U.S. NUCLEAR REGULATORY COMMISSION

Region I

Report No. 82-03

Docket No. 50-410

License No. CPPR-112 Priority -- Category A

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

Facility Name: Nine Mile Point Nuclear Station, Unit 2

Inspection at: Scriba, New York

Inspection conducted: March 29 to April 30, 1982

Inspectors: R D Schulz — 5/11/82
R. D. Schulz, Resident Inspector — date signed

A. G. Varela — 5/14/82
A. A. Varela, Reactor Inspector — date signed

_____ — date signed

Approved by: H B Kister — 5/14/82
H. B. Kister, Chief, Reactor Projects Section 1C — date signed

Inspection Summary:
Inspection on March 29 to April 30, 1982 (Inspection Report No. 50-410/82-03)
Areas Inspected: Routine inspection by the resident inspector of work activities relative to structural steel base metal repair, cadwelding, nonconformance and disposition reports, risk releases, concrete expansion anchors, piping weld repair, mechanical components, and design control. The inspector also performed plant inspection tours and reviewed licensee action on previously identified items. The inspection involved 110 inspector hours.
Inspection on April 12-16, 1982 (Inspection Report No. 50-410/82-03)
Areas Inspected: Routine, unannounced inspection by one regional based inspector of work observations in concrete construction for the Aux Bay floor, West Electric Tunnel Containment Interior Wall, and concrete encasement of intake water lines in the Lake Tunnels. A tour of the construction site was performed and interviews were conducted relating to previously reported significant deficiency 81-00-03 and NRC Circular 81-08. The inspection involved 36 inspection hours on site and the inspection details are discussed in paragraphs 12-16.

Results: Three violations were identified: Inadequate fillet welds designed to support cable tray cross bracing (paragraph 2), Failure to control welding procedures (paragraph 2) and Lack of procurement document control (paragraph 3).

DETAILS

1. Persons Contacted

Niagara Mohawk Power Corporation

W. D. Baker, Construction
J. J. Bebko, Manager, Compliance and Verification
R. Clancy, Senior Vice President
S. E. Czuba, Construction
J. L. Dillon, Q. A. Engineer, Site Lead
G. J. Doyle, Q. A. Technician
M. S. Dunlop, Q. A. Technician
P. E. Francisco, Nuclear Licensing Engineer
E. Manning, Q. A. Technician
S. F. Manno, Project Manager, Unit 2
H. Mastin, Lead Electrical Construction Engineer
C. Millian, Project Compliance
R. A. Norman, Q. A. Supervisor
J. P. Ptak, Manager of Construction, Site
G. Rhode, Vice President, System Project Management
J. Swenszkowski, Q. A. Technician

Stone & Webster Engineering Corporation

A. Barsuch, Q. C. Inspector
L. W. Brown, Superintendent of Construction
R. L. Bunch, Q. A. Engineer
R. Clarke, Q. C. Inspector
K. E. Conrad, CCCP Administrator
S. W. Crowe, Assistant Superintendent Field Q. C.
T. Dean, Q. C. Inspector
R. Hardison, Q. C. Engineer
R. Huggon, Q. C. Engineer
R. Kelvin, Senior Q. C. Engineer
D. Kuchek, Senior Purchasing Agent
D. W. Lanham, Senior Q. C. Engineer
E. A. Magilley, Assistant Superintendent Field Q. C.
B. Pierce, Training Supervisor
G. W. Pierce, Q. A. Site Supervisor
H. J. Pierre, Office Supervisor
T. Saczynski, Principle Geotech Engineer
L. E. Shea, Superintendent of Engineering
D. Smith, Structural Engineer
T. Syrell, Senior Civil Q. C. Engineer
R. Wagner, Resident Manager & Senior Site Representative
J. Weaver, Civil Q. C. Engineer
G. Wilkins, Q. C. Inspector

L. K. Comstock and Company

D. Brinley, Assistant Project Manager
A. Fallon, Project Manager
J. Mueck, Area Manager

ITT Grinnell Industrial Piping, Inc.

R. Askew, Welding Inspector
A. C. Carter, Chief Welding Engineer
J. Caveilier, Millwright Foreman
G. DeRouse, Q. C. Inspector
D. R. Giguere, Q. C. Manager
D. L. Grodi, Inspection Supervisor
T. Iosue, Construction Manager
D. Margrey, Q. C. Training Coordinator
G. McDonough, Senior Office Engineer
J. Pashley, Welding Inspector
L. Pela, Technical Supervisor

Walsh Construction

J. Catalane, Civil Field Engineer

Peter Kewit & Sons

M. Conners, Project Engineer

2. Plant Tours

The inspector observed work activities in progress, completed work and plant status in several areas during general inspections of the plant. The inspector interviewed craft personnel, supervision and quality inspection personnel such as personnel were available in the work areas. The inspector toured the lake intake tunnels and witnessed concrete curing in intake tunnel number two.

Welding was observed on circular pipe supports for service water piping, and the fillet welds were in accordance with approved drawings. The inspector examined weld preparations on 20" low pressure core spray piping in the north auxiliary bay, fit-ups on 18" residual heat removal piping in the south auxiliary bay and secondary containment, and welding on 20" residual heat removal piping, ASME Boiler and Pressure Vessel Code Class 1 in the primary containment. The inspector also examined welding on reactor coolant system whip restraints in the primary containment.

Plate attachment fillet welds designed to support cable tray cross braces in the control room building, were examined for compliance to approved drawings and welding details. While reviewing drawing 12177-EE-340 DE-2, the inspector noted that the fillet weld detail for the plate attachment was incorporated in the drawing by means of Engineering and Design Coordination Report C40935, dated January 27, 1982. Welded connection, detail G, was for a $3/8_T$" x 8_W" x 9_L" plate and the fillet weld required was 3/16", the entire 9 inch length of the plate, both sides. Welded connection, detail H, was for a $3/8_T$" x 9_W" x 22_L" plate and the fillet weld required was 3/16", but only 4" minimum to 6" maximum in length, both sides. The design of the fillet weld for the 22" long plate did not appear to be adequate and the inspector expressed his concerns to Stone & Webster

engineering personnel. Subsequently, engineering personnel issued Nonconformance and Disposition Report #3148 and Engineering and Design Coordination Report #F40230. Nonconformance and Disposition Report #3148 listed 22 welds having insufficient weld deposit due to detail H being erroneously issued. The weld area is to be increased by requiring a center weld 6" long, both sides and top/bottom welds each 4" long, both sides. Engineering and Design Coordination Report #F40230 authorized the revision to Engineering and Design Coordination Report #C40935 to incorporate the revised weld detailed in drawing 12177-EE-340 DE.

The incorrect fillet weld design on the 22" long plate is considered to be a violation of 10 CFR 50, Appendix B, Criterion III. (410/82-03-01) No response is required by the licensee as corrective action measures have been established and the inspector will verify in a future inspection period that the fillet welds have been completed in accordance with the revised detail.

During a tour of the primary containment at elevation 247', the inspector examined a fit-up on a 24"feedwater line. The components involved were a 24" O.D. (2.062 wall) feedwater swing check valve and a primary containment penetration. The feedwater valve was located just inside the primary containment and was identified as 2FWSV12B. While reviewing the weld data report and from subsequent investigations, the inspector discovered that the welding procedures authorized for use on this joint, identified as FW009 on Isometric 47-16, had not been qualified for impact testing. The components being joined were classified by design as ASME B&PV Code, Section III, Subsection NB, Class 1 components. Due to size and wall thickness of the components, NB-2300 required impact testing and therefore, the welding procedures used had to be qualified for impact testing per Installation Specification P301C, Field Fabrication and Erection of Piping, Revision 2, and ASME B&PV Code, Section IX, 1974. The requirements of NB-2300 assure the prevention of nonductile failure. The inspector requested ITT Grinnell to perform a detailed review in order to determine if any other field planners had been erroneously issued, authorizing for use welding procedures which had not been qualified for impact testing, if required, due to material requirements of ASME B&PV Code, Section III or Section II (base material specifications). Detailed below are the results of ITT Grinnell's review which specifies all piping joints which had non impact test welding procedures erroneously authorized for use, including those weld joints on which welding had been performed:

System	Iso	Weld Joint #	ASME Code Class
Main Steam	1-13	002 003 006 (MSIV) 007 (MSIV) 008*	Class 1
Main Steam	1-14	002 006 (MSIV) 007 (MSIV) 008* 013 014	Class 1

System	Iso	Weld Joint #	ASME Code Class
Main Steam	1-15	002	Class 1
		003	
		006 (MSIV)	
		007 (MSIV)	
		008*	
Main Steam	1-16	002	Class 1
		003	
		006 (MSIV)	
		007 (MSIV)	
		008*	

*Welding performed on 26", 1.177" minimum wall pipe, welding procedures used 1-4-2-2 (GTAW), 1-1-1-7 (SMAW)

System	Iso	Weld Joint #	ASME Code Class
Residual Heat Removal	66-19	003	Class 1
		004	
		005	
		009	
		010	
		011	
Residual Heat Removal	66-21	002	Class 1
		003	
		004	
Residual Heat Removal	66-26	010	Class 1
		011	
		012	
Residual Heat Removal	66-31	011	Class 1
		012	
		013	
Residual Heat Removal	66-32	005	Class 1
		006	
Residual Heat Removal	66-52	001	Class 1
		002	
		003	
		004	
		005	
		006	
Residual Heat Removal	66-53	001	Class 1
		002	
		003	
		004	

System	Iso	Weld Joint #	ASME Code Class
Residual Heat Removal	66-55	003	Class 1
		004	
		005	
		006*	
		007*	
		008*	
		009	
		010	
High Pressure Core Spray	25-9	009	Class 1
High Pressure Core Spray	25-10	001	Class 1
		002	
		003	
		004	
		005	
		006	
		007	
		009	
		010	

*Welding performed on 20", S/8C pipe, welding procedures used 1-4-2-2 (GTAW) 1-1-1-7 (SMAW)

System	Iso	Weld Joint #	ASME Code Class
Feedwater	47-13	006	Class 1
		007	
		008	
		009	
		010	
		011	
		012	
		014	
Feedwater	47-14	001	Class 1
		002	
		003	
		004	
Feedwater	47-15	001	Class 1
		002	
		004	
		005	
		006	

System	Iso	Weld Joint #	ASME Code Class
Feedwater	47-16	002 (FWIV) 003 (FWIV) 006 007 008 009 010 011	Class 1
Feedwater	47-16	012 013 014	Class 1
Feedwater	47-17	001 002 003	Class 1
Feedwater	47-18	001 002 004 005 006	Class 1

Further review by the inspector identified a significant breakdown of the multiple checkpoints in that incorrect welding procedures were issued by engineering, approved for production welding by the Quality Assurance Department, and approved for use by the Authorized Nuclear Inspector. The weld joints included emergency core cooling systems and main steam isolation valves.

This breakdown of the review process which resulted in the issuance and use of incorrect weld procedures represents a violation of 10 CFR 50, Appendix B, Criterion IX. (410/82-03-02)

In addition, the inspector requested the licensee to review the qualification and training requirements for ITT Grinnell engineering and quality assurance personnel responsible for determining and authorizing welding procedure specifications. This is an unresolved item which will be examined in a future inspection period. (410/82-03-03)

3. Licensee Action on Previous Inspection Findings

a. (Closed) NONCOMPLIANCE, SEVERITY LEVEL V (81-07-01): Megger test evaluation. Specification NMP2-E061A was revised on October 30, 1981 to read that only if a 1-minute motor winding insulation resistance test is found to be unacceptable, then an additional 10-minute megger test is to be performed and submitted to the engineers for evaluation. On August 7, 1981, training was given to contractor and Stone & Webster Quality Assurance personnel on electrical meggering. Inspection

personnel performing a witness function of meggering have been certified in accordance with ANSI N45 2.6-1978. Personnel performance is evaluated by ITT field audits. ITT field audits reported satisfactory megger testing.

b. (Closed) UNRESOLVED (81-10-01): 50.55(e) evaluation. Additional training was given to Stone & Webster personnel who disposition Nonconformance and Disposition Reports (N&D's) regarding 50.55(e) evaluation. In addition, future training has been formalized for new personnel and re-training for existing personnel to maintain proficiency with regards to 10 CFR 50.55(e) reportability. The N&D Report form has been changed to include a checkoff requirement signifying 10 CFR 50.55(e) review. A detailed review of past N&D's has been completed concerning correct determination of potential deficiency reporting to the Nuclear Regulatory Commission and no N&D's have been identified which were not already evaluated as potentially significant deficiencies in accordance with 10 CFR 50.55(e).

c. (Open) UNRESOLVED (82-01-07): 10 CFR 50, Appendix B applicability. Safety related field purchase orders 13247A and 12550 to Interstate Steel for structural steel, did not reference 10 CFR 50, Appendix B or any quality assurance program statement. In addition, the approved vendors list, (Quality Rating List) had a stipulation that for orders placed with Interstate Steel, all furnished material must be purchased from an ASME material manufacturer, material supplier or customer approved source. Purchase Orders #13247A and 12550 did not contain any stipulation statements with regard to Interstate Steel suppliers despite the conditional statement incorporated in the Quality Rating List.

Further investigation by the licensee and inspector failed to reveal justification for not incorporating 10 CFR 50, Appendix B, applicability statements in the purhcase orders. The Stone & Webster Quality Assurance Program Manual, Revision C, states in Section 4, Procurement Document Control, in part, "Sellers who perform Category I work shall be required to have quality assurance programs consistent with applicable provisions of Appendix B, 10 CFR 50. These provisions shall be imposed on their suppliers as appropriate." Additionally, the inspector discovered that a safety related purchase order, FPO-14144 for structural steel was placed with Interstate Steel on April 13, 1982 despite the fact that Interstate Steel was not on the approved Category I sellers list (Quality Rating List), issued April 1, 1982. The Stone & Webster Quality Assurance Program Manual, Revision C, states in Section 7, in part, "Field purchase orders for Category I items shall be placed only with approved Category I sellers." The Senior Purchasing Agent was unaware that Interstate Steel had been removed from the approved sellers list.

Failure to include 10 CFR 50, Appendix B applicability statements in purchase orders 13247A and 12550 and placement of purchase order #14144 to a vendor not on the approved Category I sellers list is a violation of 10 CFR 50, Appendix B, Criterion IV. (410/82-03-11)

4. Base Metal Repair - Structural Steel

The objective of this part of the inspection was to determine that base metal repairs including weld repairs were in accordance with installation specifications and AWS D1.1-1977. The inspector observed completed work involving metal removal of beams at elevation 289, aximuth 35°. Some of the deck angles and supports were cut out to accommodate added supports for the pedestal crane. In order to ensure the remaining base metal was not nicked or undercut, a magnetic particle examination was done. Listed below are the results of the magnetic particle examination and corresponding beam:

Beam	Magnetic Particle Results	Weld Repair
D5092	Acceptable, except one area below flush 1½" circle, 3/32" deep	Yes - acceptable magnetic particle examination after welding
B5109	Acceptable	Not needed
A5109	Acceptable	Not needed

The inspector examined records on the following base metal repairs:

Beam	Condition	Magnetic Particle After Grinding	Weld Repair	Magnetic Particle After Welding
A3208	Cavity due to stud removal	Acceptable	Yes	Acceptable
A6210	Gouges	Acceptable	Yes	Acceptable
A1167	Linear Indications Cover Plate	Acceptable	Not Needed	

All repairs were in accordance with AWS D1.1, Section 3.7 and Table 3.2.3 which stipulates the limits on acceptability and repair of edge discontinuities in cut plate. Stone & Webster had an approved Engineering and Design Change Request which allowed repairs to be made without engineering approval on any discontinuity discovered in plate, except those over 1" in length with depth greater than 1/4". Depressions, per an Engineering and Design Change Request, could not extend below 1/32" for material less than 3/8" thick or 1/16" for material 3/8" to 2" in thickness. If these dimensions were exceeded, weld metal deposit was required. The base metal repairs requiring weld metal deposit were all welded in accordance with approved welding procedure specifications. Weld repair data sheets included Q. C. hold points for pre-heat, weld surface finish, and magnetic particle results. Welds were visually examined to the acceptance criteria of Section 8.15, AWS D1.1.

No violations or deviations were identified.

5. Cadwelding

The inspector randomly observed several cadweld splices at elevation 315', of the fuel pool floor during preparation and firing, and continued to monitor splices after the reaction was complete and ambient temperature had been reached. During preparation the inspector noted proper cleaning, drying, bar spacing, alignment, packing, and correct filler metal. Firing was observed for gas blowout and extent of leaking of filler metal. The post firing inspection included verification of centering of sleeve on the spliced ends and marking, which consists of punch marks located 12 inches from the end of the bar with a tolerance of ± 1/16 inch. The slag/filler metal riser was broken off with sharp blows from a hammer prior to cooling. The entire process was in accordance with Construction Methods Procedure 6.1-1.79, dated January 1979. The inspector examined the cadweld records program for compliance with the following documents:

a. Installation Specification S203C, Placing Concrete and Reinforcing Steel, Revision 7, dated February 18, 1982.

b. Regulatory Guide 1.10, dated January 2, 1973.

c. Q. S. 9.11, Cadwelding (Structural), Revision 0, dated October 16, 1980.

Cadwelding records were randomly selected from the following areas: primary containment, secondary containment, main steam tunnel, and fuel pool. Cadwelder qualification reports were examined for fifteen cadwelders and records verified: acceptable centering of the sleeve on spliced bar ends, permissible gap between bar ends and bottom of sleeve, sleeve type, allowable voids in filler metal, inclusion of filler metal, and quantity of slag at the tap hole. Splices passed visual examination and tensile test results. Cadweld production testing cycle records were maintained for each bar size and each cadwelder for the horizontal, vertical, and diagonal position, both for T-series and T-series sister.

Randomly selected splices were tensile tested in accordance with the frequency established in Regulatory Guide 1.10. Cadweld splice test report records indicated all splices met the 125 percent of the minimum yield strength requirement and also the ultimate tensile specified for the reinforcing bar based on the average tensile strength of 15 consecutive samples. The inspector verified, through cadweld control records, that cadwelders were qualified for production splicing completed, taking into consideration position and use of position for a three month period. Inspection records of production splicing, both in-process and final examinations, were reviewed. The inspection records included the following attributes:

Final	In-Process
Sleeve type	Pre-heating
Identification	Cleaning
Bar centering marks	Witness marks
Voids/slag	End square cut
Cadwelder qualification	Set-up
	Filler metal
	Sleeve type

Cadwelds not completed within 48 hours after cleaning are protected by taping the ends. The inspector interviewed the day shift, Q. C. Cadweld Inspector, and the inspector appeared knowledgeable in all areas of the cadwelding process. Records verified qualification in accordance with ANSI N45 2.6.

No violations or deviations were identified.

6. Nonconformance and Disposition Reports

The inspector reviewed nonconformance and disposition reports written from December 1981 to March 26, 1982 for corrective action, including measures to prevent recurrence. The following N&D's did not contain any measures to prevent recurrence even after identical nonconforming conditions were repeated:

N&D #	Date	Condition
2750	December 16, 1981	Failure to stop at assigned quality control hold point regarding structural steel preheat control.
2874	January [illegible] 2	Failure to stop at assigned quality control hold point regarding structural steel preheat control.
2730	December 9, 1981	Failure to perform required quality control inspection of structural steel mating surfaces.
2841	January 14, 1982	Failure to perform required quality control inspection of structural steel mating surfaces.
2862	January 19, 1982	Failure to perform required quality control inspection of structural steel mating surfaces.

In addition, the following N&D's circumvented quality control requirements:

N&D #	Date	Condition
2709	December 2, 1981	High strength bolts not installed by an approved method.
2724	December 8, 1981	Concrete anchors not installed as per original requirement (omitted).
2731	December 11, 1981	Failure to notify quality control when coring would start, resulting in cores not being identified with the location from which the core was taken.

Based on the fact that an effective Quality Assurance Program provides control over activities, including assurance that all prerequisites for a given activity have been satisfied, the inspector has requested the licensee to determine that actions may need to be taken to prevent recurrence of the above mentioned nonconforming conditions. This issue will be examined in a future inspection period. (410/82-03-04)

Nonconformance and Disposition Report #2709 concerned 300 high strength bolts in the screenwell which had been installed by an incorrect method. The bolts had been tightened by a torque wrench which was not adjusted and maintained to give the required fastener tension. The disposition details required that only 10% of the bolts or not less than two bolts per connection be inspected. The inspector pointed out to the licensee that the disposition details were incorrect in that the inspection percentage was the same as it would have been if the bolts were tightened in accordance with an acceptable method per RCRBSJ, 1978, Specification for Structural Joints Using ASTM A325 or A490 Bolts. The licensee responded to the inspectors observations and inspected 88% of the installed bolts, verifying and correcting, when necessary, values to the required inspection torque. Only 2% of the bolts required correcting to the inspection torque, with 86% meeting the inspection torque. Based on licensee corrective action, this issue is resolved.

No violations or deviations were identified.

7. Risk Releases

The inspector reviewed the Stone & Webster risk release program for compliance with approved procedures and ANSI N45 2.2-1972.

a. Procedures Reviewed

Q.A.-15.3, Risk Release of Unsat/Nonconforming Material/Equipment, Revision B, dated August 31, 1979.

QCI/FN2-S15.3-010, Risk Release of Nonconforming/Unsat Equipment and Material, dated September 2, 1977.

b. Records Reviewed

Risk releases, involving unsatisfactory or nonconforming material issued to construction for in place storage or installation, were reviewed to assure adequate controls had been exercised and justification for use had been correctly documented.

QCI/FN2-S15.3-010, states in section 4.3 that an item will be risk released to the construction forces only when there is evidence that the nonconforming/unsatisfactory inspection report will be satisfactorily resolved within a short period of time. The following risk releases appear to be overdue for resolution:

Risk Release Serial No.	Date	Unsat. Issue
0105	August 28, 1981	454 mechanical snubbers not furnished to procurement requirements
0093	May 18, 1981	4 motor operated valves without seismic certificates of compliance, operability test reports, and seismic calculations
0094	May 18, 1981	1 motor operated valve without seismic certificates of compliance, operability test reports, and seismic calculations

Risk release 0125, dated February 15, 1982, concerned two beams which had defects up to 3/16" deep and had been released to construction for installation. The justification for release was documented as, "beams are scheduled to be installed February 16, 1982, risk release needed to meet schedule." This justification is not in accordance with ANSI N45 2.2, paragraph 5.3.3. The inspector has requested the licensee to review risk releases 0105, 0093, and 0094 for possible resolution and risk release 0125 for defect repair. The inspector plans to review these risk releases in a future inspection period. (410/82-03-05)

No violations or deviations were identified.

8. Drilled-In Expansion Type Concrete Anchors

The inspector reviewed the drilled-in concrete anchor installation and inspection program for compliance with regulatory requirements, Stone & Webster Specification NMP2-S203G, Drilled-In Expansion Type Concrete Anchors, dated February 27, 1981, Revision 3, and Quality Assurance Directive 10.43, Hanger and Anchor Bolt Installation Inspection, dated September 25, 1979, Revision A.

a. Observation of Work

The inspector witnessed the installation of four (1/4") concrete anchor bolts in the control room building by L. K. Comstock (electrical contractor) craftsmen. The craftsmen appeared to be lacking in knowledge concerning spacing and angularity requirements. This conclusion was drawn by the inspector based on questions the craftsmen asked the Stone & Webster field quality control inspector and responses communicated to the resident inspector while examining the installations. Of the four concrete anchor bolts installed, all failed projection requirements and two failed angularity requirements. The two that failed both angularity requirements and projection requirements had to be pointed out to the craftsmen by the Stone & Webster field quality control inspector and resident inspector. During the installations, a torque

wrench was dropped from the top of the ladder and landed on the concrete floor. The craftsmen continued to use the torque wrench instead of setting it aside to be recalibrated.

There appears to be a need to review L. K. Comstock craftsmen training in the following areas:

(1) Use and control of calibrated torque wrenches

(2) Concrete anchor installations, including spacing, projection, and angularity

Pending investigation by the licensee and corrective action, if required, this is an unresolved item and will be examined in a future inspection period. (410/82-03-06)

b. Records Reviewed

Prequalification test program results were examined and found satisfactory. During a quality control inspection record review of anchor installations by L. K. Comstock, the inspector discovered that Stone & Webster field quality control personnel were not recording measurements concerning embedment length, bolt diameter, anchor spacing, concrete edge distance, and angular measurement for perpindicularity. Actual measurements taken furnish evidence that dimensions are within acceptable parameters. One of the applications of the concrete expansion anchor (electrical contractor) is for seismic cable tray supports.

Quality Assurance Directive 10.43 stipulates that measurements must be taken by field quality control personnel. Stone & Webster quality control supervision stated that the measurements were being taken but not recorded, as inspection records indicate a satisfactory finding (represented by the letter S) after each attribute such as embedment length. The inspector interviewed one of the (electrical) concrete anchor inspectors and at one point in the interview the anchor inspector stated that he took measurements only twenty percent of the time, the remaining inspections were being done visually. The concrete anchor inspector did appear knowledgeable in the mechanics of anchor installations.

Based on past industry problems with anchor installations, inspector observations of deficient (electrical) anchor installations, and the (electrical) field quality control inspectors response with regard to visual inspections versus program required measurements, the inspector has requested the licensee to address the following concerns:

(1) Since measurements must be taken and the recording of measurements furnishes results of inspections, what is Stone & Webster's justification for not recording actual measured dimensions? This concern applies to all anchor bolt installations. (i.e., Electrical, Structural and Mechanical)

(2) In order to assure quality, is there justification for field quality control re-inspecting "all" Category I anchor bolts installed by L. K. Comstock for such attributes as anchor spacing, projection, perpendicularity, and one hundred percent torque testing?

(3) The Category I inspection program is based on a random sampling plan. Is this random sampling plan adequate for installations by L. K. Comstock?

Pending investigation by the licensee of the above concerns and NRC evaluations of licensee corrective action, if required, this item is unresolved. (410/82-03-07)

No violations or deviations were identified.

9. Weld Repairs/Base Metal Repairs - Piping

The inspector reviewed ITT Grinnell documentation in order to determine that weld repairs and base metal repairs were in accordance with ASME Boiler and Pressure Vessel Code requirements. The following base metal repair procedures were reviewed and found to be in compliance with ASME B&PV Code, Section III requirements:

-- ES-1066, Base Metal Weld Repairs-Damage or Build-up, dated October 23, 1981.

-- ES-1067, Repair of Base Material Defects, dated August 6, 1981.

Repairs requiring welding were examined for compliance with the applicable sections of ASME B&PV Code, Section III, as detailed below:

Base Metal Repairs	Weld Repairs
NC-4130 & NC-2539 (Class 2 piping)	NC-4453 (Class 2 piping)
ND-4130 & ND-2539 (Class 3 piping)	ND-4453 (Class 3 piping)

Listed below are the documentation packages reviewed:

Deviation Report	System/ ASME Class	Iso	Repair Weld	Defects Base Metal	Size	Condition
#1592	Service Water Class 3	21-48		yes	20" .375 wall	Linear indication
#1610	High Pressure Core Spray Class 2	25-4		yes'	16" .375 wall	Bevel damaged
#1692	High Pressure Core Spray Class 2	25-3		yes*	16" .375 wall	Base metal removed

Deviation Report	System/ ASME Class	Iso	Repair Weld	Defects Base Metal	Size	Condition
#1729	Service Water Class 3	Spool NM-21-319		yes*	20" .375 wall	End prep gouge
#1703	Service Water Class 3	21-51		yes	12" .375 wall	Linear indication
#1724	High Pressure Core Spray Class 2	25-6	FW009		3" .300 wall	Lack of penetration and slag
#1619	Service Water Class 3	21-60	FW003		6" .280 wall	Porosity
#1815	Residual Heat Removal Class 2	66-24	FW012		18" .500 wall	Porosity
#1825	Residual Heat Removal Class 2	66-8	FW-007		3" .216 wall	Welded by unqualified welder

*Required weld deposit

All repairs requiring grinding and/or welding and subsequent nondestructive examination were in accordance with the ASME Boiler and Pressure Vessel Code.

No violations or deviations were identified.

10. Mechanical Components

The inspector checked the in place condition of the low pressure core spray pumps, reactor core isolation cooling pump, and reactor core isolation cooling Terry turbine, comparing the in process work with quality control inspection records. The reactor core isolation cooling turbine had been bolted down in its permanent location, but the required quality control inspection for initial setting had not been done. The reactor core isolation cooling pump had been bolted down and grouted, but the required quality control inspections for initial setting and grouting had not been done. The inspector questioned the ITT Grinnell, Level II, equipment inspector as to why the inspections had not been done, and the answer given was that it was just an oversight on the part of the equipment inspector. Furthermore, the inspector discovered that fastener requirements have not been established for the reactor core isolation cooling pump and turbine tie down bolting. These issues will be examined in a future inspection period. (410/82-03-08)

Installation documentation on the low pressure core spray pump head verified that the following attributes had been reviewed by an ITT Grinnell Quality Control Inspector:

-- Installation preparation

-- No physical damage

-- Protective measures

-- Cleanliness

-- Foundation inspection

-- Bearing plates set level

-- Level and plumbness within tolerances

-- Location and parellelism of main piping connections

In addition, the inspector reviewed certifications for the low pressure core spray pumps, reactor core isolation cooling pump, and reactor core isolation cooling turbine and found manufacturer's code data reports to be in accordance with requirements.

The inspector reviewed the ITT Grinnell storage and preventive maintenance program to verify compliance with specification NMP2-SM01, Storage and Maintenance During Storage of Permanent Plant Equipment, dated February 3, 1982. The following documents were examined:

-- Storage Area Surveillance Reports for January and February 1982.

-- Preventive Maintenance Audits for November and December 1981 and January, February and March 1982.

-- Qualification of quality control inspectors to ANSI N45 2.6.

-- ITT Grinnell Procedures.

The ITT Grinnell preventive maintenance audits identified significant program deficiencies. Due to the large number of ITT Grinnell findings, the inspector reviewed Niagara Mohawk records with regard to the preventive maintenance of mechanical components, including such maintenance as rotations, lubrications, meggering, and heat-drying applications. Niagara Mohawk records indicated substantial evidence of a failure by Stone & Webster and ITT Grinnell to effectively implement preventive maintenance program SM01. The lack of effective implementation was documented by Niagara Mohawk in a Significant Deficiency Report and Action Sheet Request on February 5, 1982. While the inspector was reviewing the preventive maintenance program, the Vice President of Niagara Mohawk re-assigned the preventive maintenance contract to Stone & Webster, removing ITT Grinnell from their responsibilities as of June 21, 1982. The lack of an effectively implemented preventive maintenance program appears to be primarily due to a lack of sufficient construction personnel for accomplishing required maintenance and inspecting maintenance activities, and secondarily due to a lack of communication between Stone & Webster and ITT Grinnell. The ITT Grinnell Q. C. Manager was not aware of Niagara Mohawk audit findings. Niagara Mohawk Action Sheet 82.001 reported that there are approximately 1200 to 1700 required visual inspections per month and ITT Grinnell

had only one qualified preventive maintenance construction inspector. The licensee is in the process of correcting the preventive maintenance program and the inspector plans to followup on this area for timely corrective action in a future inspection period. This item is unresolved. (410/82-03-09)

The inspector toured the warehouse and examined two main steam isolation valves for required desiccant and internal heat. Specification SM01 requires that the main steam isolation valves be packed with 68 ounces of Humi-Sorb desiccant and 350-400 watts of heat application. (Desiccant was placed in accordance with requirements). The inspector discovered only 200 watts of heat application in main steam isolation valves 2MSS-HYV-7A and 7D. The moisture conditions of the valves were satisfactory, per attached indicators, however, the construction inspection records indicated that 350-400 watts of heat application was provided. The watts were increased to specification requirements and the inspector considers this item resolved.

No violations or deviations were identified.

11. Engineering and Design Coordination Reports

The inspector reviewed a random selection of Engineering and Design Coordination Reports for completeness and basis of changes. The inspector determined that the E&DCR's were adequate with respect to format, problem description and resolution. Project Procedure #16, Engineering and Design Coordination Reports, Revision 12 and Engineering Assurance Procedure 6.5, Revision 0, permit telephone approvals of E&DCR's. The telephone communication process was determined by the lead engineer to be the root cause for the incorrect fillet weld design which is discussed in the plant tour section of this report (410/82-03-01) and in Item A of Appendix A. The lead engineer stated that information was miscommunicated over the phone. The inspector has asked the licensee to address the issue of telephone approval of E&DCR's as an acceptable method instead of a formal written review and approval. The inspector will review this issue in a future inspection period. (410/82-03-10)

No violations or deviations were identified.

12. Observation of Concrete Construction

The inspector observed work being performed in concrete construction to determine whether work and inspection activities are being accomplished according to applicable specifications, codes, standards, drawings and procedures in the following areas:

a. -- Placement Preparation, including reinforcing steel and embedment installation and form work.

-- Preparation and Control of Construction Methods including concrete pre-placement checklist sign-off.

These activities were observed for South Aux Bay Pour number 1-421-189, Interior Wall Pour number 1-RB-253P, and Lake Tunnels intake water lines concrete reinforcing steel encasement.

b. -- Concrete Aggregate and Cement Storage and Mixing including batch plant qualification, scale calibration and quality control and inspection.

-- Concrete Delivery, Testing and Placement including controls for proper mix, transporting, truck discharge and pump line testing, temperature, QC inspection of placement and consolidation, and crew and equipment adequacy.

-- Concrete Finishing and Curing including temperature, moisture controls, and QC verification.

The above activities were observed for concrete placements in a section of the West Electric Tunnel Wall, South Aux Bay floor, and Lake Tunnels intake water line encasement. During the above observations, craft, QC and supervisory personnel were interviewed to determine knowledge of their assigned tasks. All were found knowledgeable.

No violations or deviations were identified.

13. Site Tour

The inspector observed rock excavation, cleaning, inspection and concrete level course application for the diesel generator building foundation, installation of structural steel members inside secondary containment, observed status of equipment calibration in concrete test laboratory, status of test laboratory certification by CCRL and batch plant certification by NRMCA. The inspector conferred with field engineers, supervision and QC personnel encountered enroute. Particular note was taken regarding the presence of quality control personnel and indications of quality control activities through visual evidence such as inspection records, material identifications, nonconformance and acceptance tags.

No violations or deviations were identified.

14. Licensee Action on Previous Inspection Findings

(Closed) 50.55(e) Item (81-00-03): Voids in concrete found adjacent to the primary containment equipment hatches: Niagara Mohawk Power Corporation has submitted to the NRC, letters dated January 5 and April 6, 1982, their analysis and evaluation of the potential deficiency regarding voids suspected to exist behind the liner. Void areas determined from sounding the liner were assumed to have depths to provide or otherwise not anchor the liner studs. These were used in analysis for possible liner plate rupture. The report concludes the liner stresses in a 20-foot by 18-inch region of suspected void areas were determined to be within the allowable stress limits. Regarding corrective action, Stone & Webster undertook further investigation to provide a more accurate approximation of size and depth of the suspected areas. A nondestructive test method was undertaken and, a 2" diameter exploratory hole was drilled thru the liner to check the worst case. The NRC inspector observed from his review of E&DCR #F10585 and discussions with cognizant engineers that concerns for potential voids at both the Azimuth 135° and 315° Equipment Hatches is resolved based on satisfactory results of the exploratory hole through the liner at the

135° Hatch, which disclosed liner/concrete separation of 0.023 inch and sound concrete at the drilled hole. The inspector has no further questions.

No violations or deviations were identified.

15. Review of Response to NRC Circular 81-08, Foundation Materials

Stone & Webster response to NMPC concerning the NRC Circular 81-08, Foundation Materials states that all major Category I structures were founded on rock and no settlement program is necessary. For other Category I structures not founded on rock, such as pipelines, tanks, and duct lines, the structural, backfill, placement and comparation requirements, including construction controls, are delineated in specifications. The NRC inspector observed these requirements comply with areas mentioned in the NRC Circular. The inspector has no further questions.

No violations or deviations were identified.

16. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations or deviations. Unresolved items disclosed during the inspection are discussed in paragraphs 2, 8 (two items), and 10.

17. 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 licensee acknowledged the inspectors findings and concerns, and all parties were cooperative.