U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 84-06

Docket No. 50-410

License No. CPPR-112 Priority -- Category A

Licensee: Niagara Mohawk Power Corporation
300 Erie Boulevard
Syracuse, New York 13202

Facility Name: Nine Mile Point, Unit 2

Inspection At: Scriba, New York

Inspection Conducted: April 9 - May 11, 1984

Inspectors: W Guldemond for
R. A. Gramm, Resident Inspector — 6/14/84 date

W Guldemond for
W. H. Bateman, Senior Resident Inspector — 6/14/84 date

_____ — _____ date

Approved by: J Collins
S. J. Collins, Chief, Reactor Projects
Section 2C, DPRP — 6/15/84 date

Inspection Summary:

Inspection on April 9-May 11, 1984 (Report No. 50-410/84-06)
Areas Inspected: Routine inspection by the assigned resident inspector and a site detailed senior resident inspector of work activities, procedures and records relative to allegations; structural steel installations; pipe supports; housekeeping and fire prevention; weld material control; post inspection rework control; and followup to construction appraisal team inspection. The inspectors also reviewed licensee action on previously identified items and performed plant inspection tours. The inspection involved 237 hours by the inspectors.
Results: Five violations were identified: Quality control inspection acceptance of nonconforming items (paragraph 5a, 6a), failure to maintain adequate inspection status records (paragarph 5a); inadequate corrective action to rectify deficient housekeeping and fire protection practices (paragraph 7); failure to follow procedures for control of weld rod material (paragraph 8); and failure to control unauthorized rework of previously inspected items (paragraph 9). The identified violations indicate that site inspection programs have been ineffectively implemented and that greater control is required to assure that unauthorized rework activity has not invalidated previously performed inspections.

DETAILS

1. Persons Contacted

Niagara Mohawk Power Corporation (NMPC)

C. G. Beckham, Q.A. Manager - Construction
W. Morrison, Project Director

Stone and Webster Engineering Corporation (SWEC)

B. Charlson, Manager of Projects
L. Terry, Project Q.A. Manager

ITT Grinnell Industrial Piping, Inc (ITT)

F. Zinkevitch, Q.A. Director

Johnson Controls, Inc. (JCI)

M. Brenner, Q.A. Manager

USNRC

M. Haughey, Licensing Project Manager
J. Spraul, I & E Reviewer

2. Plant Inspection Tours

The inspectors observed work activities in-progress, completed work and plant status in several areas during general inspection tours. The inspectors examined work for any obvious defects or noncompliance with regulatory requirements or license conditions. Particular note was taken of the presence of quality control inspectors and quality control evidence such as inspection records, material identification, nonconforming material identification, housekeeping and equipment preservation. The inspectors interviewed craft personnel, supervision, and quality inspection personnel as available in the work areas.

The inspector observed a questionable bolt installation on pipe whip restraint 2FWS*PRR006. The licensee performed QA surveillance M-84-381 to further investigate the undersized bolts. The licensee determined that the hardware was only temporarily installed for erection purposes. Although the bolts were not marked to indicate the temporary status, ITT procedure FQCR4.1-31.4 requires QC inspection at a later date to verify that the correct bolting hardware is installed for the restraint structure.

The inspector examined the anchor bolts around the base of the bio-shield wall. He reviewed drawing EV-178C-7 and Engineering and Design Coordination Report (E&DCR) C18005. The inspector questioned the lack of beveled washers and lock nuts for the outer ring of anchor bolts. The inspector was provided with as-built information which SWEC engineering had obtained to ascertain if beveled washers would be required, and that the required lock nuts were on order. As the bio-shield wall was placed in location in early 1980, the inspector notes a significant delay in completing the installation such that it can be QC inspected so that potential nonconforming conditions are promptly detected. The inspector has no further questions.

3. Licensee Action on Previously Identified Items

a. (Closed) UNRESOLVED (81-05-02): Unsatisfactory housekeeping practices within the Reactor Building. As documented within NRC Inspection Report 83-10, the licensee had instituted measures in response to the observed housekeeping deficiencies. The current NRC inspection found that the measures have not been adequate. This unresolved item is closed as the concern has been escalated to a violation as documented within paragraph 7. of this report.

b. (Closed) FOLLOWUP ITEM (83-07-04): Implementation of inspection criteria for pipe support minimum embedment plate edge separation. ITT pipe support inspectors were given training on design requirements for maintenance of edge separation. ITT re-inspected all pipe supports welded to embedment plates which had been accepted prior to promulgation of the one inch separation criteria. These supports were found to be satisfactory.

c. (Closed) UNRESOLVED (83-17-05): Relocation of HVAC ductwork and associated sub-contractor interference analysis. The HVAC specification P413L has been amended by E&DCR F01431 to restrict the available field relocation tolerance to $\pm$ one inch. All previous relocations between one and two inches have been re-analyzed by SWEC and no interference problems were identified. All future relocations in excess of one inch will be addressed to SWEC via an E&DCR for review.

d. (Closed) FOLLOWUP ITEM (83-17-06): HVAC duct support weld configuration. Design calculation Z739-0036 - Revision 4 was reviewed relative to support DSR-486 as welded conditions. The support member notch and associated reduction in weld length had been accomodated for in the calculations.

e. (Closed) UNRESOLVED (84-01-07): Seismic design of the Emergency Diesel Generator overhead crane. Further evaluation by the licensee identified that the crane was non-seismically designed and that a safe parking position could not be attained for the crane. Within NRC Inspection Report 84-05, this concern was escalated to a violation. The licensee's corrective actions for the generic seismic design control will be evaluated in response to violation 84-05-05.

f. (Closed) CONSTRUCTION DEFICIENCY REPORT (84-00-08): Material certifications for Guyon Alloys supplied ASME pipe material. The licensee verified that the material in question has not been utilized within any safety related installations. The pipe mechanical properties were found to be in conformance with SA-106 grade B properties.

4. Allegations

During the inspection period the inspectors conducted inspections and interviews in response to allegations presented to the NRC. Additionally, the inspectors monitored licensee actions resulting from the presentation of selected issues to the licensee as noted below:

a. The NRC received an allegation that site QC inspectors are not provided the proper gages to inspect J-bevel welds. The inspectors reviewed the following documents which provide details on pressure boundary welds fabricated by ITT.

-- Specification P301C, "Field Fabrication and Erection of Piping"

-- ITT FQC 4.1-3-9, "Weld Process Planner/Instructions for Inprocess Examiners"

-- ITT FQC 4.1-4-0, "Visual Examination"

-- G.A.L. Gage Co. Instructions for Hi-Lo Welding Gage

The specification defines the acceptable J-bevel weld preparation dimensions with applicable tolerances. The ITT procedures state that weld preparations will be verified to be correct at time of fit-up. The ITT QC inspectors are issued tools to check all dimensions of the J-bevel preparation with the exception of a 3/16 inch radius. ITT has issued Corrective Action Request (CAR) 645 to document the missed inspection criteria. The inspector observed ITT personnel fabricate a J-bevel preparation with a Wachs Co. "Trav-L-Cutter" tool. The resultant radius was found to be 0.150" in lieu of the specification required 0.187". The concerns about the J-bevel weld preparations are unresolved pending SWEC engineering evaluation of the undersized radius and the disposition of CAR 645. (84-06-01)

b. The NRC was notified that intimidating comments may have been made by the NMPC Project Director to a group of ITT QC personnel. Licensee management was informed of the incident. Immediate steps were taken by the licensee to inform the Project Director about the potential ramifications of intimidating QC personnel. A meeting was held between the licensee QA manager and the allegers at which time they were assured that the Project Director has no control over QC activities. The licensee has committed to disseminate a management directive that states QC intimidation will not be tolerated on the Nine Mile Point 2 site. The

allegers recontacted the NRC and stated that their concerns had been satisfied by the licensee response to the incident. The inspector had no further questions regarding the licensee's followup actions.

c. An allegation was received that an ITT welding engineer falsified his employment credentials. It was alleged that the welding engineer never completed a weld inspection course for which credit is claimed on his resume. The licensee determined through personnel interviews that the course certificate in question is valid. Additionally, the course in question was not used for qualifying the individual to perform his job function nor does the individual perform QC inspection of welds. The alleged falsification could not be verified nor does the class in question have bearing upon the ability of the individual to carry out his specified duties. Additional information to substantiate the allegation has been forwarded to the licensee for consideration and the licensee's actions will be reviewed. (84-06-02)

d. An allegation was received on several concerns regarding the Reactor Controls. Inc. (RCI) QA program. The alleger stated that material has been cut without QC verification of material traceability; that carbon steel welding is performed near stainless steel lines; and that nonconformances are not written during receipt inspections. The licensee verified that material traceability is maintained during cutting operations through the use of a cut log and associated QC verification of heat code transfer; precautions are implemented to prevent arc strikes during welding operations; and the licensee followup of these concerns documented nonconforming conditions had been identified during receiving inspections. The inspector had no further questions regarding the licensee's followup actions.

5. Structural Steel Installations

a. The inspector examined high strength A325 bolted structural steel connections within primary containment. The following items were observed:

Item	Structural Member	Notes/Findings
a	A6315 B6308 B6312	Undersized shoulder bolts in slotted hole connections, width of slot exceeded bolt diameter by more than 1/16"
b	B6427 D6426	Insufficient thread engagement, bolt flush with face of nut
c	A6321	Missing bolts
d	D6808	Improper washer placement under bolt head
e	A6376 B6379	Loose bolts

f	E6374	Loose bolts, bolt missing
g	A6110	Improper bearing of beam on shimming surface

The licensee was requested to respond to the inspector observations listed above. The following information was provided to the inspector.

Item	Response
a	The shoulder bolt connections had been final inspected and accepted on Inspection Report (IR) S2023436.
b	The inspection status for these members was indeterminate as neither SWEC civil or mechanical QC groups claimed cognizance of these members.
c	Outstanding Punch List Item Report (PLIR) 01833 existed which directs the dismantling of the connection.
d	Burnish marks indicate that the bolt head had been torqued, thus the washer placement was found to be acceptable.
e	The connections had not yet been turned over for inspection.
f	An outstanding PLIR existed for the dismantling of the connection.
g	Inspection status was indeterminate.

Conclusion

The Nine Mile Point Unit 2 FSAR commits to Regulatory Guide 1.94 which invokes ANSI N45.2.5 for the inspection of high strength bolting. The ANSI subscribes to AISC requirements for proper installation and inspection criteria. The AISC limits slotted holes to a width no greater than the bolt diameter plus 1/16 inch. Structural beams B6308 and B6312 noted in item (a) above had been inspected and accepted as evidenced by IR S2023436. The failure to implement an adequate inspection program to assure compliance to the AISC bolting requirements is a violation of 10 CFR 50, Appendix B, Criterion X. (84-06-03)

The inspector addressed specific hardware concerns to the licensee relative to beams B6427, D6426 and A6110 as noted in items (b) and (g) above. The failure of SWEC QC inspection groups to maintain clear cognizance of the

scope of their responsibilities for structural steel installations and the inability of QC to readily identify the inspection status of the beams is a violation of 10 CFR 50, Appendix B, Criterion XIV. (84-06-04)

b. The inspector reviewed the following SWEC engineering documents which pertain to structural steel beams A5080 and E5080:

-- Engineering and Design Coordination Report (E&DCR) C16076 written to remove beam A5080 due to interferences, cancelled by E&DCR C16421.

-- Advance Change Notice (ACN) 1916: written to remove beams B5080 and E5080 due to interferences, cancelled by E&DCR C16292.

-- E&DCR 16292: written to reinstall beams B5080 and E5080, cancelled by E&DCR C16421.

-- E&DCR C16421: written to reinstall beams A5080 and E5080.

The inspector visually observed that physical interferences exist which preclude the beam reassembly directed by E&DCR C16421. The inspector is concerned that several documents have been previously generated to direct the disassembly and reassembly of two beams, and field conditions exist which necessitate an additional document be issued to complete the beam reassembly. This trend indicates that incomplete job site reviews are conducted by engineering prior to issue of change documents.

Additionally, during the course of generating the change documents to direct the beam disassembly, the requisite Punch List Item Report (PLIR) was not issued as further discussed in paragraph 9. of this report.

6. Pipe Supports

a. The following documents were reviewed by the inspector for requirements applicable to pipe support installations:

-- ASME Boiler and Pressure Vessel Code, Division I, Section III, NF.

-- Specification P301J, "Field Fabrication and Erection of Pipe Supports ASME III, Code Classes 1, 2, 3 and ANSI B31.1".

-- ITT FQC 4.2-14-9, "Inspection of Installed Pipe Supports".

The inspector noted that attribute 14 of FQC 4.2-14-9 requires that full thread engagement be verified on all threaded assemblies. The inspector observed support BZ-76EJ-3 and noted the spring canister

was engaged to a threaded bar which supported the assembly. In order to verify proper installation the ITT manual of standard component hardware was reviewed. A critical thread engagement dimension was identified for the Type A spring canister. The inspector observed that no sight holes had been drilled in the spring canister such that the engagement could be visually verified following installation. Discussions with ITT QC personnel revealed that approximately 30 Type A spring canister supports had been accepted without verifying the required thread engagement parameter.

The failure to perform an adequate inspection on the Type A spring canisters is a violation of 10 CFR 50, Appendix B, Criterion X. (84-06-05)

b. During the review of specification P301J and P301F, it was observed that two different criteria had been imposed on the installers concerning pipe support baseplate eccentricity. Specification P301J for ITT supports, allows a tolerance of plus or minus one inch for the attachment to the baseplate center. The off center attachment of the pipe support to the baseplate would result in eccentric loadings upon the baseplate. Specification P301F for SWEC supports, does not allow a similar tolerance. The inspector noted that SWEC Site Engineering Group (SEG) had previously identified this discrepancy and had addressed it to Cherry Hill engineering for resolution. As the licensee recognizes the potential problem with off center attachment of the ITT supports and is taking steps to resolve the issue, the inspector had no further questions.

c. The inspector reviewed E&DCR C14764 and C15501. A condition had been identified where a minimum fillet weld size had not been met for a weld on support BZ-76EK-1. Further, a drafting error was discovered by SEG where the support load had been erroneously identified on the support drawing. The inspector reviewed the technical resolution to the problems and discussed the issue with the site lead hanger engineer. The personnel were found to be knowledgeable on the support redesign and had resolved the issues appropriately. The inspector had no further questions.

d. The inspector examined pipe support BZ-19GX. This support is attached to a B31.1 non-safety related pipe, and BZ-19GX is the first support downstream from an ASME Class 3 isolation valve for line 21-39. The support is identified on the installation drawing to be QA Category II. The inspector reviewed Regulatory Guide 1.29 which states that Appendix B requirements are applied to the first seismic restraint beyond the defined boundary. The inspector ascertained that SWEC has seismically designed the support, however ITT had not treated this pipe support as a QA Category I item for inspection purposes.

The inspector was informed that items specifically required to be seismically designed in accordance with Regulatory Guide 1.29 paragraphs C.2 and C.3 are not identified as such on the design drawings. SWEC engineering has classified these items to be QA Category II along with balance of plant non-safety items. A sampling inspection is conducted on this group of QA Category II installations. The current inspection program does not appear to fulfill the requirements of Regulatory Guide 1.29 which mandates a greater degree of QA attention to items classified as seismic II over I. This concern is an unresolved item. (84-06-06)

e. The inspector noted that ITT has final accepted numerous pipe supports throughout the plant as evidenced by the final inspection tag affixed to the supports. In paragraph 5a, of this report it is documented that the inspection status of structural steel beams is not easily traceable. In that pipe support final acceptance relies on the placement of associated structural steel, the inspector is concerned that if the support is attached to an uninspected structural member, there are no controls over the craft disassembly of the structural member which could adversely affect the attached pipe support. The inspector has a concern as to programmatic controls which assure that final accepted pipe supports are attached to final accepted structural steel. (84-06-07)

7. Housekeeping and Fire Protection

The inspector reviewed requirements which pertain to maintenance of plant housekeeping and control of combustible materials:

-- FSAR section 1.8
-- Regulatory Guide 1.39, "Housekeeping Requirements for Water-Cooled Nuclear Plants"
-- ANSI N45.23., "Housekeeping During the Construction Phase of Nuclear Power Plants"
-- Construction Method Procedure 1.4, "Housekeeping"
-- Construction Site Instruction 18.1, "Controlling Flammables and Combustibles"
-- SWEC Field Safety Manual Section F

The inspector toured the primary and secondary containment areas and identified the following deficient conditions:

-- large quantities of untreated lumber (neither painted with fire retardant paint nor pressure treated with fire retardant compound) were used to fabricate gang boxes, electrical junction box supports, drawing racks, ladders and walkways.

-- large quantities of debris composed of paper, scrap material and lunch debris were found on the floors and elevated staging.

The observed conditions are contrary to the requirements to control and minimize debris accumulation and requirements governing the use of fire retardant material within the safety related areas.

The inspector noted that a previous unresolved item, 81-05-02, documented within NRC inspection report 81-05 dealt with poor housekeeping practices within containment. The failure of the licensee to implement effective corrective action in response to that identified concern, as evidenced by the current observation of deficient conditions within the Reactor Building, is a violation of 10 CFR 50, Appendix B, Criterion XVI. (84-06-08)

The licensee took immediate steps to address the housekeeping and fire prevention concerns. The untreated lumber within containment was either removed or painted with a fire retardant covering. An intensive effort was initiated to remove all debris from within the containment structure. Construction management initiated a weekly tour of site areas to verify compliance with the governing ANSI cleanliness criteria.

The inspector noted an initial improvement as a result of the above actions. Toward the latter stages of the inspection, it was observed by the NRC inspector that the positive gains were eroded as debris began to accumulate. The licensee cleanliness review status document also indicated that the building interiors require further improvements in housekeeping. Constant attention is required of the licensee to achieve and maintain proper cleanliness levels within the plant structures. Within the response to violation 84-06-08 the licensee shall particularly address measures to implement effective long term corrective actions.

8. Weld Material Control

During activity reviews the inspector discovered a JCI portable weld rod oven (A094) which was de-energized. Both the oven and the E7018 weld material within were at ambient temperature. The weld material had been released for work on a Category I instrumentation support BZ-420W P-1. The inspector reviewed JCI weld material requisition 21835 which stated that one pound of E7018 rod had been subsequently returned by the welder and had been put into the rod issue station holding oven. The inspector reviewed JCI procedural controls for issued weld material. JCI procedure QAS-904-NMP2 "Weld Material Control" states that:

-- Low hydrogen electrodes issued to the field shall be kept in portable rod ovens maintained between 120°F and 350°F.

-- Electrodes returned to the rod issue station which have exceeded the maximum exposure time (4 hours for E7018) shall be discarded.

The procedural controls for the weld material have been established to prevent excessive moisture absorption by the weld rod coating material which can result in detrimental conditions within the final weld.

The failure of JCI to assure that procedural controls for weld material are adhered to, as evidenced by a welder not maintaining proper portable oven temperature,and for failure to scrap the nonconforming electrodes, is a violation of 10 CFR 50, Appendix B, Criterion V. (84-06-09)

Upon notification of the deficient condition, JCI and the licensee promptly implemented the following corrective actions:

-- placed rod issue station holding oven 1497 on hold,
-- issued inspection surveillance report 4894 to grind out the welds in question and to scrap all material within oven 1497,
-- terminated the welder to whom the material had been issued,
-- JCI conducted training for welders, rod room attendants and QC personnel on procedural requirements for weld rod control,
-- initiated augmented surveillance inspections of oven weld material control.

Based upon the above corrective actions which were implemented by the licensee during the conduct of this inspection, the violation stated above (84-06-09) is considered to be closed. No written response is required at this time.

9. Post Inspection Rework Control

a. As noted in paragraph 5.b. the inspector examined structural beams A5080 and E5080 located at elevation 261 azimuth 180° within secondary containment. The beams were observed to have been dismantled from a previously complete connection. A review of QC inspection records indicated that the beams had been inspected on 9/28/81 as documented by IR S1016413. The inspector determined that the QC records did not reflect any rework subsequent to the documented acceptance of the structural members. (Example 1)

The inspector observed the connection of beam D6869 to D6800. He noted that a cracked washer was present under one nut. Upon further examination by SWEC QC, reverse peening was observed which indicates the bolts had been disassembled. A QC records check identified that the connection had been previously accepted. (Example 2)

The inspector reviewed SWEC procedure QS14.1-NM, "Post Acceptance Work Control". The procedure defines a program to control rework to previously QC accepted installations. In accordance with the procedure, a PLIR should be generated by construction when a QC inspected item is going to be reworked. The PLIR is then routed to QC to provide notification that the installation is to be reworked and to trigger the necessary re-inspection after the rework is complete.

As noted above, two examples of unauthorized structural steel beam rework were identified for which a PLIR was not generated. The failure to implement effective controls to prevent unauthorized rework to previously QC accepted items is a violation of 10 CFR 50, Appendix B, Criterion V. (84-06-10)

b. The inspector reviewed SWEC QC inspection records to determine the extent of unauthorized rework identified to date. A review of type C inspection reports yielded the following information:

Inspection Report	Contractor	Description
S3W00375	Walsh	Column removed without PLIR
S3K00387	L. K. Comstock	Conduit supports loosened without PLIR
S3K00342	L. K. Comstock	Cable tray risen support re-installed without PLIR
E3K00067	L. K. Comstock	Cable tray removed without PLIR
E3K00522	L. K. Comstock	Conduit disassembled without PLIR
S3M00297	Cives	Rework without weld data

The historical records do not indicate that numerous instances exist of rework having been accomplished without the proper generation of a PLIR. Based on NRC identified improper conduit disassembly within inspection report 83-18, and the two examples of unauthorized structural steel rework discussed above the inspector is concerned that current surveillance activity does not identify the magnitude of the unauthorized rework problem. The licensee is requested to address this concern in response to Appendix A, Item 2.

10. Followup to Construction Appraisal Team Inspection

During the conduct of this inspection, the inspector monitored the corrective actions implemented by the licensee in response to the Construction Appraisal Team (CAT) inspection. The CAT inspection findings are documented within Inspection Report 50-410/83-18 issued on January 31, 1984. Actions noted during the inspection period are discussed below:

Niagara Mohawk QA has completed their 100% review of ITT radiographs. Numerous documentation problems were identified. Two welds were identified as requiring weld repairs. The planned NRC Nondestructive Examination Inspection will sample radiographic film from the document vault to verify the adequacy of the NMPC film review.

The NMPC QA site audit program has been established. Two audits have been conducted to verify the acceptability of hardware installations.

Additional pull tests of Hilti bolt anchors in 3000 psi concrete are planned. The pull tests will be conducted at loadings up to four times the design load in compliance with Inspection and Enforcement Bulletin 79-02. The inspector will observe the conduct of the additional pull tests.

Rework and re-inspection continue on the PGCC cabinets to identify and correct separation nonconformances. Further problems have been identified with the Redundant Reactivity Control System panel.

Two cases have been found where discrepancies exist for equipment bolting as identified on vendor drawings and the associated seismic analysis. These problems will be investigated and further QC sampling of field installations is planned.

A re-inspection of 1200 HVAC duct supports has been completed. The identified nonconformances have been documented on a Nonconformance and Disposition Report which received an accept-as-is disposition.

11. Unresolved Items

Unresolved items are matters for which more information is required in order to ascertain whether they are acceptable items, items of violations or deviations. Unresolved items discosed during the inspection are discussed in paragraph 4.a and 6.d.

12. Management Meetings

At periodic intervals during the course of this inspection, meetings were held with senior plant management to discuss the scope and findings of this inspection. The inspector attended periodic meetings with the NMPC QA manager and project director to discuss the status of CAT corrective actions.

Apparent violations of NRC requirements were discussed with licensee plant management during exit meetings held on April 19, 1984 and May 11, 1984.