

SUMMARY OF NFPA CODE COMPLIANCE EVALUATIONS

NFPA 10, 12, 12A, 13, 14, 15, 17, 20, 30, 72D, 72E, 80, 90A and 232

FOR

DONALD C. COOK NUCLEAR PLANT

UNITS 1 AND 2

INDIANA MICHIGAN POWER COMPANY

PREPARED BY:

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AMERICAN ELECTRIC POWER SERVICE CORPORATION

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## 1.0 INTRODUCTION

### 1.1 Overview

The following is intended to provide a brief summary of the National Fire Protection Association (NFPA) Code Compliance reviews performed at Cook Nuclear Plant. These code compliance reviews were performed to evaluate certain fire protection systems against specific NFPA Codes. The fire protection systems of concern are those protecting safe shutdown and safety related systems in the Containment, Auxiliary, Turbine and Screenhouse Buildings. The fire protection systems in these areas have been evaluated against NFPA Codes 10, 12, 12A, 13, 14, 15, 72D and 72E.

### 1.2 Background

AEPSC has committed to fourteen NFPA Codes. These codes are NFPA 10, 12, 12A, 13, 14, 15, 17, 20, 30, 72E, 72E, 80, 90A and 232.

ABB Impell Corporation was contracted to review, evaluate and justify code compliance issues for NFPA 10, 12, 12A, 13, 14, 15, 72D and 72E. Only the fire detection and suppression systems located in certain safety related areas of the plant were evaluated by ABB Impell. The results of their review are contained in Report No. 09-0120-0123, dated May, 1988.

AEPSC conducted its own review of NFPA Codes 17, 20, 30, 80, 90A and 232 to determine its position on these remaining codes. AEPSC's decision to perform a code compliance review is based on several factors. These factors included the subject of the NFPA Code, the safety classification of the system(s) covered by the code, the degree of benefit to be gained, the extent of previous evaluations and the actual commitment which specifically references the NFPA Code. It was concluded that only NFPA 20 and 30 should have a code compliance review performed. The other NFPA Codes did not require a review because the applicable systems had been previously reviewed under a different format or were nonsafety related. AEPSC's positions on these codes are stated in Section 2.0.

NFPA 20 Code Compliance Evaluation for fire pumps was completed in December of 1989. NFPA 30 Code Compliance Evaluation for the storage of flammable liquids was completed in June of 1990. The results of these reviews are contained in their own code compliance evaluation reports.

During a November 1 and 2, 1989 meeting with the NRC (Messrs. D. Kubicki and J. Glitter of NRR and J. Ulie, Region III), we discussed our original NFPA Code Compliance Program. Our original NFPA Code Compliance Program was restricted to fire detection and suppression systems in certain safety related areas. The NRC requested that this review be expanded to cover all safety related areas. These additional fire protection systems (in the expanded areas) are to be reviewed against the "significant" deviations that were found in our original NFPA Code Compliance Review, ABB Impell Report 09-0120-0123. This also limits our review to the NFPA Codes in which we have performed a past review. This NRC request was further documented in their SER, dated April 26, 1990, concerning their review of the Appendix R Safe Shutdown Capability Assessment, Proposed Modifications and Evaluations Report (Revision 1, dated December, 1986).

AEB Impell also performed our Expanded NFPA Code Compliance Report. Their review focused on the significant deficiencies previously identified under the original NFPA Code Compliance Report, No. 09-0120-0123. The significant deficiencies were defined as those that would impact system effectiveness (i.e., nozzle spacing, obstructions, system materials installed, etc.), supervision (i.e., method of connection to plant fire alarm system) and maintenance (i.e., surveillance performance and procedures). The results of their review are contained in Report No. 09-0120-0381 dated January, 1991.

These reports are a "snapshot in time" of the Cook Nuclear Plant compliance status with the NFPA codes. Future additions, deletions, and modifications to these systems will occur as the plant configuration changes. Engineering supplements to the NFPA Code Compliance Evaluation reports will be prepared to document and justify any further deviations from compliance with NFPA codes which occur as a result of these configuration changes.

### 1.3 Scope of Work

Each code compliance evaluation reviews the identified fire protection systems and determines compliance with or noncompliance with specific NFPA Code requirements. The code requirements upon which the fire protection systems were reviewed were based on the edition years which were in effect at the time the systems were designed and/or installed or against the most current edition at the time of the evaluation.

The systems were evaluated against the code requirements for each NFPA Code edition to determine compliance, noncompliance and open items. Deviations (noncompliances) were reevaluated to determine whether each item could be deemed acceptable "as installed" based upon credited plant procedures or past practices at the plant. Deviations and open items which could not be justified on these bases or on changes to the specific code requirement in later editions, were then evaluated based on engineering judgements, calculations, analysis of plant design features, field reviews, etc. In instances where the deviation could not be justified, modifications are to be made to the systems.

The previous evaluations have concluded that the fire protection systems at Donald C. Cook Power Plant are generally in compliance with the NFPA Codes reviewed. These previous evaluations have also followed the above methodology.

The NFPA Codes reviewed in the above evaluation Reports are:

- 10 - Portable Fire Extinguishers
- 12 - Carbon Dioxide Extinguishing Systems
- 12A- Halon 1301 Fire Extinguishing Systems
- 13 - Installation of Sprinkler Systems
- 14 - Installation of Standpipe and Hose Systems
- 15 - Water Spray Fixed Systems
- 20 - Installation of Centrifugal Fire Pumps
- 30 - Flammable and Combustible Liquids Code
- 72D- Installation, Maintenance and Use of Proprietary Protective Signaling Systems
- 72E- Automatic Fire Detectors

The areas of the plant that have been reviewed include:

- o Auxiliary Building (FZs 1, 1A-H, 3, 4, 5, 6N, 6M, 6S, 12, 22, 31, 32, 33, 33A-B, 34, 34A-B, 35, 36, 37, 43, 44A-H, 44N, 44S, 48-52, 61, 62A-C, 63A-C, 64A-B, 65A-B, 69-73, 105-117, 127, 136, 137, 139A-C, 146)
- o Unit 1 Reactor Cable Tunnels Quadrants 1 through 4 (FZs 7-11, 38)
- o Unit 2 Reactor Cable Tunnels Quadrants 1 through 4 (FZs 23-27 and 39)
- o Unit 1 Power Systems Complex (FZs 13, 14, 15, 16, 40A-B, 41, 42A-D)
- o Unit 2 Power Systems Complex (FZs 18, 19, 20, 21, 45, 46A-D, 47A-B)
- o Units 1 and 2 Auxiliary Feedwater Pump Rooms in the Turbine Building (FZs 17A-G)
- o Units 1 and 2 Essential Service Water Pump Rooms in the Screenhouse (FZs 29A-G)
- o Units 1 and 2 Diesel Fire Pump Rooms in the Screenhouse (FZs 28, 30) and Turbine Building Pump Bay (FZ 2).
- o Unit 1 Control Room (FZ 53)
- o Unit 2 Control Room (FZ 54)
- o Unit 1 Cable Vaults (FZs 55, 56, 57, 144)
- o Unit 2 Cable Vaults (FZs 58, 59, 60, 145)
- o Unit 1 Containment (FZs 66, 67, 68, 101, 103, 118, 120, 122, 132, 134)
- o Unit 2 Containment (FZs 74, 75, 76, 102, 104, 119, 121, 123, 133, 135)
- o Unit 1 Turbine Building (FZs 79, 80, 90, 91)
- o Unit 2 Turbine Building (FZs 84, 85, 96, 97)
- o Unit 2 Turbine Building Miscellaneous Oil Storage Room (FZ 89).
- o Service Building Flammable Liquid Storage Room (FZ 131).
- o Auxiliary Building: H<sub>2</sub> Tube Racks (yard)
- o Units 1 and 2 Main Transformers and Turbine Building Wall (yard)

#### 1.4 Fire Protection Systems Reviewed

The fire protection systems which have been reviewed are identified in the various code compliance reports. Further details on the individual systems are given in the applicable reports. The reports include assumptions, access limitations, edition year and code sections that were not applicable and, therefore, were not evaluated.



## 1.5 Results of the Reviews

The results of each of these reviews are given in their respective Code Compliance Evaluation reports. These reports include information concerning scope, methodology, assumptions, conclusions, deviations, recommendations, justifications and references. Due to the size of the original reports, certain backup information has not been included in this submittal. This backup material includes copies of the NFPA Codes to which the systems were reviewed, walkdown notes and checklists, miscellaneous correspondence, etc. The information provided in this submittal contains sufficient detail to demonstrate Cook Nuclear Plant compliance with the NFPA Codes, justifications for deviations to specific code sections and recommended corrective actions for returning to compliance where engineering justifications were not warranted.

Each of the reports also includes a Code Compliance Verification Checklist for each NFPA Code. This checklist provides a section-by-section review of the Code. The checklist states the specific code requirements, identifies the method of verification used (walkdown, document review or both) and gives a summary of the results. This checklist is the final compilation of data obtained from the other walkdown and document review checklists that were performed during the review. The summary of results can list any of several possible code compliance categories; information only, not applicable, complies, does not comply or open item. It also lists the references used to make this conclusion. A listing of the references is provided prior to the code section-by-section review.

For the Contractor prepared reports 09-0120-0123 and 09-0120-0381, the "open items" and "does not comply" categories were then listed in the "Deviation and Recommendations/Justifications" Tables provided for each NFPA Code. Each table pulls together all the deviations for that particular Code and provides a recommendation for corrective action or provides a justification for acceptance of the deviation. The justifications that appear in the tables are simple in nature, straight forwarded in their reasoning and did not require extensive analysis or evaluation. However, for each of the NFPA Code Compliance reports, more detailed or supplemental justifications were also necessary in order to remove other recommendations given in the tables. In the case of the NFPA Code Compliance Evaluation report 09-0120-0123, the supplemental justifications are contained in Section 4.0. This Section was added by AEPSC in order to keep the entire report and its final justifications and recommendations together. These supplemental justifications were prepared by both the Contractor and AEPSC. For the Extended Code Compliance Evaluation report 09-0120-0381, the supplemental justifications are contained in Appendix B1, Deviation Evaluation Calculation No. 0120-164-007. These supplemental justifications were performed by the Contractor. A new appendix, Appendix B2, has also been added by AEPSC in order to keep the entire report and the AEPSC prepared final justifications and recommendations together.

For the AEPSC prepared NFPA 20 and 30 Code Compliance Evaluations, the justifications for the "open items" and "does not comply" categories appear directly in the Code Compliance Verification Checklist. A deviations and recommendation/justification table is not used. A final listing of the conclusions and recommendations appears in Section 4.0 of the report.

The following provides a brief status of the various NFPA Code Compliance reports and the actions being taken to bring the plant into compliance with the code requirements.

#### 1.5.1 NFPA Code Compliance Evaluation Report 09-0120-0123

The NFPA Code Compliance Evaluation reviewed only certain fire detection and suppression systems located in safety related areas of Cook Nuclear Plant. The exact areas of review are given in the report, but generally included the Auxiliary Building, the Unit 1 and 2 Auxiliary Feedwater Pump Rooms in the Turbine Buildings, the Unit 1 and 2 Essential Service Water Pump Rooms in the Screen House and the Unit 1 and 2 Control Rooms. The NFPA Codes included in this review were NFPA 10, 12, 12A, 13, 14, 15, 72D and 72E.

This evaluation also includes engineering justifications along with recommended corrective actions for the noted deficiencies. The noted deficiencies requiring corrective actions are described in the "Deviation and Recommendations/Justifications" Tables for each NFPA Code. The list of recommendations was reduced even further by the development of supplemental justifications. These justifications appear in Section 4.0 of the report. The AEPSC prepared justifications were also independently reviewed by a consultant (ABB Impell). The consultant's concerns were addressed and did not result in additional design or procedural changes or the generation of new maintenance items.

Plant design changes, maintenance items and procedural changes which were necessary for the reviewed systems to maintain compliance with the various NFPA Codes are identified below. Many of the maintenance items were corrected under the plant's ongoing maintenance and surveillance program. A listing of the maintenance items is given in Section 4.0 of the report in a July 18, 1988 memo from S.J. Gerwe to P.R. Jacques. Supplemental justifications were also prepared for some of the maintenance items.

Note: During the course of implementing the plant design changes, additional engineering walkdowns and design reviews were performed. Some of these design change activities lead to the formation of additional supplemental justifications which removed various recommendations. These supplemental justifications were then filed with both the design change package and in Section 4.0 of the NFPA Code Compliance Evaluation report.

#### Schedule for Completion

The maintenance items and procedural changes required by this Report 09-0120-0123 have been completed except as noted below.

As stated in the November, 1990 NRC Appendix R Inspection Report 50-315/90018 and 50-316/90018, we committed to complete the two design change packages resulting from Report 09-0120-0123 by December 31, 1991. Work activities associated with certain portions of these design change packages are continuing. These two design change packages were RFC 12-3003 for sprinkler system modifications and RFC 12-3004 for detection system modifications.

#### NFPA 10 - Portable Fire Extinguishers

Justifications have been provided for closeout of some code deviations identified in the report. No design changes were required.

Maintenance Items: Remounted four fire extinguishers. Replaced five fire extinguishers which were no longer properly labeled.

Procedural Changes: Revised procedure to reference Fire Facilities drawings showing fire extinguisher locations.

#### NFPA 12 - Carbon Dioxide Extinguishing Systems

Justifications have been provided for closeout of some code deviations and a maintenance item identified in the report. No design changes were required.

Maintenance Items: Provided label for manual pull station. Removed obstructions to a CO<sub>2</sub> hose reel. Due to safety concerns, a justification has been prepared for the maintenance item which identified the need to reinstall copper tube pressure vent lines.

Procedural Changes: Revised procedure to annually check liquid level gauges.

#### NFPA 12A - Halon 1301 Fire Extinguishing Systems

Justifications have been provided for closeout of some code deviations and a maintenance item identified in the report. No design changes or procedural changes were required.

Maintenance Items: Provided labels for manual pull stations. Readjusted the cylinder racking for a system to firmly hold the halon cylinder. System nameplates for the Unit 1 and 2 control room cable vault systems will be provided by the end of 1991. A justification has been prepared for not providing system nameplates for non-Tech. Spec. halon systems.

#### NFPA 13 - Installation of Sprinkler Systems

Justifications have been provided for closeout of some code deviations identified in the report.

Design Change RFC 12-3003: Redesigned sprinkler piping to relocate obstructed sprinklers and avoid interferences in several locations within the Auxiliary Building and Auxiliary Feedwater Pump Corridor. Modified existing heat collection plates for sprinklers in Auxiliary Building to avoid interference with sidewall sprinkler discharge patterns. Installed two new sprinklers to increase area coverage in the Contractors Access Control Building.

Maintenance Items: Replaced a broken pressure gauge. Replacement of a painted sprinkler will be coordinated to be completed with a similar maintenance item identified under the extended NFPA Code Compliance Evaluation Report 09-0120-0381.

Procedural Changes: Revised procedures to add guidelines on replacement of sprinklers with painted or ornamental finishes.

#### NFPA 14 - Installation of Standpipe and Hose Systems

Justifications have been provided for closeout of some code deviations identified in the report.

Design Change RFC 12-3003: Installed a new sectionalizing valve in the Auxiliary Building distribution piping to isolate the east hose stations from the west. Although this was not a



specific code compliance deviation identified in the report, the valve has been provided to strengthen the ability to isolate the east hose stations from the west in order to ensure backup fire protection is available.

No maintenance items were required.

No procedural changes were required.

#### NFPA 15 - Water Spray Fixed Systems

Justifications have been provided for closeout of some code deviations identified in the report. No design changes or maintenance items were required.

Procedural Changes: Procedures need to be revised to verify operability of a charcoal filter unit. The applicable procedures will be revised by the end of 1992.

#### NFPA 72D - Installation, Maintenance and Use of Proprietary Protective Signaling Systems

Justifications have been provided for closeout of some code deviations identified in the report. No design changes were required.

Maintenance Items: Remounted three manual pull stations. Repaired or replaced improperly mounted valve tamper switch. Actions needed to prevent damage to circuit conductors were completed.

Procedural Changes: Revised procedures to confirm operability of sprinkler system water flow and low air supervisory alarm initiating devices and circuits. Revised procedures to verify reset of these signals received in control room.

Procedures need to be revised to confirm operability of a) hose station manual actuation station devices and circuits and high demand fire pump supervisory devices and circuits, b) to verify reset of these signals received in the control room, c) air flow testing of CFT containment charcoal filter piping and d) loop resistance testing of the RCP line type detectors. The applicable procedures will be revised by the end of 1992.

#### NFPA 72E - Automatic Fire Detectors

Justifications have been provided for closeout of some code deviations identified in the report.

Design Change RFC 12-3004: Added new ionization smoke detectors to supplement existing area coverage in several locations within the Auxiliary Building. Redesignated the ionization smoke detection systems in the switchgear cable spreading rooms of each unit. Installed a new smoke detection system in the Service Building laydown area and chemical storage room.

Maintenance Items: Cleaning of several detectors were required. Several detectors were missing their locking shells.

Procedural Changes: Procedures need to be revised to verify operability of RCP thermistors by a loop resistance test. The applicable procedures will be revised by the end of 1992.

1.5.2 Extended NFPA Code Compliance Evaluation  
Report 09-0120-0381

The Extended NFPA Code Compliance Evaluation reviewed the remaining safety related areas of the Cook Nuclear Plant that were not previously reviewed under Report 09-0120-0123. The exact areas of review are given in the report, but generally included the eastern portions of the Unit 1 and 2 Turbine Buildings, Unit 1 and 2 Containments, Unit 1 and 2 Transformer and Turbine Wall Water Spray Systems and the Unit 1 and 2 Diesel Fire Pump Rooms. The NFPA Codes included in this review were NFPA 10, 13, 14, 15, 72D and 72E. Note: NFPA 12 and 12A were not included in the extended evaluation because there were no CO<sub>2</sub> or halon systems included within the scope of the review.

This evaluation also includes engineering justifications along with recommended corrective actions for the noted deficiencies. These justifications appear in Appendix B1, Deviation Evaluation Calculation No. 0120-164-007, of the report. The noted deficiencies requiring corrective actions are described in the "Deviation and Recommendations/Justifications" Tables for each NFPA Code.

Plant design changes, maintenance items and procedural changes which are necessary for the reviewed systems to maintain compliance with the various NFPA Codes are identified below. Some of the maintenance items were corrected under the plant's ongoing maintenance and surveillance program.

Note: During the course of implementing the plant design changes, additional engineering walkdowns and design reviews will be performed. Some of these design change activities may lead to the formation of additional supplemental justifications which may remove a recommendation. These supplemental justifications will then be filed with both the design change package and Appendix B2 of the Extended NFPA Code Compliance Evaluation report.

Schedule for Completion

The design changes noted below are scheduled for completion by the end of 1994. Maintenance items and procedural changes are scheduled for completion by the end of 1992 unless otherwise noted below.

NFPA 10 - Portable Fire Extinguishers

Design Changes: Provide additional new fire extinguishers to meet recommended travel distances. Revise Fire Facility drawings accordingly to show these changes. Note: This design change is much simpler than the other design changes noted below and will be completed earlier than the end of 1994 date given above.

Maintenance Items: Corrective actions have been taken for extinguishers that were obstructed, required relocation to their designated location and required proper markings to indicate fire extinguisher placement. This item is considered closed.

Procedural Changes: Revised the surveillance procedures to include additional surveillance criteria to ensure extinguishers are unobstructed. Procedures need to be revised to include the remaining surveillance criteria identified by the report.

#### NFPA 13 - Installation of Sprinkler Systems

Design Changes: Install additional hangers. Install missing sprinklers and new sprinklers under obstructions. Relocate existing sprinklers to within proper distance from ceiling.

Maintenance Items: Provide a valve operator to a sectionalizing valve. Realign sprinkler nozzles. Replace several improperly installed sprinklers.

Maintenance Item: Replace painted sprinklers and remove any covers (plastic bags) which were not removed after painting. Work is to be completed by the end of 1993. Although sprinklers will be replaced, a review of the issue is provided in the report that indicates that this is not a significant problem.

No procedural changes are required.

#### NFPA 14 - Installation of Standpipe and Hose Systems

No design changes, maintenance items or procedural changes are required.

Calculations: Provide hydraulic calculations for the standpipe and hose systems to demonstrate compliance with the code design requirements when supplied from the new water supply and fire pump system being installed under RFC 12-3065 and from the existing diesel fire pumps only. Work is to be completed by the end of 1992.

#### NFPA 15 - Water Spray Fixed Systems

No design changes, maintenance items or procedural changes are required.

Calculations: Provide hydraulic calculations for the water spray suppression systems to demonstrate compliance with the code design requirements when supplied from the new fire pumps and existing diesel fire pumps and accounting for system modifications being performed under RFC 12-3065. Work is to be completed by the end of 1992.

#### NFPA 72D - Installation, Maintenance and Use of Proprietary Protective Signaling Systems

No design change or maintenance items are required.

Procedure Change: Revise the containment charcoal filter (CFT) unit surveillance procedure to verify piping integrity. Procedure change to be completed by the end of 1992.

Procedure Change: Revise the reactor coolant pump thermistor detection system surveillance procedure to perform loop resistance testing. Procedure change to be completed by the end of 1992.

### NFPA 72E - Automatic Fire Detectors

No design change or maintenance items are required.

Procedure Change: Revise the reactor coolant pump thermistor detection system surveillance procedure to perform loop resistance testing. (Note: Same recommendation as the second Procedure Change under NFPA 72D.) Procedure change to be completed by the end of 1992.

### 1.5.3 NFPA 20 Code Compliance Evaluation

The NFPA 20 Code Compliance Evaluation reviewed the installation of the plant fire pumps. The fire pumps included in this study were the two high demand diesel fire pumps (2000 gpm rating), the two high demand electric fire pumps (2000 gpm rating) and the one low demand electric fire pump (500 gpm rating). This evaluation also includes the engineering justifications for the noted deficiencies. These justifications appear in the section-by-section review of the NFPA 20 code. As described in Section 4.0 of the Code Compliance Evaluation, plant design change (RFC 12-3094) was required to upgrade the battery capacity of each diesel driven fire pump. This design change is scheduled to be completed by the end of 1994.

The correspondence section of the report (Attachment 6.1) provides a chronology of the actions taken to resolve the noted deficiency identified in Section 4.0 and any other related fire pump issues.

AEPSC's NFPA Code Compliance Evaluation report was also independently reviewed by a consultant (ABB Impell). The consultant's concerns were addressed and did not result in additional design or procedural changes or the generation of new maintenance items.

Under a plant design change (RFC 12-3065) a new fire protection water supply (two aboveground storage tanks) and three new fire pumps (2500 gpm rating each) are being designed and installed. The new fire pumps are designed to provide adequate fire fighting capability even with one pump inoperable. However, in order to maintain operational flexibility, the existing diesel fire pumps (2000 gpm rating each) will be maintained in the normally isolated position. The water supply for the existing 2000 gpm fire pumps is Lake Michigan. The existing electric driven fire pumps will be removed from service upon completion of the design change. The NFPA 20 Code Compliance evaluation will be revised once the new fire protection water supply system becomes operational to reflect the design change. This design change is scheduled to be operational by April of 1993.

### 1.5.4 NFPA 30 Code Compliance Evaluation

The NFPA 30 Code Compliance Evaluation reviewed the storage of flammable liquids within the plant. This review included rooms specifically designed for the storage of these liquids, the flammable liquid storage room in the service building and miscellaneous oil storage room in the turbine building plus the use of flammable liquid storage cabinets located throughout the plant. The requirements of Appendix A to BTP APCSB 9.5-1, Section D.2(d) are specific only to the storage of flammable liquids. These requirements provided the guidance in determining the direction the code review would follow.



This evaluation also includes engineering justifications along with recommended corrective actions for the noted deficiencies. These justifications appear in the section-by-section review of the NFPA 30 code. The noted deficiencies requiring corrective actions are described in Section 4.0 of the Code Compliance Evaluation. The correspondence section of the report (Attachment 6.1) provides a chronology of the actions taken to resolve the noted deficiencies identified in Section 4.0. Supplemental justifications which have resulted from the corrective actions are also contained in Attachment 6.1.

Plant design changes, maintenance items and procedural changes are required as identified below.

Design Change: Provide a second exit in the Miscellaneous Oil Storage Room, Fire Zone 89 (02-PM-836). This design change is scheduled for completion by the end of 1993.

Design Change: Provide a Drainage system for the Miscellaneous Oil Storage Room and the Flammable Liquid Storage Room, Fire Zone 131, meeting both NFPA 30 and environmental requirements (12-PM-819). This change is scheduled for completion by the end of 1993.

Design Change: Modify existing HVAC system ductwork in the Flammable Liquid Storage Room (12-PM-819). This change is scheduled for completion by the end of 1993.

Maintenance Item: Repaired or replaced 3 flammable liquid storage cabinets. This maintenance item has been completed.

Maintenance Item: Removal of excess flammable liquid storage cabinets from Fire Zones 51 and 43. A justification has been prepared for this item and the issue is considered closed.

Procedure Change: Prepare a fire pre-plan for the Flammable Liquid Storage Room. This fire pre-plan will be completed by the end of 1991.



## 2.0 FIRE PROTECTION ON NFPA CODE COMPLIANCE REVIEWS

The following documents AEPSC Fire Protection's position on the need not to perform NFPA Code Compliance Reviews on NFPA 17, 80, 90A and 232.

### 2.1 NFPA 17 - Dry Chemical Extinguishing Systems

**Position:** A code compliance review is not required.

**Commitment Issue:** The applicable fire suppression systems have been designed and installed in accordance with NFPA 17. (This commitment was made in AEPSC's Response to Appendix A to BTP APCSB 9.5-1, Section II.A.5, dated January 31, 1977.)

**Reasons:** The fire suppression systems referred to in this commitment are the dry chemical extinguishing systems for the turbine bearings of the Units 1 and 2 turbine generators. These systems are located in the Turbine Building at elevation 633'. They are not technical specification systems, and the equipment they protect is not safety related. There are no other dry chemical extinguishing systems installed at the plant. For these reasons, a review of these systems against the requirements of NFPA 17 is not considered necessary.

### 2.2 NFPA 80 - Fire Doors and Windows

**Position:** A code compliance review is not required.

**Commitment Issue:** NRC inspection (50-315 & 50-316/82-08-15) identified that fire door assemblies for the Units 1 and 2 West Motor Driven Auxiliary Feedwater Pump Rooms were not rated fire door assemblies and had not been fire tested to demonstrate their fire resistance capabilities. In addition, the doors were not designed and installed in accordance with NFPA 80.

**Reasons:** The unrated doors referred to in the commitment were provided for missile and jet impingement protection from the Turbine Building. Since the time of the commitment, manual rolling fire doors having a three-hour rating have also been installed in order to achieve the required three-hour rating for the enclosures.

Engineering evaluations for other non-rated fire door assemblies in fire area boundaries have been prepared and have found them to be acceptable. They are presently contained in Chapters 7 and 9 of the Safe Shutdown Capability Assessment (SSCA) report which demonstrates our Appendix R compliance. These fire doors are also identified in the Fire Hazards Analysis (FHA).

The NRC reviewed the fire door placements and ratings during their review for compliance with Appendix A to BTP 9.5-1. In addition to field reviews by the NRC, AEPSC responded to questions concerning the fire door installations and ratings (refer to the NRC Appendix A 53 Questions/Positions, Question No. 9). The NRC concluded in their July, 1979 SER that with the installation and upgrade of certain fire doors, the fire doors are provided or committed, where necessary, in accordance with the provisions of Appendix A and, therefore, acceptable.

**Commitment Issue:** NRC inspection (50-315 & 50-316/82-08-17) identified two concerns over the qualification of safety related fire door assemblies. First is the use of non-listed fire door frames. Second is the degrading of the door's fire resistance rating due to modifications made to the door.

**Reasons:** While this commitment does not specifically identify NFPA 80, it does reference basic requirements of a fire door. This issue has already been addressed through plant-wide reviews performed by UL and NUTECH engineers. These reviews centered around Tech Spec required fire doors and frames and their compliance with NFPA 80. The noted deficiencies were corrected or appropriate justifications have been prepared. AEPSC's response to these inspection items and the UL and NUTECH reports provides complete documentation of the issue and closeouts. This documentation is maintained by Architectural Design.

The above reasons show that the Tech Spec related fire doors have already been reviewed: 1) by the NRC for placement and rating, 2) by two consultants for compliance with NFPA 80, and 3) for evaluating the impact that non-rated fire doors have on safe shutdown when installed in fire area boundaries. Therefore, another review of NFPA 80 does not appear to be justified in providing any beneficial gain above the previous reviews or code related items which may not have been specifically addressed.

### 2.3 NFPA 90A - Installation of Air Conditioning and Ventilating Systems

**Position:** A code compliance review is not required.

**Commitment Issue:** Several fire dampers were found without their required fire rating label even though they were purchased as Class "A" fire rated dampers and that the frames were designed to NFPA 90A. (This commitment was made in a letter from W.G. Smith (IMPC) to Keppler (NRC) dated September 1, 1982.)

**Reasons:** Engineering evaluations for non-rated fire dampers in the fire area boundaries have been prepared and have found them to be acceptable. They are presently contained in Chapters 7 and 9 of the SSCA. These fire dampers are also identified in the FHA. The NRC's acceptance of our deviation request for deviations to providing fire dampers is given in their letter of August 17, 1985, from S.A. Varga (NRC) to J.E. Dolan (AEPSC).

During review of NFPA 72E under Report No. 09-0120-0123, the code requirements for the installation of smoke detectors in the Auxiliary Building HVAC units have been addressed.

Additionally, the NRC reviewed the HVAC system design and fire damper installations during their review for compliance with Appendix A to STP 9.5-1. In addition to field reviews by the NRC, AEPSC responded to several questions concerning the HVAC system (refer to the NRC Appendix A 53 Questions/Positions, Question Nos. 2, 14 and 27). The NRC concluded in their July, 1979 SER that with the addition and upgrade of certain fire dampers, the dampers are provided or committed, where necessary, in accordance with the provisions of Appendix A and, therefore, acceptable.

AEPSC's review of NRC I.E. Information Notice 83-69 concludes that all of the fire dampers have a fire rating equal to or better than specified. Additionally, the dampers were inspected for installation and found to be acceptable following the completion of ongoing RFCs.

Based on the above, it is shown that technical specification related fire dampers and HVAC system design have already been reviewed by the NRC for damper placements, ratings and system design; reviewed by AEPSC for rating and installation; reviewed by a consultant for fire detectors in the Auxiliary Building HVAC systems; and evaluated to determine the impact of non-rated fire dampers in fire area

boundaries. Therefore, a review of NFPA 90A does not appear to be justified in providing any beneficial gain above the previous reviews or for code related items which may not have been specifically addressed.

#### 2.4 NFPA 232 - Protection of Records

**Position:** A code compliance review is not required.

**Commitment Issue:** The fire resistance rating of the Master Plant File Vault could not be determined to be in accordance with the requirements of NFPA 232. (NRC inspection report 50-315 and 50-316/83-07, 08)

**Reasons:** The Master Plant File Vault, as well as other plant record storage vaults, are considered nonsafety related. These storage vaults are also located in nonsafety related areas of the plant. For these reasons, a review of these systems against the requirements of NFPA 232 is not considered necessary.

ATTACHMENT 2 TO  
AEP:NRC:0692BY  
NFPA CODE COMPLIANCE REVIEW  
(IN BINDERS)

ABB Impell Report 09-0120-0123, "NFPA Code Compliance Evaluation,"  
Revision 0, dated May, 1988, Volumes Nos. I, IV and V.

ABB Impell Report 09-0120-0381, "Extended NFPA Code  
Compliance Evaluation," Revision 1, dated January, 1991.

AEPSC, "NFPA 20 Code Compliance Evaluation", Revision 0,  
dated December, 1988.

AEPSC, "NFPA 30 Code Compliance Evaluation", Revision 0,  
dated June, 1990.

ATTACHMENT 3 TO

AEP:NRC:0692BY

JUSTIFICATION FOR PRESENT ALARM

CIRCUIT DESIGN WITHOUT ELECTRICAL SUPERVISION



The portions of the system outside the control rooms that are not supervised in accordance with NFPA 72D include water flow and sprinkler supervisory alarm initiating circuits and alarm signals between the local control panels and the control room. As documented in the NFPA 72D Code Compliance Report, the following alarm signals are not supervised to the requirements of NFPA 72D:

- CO<sub>2</sub> system Cardox and Alison control panel alarm and trouble signals,
- Reactor coolant pump (RCP) panel alarm and trouble signals,
- Containment cable tray detection panel alarm and trouble signals,
- Halon system Alison and Pyrotronics control panel alarm and trouble signals
- alarm initiating circuits for water flow,
- sprinkler supervisory (valve tamper and low air pressure switches) signals, and
- fire pump signals

The detection system alarm and trouble signals of the CO<sub>2</sub>, RCP and containment cable tray systems interface with the control room via Alison control panels. The suppression system alarm and trouble signals of the CO<sub>2</sub> systems interface with the control rooms via Cardox control panels. The control room cable vault halon systems signals interface with the control rooms via Alison control panels. The plant computer room halon system signals interface with the control rooms via Pyrotronics low voltage System 3 control panels.

The NFPA Code Compliance Report also documents that the fire detection system alarm initiating circuits and the CO<sub>2</sub> and halon suppression system actuation (i.e., solenoids) circuits are properly supervised as required by their respective local control panel.

A properly supervised circuit as defined by NFPA 72D, Sections 3-9 and 3-10, is a circuit that verifies operability of the circuit by indicating a trouble condition at the associated control panel for both open circuit and ground fault conditions. The NFPA Code Compliance review identified that the annunciator circuits associated with the EF panels are not electrically supervised to detect open circuits or wire breaks. These annunciator circuits are properly supervised for detecting ground fault conditions. A review of our licensing documents indicates that we have committed to comply with the requirement to supervise for open circuits for only the fire detection systems. The NRC accepted this position in their SER for Appendix A to BTP APCS 9.5., dated July 31, 1979.

Two of the 53 Appendix A follow-up questions posed by the NRC addressed circuit supervision. These questions were Numbers 16 and 53. Information was presented that identified those portions of the overall fire alarm system that were supervised. The Appendix A requirement for circuit supervision is limited to fire detection systems only. This was the commitment position taken by AEPSC as given in the response to Question 16b. The Appendix A SER also refers to only circuit supervision in the context of fire detection systems. The Appendix A SER states that the NRC "reviewed the fire detection system's design criteria and the basis to ensure that it conforms to the applicable sections of NFPA 72D, for Class B supervised circuits". Therefore, it is interpreted that the only NFPA 72D requirements for circuit supervision to which Cook Nuclear Plant is committed are for fire detection systems.

The Alison local detection control panels transmit signals to annunciator logic cabinets located behind the main control board containing the EF panel. The Cardox suppression system control panels and the Pyrotronics System 3 control panels for the computer rooms also transmit signals to the annunciator logic cabinets located behind the main control board. These annunciator logic cabinets transmit unsupervised alarm signals to the front of the EF panels. Since the signals between the logic cabinets and the EF panels run through the common enclosure of the control room horseshoe panel, they are not required to be supervised per Section 2-7.1.

The routine surveillance testing performed for the detection and suppression actuation and initiating circuits described above also comply with the requirements of NFPA 72D Section 2-4.3.d with the exception of the RCP systems. Section 2-4.3.d requires testing to be performed every six months. Alarms sent to the control rooms which are not electrically supervised are checked every six months. The RCP systems are functionally tested every 18 months due to the fact that the detection and suppression actuation devices are located within containment and are normally not accessible during plant operation. The function tests include checking for alarms at the local control panels and those sent to the control rooms. Operations also performs a once-per-shift visual examination of all fire panels. This examination includes checking for alarms and actuations which may have occurred. During a meeting held on November 1 and 2, 1989, at the Cook Nuclear Plant, Messrs. D. Kubicki of the NRC and B. J. Gerwe of AEPSC discussed the surveillance testing program.

Mr. Kubicki indicated that the current surveillance practices being implemented for the fire detection and suppression systems met the intent of the code and were considered acceptable.

Although the fire detection and suppression systems are being properly surveilled, all water flow and sprinkler supervisory devices (valve tamper and low air pressure switches) are not being verified as required by NFPA 72D. Justification for acceptance of these conditions is discussed below.

- 1) All of the water flow alarm devices and circuits, with the exception of the training buildings and technical support center (TSC), are verified for operability by simulated or actual flow test methods in accordance with plant procedures. The training buildings and TSC are non-safety related areas of the plant and have no impact on the operation of the plant.
- 2) The valve tamper alarm signals are not verified for receipt of a trouble signal in the control room during the performance of the valve cycling testing. However, the valves are inspected for correct position monthly by procedure. This inspection fulfills the intent of the valve tamper switch trouble signal.

- 3) The low air pressure supervisory alarm devices and their circuits are not verified for operability with the exception of the RCP low air alarm devices. However, this is not viewed as a negative factor based on the reliability of the plant air supply system and the inspection of dry pilot reaction sprinkler system piping by plant procedure. In addition, the plant procedures prohibit the indiscriminate changing of valve positions. Valve positions may only be changed under the umbrella of a plant procedure or job order. The plant air supply is considered reliable due to the redundant plant air compressors which serve both units. Should a low air pressure condition occur within one of the dry pilot piping systems located in the auxiliary building, the reaction valve would operate resulting in a water flow alarm signal being sent to the control room. Since the dry pipe systems use closed head sprinklers, no water would be discharged. The ensuing investigation of the spurious water flow alarm would point to the loss of pilot air pressure condition.
- 4) The fire pump supervisory devices are connected to the EF panels and are verified for operability under plant procedures.

Section 2.3.2 of the SER also states that there are only two unsupervised circuits within the control room to the annunciator panels on the main control board. This is not correctly stated. The statement should have been that there are two cases of unsupervised circuits within the control room. Again, the initiating device circuits on the high and low voltage Pyrotronics (smoke and flame detection) and Alison (thermistor heat detection) local control panels are Class B supervised circuits. The high voltage Pyrotronics panels, referred to as the emergency fire rear (EFR) panels, are located in each control room behind the main control board containing the EF panel. The high voltage panel monitors detector circuits as well as input signals from some of the other Pyrotronics low voltage panels. The Technical Specifications required low voltage Pyrotronics detection panels transmit alarms back to the control room on supervised high voltage Pyrotronics initiating device circuits. These EFR panels transmit duplicate alarm signals to the front of the EF panels. These alarm signals are unsupervised. However, they are considered to be in accordance with Section 2-7.1 of NFPA 72D since these circuits are

contained within the enclosure of the control room horseshoe control panel. Section 2-7.1 does not require supervision of wiring within a common enclosure. Since the control room horseshoe panel is considered to be a common enclosure, this wiring need not be supervised.