U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT

Report No.:	50-315/86015; 50-316/86015
Docket No.:	50-315; 50-316
License No.:	DPR-58; DPR-74
Licensee:	Indiana & Michigan Electric Company c/o American Electric Power Service Company One Riverside Plaza Columbus, Ohio 43216
Facility Name:	Donald C. Cook Nuclear Plant, Units 1 and 2
Inspection At:	Columbus, Ohio and Bridgman, Michigan
Inspection Conducted:	April 21 to 25 (Columbus) April 29 and 30 (Bridgman)

Inspector: for _____ 8/4/86
A. R. Johnson, Equipment Qualification Inspection Section (EQIS) — Date

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INSPECTION SUMMARY:

Inspection on April 21 to 25, 29, 30, 1986 (Inspection Report Nos. 50-315/86015; 50-316/86015)

Areas Inspected: Special announced inspection to review the licensee's implementation of a program in accordance with the requirements of 10 CFR 50.49 for establishing and maintaining the qualification of electric equipment. The inspection also included evaluations of the implementation of equipment qualification (EQ) corrective action commitments. These commitments were made by the licensee as a result of: (1) identified deficiencies in the January 17, 1983, Safety Evaluation Reports (SERs) for each unit, and October 28, 1982 Franklin Research Center Technical Evaluation Reports (TERs) for each unit; (2) proposed method of resolution for each of the identified deficiencies documented in licensee responses (January 17, June 12, October 18, and December 10, 1984) as a result of the NRC staff meeting with the licensee on September 13, 1983; (3) proposed method of resolution and commitments for each of the identified deficiencies documented in additional licensee responses (January 25, June 28, September 17, September 30, and October 21, 1985); and (4) the SERs for each unit of EQ electric equipment important to safety submitted to the licensee on January 11, 1985.

Results: The inspection determined that the licensee has implemented a program to meet the requirements of 10 CFR 50.49 except for certain deficiencies listed below. No deficiencies were found in the licensee's implementation of corrective action commitments made as a result of: (1) identified deficiencies in the SERs/TERs; (2) identified deficiencies documented in licensee responses (January 17, June 12, October 18, and December 10, 1984, and January 25, June 28, September 17, September 30, and October 21, 1985); and (3) the SERs of EQ electric equipment important to safety submitted to the licensee on January 11, 1985.

Potential Enforcement/Unresolved Items:

Name		Report Paragraph(s)	Item Number
1.	Master CEEQ File Auditability	4.F(1)	50-315/86015-01 50-316/85015-01
2.	Conax Electrical Penetration Assemblies; Haveg Kapton Insulated Penetration Feedthrough Extension Wire; and Brand Rex Triaxial Cable	4.F(2) 4.F(3) 4.F(4)	50-315/85015-02 50-316/86015-02
3.	Limitorque Motor Operators-Undocumented Internal Wire	4.F(6)a	50-315/86015-03 50-316/86015-03
4.	Limitorque Motor Operators-"T" Drains/Grease Relief Valves	4.H(1)a	50-316/86015-04
5.	ASCO Solenoid Valves-Installed Configuration	4.H(2)a	50-316/86015-17
6.	Foxboro Pressure Transmitters-Moisture Intrusion	4.H(3)a	50-315/86015-21 50-316/86015-21

Open Items:

Name		Report Paragraph	Number
1.	Procedural Definition of Harsh Environment	4.B(1)	50-315/86015-05 50-316/86015-05
2.	Procedures to Control Regulatory Requirements in EQ Procurement Documents	4.B(2)	50-315/86015-06 50-316/86015-06
3.	Conax Electrical Penetration Assemblies	4.F(2)	50-315/86015-07 50-316/86015-07
4.	Haveg Kapton Insulated Penetration Feedthrough Extention Wire	4.F(3)	50-315/86015-08 50-316/86015-08
5.	Brand Rex Triaxial Cable	4.F(4)	50-315/86015-09 50-316/86015-09
6.	Raychem Splice kits	4.F(5)	50-315/86015-10 50-316/86015-10
7.	Limitorque Motor Operators-Qualified Life Calculations	4.F(6)b	50-315/86015-11 50-316/86015-11
8.	Limitorque Motor Operators-EQ File Documentation Errors	4.F(6)c	50-315/86015-12 50-316/86015-12

Name	Report Paragraph	Item Number
9. ASCO Solenoid Valves; Eberline Radiation Detectors; Foxboro Pressure Transmitters-EQ File Documentation Errors	4.F(7)a 4.F(7)b 4.F(7)c 4.F(7)d 4.F(7)e 4.F(7)f	50-315/86015-13 50-316/86015-13
10. Grease/Lubricants for Electric Motors	4.F(8)	50-315/86015-14 50-316/86015-14
11. IE Information Notice Response Evaluations	4.G(1)	50-315/86015-15 50-316/86015-15
12. Limitorque Motor Operators-Loose Conduit	4.H(1)b	50-316/86015-16
13. ASCO Solenoid Valves-Drain Hole Configurations	4.H(2)b	50-315/86015-20 50-316/86015-20
14. Foxboro Pressure Transmitters-Installed Configuration Deficiencies	4.H(3)b 4.H(3)c	50-315/86015-18 50-316/86015-18
15. Field Verification of Cables	4.H(4)	50-315/86015-19 50-315/86015-19

DETAILS

1. Persons Contacted

American Electric Power Service Corporation (AEPSC)

*M. P. Alexich, Vice President, Nuclear Operations
*R. F. Kroeger, Manager, Quality Assurance
*J. G. Feinstein, Manager, Nuclear Safety and Licensing
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*L. F. Caso, Assistant Section Manager, Electrical Generation Section (EGS)
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Indiana and Michigan Power Company, D.C. Cook Plant

*B. A. Svenson, Assistant Plant Manager, Operations
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*L. S. Gibson, Technical Engineering Superintendent
*J. F. Stietzer, QC Superintendent, F&M
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*D. Wizner, Maintenance
*M. Lester, Senior Performance Engineer
*B. B. Bradley, Technical Engineering
*C. E. Miles, I&C/Technical Engineering
*R. Hunsicker, Maintenance
*P. Sammons, I&C Supervisor
*N. Daavettila, Performance Engineer/Maintenance
*P. Carteaux, Maintenance General Supervisor
*L. VanGinhoven, Maintenance Engineering Supervisor
*R. J. Clendenning, Plant R. P. Supervisor
*P. Terry, Maintenance Electrician
*C. Ross, Staff Engineer/Technical Engineering
*T. Postlewait, Performance Engineering Supervisor
*E. Koenig, Maintenance Engineer
*T. Johnson, Instrument Maintenance Supervisor
*J. E. Fryer, Environmental Coordinator

*Denotes those present at exit interview at Bridgman, Michigan on April 30, 1986.

2. PURPOSE

The purpose of this inspection was to review the licensee's implementation of the requirements of 10 CFR 50.49, and the implementation of corrective action commitments made as a result of: (1) identified deficiencies in the SERs/TERs for each unit; (2) proposed method of resolution for each of the identified deficiencies documented in licensee responses (January 17, June 12, October 18, and December 10, 1984) as a result of the NRC staff meeting with the licensee on September 13, 1983; (3) proposed method of resolution and commitments for each of the identified deficiencies documented in additional licensee responses (January 25, June 28, September 17, September 30, and October 21, 1985); and (4) the SERs for each unit of EQ electric equipment important to safety submitted to the licensee on January 11, 1985.

3. BACKGROUND

On September 13, 1983, the NRC held a meeting with the licensee to discuss open issues regarding environmental qualification, including acceptability of the environmental conditions for equipment qualification purposes. The meeting discussed Indiana & Michigan Electric's proposed method to resolve the environmental qualification deficiencies identified in the January 17, 1983 SERs and October 28, 1982 FRC TERs. Discussions also included Indiana & Michigan Electric's general methodology for compliance with 10 CFR 50.49, and justification for continued operation for those equipment items for which environmental qualification was not completed. The minutes of the meeting and proposed method of resolution for each of the environmental qualification deficiencies were documented in January 17, June 12, October 18, and December 10, 1984 responses from the licensee.

Additional open issues regarding environmental qualification, including supplemental requests for EQ extensions, certification of compliance, and instrument cable submergence qualification, were addressed by Indiana & Michigan Electric Company in their proposed methods for resolving environmental qualification deficiencies, as documented in their responses to NRC of January 25, June 28, September 17, September 30, and October 21, 1985.

SER's for final resolution of EQ issues for units 1 and 2 were submitted to the licensee on January 11, 1985, addressing: (1) the environmental qualification of electric equipment important to safety for compliance with the requirements of 10 CFR 50.49; (2) the licensee's proposed resolutions for deficiencies identified in the January 17, 1983 SERs and October 28, 1982 FRC TER's; (3) the licensee's proposed resolutions for additionally identified deficiencies documented in additional licensee responses beyond item (2) above; and (4) the justifications for continued safe operation (JCO's) for Donald C. Cook Nuclear Plants 1 and 2, until final environmental qualification was complete.

The above identified deficiencies in the SER's, TER's, and licensee responses of proposed resolutions were reviewed by the inspection team members and used as a basis for this inspection.

4. FINDINGS

A. EQ Program Compliance with 10 CFR 50.49

The NRC inspectors examined the licensee's program for establishing the qualification of electric equipment within the scope of 10 CFR 50.49. The program was evaluated by examination of the licensee's qualification documentation files, review of procedures for controlling the licensee's EQ efforts, and verification of adequacy and accuracy of the licensee's program for maintaining the qualified status of the covered electrical equipment.

Based on the inspection findings, which are discussed in more detail below, the inspection team determined that the licensee has implemented a program to meet the requirements of 10 CFR 50.49 for Donald C. Cook Nuclear Plants 1 and 2 although deficiencies in the program implementation were identified.

B. EQ Program Procedures

The inspectors examined the implementation and adequacy of corporate and site policies and procedures for establishing and maintaining the environmental qualification of electrical equipment in compliance with the requirements of 10 CFR 50.49. The licensee's methods for establishing and maintaining the environmental qualification of electric equipment were reviewed in the following documents:

General Procedures

GP 4.0, "Procurement Control," Revision 1, dated January 11, 1985 with Change Sheets 1-4 dated March 27, 1986.

GP 5.2 "AEPSC Specifications," Revision 3, dated March 27, 1986 with Change Sheet 1 dated March 31, 1986.

GP 5.14, "Maintenance and Update of the Control Equipment Environmental Qualification File," dated April 28, 1986.

GP 25, "Design Changes," Revision 4, dated March 4, 1985, with Change Sheets 1-4 dated March 11, 1986.

GP 42, "Maintenance and Update of the Central Equipment Environmental Qualification File," Revision 1, dated January 7, 1985.

Mechanical Engineering Division Procedures

MED 10, "Design Control," Revision 3, dated June 11, 1984 with Change Sheet 1, dated June 5, 1985.

MED 12, "Procurement," Revision 4, dated June 6, 1985 with Change Sheet 1 dated September 25, 1985.

Generation and Telecommunication's Engineering Division Procedures

EGS 3.0, "E.G.S. Design Control," Revision 2, dated May 15, 1985.

EGS 21.11, "Equipment Environmental Qualification Reports," Revision 0, Draft.

Plant Manager Instructions

PMI-5025, "Environmental Qualification of Safety-Related Equipment: S/M/R Program," Revision 0, dated March 31, 1985 and Revision 1 dated April 28, 1986.

The inspectors reviewed the above licensee procedures for implementation of the requirements of 10 CFR 50.49 including (1) definitions of harsh and mild environment, (2) equipment qualified life, (3) service conditions, (4) periodic testing, and (5) maintenance and surveillance. The licensee's EQ program was also reviewed for requirements to establish, evaluate and maintain auditable EQ documentation including EQ System Component Evaluation Worksheets (SCEW sheets), test reports, maintenance records, other supporting documents which establish equipment qualification, training of personnel, control of plant modifications (such as installation of new and replacement equipment), and provisions for updating replacement equipment, to the requirements of 10 CFR 50.49. The following observations were made:

(1) The licensee's program was found to identify and define requirements of equipment in harsh environments through EQ lists and SCEW sheets. In a review of the licensee's procedures the NRC inspectors did not find a clear statement which defined a mild, as opposed to a harsh environment. The licensee was screening components and equipment to meet all regulatory requirements, however AEPSC failed to place a definition in their procedural documents.

This item is an Open Item to be closed out by a subsequent NRC inspection (50-315/86015-05; 50-316/86015-05).

(2) Responsibility for assuring that the appropriate quality and regulatory requirements were included in procurement documents for correct application of environmentally qualified equipment, was delegated to the cognizant engineer and his section manager. Review and approval of EQ documentation by the cognizant engineer and his section manager, is evidenced only by their signatures on a transmittal sheet used to forward approved data to the nuclear safety and licensing group (NS&L). Licensee procedures then require NS&L to independently review the EQ documentation for compliance to FSAR, regulatory requirements and licensee commitments. EQ documentation which is found unacceptable by NS&L is returned to the cognizant engineering group for corrective action. NS&L approval is also indicated by only a signature on the same transmittal sheet which is used to forward approved

documentation to the EQ files. The cognizant engineering and NS&L signatures on this transmittal indicate reviews were performed; however they do not provide an auditable trail to evaluate the details of what had been reviewed, limits and criteria for approval, and uniformity of reviews between the different cognizant engineering groups. Controlling procedures are required for the above.

This item is considered an Open Item to be closed out by a subsequent NRC inspection (50-315/86015-06; 50-316/86015-06).

C. EQ Maintenance Program

All required maintenance, replacement, surveillance (MRS) tests and inspections necessary to preserve the environmental qualification of EQ identified equipment have been scheduled, and the records are being maintained on the Nuclear Test Schedule (NTS) computerized system. The NRC inspection team reviewed the NTS and found MRS work performed on schedule consistent with the requirements identified in the EQ documentation.

Licensee's procedures adequately address upgrade requirements for replacement equipment. Procurement packages for replacement cables, splices and conduit seals were also reviewed by the NRC inspection team. These packages all required qualification in accordance with IEEE STD 323-1974.

The NRC inspection team reviewed the modification package which upgraded (to provide a longer qualified life) the upper and lower gaskets on the pressure operated relief valve (PORV) limit switches. The NRC inspection team also reviewed the modification package which installed Conax seal assemblies on the reactor coolant system solenoid operated head vent valves, for an upgrade to the qualification test configuration. Each of the EQ packages documented all modifications performed on the EQ equipment.

The licensee's EQ maintenance program and its implementation are considered adequate. No deficiencies were identified.

D. SER/TER, SE, and Licensee Response Commitments

The NRC inspection team evaluated the implementation of EQ corrective action commitments made as a result of: (1) the identified deficiencies in the January 17, 1983 SER's and October 28, 1982 FRC TERs; (2) the licensee's proposed method of resolution for each of the EQ deficiencies, in item (1) above, as a result of the NRC staff meeting on September 13, 1983; (3) the licensee's proposed resolutions for additionally identified deficiencies documented in additional licensee responses beyond item (2) above; and (4) the SER's for final resolution of EQ equipment important to safety for units 1 and 2 issued on January 11, 1985.

The majority of deficiencies identified above involved EQ file documentation pertaining to similarity, aging, qualified life, and replacement schedules. The approach used by the licensee in resolution of the above deficiencies resulted in replacing equipment, additional analysis and qualification placed in the EQ documentation file beyond that reviewed by FRC, obtaining additional test reports and qualifying documents, and determining that some equipment was outside the the scope of 10 CFR 50.49.

The inspection team reviewed the licensee's EQ documentation files to verify that they contained the appropriate analyses and necessary documentation to support the equipment qualification of their 10 CFR 50.49 program. The licensee's EQ corrective action commitments provided in their submittals/addition submittals (items (2) and (3) above), along with additional commitments reiterated in the SERs of January 11, 1985, identified the results of the licensee's effort to re-examine, upgrade, add, and delete justifications for continued operation (JCOs) in effect at that time. The numerous JCOs deleted at that time reflected the licensee's replacement programs prior to the 10 CFR 50.49 (g) extension deadline date of November 30, 1985. The licensee had in effect programs to replace, partially replace, test, and perform additional analyses on equipment, earlier identified in JCOs. These actions were accomplished prior to November 30, 1985, for Unit 1. Unit 2 is currently being upgraded having been shut down since November 1985.

Based on review of the EQ documentation files including the 10 CFR 50.49 Master Environmentally Qualified Equipment List (see paragraph 4.E), the NRC inspection team identified no deficiencies in the implementation of SER/TER, SER and licensee response commitments. Ongoing review by the licensee of the Post Accident Monitoring (Regulatory Guide 1.97) Program implementation may result in additional equipment being added to the Master Environmentally Qualified Equipment List.

E. 10 CFR 50.49 Master Environmentally Qualified Equipment List (EQEL)

The EQEL identifies those items of equipment in the Donald C. Cook Nuclear Plant Units 1 and 2, that are required to be environmentally qualified in accordance with 10 CFR 50.49.

AEPSC is responsible for the preparation, review, approval, issuing, and maintaining (including changes) of the EQEL. The requirements for establishing and maintaining the EQEL are contained in AEPSC general procedure No. 5.14, Revision 0, April 28, 1986. The EQEL has been issued by AEPSC Quality Assurance Department as an attachment to AEPSC specification No. DCC QA 105 QCN, Revision 0, April 18, 1986. The cognizant AEPSC section which issues or determines that a change to the EQEL is necessary initiates changes to the EQEL, notifies other cognizant sections of the change, and obtains their concurrence. A

memo is prepared for the manager of AEPSC quality assurance indicating what changes to the EQEL have been made and the basis of the changes. The manager of quality assurance then routes the next revision to specification No. DCC QA 105 QCN with the revised EQEL attached, for review and approval, prior to distribution.

The NRC inspection team reviewed the Donald C. Cook Nuclear Plant EQEL as Attachment 1 to AEPSC specification No. DCC-QA-105-QCN, Revision 0, approved April 18, 1986, and associated documents. The NRC inspection team verified the adequacy of the implementation of AEPSC master list development and maintenance methods as accepted in the SEs for final resolution of equipment important to safety, units 1 and 2, issued January 11, 1985. In addition to the EQEL and SE's, the following documents were reviewed by the NRC inspection team:

(1) D.C. Cook Nuclear Plant, Unit 1, Operating Head Procedures Volume 25A, Draft Binder.

(2) D.C. Cook Nuclear Plant, Unit 2, Operating Head Procedures Volume 26, Draft Binder.

(3) GP 4.0, "Procurement Control," Revision 1, dated January 11, 1985 with Change Sheets 1-4 dated March 27, 1986.

(4) GP 5.14, "Maintenance and Update of the Control Equipment Environmental Qualification File," dated April 28, 1986.

(5) GP 25, "Design Changes, Revision 4, dated March 4, 1985 with Change Sheets 1-4 dated March 11, 1986.

(6) GP 42, "Maintenance and Update of the Central Equipment Environmental Qualification File," Revision 1, dated January 7, 1985.

The 10 CFR 50.49 EQEL review by the NRC inspection team, consisted of a review of the Unit 1 and 2 emergency operating head procedures (OHPs) to determine what components/equipment are required to be environmentally qualified during a design basis accident (DBA), which includes the LOCA, HELB, and the post accident monitoring period. The OHPs were reviewed to determine what components/equipment in particular are required to support and carry out the OHPs and associated safety functions. Twenty-five components were selected from those identified in the OHPs and verified against the EQEL. All were found on the EQEL.

The new OHPs for units 1 and 2 are the result of the control room design review requirements of NUREG 0737, Supplement 1 (TMI upgrades). OHPs were reviewed to determine that an operator's referral to EQ qualified instruments, equipment, and systems would take presedence over those non-qualified. The OHPs reviewed by the NRC inspection team indicated that the licensee is currently in the process of placing eight different identifying symbols and two colors on panel instruments

and devices on the main control room boards. Training of control room operators as to their significance is also being pursued by the licensee. The qualification schedule for this equipment is included in the PAM submittal forwarded to the NRC in October 1985. PAM components/equipment (approximately 48 for each unit) are in the process of being added to the EQEL. AEPSC's PAM program replacements may extend as far as 1987 thru 1990 outages.

Based on the NRC inspection team's review, the 10 CFR 50.49 EQEL is considered satisfactory.

F. Environmental Qualification Documentation Files

The licensee's master Central Equipment Environmental Qualification (CEEQ) documentation file is established and maintained to meet the requirements of 10 CFR 50.49 at the Columbus corporate office with a duplicate CEEQ located at the D.C. Cook Nuclear Plant. The requirements for establishing, controlling, routing, indexing, and filing EQ data of the CEEQ, are contained in AEPSC general procedures, No. 5.14, Revision 0, April 28, 1986, and No. 42, Revision 1, January 7, 1985, both entitled "Maintenance and Update of the Central Equipment Environmental Qualification File." The CEEQ consists of NRC submittal packages (IE Bulletin 79-01B, etc.), specified reference documents (including applicable sections of the FSAR), SCEW sheets (including revisions), qualification test reports, drawings, vendor letters and correspondence, cognizant engineering analyses, original equipment purchase orders, certificates of conformance/compliance, other documents linking purchased EQ equipment to that which was tested and identified in applicable test reports, subsequent documentation generated as a result of maintenance in accordance with PMI-5025 - "Surveillance/Maintenance and Replacement Program," documentation of design changes that fall within the scope of 10 CFR 50.49, other notes, memos, and/or documents employed to establish the environmental qualification of electrical equipment. Other interfacing procedures, related to the environmental qualification of electrical equipment, with regards to design changes, procurement, transmittals to the D.C. Cook Nuclear Plant, submittals to NRC, review of INPO significant operating experience reports, and the surveillance/maintenance/replacement parts (SMR) program, were in place and are currently in use by the licensee.

The NRC inspection team examined files for 29 selected equipment items (EQ documentation packages) to verify the qualified status of equipment within the scope of 10 CFR 50.49. In addition to comparing plant service conditions with qualification test conditions, and verifying the bases for these conditions, the inspectors selectively reviewed areas such as (1) required post-accident operating time compared to the duration of time the equipment has been demonstrated to be qualified; (2) similarity of tested equipment to that installed in the plant (e.g., insulation class, materials of components of the equipment, tested

configuration compared to installed configuration, and documentation of both); (3) evaluation of adequacy of test conditions; (4) aging calculations for qualified life and replacement interval determination; (5) effects of decreases in insulation resistance on equipment performance; (6) adequacy of demonstrated accuracy; (7) evaluation of test anomalies; and (8) applicability of EQ problems reported in IE Information Notices (INs)/Bulletins and their resolution.

During the review of the CEEQ component files the inspection team identified the following Potential Enforcement/Unresolved Items and Open Items, described below.

(1) Master Central Equipment Qualification Documentation File Auditability

The AEPSC CEEQ documentation files were not auditable to the extent that the organization of documentation was not readily understandable and traceable to permit independent verification of inferences or conclusions, as observed by the NRC inspection team as follows:

a. The file records did not contain positive statements by AEPSC as to the bases/level of qualification for each component's application (e.g., 10 CFR 50.49, DOR Guidelines, NUREG 0588, etc.)

b. No checklists (or equivalent) that identify all relating EQ documents used in determining equipment qualification were used to organize a traceable verification path. In most cases the SCEW sheet was the only document which helped the reviewer to obtain the related EQ documentation.

Even though signatures recorded on the transmittal sheets indicated that the appropriate cognizant engineers had reviewed each file, there were no documented details of this review to confirm that the engineers had found sufficient information in the files to satisfy all the requirements of the DOR Guidelines.

c. No specific references to documents contained in the numbered EQ files were identified on SCEW sheets (e.g., section, page number, appendix, etc.). SCEW sheets did not readily enable reviewers to identify the information required to be in the file in accordance with 10 CFR 50.49 paragraphs (d) and (e).

d. No evidence was found that the above control documents (items a, b, and c above) have been reviewed and approved by responsible EQ personnel. SCEW sheet information was often penciled in. Also, no controls are evident for the review and approval for acceptance of test reports (contained in the EQ files) by the responsible EQ personnel.

e. Multiple EQ file folders were identified in the EQ files with supplemental letter designators (e.g., 0063A, 0063J, etc.) when the primary numeric file designator (e.g., 0063) was the only type of information contained on SCEW sheets. No traceability to the supplemental letter file existed. The number of supplemental files available was not referenced on the SCEW sheets, and could not be determined.

f. Traceability to respective EQ file folders as referenced by the master sheet of equipment and auxiliaries (MEL) and SCEW sheets required several cross referenced documents. These cross reference documents did not list or arrange equipment items in a logical alpha or numeric order (e.g., by plant ID numbers, etc.) but required the reviewer to hunt to obtain the required information in identifying the appropriate file folder.

g. Many SCEW sheets did not have complete information with respect to manufacturer model number, etc. but identified these columns as "N/A."

h. Numerous questions had to be answered by the licensee, and various supplemental reports and correspondence, not identified in the file, had to be submitted and reviewed by the inspectors before it could be established that the equipment was qualified.

i. Many EQEL items were abbreviated not identifying manufacturers, model numbers, etc. This was particularly true for terminal blocks, electrical terminations, and electrical seal assemblies. To obtain this information the reviewer was required to go to the MEL and SCEW sheets, and hunt for each particular file folder.

Master CEEQ file auditability is a Potential Enforcement/Unresolved Item (50-315/86015-01; 50-316/86016-01).

(2) Conax Electrical Penetration Assemblies, 600V and below, Model Nos. 2325-8386-01 thru 11 and 15, D.C. Cook Tag Nos. EP-02 thru EP-14

The qualification basis was the DOR Guidelines. The file covered penetrations EP-02 to EP-14 for both units according to the SCEW sheets, but only EP-02 to EP-13 were addressed by the files. The licensee indicated penetration EP-14 would be addressed by a separate file for both units because EP-14 was a different type of penetration than EP-02 through EP-13. EP-14 is a penetration into a tank rather than a containment penetration. Conax electrical penetration EP-14 was not sufficiently described in the EQ documen-

tation files, and was not specifically addressed in the Conax test report.

This item is considered an Open Item to be closed out by a subsequent NRC inspection (50-315/86015-07; 50-316/86015-07).

Functional performance criteria were not addressed in these files, but some insulation resistance (IR) measurements were included in various tests. The EQ files did not adequately demonstrate qualification because of failure to show that the functional performance requirements of circuits passing through these penetrations were satisfied. No analyses were found which addressed how the measured IRs would affect the circuit performance.

This item is considered a Potential Enforcement/Unresolved Item (50-315/86015-02; 50-316/86015-02).

(3) Haveg Kapton Insulated Penetration Feedthrough Extension Wire, Used in Conax Electrical Penetrations

The qualification basis for Haveg Kapton insulated wire, used in the feedthroughs and pig tails of Conax penetrations, was the DOR Guidelines.

Functional performance criteria were not addressed in these files. The EQ files did not address how IRs will affect plant circuits passing through these extension wires and pig tails.

This item is considered a Potential Enforcement/Unresolved Item (50-315/86015-02; 50-316/86015-02).

The test profile enveloped the plant profile with post-test acceleration for long term qualification. The tested specimens were all 10 AWG Kapton insulated wire with no supporting evidence to qualify other sizes. A memo has been drafted, to be added to the file, concerning qualification of the other sizes.

This item is considered an Open Item to be closed out by a subsequent NRC inspection (50-315/86015-08; 50-316/86015-08).

(4) Brand Rex Triaxial Cable, Type RG 11/U, Item 3112, Inside Containment (Victoreen Radiation Monitoring System)

The NRC inspection team reviewed the file for Brand Rex RG11/U triaxial cable, Item #3112 used inside containment on the Victoreen radiation monitoring system. The cable qualification basis is the DOR Guidelines. The test profile enveloped the plant requirements with post-test acceleration for long-term qualification. Functional performance criteria were not established for the cables with respect to their application in the plant. The EQ files did not address how IRs will affect plant circuits passing through these cables.

This item is considered a Potential Enforcement/Unresolved Item (50-315/86015-02; 50-316/86025-02).

The qualification of these triaxial cables is based on a Brand Rex report which qualified coaxial cables with the same type number (RG11) and identical materials and construction. Normally, under the DOR Guidelines, this would be an acceptable approach to establish similarity. However, recent testing by Rockbestos has indicated failures of a triaxial cable, when coaxial cables with identical materials and similar construction all passed.

This item is considered an Open Item to be closed out by a subsequent NRC inspection (50-315/86015-09; 50-316/86015-09).

(5) Raychem Model NPK Splice Kits, Type WCSF-N, for Instrument Cable Connections at Electrical Pentrations (Inside Floodup Tube, Floodup Box, and at Instruments)

The NRC inspection team reviewed the EQ files for Raychem splice kits model NPK. These splice kits contain type WCSF-N splices. Both the individual splices and the splice kits have been tested by Raychem. The qualification basis for the splice kits is 10 CFR 50.49. The test profile enveloped the plant profile with post-test acceleration for long term qualification. The installed configuration was found to agree with that of the type tests.

Functional performance criteria were considered to the extent that the review of the type test report stated that insulation resistances were always above 1 megohm and should generally be acceptable, but specific applicability is to be reviewed as needed. No evidence of a specific review was available, but is in the process of being done by the licensee.

Qualification of all splices in the plant is being upgraded to 10 CFR 50.49 requirements with new test reports. The new test reports were not yet specifically identified by the SCEW sheets, but were contained in the file.

These items are considered Open Items and will be closed out in a subsequent NRC inspection (50-315/86015-10; 50-316/86025-10).

(6) Limitorque Motor Operators

AEPSC stated that all Limitorque motor operators are qualified to the DOR Guidelines.

a. In response to NRC Information Notice 86-03 (see paragraph 4.G(1)), the licensee developed an inspection program to inspect all jumper wires inside Limitorque motor operators. The walkdown inspection program was first implemented in unit 2 which was in an outage. Three out of approximately 80 motor operators (D.C. Cook Tag Nos. 2-WMO-714, 2-WMO-724, and 2-WMO-726) were identified with undocumented wire. The licensee in their 10 CFR 50.73 evaluation determined this finding was not reportable to the NRC. No Licensee Event Report (LER) was prepared, however the licensee did have a

complete report in the EQ documentation file. The report did not document the cause of the undocumented wire as these motor operators were classified as nuclear grade equipment at the time, and later were removed from the EQEL during a licensee re-evaluation of their safety function.

Since the NRC team inspection, the licensee has proceeded with a walkdown inspection for undocumented wire of motor operators in unit 1. As reported to the NRC (letter AEP:NRC 0775AF, June 17, 1986) undocumented wire has been identified in four safety-related valves, three inside the containment and one outside (IMO-315, IMO-316, IMO-54, and IMO-910). IMO-315 and 316 are the ECCS motor operated valves which are used to go from cold leg to hot leg recirculation on train A. IMO-54 is the motor operated valve on the charging flow line from the boron injection tank to loop 4. IMO-910 is in the line from the refueling water storage tank to the centrifugal charging pumps. The undocumented wire has been replaced with qualified wire and an evaluation by the licensee as to the safety significance of the identified undocumented wire is currently in process. The licensee's inspection program of motor operators in unit 1 is continuing and the licensee has committed to inspect each valve prior to the reactor entering a mode for which the specific valve is required.

This item is considered a Potential Enforcement/Unresolved Item (50-315/86015-03; 50-316/86015-03).

b. Not all qualified life calculations were included in the documentation files. AEPSC performed these calculations during the inspection and stated that they would add them to the EQ files.

This item is considered an Open Item and will be required to be closed out in a subsequent NRC inspection (50-315/86025-11; 50-316/86015-11).

c. Documentation errors in the EQ file for Limitorque motor operators are as follows:

The master equipment list (MEL) incorrectly referenced valve operators IMO-211, -211, -231, and -241 as being supported by SCEW sheet V-6. These valves were replaced in 1979, and were listed on SCEW sheet V-12. The MEL was not updated to show this change.

SCEW sheets TC13-1 and TC8-1 listed the equipment manufacturer as "not applicable." However, during the documentation review, AEPSC stated that the terminal blocks for TC13-1 were manufactured by Marathon and Penn Union and that the splices for TC8-1 were manufactured by Raychem.

SCEW sheet TC13-1 listed a qualified life of 40 years and referenced documentation package 177. Documentation package 177 did not contain the information necessary to support the 40-year qualified life, nor did it mention Penn Union terminal blocks. AEPSC performed the 40-year calculation for Marathon terminal blocks during the inspection and stated that they will do the same for the Penn Union terminal blocks and will include this information in the documentation file.

These items are considered an Open Item to be closed out in a subsequent NRC inspection (50-315/86015-12; 50-316/86015-12).

(7) ASCO Solenoid Valves, Eberline Radiation Detectors, Foxboro Pressure Transmitters, - EQ File Documentation Errors

a. ASCO Solenoid Valve, Model No. NP-8316-54V, SCEW File Number 2411-1 (D.C. Cook Tag Number XSO-505, Unit 2)

This solenoid valve, which is located inside the containment building, is used in conjunction with NRV-152 for pressurizer pressure control. AEPSC considers this solenoid valve to be qualified to the requirements of the DOR Guidelines. Qualification is established in accordance with the references provided on S11-1.

AEPSC stated that the cable terminations for this solenoid valve were deleted from the EQEL because the valve is normally closed and remains closed on failure of the cable terminations. File S11-1 does not document an analysis to justify removal of the cable terminations from the EQEL, nor does it state that the cable terminations need not be qualified.

b. ASCO Solenoid Valves Model No. 206-381-2 RVU, SCEW File No. 53-1 D.C. Cook Tag Numbers XSO-292 and XSO-297, Units 1 and 2)

SCEW File TC-13-1 "Terminal Block Cable Terminations for XSO-292 and XSO-297" lists the plant ID, manufacturer, and model number as "not applicable." AEPSC stated that only Penn Union terminal blocks are currently installed and provided test reports that establish qualification of Penn Union Type 612-N3-AEP terminal blocks with hinged or bolted covers.

c. Eberline Radiation Detector, Model DAI 6-HT-CC (D.C. Cook Tag No. VRS-1201, Unit 2)

This radiation detector is located inside the containment building. All associated monitoring/display equipment is located outside containment in a mild environment. AEPSC

considers this radiation detector to be qualified to the requirements of the DOR Guidelines. Qualification is established in accordance with the references provided on SCEW No. I-34. The EQ file did not indicate that qualification was for the radiation detector only, located in the harsh environment, or to what extent the interfaces required qualification.

d. Foxboro Pressure Transmitter, Model No. E-11GM-HIE2, SCEW File Number I-20 (D.C. Cook Tag Number NPP-152, Unit 2)

This pressure transmitter, which is located inside the containment building, is used to monitor pressurizer pressure for normal and post-accident operations. AEPSC considers this pressure transmitter to be qualified to the requirements of 10 CFR 50.49.

SCEW No. I-20 and the associated qualification documentation in the file addressed only the originally installed ITT Barton pressure transmitter. The replacement Foxboro transmitter qualification documents did not exist in the file. AEPSC stated that the file would be updated, prior to unit 2 startup.

e. Foxboro Differential Pressure Transmitters, Model No. NE13-DM-HIM1-D and NE 11-GE-HIM1 (D.C. Cook Tag Nos. FFI-230, FFI -240, and NPS 122 Unit 2)

Differential pressure transmitters FFI-230 and FFI-240 are located outside containment in the auxiliary building and are used to monitor auxiliary feedwater flow. Pressure transmitter NPS-122, located inside the containment building, is used for monitoring reactor coolant system pressure. AEPSC considers these pressure transmitters to be qualified to the requirements of 10 CFR 50.49.

The referenced test reports contained in the EQ file require that a 1/4-inch weep hole be placed at the lowest point of the connecting electrical conduit. AEPSC stated that, in accordance with construction drawing PDS 1341-4, Note 2, the entrance and exit of conduit for components involved must be sealed with an approved silicon sealant (RTV) in lieu of the weep hole requirement. Note 2 is not referenced on SCEW No. I-5, in the qualification test report, or anywhere in the EQ documentation file.

f. ITT Barton Differential Pressure Transmitters, Model 764, Inside Containment, D.C. Cook Tag Nos. NLI-110, 120, 121 (Unit 1) and NLA-310 (Unit 2)

(1) Tag Nos. NLI-110, 120, and 121 (Unit 1) were currently in the process of being replaced by Foxboro transmitters Model N-E13 DM. Qualification documentation for the replacement Foxboro transmitters does not exist in the EQ file.

(2) Tag No. NLA-310 SCEW sheet referenced QA documentation file 62 for electrical connections. File 62 contained parts 62, 62A, 62B, and 62C which were superseded by 62D. The superseded documents should be removed from the file if they have no application to establish qualification.

The above items (paragraphs 4.F(7)a thru 4.F(7)f above) are considered Open Items and will be closed out in a subsequent NRC inspection (50-315/86015-13; 50-316/86015-13).

(15) Generic Qualification of Grease/Lubricants for Electric Motors

During the NRC review of the CEEQ files regarding electric motors, the inspection team observed that there was no reference to qualified grease and lubricants. The inspection team determined that the licensee had qualified a grease (Mobilux EP-2), in accordance with the requirements of 10 CFR 50.49 and the DOR Guidelines for use in all electric motors in the plant. However, since there was no reference to this qualified grease in the EQ documentation files, the possibility that an unqualified grease could be used inadvertently during maintenance was a concern. The licensee agreed to insert a document identifying the qualified grease, in all appropriate EQ files for electric motors.

This item is considered an Open Item to be closed out by a subsequent NRC inspection (50-315/86015-14; 50-316/86015-14).

G. IE Information Notices and Bulletins

The NRC inspection team reviewed and evaluated the licensee's activities related to the review of EQ-related IE Information Notices/Bulletins. The inspection team's review included examination of the licensee's procedures and EQ documentation files relative to 12 IE Information Notices and one IE Bulletin. The procedures review determined that the licensee does have a system for distributing, reviewing, and evaluating IE Information Notices/Bulletins relative to equipment within the scope of 10 CFR 50.49 (refer to paragraph 4.B).

The AEPSC program status of their MSLB effect on environmental qualification of equipment, outlined in IE IN 84-90, was reviewed by the NRC inspection team. The licensee's program was addressed in detail by AEPSC in their letter to the NRC on August 3, 1984 (AEP:NRC 0775M). However, AEPSC is currently in the process of considering plant-specific analyses of the D.C. Cook plants with regards to the Westinghouse revised mass and energy releases from MSLB's. AEPSC has indicated that thermal environments are now more severe than previously prescribed under their MSLB analyses based on the earlier steam generator blowdown model of WCAP 8822 and WCAP 8860. The new analyses and implementation of new values into APESC EQ program is scheduled for July 1986.

H. Plant Physical Inspection

The NRC inspection team, with the required tagging out of operation of selected equipment and components by the licensee, walked down and physically inspected approximately 41 components (12 in unit 1; 29 in unit 2) in both units 1 and 2. The inspection team examined attributes and characteristics such as mounting configuration, orientation, interfaces, model numbers, ambient environment, and physical condition.

During the NRC walkdown inspection, the inspection team identified the following Potential Enforcement/Unresolved Items and Open Items described below:

(1) Limitorque Motor Operators (D.C. Cook Tag No. IMO-54)

a. Vendor documentation recommends the use of "T" drains and grease relief valves for operators used inside containment. However, during the plant walkdown, neither a grease relief valve nor a "T" drain could be identified for valve operator IMO-54, which is located inside the Unit 2 containment building. This motor operated valve is used for emergency core coolant safety injection, normal reactor heat removal, and containment isolation. Limitorque test report 600376A and Franklin report F-C3441 support qualification of this operator. AEPSC has an engineering evaluation program underway to evaluate the use of "T" drains, motor heaters, grease relief valves, and valve orientation for applicability to the installed valve operators in both units 1 and 2. No completion date has been determined for this evaluation.

This is a Potential Enforcement/Unresolved Item (50-316/86016-04).

b. Limitorque motor operator FMO-211 is located in Unit 2 auxiliary building and is used in the turbine-driven auxiliary feedwater system. This motor operator had a loose conduit at the junction box. AEPSC stated that this would be resolved.

This item is considered an Open Item and will be closed out in a subsequent NRC inspection (50-316/86015-16).

(2) ASCO Solenoid Valves, Model Nos. NP-8316 and 206-381, D.C. Cook Tag Nos. XSO-122, Unit 2, and XSO-292, XSO-297, units 1 and 2

a. ASCO solenoid valve model NP-8316, D.C. Cook tag XSO-122, which is located inside the unit 2 containment building, is used in conjunction with another solenoid valve for containment ventilation isolation. AEPSC considers this solenoid valve to be qualified to the requirements of the DOR Guidelines. Qualification for the solenoid valve is established in accordance with the references provided in SCEW No. S17-1.

Valve XSO-122 is installed in a configuration identified in the qualification test report. However, the termination box does not have (1) a coverplate gasket; (2) RTV sealant for the conduit entering and leaving the box; and (3) a Raychem splice for the cable terminations, which are loosely wrapped with black electrical tape. This installation is not in accordance with qualification documentation and is therefore considered a Potential Enforcement/Unresolved Item (50-316/86015-17).

b. ASCO solenoid valves, model 206-381-1 RVU, D.C. Cook tag XSO-292 and XSO-297, which are located outside containment in the auxiliary building, are used to close the main feedwater regulating valves when required. AEPSC considers these solenoid valves to be qualified to the requirements of the DOR Guidelines. Qualification of these solenoid valves is established in accordance with the references provided in SCEW No. S3-1.

The associated terminal block enclosures in unit 1 are of the sidehinged access door type with drain holes. Enclosures in unit 2 are of the top-hinged access door type without drain holes. The files did not contain evaluation to establish requirements for drain holes in these terminal block enclosures.

This is considered an Open Item to be closed out by a subsequent NRC inspection (50-315/86015-20; 50-316/86015-20).

(3) Foxboro Pressure Transmitters, Model Nos. NE13-DM-H1H22 and E11-GM-H1E2

The following items were identified by the NRC inspection team with regards to Foxboro pressure transmitters:

a. Foxboro Differential Pressure Transmitters, Model No. NE 13-DM-H1H22, D.C. Cook Tag Number FFC-230, Units 1 and 2 FFC-241, Unit 1

These differential transmitters are located outside containment and are used for main feedwater flow indication.

D.C. Cook tag No. FFC-230 and FFC-241 transmitters did not have a weep hole installed at the low-point in the electrical conduit installation that is required by the qualification test report. The pressure transmitter cable termination conduits did not have the silicon sealant applied in lieu of the conduit weep hole as required by construction drawing PDS-1341-4, Note 2. No analysis in the EQ file addressed the installed configuration with regards to moisture intrusion.

This is considered a Potential Enforcement/Unresolved Item (50-315/86015-21; 50-316/86015-21).

b. Foxboro Pressure Transmitter, Model No. E-11GM-H1E2, SCEW File No. I-20, D.C. Cook Tag No. NPP-152, Unit 2

During the plant walkdown, the electrical conduit for pressure transmitter NPP-152 did not have a weep hole installed at the low point in the conduit installation. However, all conduit and transmitter connections were sealed with silicon sealant. This Open Item is discussed with regards to SCEW sheet I-5 (see paragraph 4.F.(7)e). The analysis in the EQ file did not address the installed configuration of silicon sealant connections.

c. Foxboro Differential Transmitters, Model No. NE13-DM-H1H22 (D.C. Cook Tag Number FFC-230, Units 1 and 2 and FFC-241, Unit 1

During the plant walkdown, the electrical conduit for pressure transmitter FFC-230, unit 1, did not have a weep hole installed at the low point installation, however all conduits and transmitter connections did have silicon sealant. This Open Item is also discussed with SCEW sheet Number I-5, (see paragraph 4.F(7)e). The analysis in the EQ file did not address the installed configuration of silicon sealant connections.

Items 4.H(3)b, and 4.H93)c above are considered an Open Item to be closed out by a subsequent NRC inspection (50-315/86015-18; 50-316/86015-18).

(4) Field Verification of Cables

A field verification of electrical cables with regards to identification and control of materials was conducted by the NRC inspection team. D.C. Cook identifies their field cable by use of pull cards which are controlled and revised as plant modifications and replacement occur. The pull card refers to a specific purchase order under which the cable was purchased and indicates a cable item number developed by AEPSC to designate the number and size of conductors. In some cases the purchase order numbers were not found on pull cards, however the item numbers were available to identify the manufacturers of the cable. Qualification documentation for each manufacturer was located in the EQ files.

During the plant walkdown, four cables were verified against the qualification documentation located in the EQ files. Cable tag number 9963CY-2, a triaxial cable used in the Victoreen radiation monitoring system, was not documented on the cable pull cards. Also the EQEL indicated the cable number as 9960CY-2 and 9961CY-2. These documentation errors are required to be corrected.

This item is considered to be an Open item and will be closed out in a subsequent NRC inspection (50-315/86015-19;50-316/86015-19).