly is more than likely due to the presence of dirt and debris in the damper sections.

In order to assure proper functioning of the fire dampers in the future, engineering suggested that a revision to GEN-M-031 be initiated and made effective by the end of April 1985. In addition, Perry Plant Department procedures for the surveillance testing of fire dampers were to include these changes.

The inspector was provided with the licensee's "Fusible Link Fire Damper Test" procedure numbered GEN-M-031. This procedure states:

<u>Step</u>	<u>Instruction</u>
5.8	Verify that the damper/section is not damaged or warped.
5.9	Verify dampers are free of any obstruction.
5.10	Verify blade package(s) are not cocked in the housing.
5.14	Inspect Damper (in Closed Position) for dirt/debris of any kind and clean as necessary.
5.19	Verify proper alignment at blade package(s) in the open position. Manipulate the blades, as required to assure no binding or cocking exists.

Based on the information reviewed, this portion of the open item is considered closed.

In the letter dated November 14, 1985 from M. E. Heleman CEI to B. Youngblood NRR the licensee forwarded an analysis concerning mounting of fire dampers in pyrocrete protected steel supports, rather than inside reinforced concrete type fire walls. This analysis was reviewed by NRR and adequately addressed this concern based on the information provided.

3. Fire Brigade Drills

The inspectors examined the licensee's fire brigade organization and related training programs.

According to the licensee each fire brigade member receives 120 hours of both classroom instruction and hands-on firefighting training, while fire brigade leaders receive an additional 16 hours of special training on organization and use of pre-fire plans. In addition, certain security personnel receive two 40 hour training programs on plant systems. An inspector attended two training classes being held for fire watch personnel and incipient firefighting personnel which, according to the fire training instructor, were similar to training provided to the fire brigade. The inspector found this training met NRC guidelines for fire brigade personnel.

NRC guidelines indicate that all members of the fire brigade should have the opportunity to train as a team in the major areas of the plant. The licensee did not address this guideline in their comparison review of Appendix A to the Branch Technical Position 9.5-1. The inspector learned during his review that no actual fire drills having demonstrated that the fire brigade applied their classroom and hands-on fire training had occurred in safety-related areas of the plant.

On October 24, 1985, upon inspector request, the licensee conducted a fire drill witnessed by the inspector covering the RHR Pump Room A on Elevation 574'. This drill simulated a fire involving the pump motor windings and a resulting oil fire. Due to the limited simulated fire drilling which the fire brigade had previously conducted, no pass/fail remarks were given. Subsequently, on November 19, 1985, the inspector witnessed a fire brigade training exercise (different from a drill in that the instructor provided an immediate critique rather than waiting until the drill was completed).

During the inspector's observations of these two simulated fire conditions, certain significant deficiencies were observed including failure to apply an extinguishing agent on the postulated fire, delay in assessing the fire situation after arriving at the fire area, brigade members unaware of certain recently installed fire equipment at the fire brigade stations, and a delay in responding to the fire area once notification of a fire was given.

Prior to fuel loading, fire brigade drilling in the major areas (most important are areas containing safe shutdown equipment) of the plant is necessary. This item is considered an open item (440/85074-03(DRS)).

The inspector noted that it was not apparent from the documentation the licensee provided during the November inspection visit that the development of fire drill scenarios and the conducting of those fire drill scenarios were being accomplished in a timely manner. The licensee has subsequently put forth a sizeable effort to perform the fire drills in major areas of the plant.

4. Throttle Valve

At the request of the inspector, the licensee performed a manual operation of the motor/manual thermostatically controlled throttle valve numbered P42-F315A for the control complex chiller. This is an operation in Section 4.10 of the procedure entitled, "General Shutdown from Outside the Control Room." The valve was found to be manually inoperable. Subsequently, the licensee provided the inspector with documentation demonstrating that the valve had been repaired.

5. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee or both. Open items disclosed during the inspection are discussed in Paragraphs 2 and 3.

6. Exit Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) at the conclusion of the onsite inspection on October 25 and November 22, 1985, and summarized the scope and findings of the inspection. The licensee acknowledged the statements made by the inspector. The inspector also discussed the likely informational content of the inspection report with regard to documents reviewed by the inspector during the inspection. The licensee did not identify any of the documents as proprietary.

In a telephone conversation on December 5, 1985, between Region III and the licensee, additional information was discussed regarding the inspector's in-office review of documentation provided by the licensee.