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Executive Vice President
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October 21, 1988
IPN-88-047

Director, Office of Enforcement
U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station Pl-137
Washington, D.C. 20555

Subject: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
Reply to Notice of Violation and Proposed
Imposition of Civil Penalty Regarding
NRC Inspection Reports Nos. 50-286/86-10;
50-286/86-24; 50-286/87-20; and 50-286/87-22

Reference: 1. Letter from Mr. William T. Russell to Mr. J. C.
Brons, dated September 21, 1988 entitled, "Notice
of Violation and Proposed Imposition of Civil
Penalty (NRC Inspection Reports Nos.
50-286/86-10; 50-286/86-24; 50-286/87-20; and
50-286/87-22)

Dear Sir:

Reference (1) transmitted the NRC's Notice of Violation (NOV) and Proposed Imposition of Civil Penalty regarding the Indian Point 3 (IP3) equipment qualification program. As required by the NOV, Attachment I to this letter provides the Authority's "Reply to the Notice of Violation," and Attachment II provides the "Answer to the Notice of Violation." Also enclosed is a check in the amount of seventy-five thousand dollars (\$75,000) in payment for the proposed civil penalty.

Notwithstanding our payment of the civil penalty, the Authority is concerned with certain statements made by the Staff in its letter transmitting the NOV. First, the Authority disagrees with the Staff's assertion that indications of reviews and approvals of EQ files prior to the inspection suggests the Authority had not used best efforts to comply with 10 CFR 50.49 prior to the November 30, 1985 deadline. The Authority had and currently maintains an ongoing effort to incorporate current

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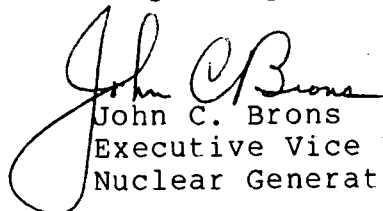
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technology and NRC interpretations into the EQ program. Prior to the Staff's inspection, the NRC had not clearly enunciated its threshold of acceptability for all EQ issues. As we became more aware of these thresholds, including through our review of the results of inspections at other facilities, file modifications were made. The timing of the reviews were, therefore, primarily the result of the Authority's continuing best efforts, rather than its lack of best efforts as indicated by the Staff.

Second, the Authority is concerned with the enforcement posture taken by the Staff in issuing this NOV and proposing a civil penalty. First, the civil penalty is not consistent with the actual safety significance of the violations in that the ability of plant/systems to perform their intended safety functions was not significantly affected. Further, assessment of a civil penalty in this case does not promote the safe operation of IP3 or Commission enforcement goals. Indeed, the civil penalty may have a negative impact regarding hard working, conscientious personnel who expended significant efforts in attempting to comply with the November 30, 1985 deadline, and responded promptly to deficiencies as they were identified, whether by the Authority or the Staff. In situations such as this, the Commission has recently acknowledged that assessment of a civil penalty does not further enforcement goals. (See Enforcement Policy Statement revisions 53 Fed. Reg. 40019 at V.B.1).

Should you or your staff have any questions regarding this matter, please contact Mr. P. Kokolakis of my staff.

Very truly yours,


John C. Brons
Executive Vice President
Nuclear Generation

cc: See next page

cc: William T. Russell
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ATTACHMENT I TO IPN-88-047

REPLY TO THE NOTICE OF VIOLATION
DATED SEPTEMBER 19, 1988

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
Docket No. 50-286
DPR-64

NOTICE OF VIOLATION

As a result of several Environmental Qualification Inspections at IP-3 and in accordance with the modified enforcement policy contained in NRC Generic Letter 88-07, the following violations have been identified and assessed a civil penalty:

- I. 10 CFR 50.49(d), (f), and (j), respectively, require, in part, that (1) a list of electric equipment important to safety be prepared, and information concerning performance specifications, electrical characteristics and postulated environmental conditions for this equipment be maintained in a qualification file; (2) each item of electric equipment important to safety shall be qualified by testing and/or analysis of identical or similar equipment, and the qualification based on similarity shall include a supporting analysis to show that the equipment to be qualified is acceptable; and (3) a record of the qualification shall be maintained in an auditable form to permit verification that each item of electrical equipment important to safety is qualified and that the equipment meets the specified performance requirements under postulated environmental conditions.

Contrary to the above, from November 30, 1985 until certain dates specified herein, the following items were not demonstrated to be environmentally qualified.

- a. As of September 2, 1986, qualification of the containment High Range Radiation Monitors (Nos. R-25 and R-26) cable connector assembly was deficient in that the cable/connector assembly was installed in a configuration different than tested in that the installed assembly was missing the environmental Raychem heat shrink tubing.
- b. As of September 2, 1986, qualification of six series 200-300 Marathon Terminal Blocks inside containment (used in safety related circuits for containment sump level indication, recirculation sump level indicator, and containment water level indication) was deficient. Specifically, these terminal blocks are not qualifiable for the particular inside containment application because of the potential for electrical shorting due to moisture buildup.
- c. As of August 21, 1987, the qualification of 480 volt motor lead splices, used as power leads for twenty-nine motors in Engineered Safeguards, Auxiliary Feedwater and Auxiliary Coolant Systems, was deficient in that an evaluation had not been performed of differences between installed and tested configuration.

- d. As of September 25, 1987, the qualification of Lewis Thermocouple cable used in Hydrogen Recombiners (for monitoring the temperature of the recombiner elements for control of the recombiner), was deficient. Specifically, the similarity analysis was inadequate in that it failed to adequately justify the acceptability of differences, such as insulation formulation, between the cable tested and installed cable.

These violations constitute an E.Q. category B violation.

REPLY TO VIOLATIONS:

- I.a. The Authority recognizes that the deficiency stated in Item I.a. of the violation did exist.

The High Range Radiation Monitors, R-25 and R-26, were originally installed in 1980 as part of the Authority's TMI Action Plan, implementing the requirements of NUREG 0737. The original system installation documents required the installation of the heat shrink tubing and such tubing was installed. In 1985, a modification was issued to install new containment penetrations for this system. The new penetrations were at different locations and the reinstalled cable was not long enough to reach the new penetrations. This modification provided details to replace the cable but did not include details on the need to install the heat shrink tubing. As a result the cable/connector assembly was installed without the heat shrink tubing.

This condition was discovered during a walkdown of E.Q. equipment during the 1986 turbine outage. The heat shrink tubing was promptly installed over the connector assemblies as required by the qualification documentation in August 1986.

The Authority has developed a Maintenance Program for the equipment on the E.Q. Master List. The requirements of this program are contained in procedures 3-MD-14, Environmental Qualification Program and IC-AD-11, Environmental Qualification Program and were issued by April 1987. A database has been developed for this program that identifies the required preventive and corrective maintenance including I&C activities for the equipment identified on the Master E.Q. List. This database specifically identifies that Raychem heat shrinkable tubing is required on all connections inside containment for the R25 and R26 Radiation Monitoring Systems.

The Authority also issued Administrative Procedure No. AP-38, Environmental Qualification, in March 1987 that established the requirements for environmental qualification of equipment during design and engineering activities. This action in conjunction with the training given to personnel involved with the Authority's E.Q. Program will ensure that this violation will not re-occur.

The Authority achieved full compliance with the requirements of 10 CFR 50.49 specific to this item prior to the plant going above cold shutdown status on September 2, 1986.

- I.b. The Authority recognizes that the deficiency stated in Item I.b. of the violation did exist.

The Containment Water, Containment Sump, and Recirculation Sump level indication systems were installed as part of the Authority's TMI Action Plan to implement NUREG 0737 and Regulatory Guide 1.97 implementation program. The Containment Sump and Recirculation Sump Level indications are one of two means of ensuring sufficient water has been injected to allow switch over to recirculation. Containment Water Level provides indication of total amount of water in the containment.

The deficiency was identified during a 1986 field inspection of E.Q. equipment. An investigation determined that the installation documents specified qualified terminal blocks. These systems including the terminal blocks were partially installed in 1982 with installation completed in 1985. The root cause of the deficiency was that the modification procedure and installation documents specifying installation of qualified terminal blocks were not followed completely. This deficiency was promptly corrected by installing qualified terminal blocks in the level indicating circuits prior to the plant going above the cold shutdown status.

The Authority has undertaken numerous initiatives aimed at addressing programmatic issues, including the item identified above, as a result of recent Safety System Outage Modification Inspection, Systematic Assessment of Licensee Performance, and Operational Assessment Team inspections. These initiatives include a design control and configuration management program, the re-organization of the Authority's technical groups to improve their efficiency and accountability, a directive reaffirming the Authority's commitment to adherence to procedures, and an effort to revise procedures used at Indian Point 3. These initiatives are comprehensive efforts that are ongoing in other areas which impact the environmental qualification area.

The Authority achieved full compliance with the requirements of 10 CFR 50.49, specific to this item, on September 2, 1986, prior to the plant going above cold shutdown status at the end of the turbine outage.

I.c. The Authority recognizes that the deficiency identified in Item I.c. of the violation did exist. The 480 volt motor splices identified were on the power leads on the following sixteen (not twenty-nine as stated in Item I.c.) motors:

- o Safety Injection Pump Motors (3)
- o Auxiliary Feedwater Pump Motors (2)
- o Containment Building Fan Cooler Motors (5)
- o Residual Heat Removal Pump Motors (2)
- o Recirculation Pump Motors (2)
- o Recombiner Blower Motors (2)

The Authority agrees that prior to the NRC E.Q. inspection, it did not perform a detailed verification and evaluation of the differences between the installed motor terminations and the tested configuration. Prior to the Staff finding, the Authority believed it had reasonable assurance that the motor splices were installed in accordance with the cable and conduit termination schedule and were qualified in WCAP 7829. Even though the Authority has not disputed the violation, it should be noted that the accepted practices prior to November 30, 1985 did not require inspections involving disassembly of equipment. Some splices were re-made during maintenance activities after original construction. The primary emphasis during maintenance activities was to construct a quality splice with proper material that would provide for acceptable electrical conducting and isolating characteristics.

In addition, 10 CFR 50.49 qualified heat shrinkable tubing was installed over these taped splices which was thought by plant personnel to ensure that original qualification would be maintained and enhanced. This rationale was used by the maintenance forces since other splices on power, control and instrumentation circuits were made using environmentally qualified Raychem Heat Shrinkable tubing.

The Authority re-evaluated the qualification documentation for the 480 volt motor splices during an upgrade of the E.Q. files. The motor splices on the following were upgraded to Raychem heat shrink tubing splices during the 1987 outage:

- o Recombiner Blower Motors (2)
- o Recirculation Pump Motors (2)
- o Containment Building Fan Cooler Motors (5)
- o Residual Heat Removal Pump Motors (2)

The motor splices on the Auxiliary Boiler Feedwater Pump Motors (2) and the Safety Injection Pump Motors (3) were evaluated, analyzed and qualified by analysis. The motor splices on the Auxiliary Feedwater Pump Motors were upgraded to Raychem heat shrink tubing splices during maintenance activities in May 1988.

The Authority developed and issued in April 1987, a Low Voltage Cable Splicing Specification that provides instructions for the selection, installation, and inspection of heat shrinkable splicing products at IP-3. The maintenance procedures for the respective motors were revised by May 1988 to include instructions on the splicing of each lead with Raychem heat shrinkable tubing. Training on the selection and installation of Raychem heat shrinkable product has been given to electricians, engineers and drafting personnel during 1987 and is given on a continuing basis as needed. The combination of a splicing specification, specific maintenance procedures, and related training of personnel will ensure that further violations do not occur.

The 480 volt motor splices were in full compliance with the requirements of 10 CFR 50.49 as of September 1987.

- I.d. The Authority recognizes that the deficiency stated in Item I.d. of the violation did exist. The Lewis Thermocouple Cable is connected to the Hydrogen Recombiner Thermocouples that monitor the temperature of the recombining process for control purposes.

The Authority believed that the cables were similar to each other including insulation formulation. The Authority participated in additional cable qualification testing which fully confirmed the qualification of Lewis Cable. The qualification test report for Lewis Cable was used to establish qualification of the thermocouple cable. The Authority did perform a similarity analysis for the qualification of the thermocouple cable but did not address all of the differences between the tested and installed cables.

The Authority evaluated the documents in the E.Q. Files on this cable subsequent to the E.Q. Audit. Based on this, the operability of the Hydrogen Recombiner System using alternative test data was analyzed. A justification for continued operation issued on July 22, 1988 concluded that the Recombiner System is operable. The Authority will replace the Lewis Thermocouple Cable during the cycle 6/7 refueling outage scheduled to begin in the first quarter of 1989. The Authority's preventive steps to avoid further violations are described in Item I.b. The Authority has assured operation of IP-3 is presently in compliance with applicable staff guidance relative to 10 CFR 50.49. As noted, the Authority will replace the thermocouple cable during cycle 6/7 refueling outage to satisfy 10 CFR 50.49.

As a result of additional inspections at IP-3, the following E.Q. violations have been identified and not assessed a civil penalty:

- II. 10 CFR 50.49(d), (f), and (j), respectively, require, that (1) a list of electric equipment important to safety be prepared, and information concerning performance specifications, electrical characteristics and postulated environmental conditions for this equipment be maintained in a qualification file; (2) each item of electric equipment important to safety shall be qualified by testing and/or analysis of identical or similar equipment, and the qualification based on similarity shall include a supporting analysis to show that the equipment to be qualified is acceptable; and (3) a record of the qualification shall be maintained in an auditable form to permit verification that each item of electrical equipment important to safety is qualified and that the equipment meets the specified performance requirements under postulated environmental conditions.

Contrary to the above, examples of the violation include:

- a. From November 30, 1985 until September 25, 1987, thirteen items of electrical equipment important to safety were not included on the EQ master list of electric equipment important to safety. The specific items not properly incorporated onto the EQ Master List are those 13 items specifically not required by Regulatory Guide 1.97 which are listed in licensee memorandum No. EQ-IP-87-301, dated September 8, 1987.
- b. From November 30, 1985 until September 25, 1987, qualification for Silicon Rubber Insulated Cable was not established in that the cable had not been tested for submerged applications. A similarity analysis was performed based on test data for a cable with different insulating materials, but the effects of different chemical composition and the variation of the manufacturing process were not fully evaluated. However, the cable was considered qualifiable considering the large margin to failure.
- c. From November 30, 1985 until August 24, 1987, the qualification for 14 AWG single conductor Amerlink cables was not established in that the qualification documents supporting cable qualification were not complete. Specifically, the qualification test results, although available, had not been incorporated in the qualification file.

REPLY TO VIOLATIONS:

II.a. The Authority recognizes that the deficiency stated in Item II.a. of the violation did exist. The equipment was added to the Authority's E.Q. list based on a review of the latest Emergency Operating Procedures and detailed walkdowns of equipment requiring qualification. Operating procedures had been reviewed originally and equipment inspections had been performed.

Since November 30, 1985, the Authority has enhanced its efforts to confirm the acceptability of equipment subject to environmental qualification requirements. In response to new questions regarding specific equipment and, in accordance with management directives, the Authority has performed additional equipment reviews to verify such acceptability.

Specifically, the Authority's activities generally fell into three categories: (1) those undertaken in response to specific new information, (2) expanded efforts in conjunction with (1), and (3) efforts initiated by management to provide further verification of the adequacy of existing equipment. These efforts, some of which resulted in the identification of the equipment subject to this finding, included the following:

New Information

- o Inspections of the internal wiring of motor operated valves on the E.Q. Master List in response to Information Notice 86-03, "Potential Generic Problems Regarding the Environmental Qualification of Electrical Wiring use in Limitorque Motor Valve Operators." Appropriate changes were implemented immediately upon identification. The NRC Staff has reviewed these inspection activities.

- o Comprehensive field inspections were undertaken to address the conditions described in Information Notice 86-53, "Improper Installation of Heat Shrink Tubing." Modifications of these connections (as required) were undertaken promptly. The NRC Staff has also reviewed these inspection activities.

Expanded Efforts

- o In conjunction with the field inspections of splices undertaken to address Information Notice 86-53, the Authority also inspected additional items. This expanded inspection included items such as terminal blocks, wiring, cable, and the installed configuration of components associated with environmentally qualified equipment. As discussed previously, this expanded effort resulted in the identification of certain items warranting modification. These modifications were accomplished promptly.
- o Additional field inspections of interface splices were performed in 1987 to provide further focus, using expanded inspection procedures and criteria, on the splice questions. The Authority provided comprehensive training for inspection personnel. The Authority responded promptly to the findings of this inspection.

Initiative in Response to Management Directive

- o The Authority also undertook, in response to a senior management directive, additional inspections of E.Q. equipment to provide additional assurances that equipment and components installed in the field satisfied applicable environmental qualification provisions and to respond to the information derived from the inspections discussed above (as well as information currently regarding qualification topics). These inspections were conducted during outages in 1986 and 1987. The Authority prepared detailed inspection criteria and procedures, and provided training to personnel performing the inspections. The Authority responded appropriately to the findings of this inspection.

The Authority is in full compliance with 10 CFR 50.49 specific to this item.

II.b. The Authority does not believe that the violation stated in Item II.b. of the notice of violation exists. The issue of cable submergence was identified as an E.Q. deficiency in the Franklin Research Center TER in December 1982. Proposed resolutions to this deficiency and the others identified in the TER were submitted in the Authority's responses dated April 30, September 26, and December 27, 1984. These proposed resolutions were discussed with the NRC Staff during a meeting held on April 25, 1984. Lengthy discussions were held on the use of additional analysis to resolve the deficiencies. Although the staff did not review the analyses, the Authority and staff discussed how each analysis was being used to resolve deficiencies identified, in order to determine the acceptability of these methods. The staff found the Authority's approach for resolving the identified deficiencies acceptable. (See NRC letter dated April 30, 1984).

As discussed with the Staff at the April 1984 meeting, the Authority's E.Q. Consultant, Synergic Research Corporation, had evaluated the submergence issue and performed an analysis that established the qualification of cables that can become submerged after a LOCA. The analysis was issued in March 1984. The Authority believes this analysis provided an adequate basis for demonstrating submergence qualification of cable between 1985 and 1987. Thus, the approach used by the Authority since 1984 in demonstrating qualification of this cable has been a combination of test and analysis, based on the diffusion effects of cable insulations.

Subsequently in September 1987, this analysis and its associated report had been revised by the Authority's consultant, incorporating new information. This new report was incorporated into the E.Q. files as part of an overall upgrade to these files. Contrary to the Staff's assertion, the approach used by the Authority, as also reflected in this report, is not a similarity analysis. It establishes submergence qualification of G.E. Silicone Rubber, Rockbestos, Kerite, and Lewis Cables based on actual parameters measured for each of the cables during the LOCA testing. The methodology used in the analysis is validated by comparison of the predicted cable performance against the measured cable performance taken during actual submerged conditions for Rockbestos Cable. The analysis establishes that the predicted cable performance is the more conservative of the two. Therefore this analysis does not evaluate the differences between the cables because it uses data that is specific to the cable being qualified and does not rely on data from another cable. The report documenting this qualification analysis is SE Project No. 860230-10, Report No. 170E, dated September 17, 1988.

This report:

- o Applies known diffusion phenomena and mathematical relationships to predict the insulation resistance of a cable's insulation when subjected to specified environmental conditions.
- o Determines two coefficients for the mathematical relationship from test data contained in the qualification test reports for each cable listed above.
- o Used the mathematical relationship to predict each cable's insulation resistance for LOCA and submerged conditions.
- o Compares the predicted insulation resistance for LOCA conditions with the insulation resistance measured during the qualification testing for all cables listed above and establishes that the predicted insulation values are conservative.
- o Compares the predicted insulation resistance for submerged conditions with the insulation resistance measured during submerged testing of Rockbestos Firewall III to validate the methodology used in the report.
- o Calculates the insulation resistance for the submerged conditions for all the cables listed above.
- o Establishes that the calculated insulation resistance values for submerged conditions are sufficiently high enough to ensure that there would be no degradation of voltage or current in power and control circuits and no detectable effect on instrumentation circuits.

The Authority concludes that the qualification approach is valid and submergence qualification has been established based on the cable specific analysis contained in Report No. 170E Rev. 3.

The Authority will provide this report and any other information pertinent to this item to the NRC and be available to discuss it with the staff if requested.

II.c. The Authority recognizes that the deficiency identified in Item II.c. did exist.

The Amerlink SIS Wire is installed in the Auxiliary Boiler Feedwater Pump (ABFP) room as part of the circuitry for the local/remote control of the motor driven ABFPs. This wire was added to the E.Q. Master List in September 1987, as a result of an Emergency Operating Procedure review and walkdowns performed in July 1987.

The Authority agrees that qualification documents supporting cable qualification were not complete from November 30, 1985 until August 24, 1987. These documents were not part of the Authority's E.Q. filing system because it was not determined that this wire required qualification until July 1987. The Authority had performed detailed reviews of plant drawings and procedures during the development of its E.Q. Program prior to November 30, 1985. These efforts apparently did not identify this cable as requiring qualification.

The documents supporting the cable qualification were approved and added to the Authority's E.Q. Files in August 1987. The Authority believes that the procedure reviews and equipment walkdowns performed in 1987 (see discussion above Section II.a.), provided additional assurance that electrical equipment that requires qualification has been identified. The Authority was in full compliance with the requirements of 10CFR50.49, specific to this item, in August 1987.

ATTACHMENT II TO IPN-88-047

ANSWER TO THE NOTICE OF VIOLATION
DATED SEPTEMBER 19, 1988

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
Docket No. 50-286
DPR-64

VIOLATION II.b. (CABLE SUBMERGENCE QUALIFICATION)

As discussed in Attachment I (paragraph II.b.), the Authority denies the alleged violation concerning cable submergence qualification. The Authority sets forth below its reasons for denial.

I. BASIS FOR DENYING THE VIOLATION

The Staff alleges that the Authority failed to establish qualification of Silicon Rubber Insulated Cable because a similarity analysis performed did not evaluate the differences in the cable tested and the other cables requiring qualification. As discussed in additional detail in the Reply to the Notice of Violation (Attachment I, paragraph II.b.), contrary to the Staff's stated position, the Authority did not attempt to qualify G.E. silicon rubber insulated cable for submergence through similarity. The approach used was a combination of test and analysis, based on the diffusion effects of cable insulation, not similarity. The Authority did not rely on similarity because the testing performed evaluated cable-specific characteristics.

As explained in Attachment I, the Staff had previously found the Authority's approach regarding this matter to be acceptable. The Franklin Research Center initially identified this submergence issue in its December 1982 Technical Evaluation Report (TER). Proposed resolutions to the concern were discussed with the NRC Staff during a meeting on April 25, 1984. The Staff accepted the Authority's approach in a letter dated April 30, 1984. The NRC accepted approach was reflected in E.Q. documentation in March 1984. The same methodology was used when new information was incorporated in the report, reflected in a 1987 revision. In sum, since 1984 this combination of testing and analysis has fully demonstrated qualification of the cable using an approach accepted by the Staff.

II. THE VIOLATION SHOULD BE WITHDRAWN

Based on the above discussion, and the information provided in Attachment I, paragraph II.b., the Authority requests that the subject violation be withdrawn.