



THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

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PERRY NUCLEAR POWER PLANT

Al Kaplan

VICE PRESIDENT
NUCLEAR GROUP

March 11, 1988
PY-CEI/NRR-0319 L

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Perry Nuclear Power Plant
Docket No. 50-440
NRC Enforcement Action EA 87-206

- References:
1. NRC Region III letter 2/11/88 (EA 87-206): Notice of Violation and Proposed Imposition of Civil Penalty (NRC Inspection Report No. 50-440/87013).
 2. NRC Inspection Report No. 50-440/87013 via transmittal letter dated 12/17/87.

Dear Gentlemen:

Pursuant to 10 CFR 2.201, The Cleveland Electric Illuminating Company (CEI) hereby provides our Reply to the Notice of Violation identified in reference 1 above (Attachment A).

Additionally, pursuant to 10 CFR 2.205.b, Attachment B provides our Answer to the Notice of Violation addressing the severity level classification of the violation. After extensive review, CEI believes that the violation has been improperly categorized as a Severity Level III problem and consequently requests that the violation be re-classified as a Severity Level II problem. Also, due to the past performance in this area as well as the prompt and extensive corrective actions taken, CEI believes full mitigation of the civil penalty is warranted.

However, CEI believes that our resources will be better spent in working cooperatively to resolve this matter, and to continue the quality of operation of the Perry Nuclear Power Plant. Therefore, a check made payable to the Treasurer of the United States is enclosed in payment of the civil penalty. Please feel free to contact us should you have any additional questions.

Very truly yours,

Al Kaplan
Vice President
Nuclear Group

AK:cab

Attachments

cc: Director, Office of Enforcement
Regional Administrator, USNRC Region III
T. Colburn
K. Connaughton

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Alvin Kaplan who, being duly sworn, deposed and said that (1) he is Vice President, Nuclear Group of The Cleveland Electric Illuminating Company, (2) he is duly authorized to execute and file this report on behalf of The Cleveland Electric Illuminating Company and as duly authorized agent for Duquesne Light Company, Ohio Edison Company, Pennsylvania Power Company and the Toledo Edison Company, and (3) the statements set forth therein are true and correct to the best of his knowledge, information and belief.



Alvin Kaplan

Sworn to and subscribed before me, this 11th day of March, 1988.



CONSTANCE A. PAEVVICK
NOTARY PUBLIC, STATE OF OHIO
MY COMMISSION EXPIRES MAY 29, 1991

CEI REPLY TO THE NOTICE OF VIOLATION OF EA 87-206,
PURSUANT TO 10 CFR 2.201

Restatement of Violation (50-440/87013)

- I. 10 CFR 50.49 (a) requires each holder of a license to operate a nuclear power plant to establish a program for qualifying safety-related electric equipment, nonsafety-related electric equipment whose failure could prevent the satisfactory fulfillment of a safety function, and certain post-accident monitoring equipment.

10 CFR 50.49 (f) requires that each item of electric equipment important to safety be qualified by test and/or analysis.

Contrary to the above, as of November 10, 1987, equipment which the licensee determined had to be qualified was not properly qualified due to test and/or analysis deficiencies, as demonstrated by the following examples:

- A. Valcor solenoid valves were not properly qualified because the thermal aging was based on a process fluid other than that actually used in operation (Test Report No. NEDC-30735).
- B. PYCO temperature elements (Model No. 102-9039-11) were not properly qualified because repairs were made to the equipment (torquing the cover) during qualification testing (File No. E-301-C03-01).
- C. ITT General Controls electrohydraulic actuators were not properly qualified because they were installed inside containment while the qualification testing was performed to a set of less severe accident conditions representing conditions outside containment (File No. E-245-00-001 [sic E-524-00-001]).
- D. ASCO solenoid valves were not properly qualified because thermal aging was based on a process fluid other than that actually used in operation. Also the thermal aging evaluation was based on partial thermal aging in the test program combined with aging as a result of the design basis event exposure. Thermal aging is required to be performed prior to the event exposure (File Nos. E-641-001-01, E-641-000-01 and E-607-001-01).
- E. Marathon 1600, Buchanan 200, and GE EB-5 terminal blocks were not properly qualified because insulation resistance readings during qualification testing were taken at voltages lower than that which would be actually experienced in operation (6 volts vs. 480 or 120 volts) (File No. E-568-000-04).

- II. 10 CFR 50.49(f) requires that each item of electrical equipment important to safety be qualified by testing and/or analyses of an identical item of equipment under identical conditions, or a similar item or under similar conditions with a supporting analysis to show that the equipment to be qualified is acceptable.

Contrary to the above, as of November 10, 1987, equipment which the licensee determined had to be qualified was not properly qualified by testing and/or analyses of an identical or similar item or under identical or similar conditions in that discrepancies existed between the tested/analyzed and the installed configuration without supporting analyses, as demonstrated by the following examples:

- A. Target Rock Solenoid Valve No. 1E12-F075B (Model No. 77JJ-006 SOV) was found installed with three bolts missing from the solenoid housing while the tested configuration was with all eight bolts installed.
- B. Limitorque Actuator 1P51-F652 had a T drain installed such that condensate which might collect during an accident could short the electrical internals while the tested configuration had the T drain properly located to allow proper drainage.
- C. Thirty-five Limitorque Actuators (including 1P51-F652) were found installed with plastic shipping caps on the grease relief valves while the tested configuration was with those caps removed.
- D. Limitorque actuators, addressed under File E-568-000-00 and located inside containment, were installed without the suppression pool swell deflector plates changing the environment the actuator would experience post-LOCA from the tested environment.
- E. PYCO Thermocouple No. 1E31N001A was found installed with a loose housing cover while the tested configuration required a 50 ft-lb torque to be applied to the housing cover for adequate sealing.
- F. WEED Resistance Temperature Detectors, Series 611, including 1D23N050A and B were found with loose housing covers while the tested configuration required the covers to be hand tight plus 1 1/2 turns to provide adequate sealing.

III. 10 CFR Part 50, Appendix B, Criterion V, as implemented by the licensee's Quality Assurance Program, requires that activities affecting quality be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances.

Contrary to the above, as of November 10, 1987, the maintenance procedures for equipment which the licensee determined had to be qualified were not appropriate to the circumstances in that they did not include the EQ maintenance requirements specified by the equipment vendor, as demonstrated by the following examples:

- A. O-ring replacement was not required in the maintenance procedure each time the housing cover was removed from PYCO temperature elements.
- B. O-ring inspection, application of radiation resistant sealant, and torquing the cover housing were not required in the maintenance procedure for WEED thermocouples each time the cover was removed.

- C. O-ring replacement and application of Dow 55M silicone grease to the body and housing cover threads and Nebula 1000 grease to the housing pipe plug threads were not required in the maintenance procedure for Rosemont transmitters each time the housing cover was removed and as necessary.
- D. Replacement of the motor junction box cover gasket was not required in the maintenance procedure for MSIV blower motors 1E32-C001, 1E32-C002B and 1E32-C002F whenever the cover was removed. The failure to specify this caused invalidation of equipment qualification when Work Order 86-05531 required removal the cover of 1E32-C001, but did not require gasket replacement.
- E. Seal and gasket replacement was not required in the maintenance procedure for Target Rock solenoid valves each time the housing cover was removed.

Collectively, these violations have been categorized as a Severity Level III problem (Supplement I).

Response to Violations

(1) Admission or Denial of Alleged Violations

The Cleveland Electric Illuminating Company (CEI) is in agreement with many of the identified examples demonstrating deficiencies in our EQ programs. However, CEI does not believe that the overall conclusions as stated in this NOV are representative of our program. In addition, CEI believes the violation more accurately represents a Severity Level IV problem.

(2) Reason for the Violations

- I. The cause of the identified test and/or analysis concerns has been attributed to an oversight by CEI personnel responsible for the original review and approval of the EQ documentation. Existing personnel were confident of the qualification documentation packages and had no reason to believe otherwise.
- II. The cause of the identified discrepancies between the tested and installed configurations has been attributed to either improper original installation or to the effect of activities during the preoperational/startup test phase. The scope of subsequent equipment walkdowns did not include these specific items.
- III. The cause of the identified maintenance procedure deficiencies have been attributed to the existence of specific areas of programmatic controls which were not practical for routine implementation. The program as written appeared adequate and existing personnel had no reason to believe otherwise.

(3) Corrective Steps Taken and Results Achieved

- I. Five examples were identified of equipment not properly qualified due to existing test and/or analysis deficiencies. Subsequent evaluations have determined that the equipment was qualified, and in the worst case the evaluations resulted in the service life of certain components being conservatively shortened. It should be noted that the Office of Nuclear Reactor Regulation (NRR) had previously documented in Supplements No. 5 and 7 of the Perry Safety Evaluation Report (SER) (NUREG-0887) the review and approval of qualification of the subject EQ equipment on the basis of the documents contained in the EQ files during their on-site visit or in followup documentation provided in subsequent correspondence. Thus, it should not be concluded that CEI should have or could have identified the stated deficiencies prior to the conduct of the NRC inspection.

The following corrective steps were taken as a result of the qualification test and/or analysis concerns.

- o An immediate engineering evaluation was performed for each concern which reverified qualification of the subject equipment. This effort was complete by August 24, 1987.
- o An extensive review was performed of other EQ files for class 1B equipment located in a harsh environment which were not reviewed during the NRC inspection. The minor discrepancies identified were resolved. This effort was complete by November 6, 1987.
- o The subject EQ files were modified to incorporate the evaluation results as necessary. This effort was complete by January 29, 1988.

Each of the identified examples are discussed in detail below.

- A. The Valcor solenoid valves are qualified for the Perry application in air service and at no time were they considered inoperable or unable to perform their intended function. However, an aging calculation which considered the correction for an air process fluid versus nitrogen was performed to determine the qualified life of the solenoid coil and valve body O-rings of Valcor solenoid valves. The qualified life was determined to be 22.61 years for the coil and 5.35 years for the O-rings. The EQ file for the Valcor solenoid valves was revised August 6, 1987 to reflect these results and to incorporate a Special Maintenance and Replacement Requirement (SMRR) for the two applicable Valcor valves. The SMRR utilizes the Repetitive Task program to ensure that the periodic maintenance is performed as required. The associated repetitive tasks require replacement of the O-rings every 5 years and the solenoid coils every 10 years.

Additionally, a recent test report (F-609-6, "Aging and Qualification Research of Solenoid Operated Valves") has shown that accelerated aging in nitrogen more closely simulates natural aging in air than accelerated aging in air. Thus, the administrative reductions made in the service lives are considered conservative.

- B. The PYCO temperature elements are properly qualified and at no time were they considered inoperable or unable to perform their intended function. CEI disagrees with the NRC assessment of the qualification of these PYCO temperature elements. The torque applied to the cover was not a repair, but rather a degradation of the equipment condition. The qualification documentation contained within the EQ file was adequate and in compliance with 10 CFR 50.49. However, the below clarification was incorporated into the files September 15, 1987 to avoid future confusion.

The General Electric test of the PYCO temperature element included thermal and radiation aging of the terminal head cover gaskets. These gaskets are composed of asbestos fibers and designed such that after tightening the terminal head cover to the specified torque the gasket cannot be reused. The gasket material is virtually rigid and is not susceptible to the compression set phenomena as exhibited in O-rings. The test of the seal configuration with the PYCO temperature element cover torqued is, therefore, a conservative representation of the installed condition. Any removal and tightening (at any torque) of the terminal head cover would cause irreparable damage to the gasket. The torquing of the terminal head cover to the specified value, prior to the DBE exposure during the test, would at best represent a degradation of the installed condition. This evaluation was complete July 24, 1987.

- C. The ITT General Controls electrohydraulic actuators are qualified and at no time were they considered inoperable or unable to perform their intended safety function. Additionally, the actuators fail in a safe condition (closed) and their only function during an accident is to close, which is accomplished by operating normally or failing.

A review of pressure requirements and the EQ file package was performed. It was originally determined that the finding was valid and the auditor was informed that, in the worst case, consequences of failure were that the ITT actuator would fail closed following an electrical short (safe condition). This was accepted and the test data for the fail safe condition was added to the ITT test report and EQ file.

On August 11, the NRC requested further information on the operability of other equipment on the same electrical bus as the ITT actuator. As requested, a further review was performed. The review results concluded that no other equipment operability was impacted due to circuit design (double fuse) and this information was provided to the NRC.

Initial review concluded that the actuator could fail with no safety consequences however, PNPP has reviewed data from an ITT qualification report 730.1.140 (Rev. 4) which provides for qualification of the actuator. The report tested the actuator with an unsealed conduit configuration in addition to applying a 6

psig pressure. The design rating (NEMA 4) of the actuator, in addition to being a completely "sealed" configuration at Perry, adequately protects the equipment during a LOCA. The PNPP environmental conditions are enveloped by the 730.1.140 report with the exception of 3 seconds, (peak pressure of 8.8 psig) during the LOCA. This 3 second period would not increase the relative volume of environment that could have entered the unsealed configuration. Therefore, it is our position that the PNPP environmental configuration is less severe than an unsealed configuration.

Also, as stated in the test report an NH94 actuator was subjected to an ambient pressure of 60 psig for greater than 20 days during its DBE test, and the actuator cycled properly at the end of the test. Both the Perry NH95 and the NH94 have identical NEMA-4 enclosures. Since the NH94 actuator was tested under significantly greater pressure and duration than required by the design base accident conditions at Perry with no indication of mechanical binding or deflection of the actuator housing, it is further concluded that the Perry actuators in question are qualified for the accident pressure environment.

The above clarification was incorporated into the EQ file package January 15, 1988 for ITT actuators in order to avoid future concerns.

- D. The ASCO solenoid valves are qualified for the Perry application in air service and at no time were they considered inoperable or unable to perform their intended safety function. However, aging calculations which corrected for the use of air process fluid versus nitrogen and deleted the use of a portion of the DBE test for thermal aging were performed to determine the qualified life of the ASCO solenoid valves. The most limiting service life was 5.5 years for the elastomers and solenoid coils of the valves used in the highest service temperature with the coil energized during normal operation and testing. The conclusions of these calculations resulted in revisions to the appropriate EQ file packages and incorporation of SMRRs (completed September 11, 1987).

In addition, a recent test report (F-609-6) has shown that accelerated aging in nitrogen more closely simulates natural aging in air than accelerated aging in air. Thus, the administrative reductions made in the service lives are considered conservative.

- E. The multi-point terminal blocks used in Limitorque valve actuators at Perry are qualified and at no time were they considered inoperable or unable to perform their intended function. CEI disagrees with the NRC assessment of the qualification of the Limitorque motor operator terminal strips. The qualification documentation contained within the EQ file was adequate and in compliance with 10 CFR 50.49.

Within a month prior to our inspection, the NRC conducted an audit at Limitorque. During this audit, it was identified that the "Insulation Resistance (IR)" was measured incorrectly, in that the measurement was taken utilizing the internal power supply of the megger (approx. 6 VDC). This IR measurement was not considered appropriate to reflect IR that would occur at actual power voltages of 480 VAC.

CEI has contacted the Limitorque Corporation regarding the adequacy of the Limitorque qualification test report B0119 in light of the NRC concerns. Limitorque has indicated to CEI their disagreement with the NRC concerns regarding the adequacy of the test report and the qualification of the items in question. Until resolution of this issue between Limitorque and the NRC, it is CEI's position that the B0119 report is satisfactory and meets the necessary requirements to provide proof of Equipment Qualification. Additionally, CEI has obtained several other qualification reports which further substantiate our position that the existing terminal blocks are qualified. The appropriate EQ file package was revised January 24, 1988 to provide the additional documentation further substantiating the validity of the Limitorque report B0119.

However, in order to preclude an impact on the plant schedule, CEI initiated a review of the existing terminal strips in our Limitorque operators. CEI concluded that those configured with Marathon 300 series (terminal strip wired to the motor during the Limitorque test), General Electric EB5's, and those previously "butt spliced" were acceptable to NRC and required no action. Two operators that contained other types of terminal blocks were replaced with Marathon 300's due to the potential impact on plant startup and the lengthy period of time necessary to resolve this issue between Limitorque and the NRC.

It should also be noted that PNPP was not notified of NRC concerns from the Limitorque vendor audit through NRC bulletins, notices or vendor part 21 reports. Existing plant programs for review of such documents would have addressed the industry concern prior to the NRC inspection at Perry. To date, no such report has been received.

- II. Six examples were identified of discrepancies between the tested/analyzed and the installed configurations without supporting analyses. Subsequent evaluations have determined the equipment was operable and able to perform its intended function. The following corrective steps were taken as a result of the installed configuration concerns.
- o Engineering evaluations were performed which verified the operability of the subject equipment. This effort was complete by August 16, 1987.

- o A physical walk-down and visual inspection was performed of selected installed class 1E electrical equipment located in a harsh environment, which confirmed the original scope of the problem to be limited to temperature elements and solenoid valves. This effort was complete by July 31, 1987.
- o Although the as-found conditions were determined to be functionally acceptable, those items that needed corrective maintenance were reworked. This effort was complete by August 8, 1987.

Each of the identified examples are discussed in detail below.

- A. The Target Rock solenoid valves identified with missing bolts were at no time inoperable or unable to perform their intended safety function. All Target Rock solenoid valves located in a potentially harsh environment were inspected (26), and those identified as missing bolts (4) were reworked. This effort was complete by August 6, 1987. An engineering evaluation was conducted to determine if there was a potential for loss of cover gasket compression since if the gasket compression were lost, then a loss of the required environmental seal could result. The evaluation results (completed July 22, 1987) with 3 bolts missing (worst case found) indicated that compression would not be lost. Therefore, CEI concludes that the environmental seal was not, nor would not be, affected.
- B. The Limitorque actuator with the incorrectly installed T drain (1P51-F0652) was at no time inoperable or unable to perform its intended safety function. 1P51-F0652 is located in a containment zone which experiences a peak post accident temperature of 184.6 degrees, 100 percent relative humidity, and containment spray (no steam environment). Since no steam condition is experienced, no intrusion of condensate would be introduced through the T drains, conduit, and actuator seals. Additionally, the conduit is routed vertically up the wall and then takes a 90 degree turn before the cable (which comes out of the conduit) goes downward to the cable tray. No significant amount of condensate if any could enter the T drain due to the valve configuration. Consequently, in comparison to the severity of condensate intrusion performed in Limitorque qualification Test report 6000376A (F-C3441), valve 1P51-F0652 would be able to perform its intended safety function.

Nonetheless, the T drain on 1P51-F0652 was relocated October 7, 1987 to the low point. A 100 percent inspection of Limitorque actuators located in a potentially harsh environment was performed to ensure that all T drain connections were properly located. No additional improperly located T drains were identified. Additionally, Preventive Maintenance Instruction (PMT)-0030, "Maintenance of Limitorque Valve Operators," was revised August 3, 1987 to ensure that Limitorque valve actuator T drain connections will be properly located in the future.

- C. The Limitorque actuator identified with shipping caps installed was at no time inoperable or unable to perform its intended safety function. The purpose of the grease relief valve is to provide for the relief of grease and pressure when thermal expansion takes place due to prolonged elevated temperatures. A 100 percent inspection of Limitorque actuators located in a potentially harsh environment was performed by CEI July 23, 1987 to identify the presence of any grease relief shipping caps. CEI identified 31 additional caps installed.

All of the affected actuators were located in the containment (outside the drywell). The worst case post accident environmental conditions in containment identify a peak temperature of 240 degrees. The Limitorque qualification test report B0003 successfully tested an actuator with no grease relief valve to a peak temperature of 250 degrees without thermal expansion of the grease affecting the operability of the actuator. Additionally, CEI has obtained a qualification test report (TR-076) which provides evidence that the shipping caps should melt off during an accident scenario.

All shipping caps found were removed by July 23, 1987. Also, PMI-0030 was revised to ensure that Limitorque actuator grease relief valve shipping caps are removed during any future installation of Limitorque actuators.

- D. The Limitorque actuators installed without deflector plates were identified by CEI following the NRC inspection and promptly reported under 10 CFR 50.72 and 50.73. These actuators were at no time inoperable or unable to perform their intended safety function. The deflector plates are designed to reduce hydrodynamic loads on six safety-related isolation valve actuators which would otherwise be subjected to the dynamic loads associated with suppression pool swell effects following a postulated LOCA. These plates are not required for Limitorque actuator environmental qualification per 10 CFR 50.49, and thus could not change the environment the actuator would experience post-LOCA from the tested environment. 10 CFR 50.49 states that the requirements for dynamic and seismic qualification of electrical equipment is not included within the scope of this section.

Evaluations performed for pool swell loads on the valve actuators during a LOCA showed that the critical components were the mounting bolts. The structural evaluation for the operators in their as-built configuration showed that the bolts would not reach their yield stress and therefore would not have failed due to the hydrodynamic load.

Final assurance that this was an isolated case and that work issued to a contractor was properly installed was established through a review of "As-built" drawings. In this instance, it was determined that as-built drawings were not required for these deflectors. Therefore, a review was conducted of all other

drawings issued for installation to the piping contractor for which as-built drawings were not required. The review also looked at other drawings issued to the contractor which involved work outside of the contractor's typical piping and pipe support work scope. No additional concerns were identified as a result of these reviews. The six deflector plates involved were installed and as-built drawings were completed by August 21, 1987 to reflect this installation.

- E. Evaluation has concluded that the PYCO thermocouples with loose housing covers were at no time inoperable or unable to perform their intended functions. An engineering evaluation of the as-found configuration based on Wyle Lab test report 17711-1 showed that the PYCO temperature elements survive successfully with no conduit seal. Additionally, since this type of temperature element is a voltage device and having a low internal resistance, the voltage drop due to current leakage will be negligible. Consequently, operation of the temperature element would not have been affected.

All PYCO temperature elements located in a potentially harsh environment had maintenance performed to provide and ensure proper seal and torque requirements. This was complete by July 31, 1987. Also, Instrument Maintenance Instruction (IMI)-E3-14, "Equipment Qualification", which is a post maintenance restoration instruction, was created August 4, 1987 to ensure that the PYCO temperature element housing covers are restored to 50 ft-lbs in the future following any maintenance activity.

- F. Evaluation has concluded that the Weed temperature elements with loose housing covers were at no time inoperable or unable to perform their intended safety function. As previously stated, the Weed temperature elements are qualified for the as-found installation configuration based on the Wyle Lab test report 17711-1. This report showed that the similar PYCO temperature elements survive successfully with no conduit seal. Since it was determined that the condensate formation is more probable with the PYCO than the Weed, the PYCO steam test results are applicable to the Weed temperature elements.

All Weed temperature elements located in a potentially harsh environment had maintenance performed to provide and ensure proper seal and torque requirements. This was complete by July 31, 1987. Also, IMI-E3-14 was created August 21, 1987 to ensure that the Weed temperature element housing covers are hand tight, plus 1/2 turn, following any maintenance activity.

- III. Five examples were identified of an inappropriate maintenance procedure which did not appear to contain EO maintenance requirements specified by the equipment vendor. It could not be verified in any of the provided examples that the equipment was not properly maintained. In some cases it was subsequently determined that implementation of the vendor recommendations was not necessary to

maintain the equipment in a qualified condition. Plant Administrative Procedure (PAP)-0905, "Work Order Process," has stated since March 1986 that during the Work Order planning "special consideration shall be given to the completion of any Equipment Qualification Special Maintenance and Replacement Requirements during the work activity". Therefore, CEI disagrees that any of the identified examples demonstrate a failure to properly maintain EQ equipment.

Nonetheless, the following corrective steps were taken as a result of the EQ maintenance concerns.

- o A work history search was performed on the subject components in an attempt to identify restoration deficiencies. This effort was complete by November 6, 1987.
- o Applicable maintenance instructions were revised to more specifically address the performance of post maintenance and sealing requirements for the subject components. This effort was complete by December 7, 1987.
- o The work order process procedure was enhanced to ensure that any EQ maintenance requirements are captured within the work instructions. This effort was complete December 7, 1987.
- o A 100 percent scope reverification was conducted to ensure that maintenance requirements are captured. First, all harsh environment IE equipment qualification reports were reviewed for additional EQ requirements not previously addressed by the repetitive task program or instructions. This review turned up no unaddressed requirements. However, based on good maintenance practices, additional activities over and above the specified requirements were documented concerning existing seals and maintenance. Also, all associated vendor manuals were reviewed for additional vendor requirements not previously addressed. This review also resulted in no additional requirements but program additions similar to those in the above program were documented. All program additions identified during the reviews were implemented by December 7, 1987.

Each of the identified examples are discussed in detail below.

- A. Although specific EQ procedures did not address PYCO thermocouple O-ring replacement, this requirement was addressed during the performance of routine maintenance practices (PAP-0905). As a result of the maintenance walkdown all PYCO temperature elements located in a potentially harsh environment had maintenance performed to provide and ensure proper seal and torque requirements. This effort was complete by July 31, 1987. A review of the Perry Plant Maintenance Information System (PPMIS) work history and a hard copy review of applicable work packages identified only one work package that could have required O-ring replacement. This was complete by November 6, 1987. Since it could not be verified if the O-ring should have been replaced, this example does not demonstrate a failure to properly maintain EQ equipment.

Nonetheless, enhancements were made to further ensure that PYCO thermocouple O-ring replacement is performed when required. The applicable EQ file was revised to incorporate a reference to IMI-E3-14 for post maintenance and sealing requirements. IMI-E3-14 was revised to specifically require that "whenever the terminal cap is removed the gasket shall be replaced and the cap torqued to 50 ft-lbs". Additionally, PAP-0905 was revised to further ensure that IMI-E3-14 is utilized when maintenance activities are performed.

- B. Although specific EQ procedures did not address O-ring inspection, sealant application, and housing cover torquing for Weed temperature elements, this requirement was addressed during the performance of routine maintenance practices (PAP-0905). As a result of the maintenance walkdown all Weed temperature elements located in a potentially harsh environment had maintenance performed to provide and ensure proper seal and torque requirements. This effort was complete by July 31, 1987. A review of PPMIS work history and a hard copy review of applicable work packages identified only five work packages that could have required O-ring inspection, sealant application, or cover house torquing. This was complete by November 6, 1987. It could not be verified if these maintenance and replacement requirements should have been performed. Therefore, this example does not demonstrate a failure to properly maintain EQ equipment.

Nonetheless, enhancements were made to further ensure that Weed temperature element maintenance and replacement requirements are performed when required. The applicable EQ file was revised to incorporate a reference to IMI-E3-14 for post maintenance and sealing requirements. IMI-E3-14 was revised to specifically require that whenever the terminal cap is removed the gaskets and threaded portions be visually inspected, sealant be applied, and the cap be hand tight plus 1/2 turn. Additionally, PAP-0905 was revised to further ensure that IMI-E3-14 is utilized when maintenance activities are performed.

- C. The EQ requirements for the Rosemount Transmitters have been properly maintained. Prior to May 27, 1987, the O-ring was checked for cleanliness, cleaned as necessary, lubricated using silicone O-ring grease, and torqued to 200 inch-pounds when the Rosemount transmitters were placed in service. Steps to this effect appear in Instrument Calibration Procedure (ICP)-B2-2, Revision 6, dated 5/26/85, used by the Nuclear Test Section (NTS) and Plant Instrument Calibration Instruction (ICI)-B2-2, Revision 0 and Revision 1 used previous to the May 27 date by the Instrumentation and Control Section (ICS). Further evidence is available from a review of torque wrench usage which indicates these devices were used with the referenced ICIs and Rosemount transmitter MPLs.

Existing practice has been to utilize ICI/IMI procedures or vendor manuals to perform routine or corrective maintenance and calibration. In May of 1987, CEI became aware of a decision by Rosemount to require the replacement of the O-ring rather than cleaning the existing device. ICI-B2-2 was thus revised accordingly. It should be noted that the EQ certification test was performed using an old O-ring with the cover installed as previously described.

As a result of the NRC identification of two transmitter covers which were able to be removed without tools, CEI performed a bench test and discussed this occurrence with the manufacturer. The results of the bench test were inconclusive, however, Rosemount felt that if the cover had recently been installed with fresh grease, that it may be removed without the use of tools. If the grease had not been given adequate time to setup, it would act as a lubricant, and make the cover easier to remove. The purpose of the lubricant is to assure adequate O-ring compression by controlling friction of the mating surfaces. Without lubricant, the cover could be torqued to the specified value without properly compressing the O-ring. It should be noted that the two covers in question were installed a day earlier in accordance with site procedures. Therefore, CEI disagrees that this example demonstrates a failure to properly maintain EQ equipment.

Nonetheless, enhancements were made to further ensure that Rosemount transmitter maintenance and replacement requirements are performed when required. The applicable EQ file was revised to incorporate a reference to IMI-E3-14 for post maintenance and sealing requirements. IMI-E3-14 was revised to specifically address all Rosemount transmitter EQ post maintenance and sealing requirements. Additionally, PAP-0905 was revised to further ensure that IMI-E3-14 is utilized when required.

- D. The EQ requirements for the subject MSIV blower motors have been properly maintained. The question of operability has been addressed by a review of all maintenance histories documented for these components. The only cover removal identified was the result of a motor terminal connection check under Work Order number 86-05531 (1E31-C0001, closed 4-29-86 before initial reactor criticality). No gasket replacement was able to be identified per the Work Order history.

Discussions with the vendor (General Electric) has determined that the recommendation to replace the gasket was included in the E.Q. Report NEDC-30204 as a result of the end-of-life condition of the test gasket (hardened). The intent was to preclude reuse of a gasket that might be partially hardened by the aging process during plant operation. In this case, no plant operation had occurred at the time the blower junction box was opened, thus no hardening of the gasket could have occurred.

This event was not significantly different from the opening of the junction box of the EQ specimen in order to make electrical connections prior to the start of the EQ test (that gasket was used for the test, not replaced). Since the gasket was not required to be replaced at this time, this example does not demonstrate a failure to properly maintain EQ equipment.

Additionally, since relative humidity conditions where the blowers are required at Perry are always 90 percent or lower for all normal and postulated accident environments, the requirement to ever replace the junction box cover gasket appears questionable.

Nonetheless, the gasket from the subject blower has subsequently been replaced by July 31, 1987. Inspection of the removed gasket revealed that it had not been environmentally degraded. A durometer check indicated no significant hardening (a shore hardness of 75), and close inspection revealed that the degree of compression set was minimal and would not have affected the ability of the gasket to provide a seal.

Also, enhancements were made to further ensure that the subject MSIV blower motor maintenance and replacement requirements are performed when required. The applicable EQ file package was revised August 6, 1987 to incorporate a SMRR for the junction box cover gasket. The SMRR utilizes the Repetitive Task program to ensure that anytime the junction box cover is removed, the gasket shall be replaced.

- E. Although specific EQ procedures did not address seal and gasket replacement, this requirement for Target Rock solenoid valves was addressed during the performance of routine maintenance practices (PAP-0905). A review of PPMIS work history and a hard copy review of applicable work packages identified only one work package that could have affected that seal or gasket. It could not be verified if the maintenance and replacement requirements should have been performed. Therefore, this example does not demonstrate a failure to properly maintain EQ equipment.

Nonetheless, enhancements were made to further ensure that Target Rock solenoid valve maintenance and replacement requirements are performed when required. The applicable EQ file package was revised August 6, 1987 to incorporate a SMRR for the O-ring seals and gaskets. The SMRR utilizes the Repetitive Task program to ensure that anytime the subject solenoid valves are disassembled, the silicone rubber O-ring seal and gaskets are replaced.

(4) Steps Taken To Avoid Further Violations

- I. An extensive review was performed of EQ packages for class 1E equipment located in a harsh environment which were not reviewed by the NRC inspectors. This review was conducted to identify any discrepancies similar to those identified during the NRC audit. The minor testing/analysis discrepancies identified have been resolved and the appropriate EQ files revised accordingly. The existing programs are adequate to ensure proper review of EQ test reports for future equipment at Perry.
- II. In order to demonstrate the isolated nature of the discrepancies identified and to ensure that all potential deficiencies had been captured, a physical walk-down and visual inspection was performed of Class 1E electrical components installed in a harsh environment. The equipment selected concentrated on those requiring environmental seals for which enclosure hardware could have been incorrectly installed or adversely affected. This walk-down was to verify that the equipment was installed in accordance with its qualification requirements. Although the as-found condition was determined to be functionally acceptable, those items which required corrective maintenance were reworked. Major items covered by this walk-down included temperature elements, solenoid valves, limit switches and pressure, differential pressure, and level transmitters. Results of the walk-down confirmed the original scope of the problem to be limited to temperature elements and solenoid valves.

Additionally, a visual inspection of all Class 1E Limitorque operators located in a harsh environment was performed. This inspection was to (1) identify and remove any grease relief shipping caps which may have remained installed following installation and (2) ensure that the T-drain connections were properly located. Results indicated no additional improperly located T-drains and the presence of several grease relief shipping caps. Each of the shipping caps have been removed.

The existing programs are adequate to ensure that EQ equipment is properly installed, and adequate to identify as-installed deficiencies in the future.

- III. Although the maintenance/EQ interface was not the root cause of the items identified during the inspection, the following actions have been or will be taken to enhance the programs which ensure that EQ is maintained.
 1. A 100 percent scope reverification was conducted to ensure that maintenance requirements are captured. First, all harsh environment 1E equipment qualification reports were reviewed for additional EQ requirements not previously addressed by the repetitive task program or instructions. This review turned up no unaddressed requirements. However, based on good maintenance practices, additional activities over and above the specified

requirements were documented concerning existing seals and maintenance. Also, all associated vendor manuals were reviewed for additional vendor requirements not previously addressed. This review also resulted in no additional requirements but program additions similar to those in the above program were documented. All program additions identified during the reviews were implemented by December 7, 1987.

2. A thorough review was performed of appropriate maintenance procedures and instructions to determine where necessary EQ requirements for applicable restoration following maintenance could be more specifically identified. The applicable instructions have been revised accordingly as of December 7, 1987.
3. Equipment which requires special EQ requirements is now identified in the Plant Equipment Master-file System (PEMS) computer database.
4. As stated previously, procedure revisions were incorporated into the Work Order process procedure to further ensure that all EQ restoration items are identified for appropriate equipment each time the equipment is disturbed.
5. Two training seminars had been held prior to the inspection, one for systems engineers (May 1987) and one for work planners (July 1987). In addition, an EQ training course has been developed for personnel involved with EQ maintenance activities. This course will be made a requirement on matrix/qualification cards for Grade I mechanics and I&C technicians.
6. The EQ implementing procedures were revised to further ensure that any changes to environmental conditions or sealing requirements are properly identified and incorporated into the respective programs accordingly.

(5) Date When Full Compliance Will Be Achieved

Full compliance has been achieved.

CEI ANSWER TO THE NOTICE OF VIOLATION OF
EA 87-206, PURSUANT TO 10 CFR 2.205.B

Summary

Enforcement Action 87-206 proposed imposition of a civil penalty against CEI for a violation concerning implementation of the requirements for assuring environmental qualification (EQ) of electrical equipment. Specifically; 1) deficiencies were identified within the tests and/or analyses of EQ equipment, 2) discrepancies were identified between the tested/analyzed condition and the installed configuration, and 3) the EQ maintenance requirements specified by the equipment vendor were not specifically addressed in the EQ maintenance procedures.

As noted in the violation response (see Attachment A to PY-CEI/NRR-0819 L), CEI is in agreement with many of the identified examples demonstrating deficiencies in our EQ programs. However, CEI does not believe that the overall conclusions as stated in the NOV are representative of our program. As stated in NRC Region III letter dated 2/11/88 (EA #87-206), "the deficient conditions may not have been to such a degree as to impair a system's ability to perform its intended function". Pursuant to 10 CFR 2.205.b, CEI requests a reduction in the severity level of the violation and mitigation of the civil penalty.

Basis for Reduction in Violation Severity Level

CEI believes the admitted violation more accurately represents a severity level IV violation based on the following considerations.

- 1) As discussed in Attachment A, CEI concluded the identified problems had no safety significance individually or collectively. Evaluations determined that all involved equipment was operable and able to perform its intended function.
- 2) Although CEI agrees that enhancements to programs for the control of EQ equipment were prudent and necessary, the existing programs and management controls did not represent a safety concern. As stated above, any deficiencies of a programmatic nature did not result in inoperable EQ equipment.
- 3) 10 CFR 2, Appendix C, Supplement I, provides certain examples of Severity Level III violations for reactor operations. The subject violation does not correspond to any of the specific examples or to the inferred characteristics of a Severity Level III violation. Only two Severity Level III examples even remotely resemble the subject violation. The first example involves a system designed to prevent or mitigate a serious safety event not being able to perform its intended function under certain conditions. The subject violation does not apply here since all equipment was operable and able to perform its intended function under all perceived conditions. Therefore, the programmatic and managerial controls also did not fail to perform their intended functions.

The other similar example involves a failure to conduct adequate oversight of vendors resulting in the use of products or services which are of defective or indeterminate quality and which have safety significance. Again, CEI maintains that the subject violation did not represent or result in problems which have any safety significance. Thus, this example does not apply to the subject violation.

- 4) CEI has no prior poor performance in this area of concern. Supplement No. 5 of the Perry Safety Evaluation Report (NUREG-0887) documents the Office of Nuclear Reactor Regulation site audit and review and approval of the Perry program for environmental qualification of electrical equipment important to safety, dated February 1985. Additionally, CEI has not previously received a severity level III violation in this or any other area subject to NRC inspection.
- 5) The number of concerns expressed as a result of your inspection is small compared to the total volume of documentation and equipment reviewed, and even smaller when compared to all EQ documentation and equipment at Perry. The NRC inspection only identified 5 qualification documentation concerns of a total of 83 EQ file packages and only 11 installation concerns of approximately 920 class 1E components installed in a harsh environment at Perry.
- 6) CEI has conducted a review of the results of similar inspection efforts throughout the industry, and has concluded that the classification of the subject Perry violation indicates an inconsistent application of the Enforcement Policy. Similar inspections at other facilities have identified EQ problems representing equal if not greater safety significance, but resulted in less regulatory action.
- 7) Significant oral and written communication addressing the concerns identified in the NOV had been provided during the inspection period. It appears that this information presented by CEI addressing the concerns and the lack of safety significance may not have been fully recognized in determining the severity level of the violation.
- 8) Due to the demonstrated high level of attention given to this issue at the time of the inspection, it should be clear that escalated enforcement action is not necessary to obtain adequate management attention.

Therefore, CEI believes that in this case a reduction in the severity level of the subject violation is warranted. As stated in Section 4.e of your inspection report (50-440/87013), "during this review, the inspectors determined that the licensee had implemented a program to monitor the quality of EQ activities through surveillance, audits, and reviews of the records and files for plant modifications and equipment procurement. NRC inspectors found the methodology, results, and followup corrective action relative to QA activities acceptable". Therefore, adequate management and programmatic controls to ensure the initial and continuing qualification of equipment important to safety are considered to have been in place. In conclusion, CEI believes that the conclusions, and findings, of the subject violation are inconsistent with a Severity Level III finding.

Basis for Mitigation of the Civil Penalty

Analyses of this violation against each of the five factors of Section V.B of 10 CFR 2, Appendix C, supports further mitigation of the civil penalty, as discussed below.

1. Prompt Identification and Reporting

The subject concerns were NRC identified. Therefore, no reduction of the base civil penalty is warranted here.

2. Corrective Action to Prevent Recurrence

Based on the prompt and extensive corrective actions taken as discussed in Attachment A, the base civil penalty has been reduced by 50 percent.

3. Past Performance

CEI has no negative past performance in the area of environmental qualification of electrical equipment. Supplement No. 5 of the Perry Safety Evaluation Report (NUREG-0887) documents the Office of Nuclear Reactor Regulation (NRR) site audit and review and approval of the Perry program for environmental qualification of electrical equipment important to safety. All questions raised as a result of the NRR review were promptly and effectively addressed. Additionally, CEI has not previously received a severity level III violation in this or any other area subject to NRC inspection. Thus, a reduction of up to 100 percent of the base civil penalty is warranted due to prior good performance in the area of EQ programs and management controls.

4. Prior Notice of Similar Events

CEI had no prior knowledge of the subject programmatic violations in the area of environmental qualification of electrical equipment. Therefore, no increase in the base civil penalty is warranted here.

5. Multiple Occurrences

Multiple examples were identified indicating that an increase in the base civil penalty may be warranted here. However, as discussed at great length in Attachment A to this letter, many of the examples were determined to be of no consequence.

Thus, CEI believes that 100 percent mitigation of the base civil penalty is warranted due to past performance in this area as well as the prompt and extensive corrective actions taken.

Conclusion:

Based on the above discussions, CEI requests consideration of a reduction in the severity level of the violation and mitigation of the civil penalty.