

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 85-10

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: March 19, 1985 to April 26, 1985

Inspectors: R.A. Gramm, Senior Resident Inspector
S.D. Hudson, Senior Resident Inspector
R.M. Wheeler, Resident Inspector
A.J. Luptak, Resident Inspector
H.W. Kerch, Senior Reactor Engineer

Approved by: James C. Linville
J.C. Linville, Chief, Reactor
Projects Section 2C, DRP

5/29/85
date

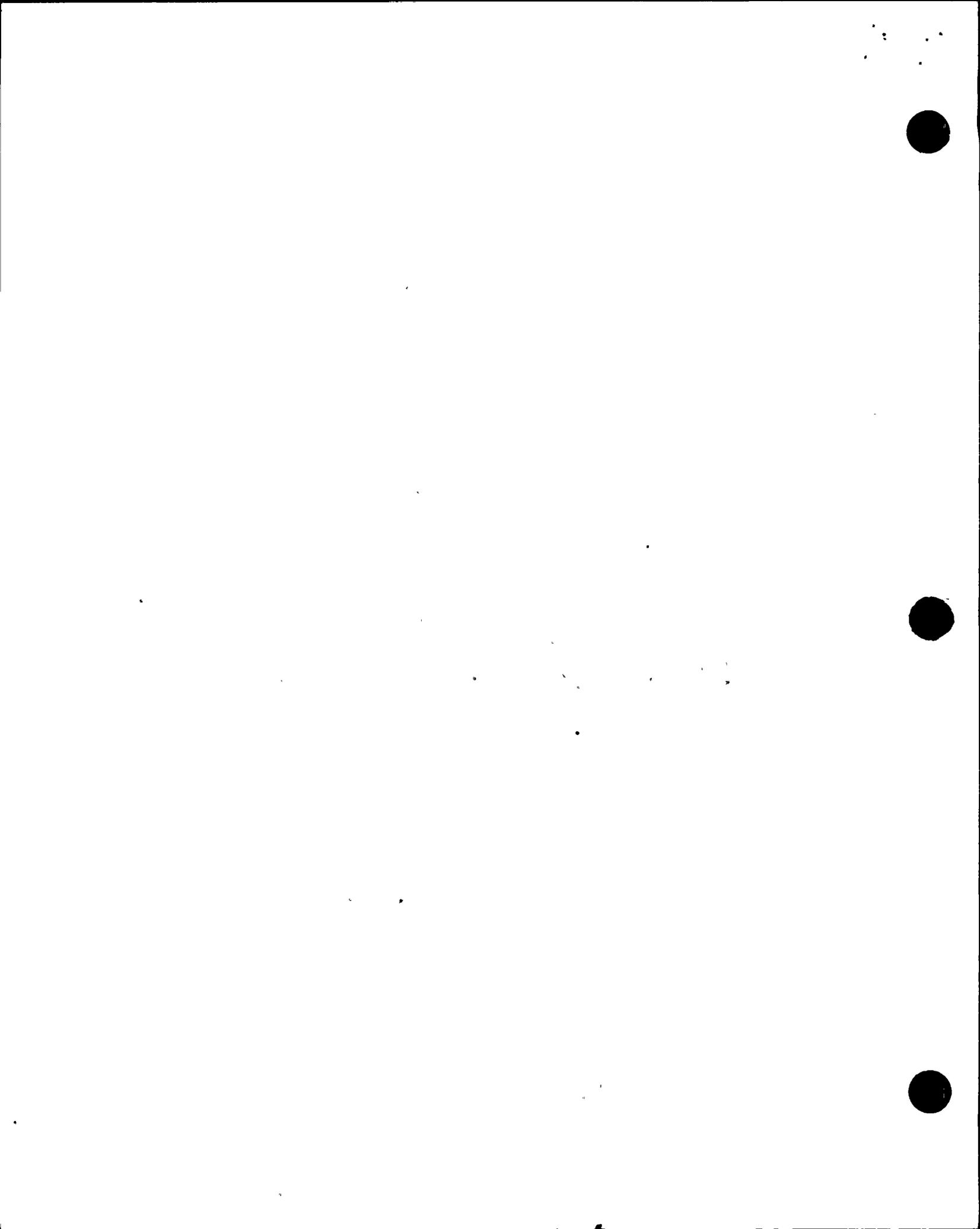
Inspection Summary:

Inspection on March 19, 1985 to April 26, 1985
(Report No. 50-410/85-10)

Areas Inspected: Routine inspection by the resident inspector of work activities, procedures and records relative to Allegations, Quality Performance Management Program, Nitrogen Inerting System, Reactor Coolant System Hydrostatic Test, and Spent Fuel Racks. The inspector also reviewed licensee action on previously identified items and performed plant inspection tours. The inspection involved 473 hours by the inspectors.

Results: One violation was identified: Improper installation and inspection of a concrete anchor bolt (paragraph 2).

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DETAILS

1. Project Organizations

Niagara Mohawk Power Corporation (NMPC)

Stone and Webster Engineering Corporation (SWEC)

General Electric Company (GE)

ITT-Grinnell Industrial Piping, Inc. (ITT)

Johnson Controls, Inc. (JCI)

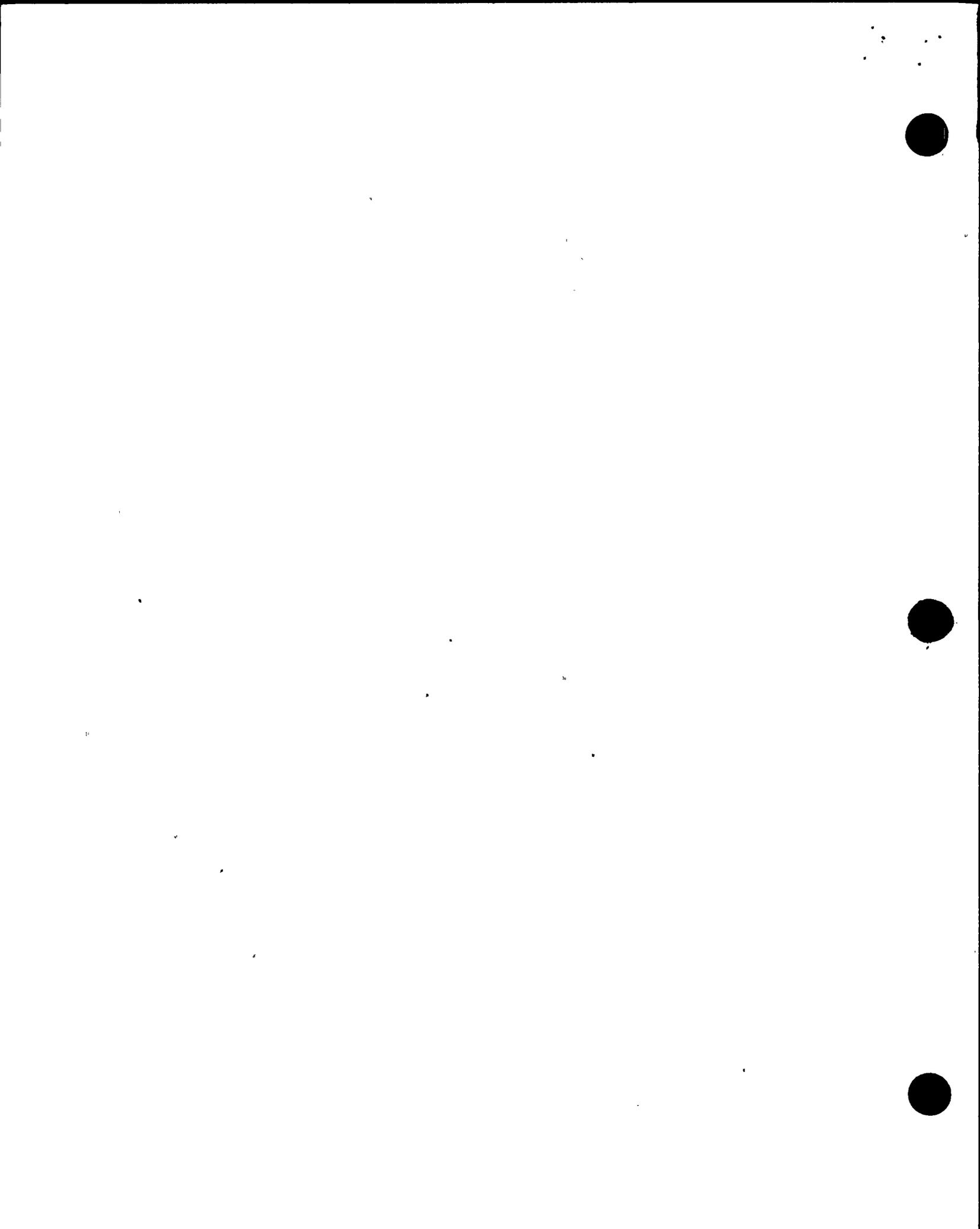
Reactor Controls, Inc. (RCI)

2. Plant Inspection Tours

The inspector observed work activities in-progress, completed work and plant status in several areas during general inspection tours. Work was examined 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 inspector interviewed craft supervision personnel, and quality inspection personnel in the work areas. Observations are noted below:

The concrete expansion anchors for the base plate of structural steel column mark B3470 located at elevation 175' of the South Auxiliary Bay were inspected for compliance to specification S203G revision 5. It was noted that the center 1" diameter bolt on the north edge of the base plate was incorrectly installed. The vertical off-set of the bolt exceed 3 degrees and no beveled washers were installed as required by the specification. The nut was also not in contact with the washers between the bottom of the nut and the top of the baseplate. The bolt had not been properly torqued and violated the specification requirement for bottoming out of nuts. As a result of the inspectors concern, all the bolts in this baseplate were reinspected. SWEC issued unsatisfactory Inspection Report IR S5A53110 to document the improperly installed anchor bolt. Additional anchor bolts on the B3470 baseplate were identified by SWEC to violate the minium embedment depth requirements. This particular installation had been originally accepted by FQC under IR2020638 dated January 7, 1982.

The acceptance of the improperly installed concrete expansion anchor bolts by the SWEC inspection program is a violation of 10 CFR 50, Appendix B, Criterion X. (85-10-01)



The inspector reviewed Nonconformance and Disposition (N&D) report 10,105. GE had supplied thermowells to SWEC for use on ASME piping systems however the requisite material certifications had not been provided by GE. SWEC receipt inspection had identified the fact that further documentation was necessary prior to installation of those thermowells. The inspector reviewed the SWEC disposition and found it to be satisfactory. The inspector requested the licensee to review the material certifications for the RCI installed GE thermowells on the recirculations piping. This item is open pending licensee verification of the adequacy of the installed thermowells and resolution of the SWEC/GE design philosophy differences in regards to the thermowell code classification. (85-10-02)

3. Licensee Action On Previously Identified Items

- a. (Closed) CONSTRUCTION DEFICIENCY (79-00-03): Potential movement of the Radwaste Building geologic feature. Several field studies were performed by the licensee to ascertain the extent and the nature of the Radwaste Building fault. A bedrock exploratory trench was excavated to determine the depth of the discontinuity. Eight vertical borings were drilled so the bedrock core could be logged, and a television survey was performed in the borings. Four vertical overcore borings were drilled to determine the in situ stress conditions. The clay encountered in the bedrock was evaluated through Carbon-14 dating and pollen analysis. Extensive analysis of the fault by the licensee found that future movements will be limited to 1/4 inch and that the fault is not seismotectonic. A conservative allowance of one inch future displacement was utilized for design purposes. The Nine Mile Point 2 Safety Evaluation Report, section 2.5.4.11, states that review of the licensee design criteria, field investigations, laboratory tests, and design analysis, yields the conclusion that the station foundations will permit a safe operation under both static and Safe Shutdown Earthquake conditions. The Structural Design Criteria for the plant has incorporated the geologic findings in that potential Radwaste fault movement of up to one inch and a settlement of up to one-tenth of an inch has been considered. This item is closed.
- b. (Closed) UNRESOLVED (82-11-03): Use and documentation of calibrated equipment during installation of mechanical components by ITT. The inspection records for the CRD pumps, the Recirculation motor-generator sets, the Residual Heat Removal heat exchanger and the Diesel Generator fuel tank were reviewed by SWEC Quality Control (QC) for proper documentation of Measuring and Test Equipment (M&TE). The SWEC review found that calibrated instruments were not required, for the work performed to that point in time, on the motor generator sets and the heat exchanger. The fuel tank documentation was amended to include the survey transit and level identification. The CRD pump A records were found to be accurate, and measurements were retaken by ITT to provide accurate data for the CRD pump B records. ITT revised the QC procedure to include data relevant to calibrated M&TE. ITT



reviewed all field planners for M&TE documentation. The mechanical erection scope of work was subsequently assumed by SWEC. All ITT records were transferred to SWEC and were reviewed for technical adequacy. The SWEC program requires documentation of M&TE useage to preclude the recurrence of the original problem. This item is considered to be closed.

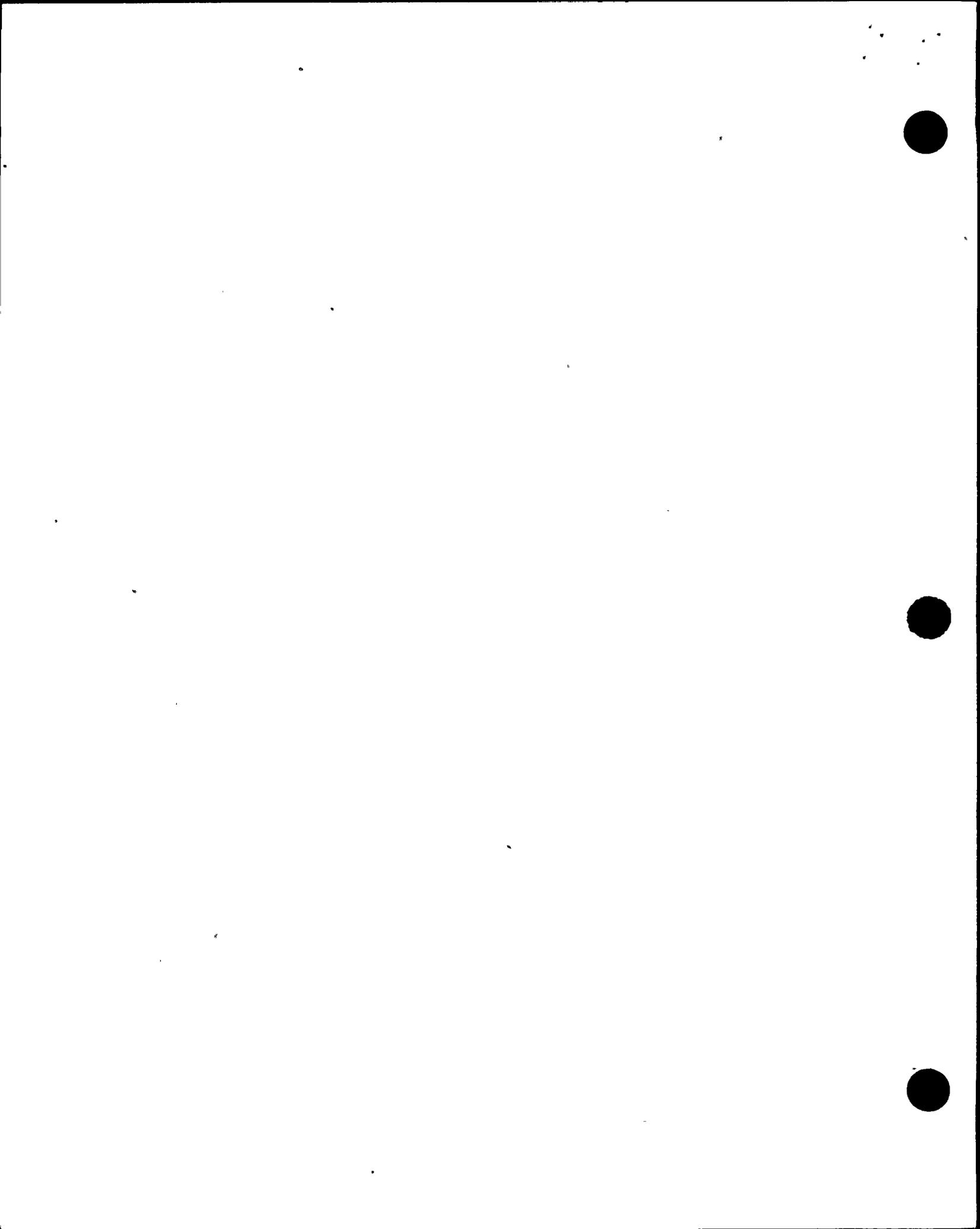
- c. (Closed) UNRESOLVED (83-04-01): Timely resolution and followup of NMPC surveillance findings. The Surveillance Reports (SRs) referred to within Inspection Report 83-04 were reviewed. SRs 283-82, 76-82, and 214-82 have been satisfactorily closed. NMPC Corrective Action Request (CAR) 84.001 documented all open SRs and Nonconformance Reports (NRs). The items were either closed out in accordance with NMPC QA procedures or escalated for management attention. NMPC Quality Assurance Procedure 10.03, "Quality Assurance Department Surveillance Activity" now requires that SRs be closed within fifteen days of initiation, or the item is escalated to a CAR. Alternatively, the QA manager may grant an extension if the situation warrants. The SR logbook was reviewed and it was observed that the SRs generated by NMPC QA had been closed within acceptable time frames. The Management Analysis Company (MAC) review of previously issued SRs was examined by the inspector. The MAC review was performed to establish whether SRs had been properly closed. One hundred and forty nine (149) SRs were reviewed by MAC out of a population of eight hundred and eighty nine (889) Category I hardware related SRs. Twenty four SRs were found to have been prematurely closed, however a subcontractor deficiency document had tracked the problems through to final resolution. The sample found that in all cases, the hardware concerns identified within the SRs were properly resolved. This item is considered to be closed.
- d. (Closed) FOLLOWUP ITEM (83-18-04): Punchlist inspection reports were not referenced on associated inspection records. Inspection documentation did reflect changes to completed work resulting from the issuance of Punchlist Inspection Reports (PLIRs). Since PLIR's were a multi-purpose document, control and use of the PLIR's for completed and inspected work was not appropriate. To provide adequate procedural controls, Quality Standard QS 14.1-NM was revised to implement the use of the Rework Control Form (RCF) as a substitute for the PLIR's. The procedure requires the RCF to be initiated prior to rework or alteration of previously QC accepted work. After completion of the rework, the RCF is to be retained in the QA records associated with the affected item. An examination of the SWEC small bore rework control log revealed that each RCF was cross referenced to a design document. A completed RCF was selected to determine if the the QC documentation package contained the completed form. The documentation package for BZ 452LV contained the appropriate rework control form SB003.



Unauthorized disassembly of CAT I conduits was also identified as a concern. Several training sessions have been conducted to make site personnel aware of the consequences of unauthorized alterations of completed work.

Based on the correct use of the RCF and the training sessions, this item is closed.

- e. (Closed) FOLLOWUP ITEM (83-18-08): Punchlist Item Reports not reflected in inspection documents. This followup item is closed on the same basis as followup item 83-18-04. See Item 83-18-04 for the detailed discussion.
- f. (Open) FOLLOWUP (83-18-09) Conduit sections disassembled without appropriate Punchlist Inspection Report (PLIR). This item will remain open pending reinstallation and reinspection of the subject raceway.
- g. (Closed) FOLLOWUP ITEM (83-18-10): Trending of SWEC Type C Inspection Reports (IRs). SWEC has issued Quality Control Instruction (QCI) 10.05, "QA Monitoring Inspection Program" that specifies that Type C IRs be trended on a monthly basis. For reject rates in excess of ten (10) percent, an evaluation is performed to assess the need to escalate the concern for documentation on a Corrective Action Request (CAR). The trend analysis of Type C IRs issued against ITT was reviewed for the months of October 1984 to March 1985. Assessments were noted when the rate of unsatisfactory conditions exceeded ten percent. NMPC CAR 84.0166, which was issued by the third party assessment team, was reviewed without any further questions. This item is closed.
- h. (Closed) FOLLOWUP ITEM (83-18-16): Electrical cable jacket damage. The jacket damage observed on cable 2RHSBYC615 was identified on SWEC IR E3008546; Nonconformance and Disposition (N&D) 5928 and N&D 5973. The conditions were attributed to the cable having been mounted on the reel while in a hot condition. The cable supplier evaluated the conditions and found that no adverse impact would result on the cable qualification or function. Other generic problems regarding Rockbestos supplied cables have been reported as Construction Deficiency Report 84-00-19. The jacket condition identified on cable 2RHSBYC036 was documented on SWEC IR E3008545 and N&D 5929. The cable was rehung and tested to ensure the integrity of the insulation properties. This item is closed.
- i. (Closed) FOLLOWUP ITEM (83-18-17): Proper identification and disposition of cable condition. SWEC N&D 5973 was issued to clarify the noted condition of cable 2RGSBYC615. The cable supplier evaluated the observed condition and found that the cables had been reeled while the jacket coating was still hot. The observed condition was judged to not have any adverse affect upon the cable function



or qualification characteristics. The revised N&D identified the scope of the problem and was properly dispositioned. This item is closed.

- j. (Closed) FOLLOWUP ITEM (83-18-31): Whip restraint structure exceeded design tolerance. N&D IG 1327 was issued to document the out of tolerance condition on whip restraint 2FWS-PRS-025. Engineering dispositioned the item as acceptable. The SWEC Procurement Quality Assurance (PQA) Inspection Plan N20P301WP001, "Fabrication of Pipe Rupture Restraints, Structures and Ring Girder/Star Truss" had required a complete dimensional verification of whip restraints since 2/25/82. ITT inspected thirteen installed restraint structures, three of which exhibited out-of-tolerance dimensions. SWEC issued N&D 7829 to evaluate the conditions identified by ITT and found that the restraints would perform their design function. Critical dimensions such as elevation, azimuth and plumbness of restraint structures are verified on-site during the installation process. This item is closed.
- k. (Closed) FOLLOWUP ITEM (83-18-33): Reduction of installation torque from 150 foot-pounds to 120 foot-pounds. SWEC Engineering and Design Coordination Report E&DCR C02082 was issued to reduce the installation torque for 3/4" concrete expansion anchors. As justification for the torque reduction, SWEC had successfully performed direct tension tests to a value 1.5 times the design allowable load for a 3/4" Hilti bolt. Although these tests demonstrated a factor of safety of 1.5, NRC bulletin 79-02 requires a safety factor of 4 for concrete expansion anchors. Subsequent to the finding, an additional three 3/4" Hilti bolts were torqued to 120 foot-pound, and were direct tension tested to 4 times the design allowable load. The three additional 3/4" anchor tests were found acceptable as neither the anchor bolt or concrete failed during the test.

Based on the additional bolt testing to 4 times the allowable design load, this item is closed.

- l. (Closed) FOLLOWUP ITEM (83-18-34): Failure to maintain Hilti expansion anchor preload. Approximately 20% of torque tested Hilti bolts exhibited a preload of less than 50% of the initial installation torque. All the bolts tested were found acceptable in accordance with specification S203G which allows acceptance of the bolt as long as the installation torque is re-achieved within one full nut rotation. Several studies have been performed to determine the relationship between bolt relaxation and load carrying capacity of the bolt. In the USNRC final report NUREG CR-2999 entitled "Anchor Bolt Study - Data Survey and Dynamic Testing" it was concluded that expansion anchor ultimate strength was not affected by the initial preload. As long as the anchor is properly set, the preload level does not affect the load carrying capacity of the bolt. In that the bolts tested by the CAT team



were able to meet the specification S203G requirements, the bolts were adequately set. The licensee response to this concern also stated anchor bolt preload is not utilized in the design criteria for Nine Mile Point Unit 2. As additional assurance bolts from various site contractors were tension tested to 1.5 and 4 times the design allowable loads. All tests gave acceptable results. This item is closed.

- m. (Closed) FOLLOWUP ITEM (83-18-35): Hilti Prequalification testing in lower strength concrete. A detailed discussion of this concern is provided below in closure of violation 83-18-69. Based on the 83-18-69 discussion, this item is closed.
- n. (Closed) FOLLOWUP ITEM (83-18-36): Supports contained Hilti bolts with unacceptable attributes. Table III-4 of the CAT Report (83-18) listed 10 pipe supports with Hilti bolts installed in deviation from specification S203G. The deficiencies were documented on the appropriate nonconformance document, discrepancies have been corrected and the associated inspection reports have been closed out. Support BZ-71-ADW-1 was examined to verify implementation of the licensee's corrective actions. The CAT report identified unmarked expansion bolts. NRC inspection confirmed the bolts in hanger BZ-71-ADW-1 had been remarked as required by the specification.

It was also identified that specification S203G does not provide inspection criteria to verify that Hilti nuts do not bottom out. Specification S203G revision 5 was reviewed and found to include appropriate criteria for bottoming out of the nut. Based on the resolution of the Hilti discrepancies and the specification change, this item is closed.

- o. (Open) FOLLOWUP ITEM (83-18-37): Mechanical equipment foundation bolting torque and hardware discrepancies. The various inspections and reinspections performed by the licensee were reviewed by the inspector. Based on the scope of the inspections, it was not clear whether the concern had been satisfactorily addressed by the licensee. Eleven mechanical installations have been selected to conduct a detail reinspection. The results will be compared with the documentation packages to determine compliance with applicable design requirements. This item remains open pending the results of the NRC reinspection.
- p. (Closed) FOLLOWUP ITEM (83-18-39): Quality Control verification of unit cooler configuration. Nonconformance and Disposition (N&D) report 5987 documents the acceptability of the weld configuration. The unit cooler vendor drawings, SWEC file numbers 0010.41-087-002F and 0010.41-087-003F were revised to reflect the as-built weld configuration. Licensee investigation identified that the QC inspector for the original installation had failed to initiate a nonconformance report relative to the welding discrepancy. This was determined to be an isolated occurrence. This item is closed.



- q. (Closed) FOLLOWUP ITEM (83-18-47): Undercut criteria for JCI weldments. The inspector that accepted the discrepant conditions was retrained in accordance with the JCI weld inspection criteria. The JCI weld inspection procedure was revised to be consistent with the AWS D1.1 code to allow for undercut. All JCI inspectors were retrained in regards to the new weld inspection criteria. The third party assessment team CAR 84.117 was reviewed in regards to a deficient JCI weld inspector. An associated NRC open item 84-19-02 is discussed within this report. This item regarding JCI weld inspection criteria is closed.
- r. (Closed) FOLLOWUP ITEM (83-18-51): Insufficient weld reinforcement on an ITT sockolet. ITT initiated Deviation Report (DR) 5312 to document the undersized weld. The weld was repaired and brought into design conformance. This item is closed.
- s. (Closed) FOLLOWUP ITEM (83-18-53): SWEC QC was not performing surveillance of rebar fabrication. NMPC QA audit SR-NMP2-1772-83 documented that SWEC FQC was not performing daily random inspections of rebar fabrication as required by specification S203C. N&D 5820 was generated to identify the noncompliance with the S203C specification requirements. Based on the satisfactory inspection of fabrication equipment and accepted preplacement rebar inspections, N&D 5820 was dispositioned "Accept-as-is." A training session was conducted by FQC to ensure future rebar fabrication operations are adequately surveilled. Based on the N&D closure and FQC retraining, this item is closed.
- t. (Open) FOLLOWUP ITEM (83-18-60): Mechanical equipment fastener discrepancies. This item remains open pending the reinspection results as discussed in followup item 83-18-37.
- u. (Closed) VIOLATION (83-18-69): Failure to properly perform Hilti bolt prequalification tests. Concrete expansion anchor prequalification tests as required by IE bulletin 79-02 are to simulate the actual installation conditions such as type of concrete and its strength properties. The Nine Mile Point Unit 2 prequalification tests were performed in concrete with a compressive strength of 1,000 psi. Most field applications called for the expansion anchors to be installed in 3,000 psi concrete. Since concrete strength affects the expansion anchor behavior and performance, additional field confirmation tests were conducted with 3/4" and 1" anchors in 3,000 psi concrete. A total of 18 tension tests in 3,000 psi concrete were performed with twelve tests at 1.5 and six tests at 4 times the design allowables. The confirmation tests results were found acceptable. Based on the additional site testing in 3,000 psi concrete, this item is closed.



- v. (Closed) CONSTRUCTION DEFICIENCY (84-00-03): Loosening of anti-rotational set screw in Anchor-Darling valve stem collars. NRC Information Notice 83-70 documented vibration induced valve failures that resulted in system inoperability. SWEC initiated Problem Report P-148 to require a plant review of all Category I valves to ascertain which were provided with anti-rotation clamp devices which utilized set screws. Within the scope of the SWEC design, no problems were identified. General Electric reported a Part 21 deficiency with regards to Anchor Darling Globe valves. Valves CSH*MOV110, 111 and 112 were reworked by staking the set screws. The completion of the staking operation in accordance with Engineering and Design Coordination Report (E&DCR) C17918, was verified. This item is closed.
- w. (Open) CONSTRUCTION DEFICIENCY (84-00-39): Duplication of ITT weld radiographs. Licensee review of completed radiographic film in the document vault has identified two instances in which a single weld was radiographed twice, but labeled as two unique welds. Two welds had therefore not received the requisite radiographic examination. The licensee developed a sampling plan to provide assurance that the weld radiographs on file reflect the actual weld radiographed. The licensee identified that six hundred and ninety one (691) Category I welds had been radiographed which required a re-radiograph sample size of sixty (60). The 60 welds were randomly selected. The inspector independently verified the correlation of fifty nine (59) re-radiographs with those on file. One weld did not match the film on file. This item remains open pending further NRC evaluation of the licensee investigations.
- x. (Open) FOLLOWUP ITEM (84-09-04): Potential harassment of a Quality Control (QC) inspector. This item remains open pending review of the NRC Office of Investigation findings.
- y. (Closed) UNRESOLVED (84-11-06): Identification and evaluation of seismic clearance conflicts. SWEC has issued Construction Site Instruction (CSI) 2.11, "Equipment Clearances". SWEC engineering personnel will perform building walkdowns to identify potential clearance violations. Quantitative criteria have been established for the walkdowns relative to acceptable clearances. Unacceptable clearance situations are to be visually marked and evaluated. This item is closed.
- z. (Closed) FOLLOWUP ITEM (84-15-04): Conduct of electrical separation inspection activities. The resolution of NMPC CARs 84.146 and 84.147 were reviewed. The SWEC Inspection System Handbook and Inspection Plans associated with raceway and cable inspection were amended to clearly identify the documentation of the deferred installation of separation barriers. A computer database has been developed to track items for which certain inspection attributes have been deferred.



SWEC issued Quality Control Instruction (QCI) 14.04, "Retrofit Inspections" to provide guidance relative to the conduct of reinspection activities. This item is closed.

- aa. (Open) VIOLATION (84-18-02): Performance of JCI weld inspection activities. The licensee has directed JCI to re-inspect all welds previously accepted by the deficient inspector. The supports which were inspected by that individual are to be identified during a QA document review. This item will remain open pending revision of JCI procedure QAS-1802 to include an attribute related to the identification of welds accepted by the deficient inspector.
- bb. (Open) VIOLATION (Inspection Report 84-19): Inspection Report 84-19 identified two violations. The licensee responded by letter dated March 4, 1985 which detailed planned corrective and preventive actions. The licensee response has been accepted and the implemented actions will be examined during a future inspection.
- cc. (Open) VIOLATION (Inspection Report 84-21): Inspection Report 84-21 identified two violations. The licensee responded by letter dated April 17, 1985 which detailed planned corrective and preventive actions. The licensee response has been accepted and the implemented actions will be examined during a future inspection.
- dd. (Closed) UNRESOLVED ITEM (84-21-04): QA Category II pipe support with Hilti bolt spacing violations in a QA Category I structure. Examination of QA Category II pipe support BZ416-P-2 identified that the Hilti bolt installation violated minimum specification spacing requirements between the bolt and embedded unistrut. Although the support installation was QA Category II, the bolt spacing violation affected the potential use of the QA Category I unistrut. N&D IG-5742 was issued detailing the specific noncompliances. The N&D has been dispositioned "Accept As Is" for the support BZ-416-P. The N&D also restricted the use of the QA Category I unistrut from elevation 246' 10" to 249' 9".

With respect to QA Category II installations in QA Category I structures, ITT has an engineering inspection program that is governed by ITT procedure #11 entitled "Inspection Reports for CAT 2/3 Supports." Based on the closure of the N&D and the ITT procedure, this item is closed.

- ee. (Closed) CONSTRUCTION DEFICIENCY (85-00-04): Dissipation of internal heat loads within Diesel Generator control panels. SWEC N&D 8941 required that the panel doors be removed and reworked by the vendor to provide adequate ventilation of the cabinet interior. The doors were reworked and reinstalled. SWEC ascertained that only two panels were affected and both sets of doors were modified. This item is closed.



4. Allegations

During the inspection period the inspector conducted inspections and interviews in response to allegations presented to the NRC. Inspector and licensee actions resulting from the allegations are noted below:

- a. (84-A-0014) The NRC received several allegations in regard to the fabrication of the Spent Fuel Pool Gates and the RHR Tee-quenchers. The inspector followed up the concerns identified below:

Improper welds were specified or accepted by SWEC for the spent fuel pool gates - The inspector reviewed specification P283V, "Shop Fabrication and Field Erection of Refueling Liners" which is applicable to the gates. The specification directs that the welding be performed in accordance with ASME VIII and that the welders/procedures be qualified per ASME IX. The design drawings, EV-6A to EV-6G, reiterated that welding on the aluminum gates is to be performed in accordance with specification P283V. SWEC engineering directed that normal industry welding practices be employed on the gates.

Numerous SWEC Nonconformance and Disposition reports were issued to identify weld defects such as those described by the allegor. The engineering dispositions required the defects to be repaired or for inaccessible welds they were accept-as-is. The calculations (FB-1032) for the gates were modified to reflect no load carrying capacity for the inaccessible weldments. The inspector did not identify SWEC approval of improper weld technique criteria and SWEC properly dispositioned the identified weld defects.

The allegor's inspection activity at the vendor shop was curtailed due to his identification of adverse findings -

The allegor performed three inspections of the gate assemblies. On each occasion he identified concerns relative to weld quality. When a fourth inspection of the gates was scheduled, the allegor was not involved as he was assigned to activities at Nine Mile Point Unit 1. The inspector could not verify the validity of this concern.

The spent fuel gates are still nonconforming -

The receiving inspection report (SWEC IR X4002309) was examined. The inspection was performed on 6/21/84 and unsatisfactory conditions were noted regarding the cleanliness and protective covers for the gates. Nonconformance and Disposition Report 8696 was issued to document that dirt, water and algae had accumulated on the items. The gates were to be steam cleaned or hyrolased to an intermediate cleanliness level using demineralized water.

NMPC QA performed a visual weld inspections W-84 of 15 linear feet of welding on gates 2 and 3. The surveillance noted that overall weld quality was poor as evidenced by the identification



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of some weld defects. SWEC subsequently issued Nonconformance and Disposition (N&D) report 8858 to evaluate the seventeen defects. Fourteen were repaired by grinding while three were found to be acceptable. The gates were issued to the field with Risk Release 681 attached as outstanding deficiencies had not yet been resolved. SWEC had issued Corrective Action Request AA019 to document the deficient vendor welding and NMPC had directed via letter 3N2.2-M58.44.2 that the gate welds are to be 100% visually re-inspected on-site.

Review of Type B Equipment Release 038.005B-001 for the gates to be transferred to the test personnel (to support the RPV hydro as the Spent Fuel Cavity was to be filled with water) showed that the necessity to complete the weld inspection/rework of the gates was a documented open item. Additional cleaning per N&D 8696 was also documented to be an open item.

The inspector concludes that while the gates still are not in conformance with the design, the deficiencies have been documented as required for rework and additional inspection will be performed to assure the weld integrity.

Improper Fabrication of the RHR Tee-quenchers -

The inspector reviewed specification P801G, "T-Quenchers for RHR Relief Valve Discharge Lines ASME III, Class 2" for the items fabricated by AMER Industrial Technologies. He reviewed several shop Nonconformance and Disposition (N&D) reports that had been generated by SWEC to document fabrication defects such as; dimensional drawing deviations, improper Liquid Penetrant examination performance, the bypass of PQA hold points, weld repair without process planner, material certification documentation lacking, and use of unapproved weld wire. The inspector reviewed the engineering disposition to the noted deficiencies.

The inspector was informed that a SWEC Procurement Quality Assurance audit had been performed on October 9-12, 1984. Eighteen Corrective Action Requests (CARs) were issued for problems such as; documentation discrepancies were excessive, weld procedures were unapproved, welding process control was inadequate, hold points were bypassed, vendors were utilized that were not documented on approved vendor list. PQA at that point assigned a second resident inspector to the AMER shop. AMER was down rated on the SWEC Qualified Rating List (QRL) to be only used for non-safety contracts for future work. A followup PQA audit was performed on October 25-26 and November 1-2 to verify the completion of corrective actions to the 18 CARs. All were satisfactorily closed. There is no indication of unknown defects existing on the Tee-quenchers. The SWEC PQA performance was acceptable in light of the contractor deficiencies.



Spent Fuel Gates were improperly cleaned -

SWEC issued N&D 8696 which documented that water and algae had accumulated on the gates. The engineering disposition was to steam clean or hydrolase the gates with demineralized water. ASTM A380 states that mechanical cleaning is acceptable to remove surface contaminants. The methods used to clean the aluminum gates are acceptable.

Further weld defects have been identified on the spent fuel gates -

Onsite SWEC and NMPC Inspection of the gate weldments has identified further deficiencies. The defects identified to date have been dispositioned and NMPC has directed that the gate weldments be 100% visually re-examined onsite.

The AMER Industrial Technology vendor survey wa's improperly performed -

AMER Industrial Technologies fabricated the RHR Tee-quenchers in accordance with specification P801G. The inspector reviewed the following items pertaining to the qualification of AMER:

- A QA facility survey was performed on April 4, 1984. The survey was performed in accordance with QAD 4.3, "Bidder/Seller Manual Review Survey System." The survey was comprised of a comprehensive review of the AMER QA program.
- The AMER contract was awarded on 9/6/84.
- The first PQA Facility audit was performed on Oct. 9-12, 1984 at which point a number of problems surfaced.

The AMER survey and audit were performed in compliance with the SWEC program and the ANSI standards. PQA appeared to respond adequately when problems were identified during the fabrication of the Tee-quenchers.

The inspector identified that the concerns identified by the allegers are valid in certain respects. The technical adequacy of the spent fuel gate weldments will be assured through total reinspection of the gates on-site. No indication exists that any undocumented problems remain in regards to the Tee-quenchers. SWEC had properly documented and dispositioned identified problems with the involved contractors. However, it is apparent that the quality of weldments produced by the spent fuel gate vendors was less than satisfactory as evidenced by the continual identification of further weld defects on-site.



As the licensee has instituted measures to assure the acceptability of the items in question, the inspector has no further questions.

5. Quality Performance Management Program

The inspector reviewed the fifteenth and sixteenth Quality Performance Management Program (QPMP) reports. The associated licensee executive board meeting on March 22 was attended by the Director, Division of Reactor Safety and the inspector while the meeting of April 11 was attended by the Section Chief and the inspector. Licensee senior project and quality assurance personnel participated in the board meeting. The inspector had no further questions.

6. Nitrogen Inerting System

NRC Information Notice 84-17 was issued to alert licensees about potential problems associated with the use of liquid nitrogen. The liquid nitrogen could cool components below the Nil Ductility Temperature and make them susceptible to brittle fracture. General Electric has evaluated the brittle fracture phenomena and issued Service Information Letter (SIL) 402 to the licensee. The inspector reviewed the GE recommendations regarding the Mark II containment system. He then reviewed NMPC letter NMP2L0162 dated September 14, 1984. To preclude injection of low temperature nitrogen the licensee committed that a device would alarm at 55 degrees F and that the outlet control valve would trip closed at nitrogen temperatures below 40 degrees F.

The inspector reviewed the following design documents:

- Engineering Change Notice GSN-008
- Flow Diagram FSK-14-1E
- Logic Diagram LSK-14-1F
- Loop Diagram 1GSN-143
- SWEC Drawing EP-53B-3

He ascertained that temperature element 138 was set to alarm at injection of nitrogen below 55 degrees F and temperature sensor T1S143 will trip the control valve closed at nitrogen temperatures below 45 degrees F. The inspector identified a drafting error on FSK-14-1E in that valve AOV 143 was labeled as fail open. The licensee committed to rectify the error as the valve, in fact, fails closed. The inspector verified the nitrogen system design incorporates the necessary elements to preclude the injection of cold nitrogen into containment.

The following portions of the licensee response to the NRC could not be verified at this time:

- Conduct of nitrogen system preoperational test



- Plant calibration, maintenance, and operating procedures to incorporate guidance on preventing low temperature nitrogen injection
- Performance of bypass leakage test to confirm integrity of the vent system.

The above items are open pending NRC witness of test performance and review of operating procedures relative to nitrogen inerting precautions. (85-10-03).

7. Reactor Coolant System Hydrostatic Test

- a. The inspector reviewed the following documents that contain requirements relative to the conduct of the Reactor Coolant Hydrostatic Test:
 - Nine Mile Point 2 FSAR Sections 5.3 and 14
 - Nine Mile Point 2 SER Section 14
 - ASME Section III Division I Article NB-6000
 - Regulatory Guide 1.116, "Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems"
 - ANSI N45.2.8, "Supplementary Quality Assurance Requirements for Installation, Inspection and Testing of Mechanical Equipment and Systems for the Construction Phase of Nuclear Power Plants"
 - Regulatory Guide 1.68, "Initial Test Programs for Water-Cooled Nuclear Power Plants"
 - NMPC Design and Construction QA Manual
 - SWEC QA Program Section II, "Test Control"
 - Nine Mile Point 2 PSAR Section 13.6.3
 - SWEC ASME QA Manual Section 22, "Pressure Testing"
 - SWEC procedure MP.GENE.001, "Generic ASME III Pressure Test Program"
 - SWEC Procedure MP.INTR.001, "Integrated Flush General Flushing Method"
 - GE Spec 22A7409, "Installation Specification Reactor System"
 - GE Spec 22A2537, "Field Cleaning and Cleanliness of Nuclear Power Plant Components"



- GE Spec 22A6792, "Installation Instruction for GE Piping Systems"
- GE Spec 22A3095, "Pressure Integrity of Piping and Equipment Pressure Parts"

The inspector obtained a copy of NMPC Procedure MP.0001.002, "Reactor Vessel Pressure Test." He noted that the Joint Test Group (JTG) had approved the procedure for use on 3/14/85 in meeting 85-17. The hydrotest procedure was reviewed in relationship to the applicable criteria contained within the documents identified above. During the course of the inspector's review of the RPV hydrotest procedure, the following questions were raised and rectified by the licensee prior to the test performance:

- Review of the hydrotest valve lineup designations identified that jumper #6 was connected to closed drain valves on FSK-6-1C and would not function to pressurize around the adjacent check valve; the location of jumper #6 was changed accordingly.
- Review of the valve lineup identified that valve RHS*V139A on FSK-25-14 was required to be open which would create an unisolable leak path to the building drain; the valve lineup was corrected to close the valve.
- The test prerequisites were ambiguous relative to time at which the prerequisites had to be completed; Field Revision Forms (FRF) MP.0001.002 and MP.0001.002-2 were issued to clarify at which points during the fill and pressurization process the prerequisites were to be fulfilled.
- GE Spec 22A7145 specified that three temporary thermocouples were to be located on the RPV bottom head while the hydro procedure called for only two; the test procedure was corrected.
- GE Spec 22A6792 specified that the recirculation system spring canister supports were to have the pin stops removed after vessel fill while the test procedure called for the stops to be removed at an undetermined time; the procedure was clarified as to the time sequence to remove the travel stops.

The inspector additionally had several other questions and concerns to which resolution was reached without having to modify the hydro test procedure.

It was noted that the RPV hydrotest procedure had been reviewed and approved by a number of organizations; namely GE, SWEC Engineering, SWEC Quality Systems, SWEC Advisory Operations, and the Joint Test Group. During the course of the NRC review of the test procedure, it became apparent that enhanced technical review



could have precluded the procedural inadequacies identified by the inspectors. Future pre-operational test procedures will be reviewed to ensure that the approved procedures are technically accurate. This item is unresolved. (85-10-04).

- b. The inspector reviewed the following documents in addition to those outlined in Section 7a. of this report, that pertain to the Reactor Pressure Vessel (RPV) head installation process:
- RCI procedure RPVHI-1, "Data Sheet for Installation of RPV Head for RPV Hydrostatic Test"
 - GE Document, "Nine Mile Point Unit II Instruction Manual 251 Inch Diameter BWR-5"
 - Biach Tension Device, "Operating and Maintenance Manual"

The inspector observed the placement of calibrated thermocouples at four locations on the RPV head. The thermocouples were utilized to monitor the RPV temperature to ensure that it was maintained above the minimum bolt up temperature of 70 degrees F. Biach Model 1-5121 devices were used to tension the head studs. The inspector observed that calibrated pressure gauges were used to monitor the degree to which the studs were tensioned. The tensioning process was monitored and adherence to the installation precautions was observed. The inspector had no further questions.

c. RPV Hydro Test

Valves within the RPV hydro boundary were positioned and repositioned during the filling, venting and testing phases of the operation. Blue valve mark up tags were used by the NMPC start up group to control the valve position. During the various phases of the RPV test, the actual valve positions of thirty valves were compared by the inspector to the valve lineup sheets contained in the record copy of procedure MP 0001.002 Revision 0. In all cases the actual valve position in the field was consistent with the position indicated in the record copy of the RPV procedure.

On 5/8/85, prior to starting the RPV fill, the record copy of procedure MPO-0001.002 was reviewed to ascertain the status of prerequisite signoffs. The inspector noted that step 5.1.22 had been signed off as complete by the RCI superintendent. The step required that personnel be trained in the operation of the RPV head stud tensioning equipment. Discussions with RCI personnel were ambiguous with respect to the extent to which RCI personnel had been trained at the point in time this prerequisite was signed off as having been completed. Training records were subsequently generated, and the personnel received additional training prior to starting the head tensioning process.



The inspector reviewed the completion of the prerequisite identified by step 5.1.24 within the test procedure. The test director had signed the completion of the dry run walkdown as having been accomplished, while other personnel within the SWEC quality organization stated that such a dry run had not yet been performed. The procedure was amended to clarify that the dry run walkdown would be conducted at 200 psi. Future pre-operational test conduct will be monitored to ensure strict adherence to procedural compliance.

Listed below are the significant test aspects of the RPV hydro procedure:

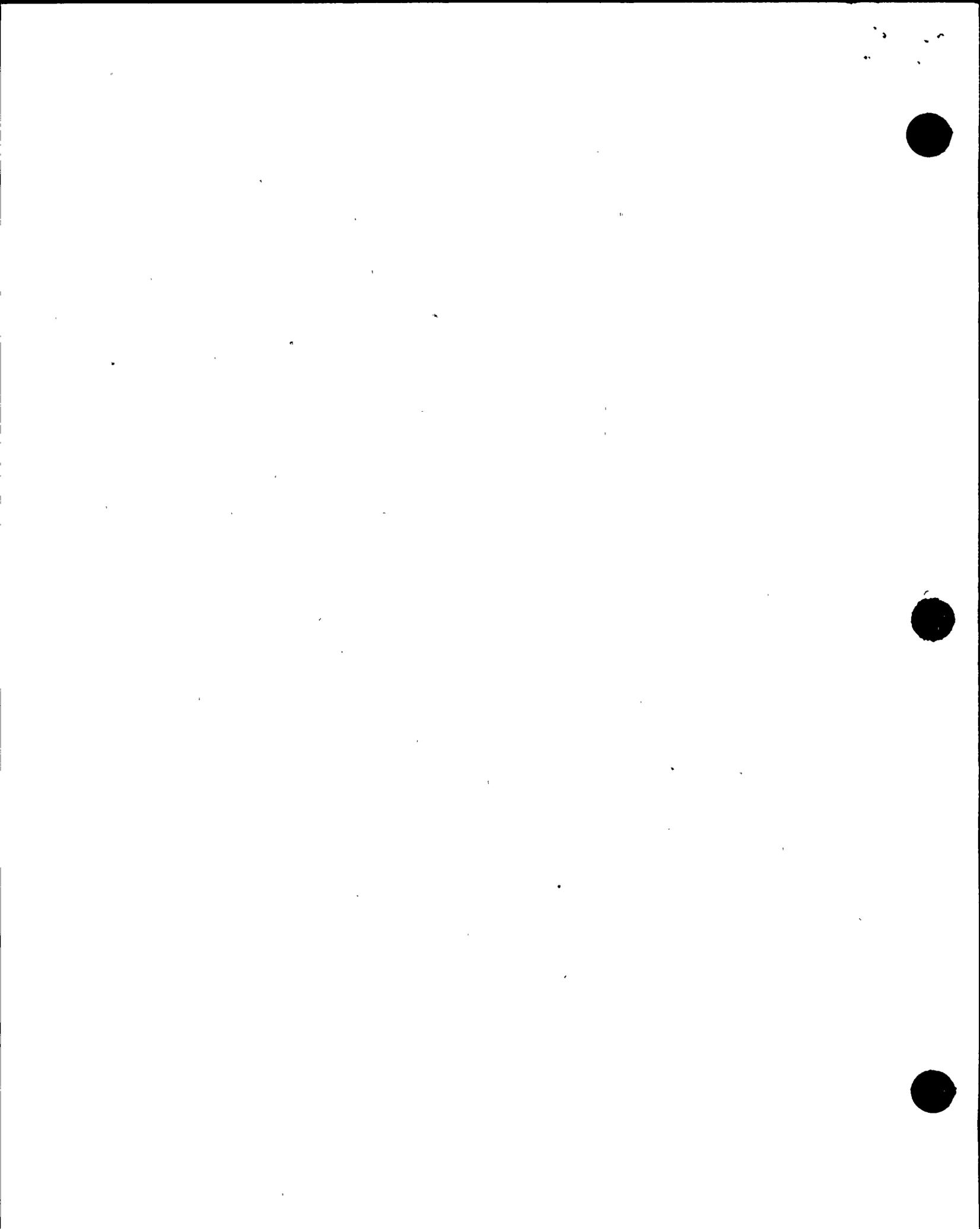
- Vessel flange temperature greater than 70 degree F for RPV head tensioning and detensioning operations
- RHR pumps are used to raise and maintain vessel temperature above 110 degrees F during the pressure test
- Intermediate walkdowns are to be performed at 180 psig and 1200 psig for mechanical leakage.
- Test pressure is 1562.5 psig to be maintained a minimum of 10 minutes.
- Inspection pressure is 1250 psig. (Inspection of joint welds)

On 4/10/85 NRC inspectors accompanied five of the ten inspection teams during the 180 psig dry run walkdown. The average vessel temperature during the walkdown was approximately 130 degrees F. As required by procedure steps 8.3.4 through 8.3.6 the teams checked for leakage in mechanical joints and valve packings. The walkdowns were thorough and complete.

After completion of the 180 psig intermediate walkdown and during the process of increasing hydro pressure, valve MSS-V175 began leaking at approximately 400 psig due to a gasket failure. Make up water was added to the system which caused the vessel temperature to decrease. Pressure was increased so that the intermediate walkdown at 1200 psig could be performed.

Hydro pressure was dropped to zero after completion of the intermediate 1200 psig walkdown. At approximately 1:30 a.m. on 4/11/85 RHR Pumps P1A & P1B were restarted to heat up the vessel. The pumps ran for approximately 2 hours until the average vessel temperature was approximately 123 degrees F.

Repressurization of the RPV hydro boundary began at approximately 3:35 a.m. on 4/11/85. Pressure was incrementally increased to a maximum pressure of 1620 psig which was maintained psig for a 13 minute period. The test pressure as noted complied with the procedure requirement of 1562.5 psig +6% for a minimum of 10 minutes. The



inspector verified that calibrated Heise pressure gauges and a calibrated pressure recorder were utilized. Based on the test pressure results and equipment checks, there were no further questions.

The RPV hydro pressure was reduced to approximately 1300 psig at approximately 5:30 a.m. on 4/11/85. NRC inspectors accompanied five inspection teams during the inspection to examine weld joints within the bounds of the RPV hydro test. Using isometric drawings as a basis for the inspection, each team inspected and documented the condition of joints and valves. During the conduct of the test, NRC inspectors inspected approximately 1000 weld joints. Mechanical joint and packing leaks were documented by the teams during the conduct of the inspections. The FQC inspection effort was appropriately conducted.

At approximately 1:30 p.m. on 4/11/85 the RPV hydro test depressurization was started. Although the inspection teams were done with the physical inspection, not all the isometric drawings had been checked before the depressurization process was started. It was originally planned to check all drawings and account for all weld joints, before depressurization. This plan was abandoned because the temperature was approaching the 110 degrees F limit. The early termination of the test contributed to some of the RPV hydro test exceptions.

After completion of RPV hydro inspection results, it was determined that the following are exceptions which require retest:

<u>Drawing Number</u>	<u>Exception Item</u>
ISC-265A	Line not inspected - line missed
RCS-107A	Field weld 17, 18 - Valve line up
66-54/R	Field weld 23,24,25 - Valve line up
47-16/x	Field weld 8,9,10 - Valve line up
47-13/x	Field weld 25,26,27 - Valve line up

The exceptions noted above will be followed up by the NRC as documented in report 50-410/85-11.

The review of the RPV test documentation will be completed and discussed in future reports as the final record version becomes available.

No violations were identified.



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8. Spent Fuel Pool Racks

The inspector reviewed the following documents pertaining to the installation and fabrication of the spent fuel pool racks:

- FSAR Section 9.1.2.2
- Specification P232G Revision 2, "Fuel Storage Racks"
- Drawing EV-3AC-2, "Fuel Storage Pool Spent Fuel Rack"
- FQC inspection records for receipt inspection of Fuel Pool racks.
- FQC inspection records for rigging and handling spent fuel pool racks.

The spent fuel racks have been placed in the spent fuel pool for temporary storage. The racks are not their final configuration. The FQC records for receipt inspection specifically IR X4003725, X4003726, X5A00294, X400256, and X4002397 were reviewed by the inspector and found acceptable. Rigging and handling IR M 5A30179 was reviewed and found to be in compliance with the vendor rigging instructions for the racks. The inspector had no further questions.

9. Unresolved Items

Unresolved items are matters for which more information is required in order to ascertain whether they are acceptable items, or violations or deviations. One unresolved item was identified within this inspection in paragraph 7a.

10. 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. Based on the NRC Region I review of this report and discussions held with licensee representatives on April 26, 1985, it was determined that this report does not contain information subject to 10 CFR 2.790 restrictions.

