

NINE MILE POINT NUCLEAR STATIONADMINISTRATIVE PROCEDUREPROCEDURE NO. AP-5.0PROCEDURE FOR REPAIRDATE AND INITIALSAPPROVALSSIGNATURESREVISION 2REVISION 3REVISION 4

Station Superintendent
NMPNS Unit 1
T. W. Roman

Station Superintendent
NMPNS Unit 2
R. B. Abbott

General Superintendent
Nuclear Generation
T. W. Perkins

Quality Assurance Concurrence
Manager, QA
Nuclear
W. Hansen

Summary of Pages

Revision 2 (Effective 3/1/86)

PAGESDATE

1-40

February 1986

This is a general rewrite

NIAGARA MOHAWK POWER CORPORATION

THIS PROCEDURE NOT TO BE
USED AFTER MARCH 1988
SUBJECT TO PERIODIC REVIEW.

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AP-5.0

PROCEDURE FOR REPAIR

1.0 PURPOSE

This procedure describes the program for corrective maintenance and repair of structural, mechanical, instrument and electrical equipment at the station (Unit 1 and Unit 2). It includes the procedures for initiation, planning, scheduling, documentation, and post-maintenance testing. Additional requirements for the Unit 2 test program are contained in SAP 117.

2.0 REFERENCES

ANSI N 18.7/ANS 3.2 1982 Section 5.2.7 Maintenance and Modifications
ANSI/ASME N45.2.1-1980 - Cleaning of Fluid Systems and Associated
Components for Nuclear Power Plants
Regulatory Guide 1.33, Quality Assurance Program Requirements
AP-4.0 - Administration of Operations
AP-3.3.1 - Control of Equipment, Markups for Personnel Safety
AP-3.3.2 - Control of Equipment, Placement of Jumpers or Blocks or
Lifting of Leads
AP-8.2 AND AP-8.3 - Surveillance and Test and Inspection Programs
AP-6.0 - Procedure for Modification and Addition
AP-7.0 - Procedure for Control of Material and Services
AP-10.1 - Management of Station Records
AP-5.1 - Site Welding Program
MI-6.0 - ASME Section XI, Maintenance Work Plan
10CFR50.49 - Environmental Qualification of Electrical Equipment
Important to Safety for Nuclear Power Plants.
Generic Letter - (GL) 83-28 "Required actions based on Generic
Implementation of Salem ATWS Events" July 8, 1983.
INPO - "Guidance for Conduct of Maintenance at Nuclear Power
Stations" October, 1985.
Nine Mile Point Unit 1 Q List
Nine Mile Point Unit 2 FSAR Table 3.2-1
Office Instruction OI-21, Work Tracking System

3.0 SCOPE

3.1 Corrective Maintenance

Mechanical, electrical, and instrument corrective maintenance are performed generally as the result of unsatisfactory equipment performance or equipment failure. Maintenance or modifications that may affect functioning of safety related structures, systems, or components shall be performed in accordance with approved procedures. Written procedures need not be required for work covering skills normally possessed by qualified maintenance personnel. Quality Assurance procedures QAP-9.0.1, and associated NDEP's, shall be used as a guide to the acceptability of special process procedures. During the Unit 2 test program and prior to receipt of license both the Nuclear Quality Assurance and Construction Quality Assurance Program are in effect providing quality assurance activities and support to Nuclear generation.



3.1 Corrective Maintenance (Cont'd)

The Administrative controls and records required by this procedure shall apply to maintenance work affecting nuclear safety on safety related systems or components and to all work on major systems and components related to plant reliability. In general, this procedure shall be used when applicable for organizing and documenting the maintenance on other systems and components.

3.2 Post-Maintenance Testing

After completion of corrective maintenance on safety related components, the equipment shall have post-maintenance testing performed to verify that components will fulfill their design function when returned to service. The tests performed shall be documented in departmental procedures or on a Post-Maintenance Test Report. The documentation shall include acceptance criteria, verification that the test is completed, and a review that the test passed the acceptance criteria. The tests should be applicable to the degree and type of maintenance performed.

For the purpose of administrative controls the following definitions apply to post-maintenance tests:

(1) Maintenance Tests: Tests usually performed by the Maintenance/I&C departments prior to Operations acceptance for post-maintenance tests. These tests are specified in the Maintenance/I&C Procedures and are indicated on line 15 of figure 2.

(2) Post-Maintenance Tests: Tests usually performed by the Operations Department after operations acceptance for post-maintenance testing. These tests as a minimum include Technical Specification requirements and are indicated on line 37 of figure 2.

3.3 Maintenance of Equipment Qualified Components

Where engineering has established corrective maintenance requirements to maintain Equipment Qualification, these requirements shall be implemented into the corrective maintenance performed, as applicable. Deviations to engineering established corrective maintenance requirements shall be approved by the Nuclear Engineering & Licensing Department.

3.4 Maintenance of ASME XI Components

Where corrective maintenance is performed on ASME XI components, a maintenance evaluation report (Figure 4) and Maintenance Work Plan (MI-6.0), if applicable, shall be complete per MI-6.0. Notifications of ISI, who would notify ANII, shall be included in the applicable maintenance procedures or addressed by MI-6.0.



3.5 Maintenance of Security Components

The Security Department performs maintenance or security instrumentation using personnel and an administrative system internal to the Security Department. However, any maintenance work performed for Security by other Site departments or work performed within the plant facilities by the Security Department shall be managed in accordance with this procedure.

3.6 Cleanness Control of Fluid Systems During Corrective Maintenance

Cleanness control of fluid systems shall be maintained per ANSI/ASME N45.2.1. Departmental procedures shall establish cleanness control and provide for verification of cleanness prior to closure of a fluid system. This verification shall be provided for safety related fluid systems and non-safety related fluid systems whose fluid interfaces with a safety related system. The cleanness level shall be established by supervisors, assistant supervisors, or engineers in the department assigned to do work.

3.7 Work Tracking System (WTS)

The WR is entered in the Work Tracking System as WR is processed in accordance with OI-21. In addition, labor accounting is performed using the Labor Accounting System (LAS).

4.0 REPORT OF SYSTEM OR COMPONENT MALFUNCTION OR DEFICIENCY

When anyone in the plant notices a system or component malfunction or deficiency which may affect station reliability, safety, or output, he shall immediately inform his immediate supervisor and the Station Shift Supervisor. The Station Shift Supervisor shall take action in accordance with AP-4.0.

Work Requests noting a system or component malfunction or deficiency, or requesting corrective action, may be originated by the person discovering the trouble, by his immediate chief or supervisor, or by the S.S.S. Approval and receipt of the WR shall be obtained from one of the following or a higher level supervisor relative to the work to be corrected. During off hours, the senior representative of the department to do work may receive a WR.

- a. Operations Assistant Supervisor, SSS or ASSS
- b. Maintenance Superintendents, Engineers, Supervisors or Assistant Supervisors.
- c. Instrument and Control Supervisor or Assistants.
- d. Chemistry and Radiation Protection Supervisor, Unit Supervisors, or Instrument Support Supervisor



4.0 (Cont'd)

- e. Reactor Analyst Supervisors
- f. Technical Support Supervisor or Assistants
- g. Senior Security Investigator, Security Investigator, Shift Sergeant, or Security Engineer.
- h. Computer Operations and Maintenance Supervisor or Assistants.
- i. Supervisor Fire Protection or Assistant Supervisor Fire Protection.
- j. Superintendent ISI or Unit ISI Supervisors.
- k. Test Group Managers, Leads, or Supervisors (During Unit 2 Test Program Only).

5.0 WORK REQUEST FORM (WR)

The Work Request Form is used for ordering, scheduling, dispatching, and recording the results of corrective maintenance work and associated post-maintenance tests at the station. Prenumbered blank forms are retained by Station Supervisors for originating work assignments. (See Figure 2 and 3)

A computerized system known as the Work Tracking System (WTS) parallels the Work Request and may later take the place of the WR when sufficient experience is accumulated. Blocks are provided on selected lines of WR form for clerks to initial when the data is entered into the WTS system. This later system will expedite the scheduling of maintenance and the accumulation of a rapidly searchable equipment maintenance history data base.

5.1 Duties of Originator

- 5.1.2.1 Enter Issue Date (line 1). Determine the lead (L) Department to Do Work (line 3).
- 5.1.2.2 Select the priority of work in accordance with the following guidelines (line 4)
 - 5.1.2.2.1 Non-Outage Work:
 - Priority 1 - Emergency, limits station operation. Top priority work for the day. Provide special coverage, if necessary.
 - Priority 2 - Urgent, hinders station operation. Schedule within 24 hours.



5.1.2.2.1 (Cont'd)

Priority 3 - Necessary, has potential to degrade or hinder station operation. Schedule within seven days.

Priority 4 - As time permits.

5.1.2.2.2 Outage work:

Priority 5 - Next unit outage

Priority 6 - Next refueling outage

5.1.2.3 Indicate the Unit (line 5), the System Code (line 6), Component Number (line 7) and Equipment Title (line 9). For system codes, see Appendix A for Unit 1 or Appendix B for Unit 2. Equipment name and number should be that given on the P&I diagram or on an approved list issued by authority of the Station Superintendent. Valves or instruments may be described by their function with the associated equipment when not otherwise named. During the Unit 2 test program, the BIP number should also be listed (line 8).

5.1.2.4 In the case of equipment failure or malfunction, give a concise description (line 10). In addition, describe the equipment location (line 10). Enter the NPRDS Symptom Code (Appendix C, line 11). An abridged version of Appendix C is preprinted on the back of the WR forms.

5.1.2.5 Sign and date the WR (line 12) and deliver to the person authorized to approve the WR for action.

5.2 Duties of the Person Approving the WR

5.2.1 Check that the correct equipment name and number is entered on the WR form (lines 6, 7, and 9). Assure lines 3 and 4 are complete and correct.

5.2.2 If the cause of equipment failure or malfunction can be determined at this time, give a concise description in line 29 and 30.

5.2.3 If the post-maintenance tests are known, these may be indicated on line 37. If the post-maintenance tests are not known, initiate post maintenance test report (fig. 5) with the appropriate department supervisor and indicate on line 37.

5.2.4 Sign and date the WR in the space marked "Approved" (line 13) and deliver the WR to a person authorized to receive the WR. During the Unit 2 test program and prior to operations acceptance of the system; and, if the Test Engineer is not the originator of the WR, concurrence from the Test Engineer shall be obtained prior to work proceeding.

5.2.5 Deliver the green copy to the WR books in the SSS office and send the remaining copies to the department designated to do the work.



- 5.2.6 Where emergency action is required (Priority 1), the person approving the WR personally delivers the WR to the person responsible for the work and verbally addresses the nature of the emergency. During non-scheduled working hours, the S.S.S. or his representative will contact appropriate personnel to deal with the emergency.

5.3 Duties of the Person Receiving the Work Request

- 5.3.1 Sign and date Work Request received, line 14. If WR is voided, notify approver and notify the S.S.S. or Security to remove the green copy from the WR book in the S.S.S. office. During the Unit 2 test program and prior to Operations acceptance of the system, Test Engineer concurrence should be obtained for voided WR's.
- 5.3.2 Where a procedure is required, list the number of the approved procedure or procedures (line 15). The procedure numbers listed shall include department procedures which perform the applicable maintenance tests.

NOTE: Certain activities within the normal ability of the individual do not require a written procedure to perform. By checking the "Not required" box in line 15, the supervisor is indicating that the work can be considered an established routine within the capabilities of a journeyman maintenance person.

- 5.3.3 If the work requires emergency maintenance during non-scheduled working hours, immediately contact the on duty or on call QA representative for review. Make required entries on line 16 of the Work Request.

NOTE: Work may not start on safety related equipment until the conclusion of QA review unless immediate action is required to eliminate an unsafe condition as determined by the SSS.

- 5.3.4 Enter the account number (line 17).
- 5.3.5 Indicate the Safety Class (line 18) for the component. Indicate if the component is Equipment Qualified (line 19) or an ASME component (line 20). An approved list issued by authority of the Station Superintendent should be referenced for this information.
- 5.3.6 Enter the cleanliness class (line 21).
- 5.3.7 Indicate any support departments required (line 3).
- 5.3.8 If the work requires a station outage, check that this is marked at the top of the form along with the appropriate priority (line 4, priority 5 and 6).
- 5.3.9 If the work requires emergency maintenance (Priority 1), hand deliver yellow, blue, white and pink copies of the WR to Quality Assurance and WTS Clerk. Otherwise, deliver the WR to QA for review on a normal schedule.



5.4 Quality Assurance Review

5.4.1 Upon receipt of the WR from the person responsible for implementing the job, the Quality Assurance representative will examine the scope of the project to determine the inspection and quality requirements. The QA department shall verify the component's Safety Class (line 18), Equipment Qualification requirements (line 19), and ASME III Component requirements (line 20) and the referenced lead department procedures (line 15). The QA department shall indicate if inspections are required (line 23).

5.4.1.1 If QC notifications or further QA review are determined to be not applicable to the maintenance to be performed, lines 26 and 35 may be initialed and marked N/A.

5.4.2 Following QA review, the yellow, blue, white, and pink copies of the Work Request are delivered to the WTS Clerk for initial entry into the WTS program.

5.5 Responsibility of WTS Coordinator

5.5.1 The request portion (lines 1 through 23) of each work request should be entered into the WTS as soon as practical after generation of the WR. WTS Clerk retains the pink copy of the WR and returns the yellow and blue copies to the lead department to do work. The white copy (Figure 3) or copies of the white copy are forwarded to the support departments indicated in line 3. A copy of the Work Request is forwarded to the ALARA Coordinator who determines whether an ALARA review is required. A copy of the Work Request is forward to ISI and Planning.

5.5.2 If the work requires emergency or urgent maintenance (Priority 1 and 2), the Planning (Scheduling) Department should schedule the work for that day.

5.5.3 The Planning Department should receive information required to schedule all work requests not to be immediately implemented. This information should be obtained after the WR is staged by the lead or support departments (lead department, line 24; support department, line D). Based on this information and similar input from other activities, an integrated schedule of deferred work requests, surveillance tests, inspections, modification operations, and preventive maintenance activities may be produced and published on a regular basis. Schedules should be dynamically adjusted to account for scheduled work which was displaced by immediate action requirements.

5.5.4 All outstanding Work Requests items and other activities which do not require a station outage for implementation shall be projected on a schedule which should always be at least one month in advance of the current date. Schedules should be issued to the department to do work and coordinated where support departments are required.



5.6 Duties of the Supervisor Receiving the Work Request from WTS Coordinator

- 5.6.1 Following receipt of the WR from QA or after verbal consultation with the QA supervisor, the work may be assigned for action.
- 5.6.2 For support departments, the supervisor shall sign that the data sheet (figure 3) is received (line A) and complete the procedure number (line B) and applicable account number (line C). This data is entered in the WTS system.
- 5.6.3 If the WR is not to be implemented during the week of receipt, the supervisor should assign the WR to be staged (lead department, line 24; support department, line D).

NOTE: The following data is entered by the departments in the WTS fields and not entered on the WR form. The data is used by the Planning (Scheduling) department to develop intergrated schedules.

- 5.6.3.1 If the WR is on hold, the reason should be entered in the WTS system.
- 5.6.3.2 If the WR is on hold due to parts, purchase requisition numbers should be indicated in the WTS system. Where parts are reserved, the reservation number may be entered in the WTS system.
- 5.6.3.3 After staging, enter the manhours and duration estimated to complete the maintenance.
- 5.6.3.4 Where the maintenance is minor or routine, staging may be not applicable. If the maintenance is of emergency or urgent nature (Priority 1 or 2), staging is not applicable.

5.7 Duties of the Person Assigned the Work Request for Action

- 5.7.1 Before commencing any maintenance affecting station output, safety, or reliability, the Station Shift Supervisor must be informed when the work commences in accordance with the approved maintenance procedure. When required, Quality Assurance must also be notified (lead department, line 26; support department, line F). The appropriate entries should be made daily into the WTS and computerized Labor Accounting System (LAS) record to reflect the starting time of each job, the total labor, hours, and materials consumed and a narrative of the work completed.
 - 5.7.1.1 For security hardware (I&C and computer only), the SSS shall be notified for hardware located only within plant facilities. In addition, the SSS shall be notified when the work is completed. Mark line 26 with the time notified or "No", as appropriate.
- 5.7.2 Upon completing the job, enter a brief description of the work under Corrective Action (line 27) of the WR and include appropriate summary remarks in the WTS record. Enter the NPRDS Corrective Action Code (Appendix C, line 28). An abridge version of Appendix C is preprinted on the back of the WR form.



- 5.7.3 If the cause of equipment failure or malfunction was not determined at step 5.2.2 of this procedure, the person completing the work or his supervisor enters a description (line 29). Enter the NPRDS Failure Code (Appendix C, line 30).
- 5.7.4 Work Requests for safety related and "Q" class components must be accompanied by copies of or must make reference to material issues and/or completed purchase orders sufficient to provide quality traceability for all materials used. In addition, documentation must be attached to the WR providing traceability to the required certifications for all welding, nondestructive examinations and tests pertaining to the quality of the work. Check to indicate that materials issue, inspection reports, and procedure check lists are attached (lead department, line 31; support department, line H). Copies of procedures referenced need not be attached. References should also be incorporated into the WTS record.
- 5.7.5 Man hour data as called for in the WR form will be available from the LAS and will be transferred to the WTS as part of the data base management. A printed transcript should be attached to the WR (lead department, line 31; support department, line H)..
- 5.7.6 Quality Control inspectors shall furnish copies of all quality inspection reports for inclusion in the records. Attach inspection reports to the work request (line 31).
- 5.7.7 For work pertaining to safety related systems, the serial numbers of all mark-ups, RWP's, QCIR's, and NCR No's shall be entered (lead department, line 32; support department, line J).
- 5.7.8 The completed WR is signed off (lead department, line 33; support department, line K) by the person completing the job. This shall indicate that all work, including QC inspections and maintenance tests, called for in the maintenance procedure has been completed and that the maintenance tests are completed and passed the acceptance criteria. Documentation must show that inspections and tests required to satisfy Appendix B to 10 CFR 50 have been completed by persons independent of those completing the work.
- 5.8 Duties of Persons Verifying Work and Acceptance for Operation
- 5.8.1 The signature of the supervisor responsible for the maintenance shall be entered as soon as practical after completion of the job indicating his verification and acceptance (lead department, line 34; support department, line K). This is to verify that all work including the items in 5.7.4 have been completed. The Department clerk shall enter this signoff into the WTS system after supervisor has signed and dated and sends to QA for verification.
- 5.8.1.1 If line 35 has been checked "NA" by a QA department representative, the yellow and blue copies of the WR is delivered by the person signing off in line 34, or his representative, to the Station Shift Supervisor. The lead department, in this case, shall attach support department copies (white copy) of the WR.



- 5.8.1.2 If the component is a ASME Section XI component, the WR is forwarded to the ISI department. The ISI department will complete NIS-2 and ASME Section XI Abstract Forms per the applicable ISI departmental procedure. After completion of the forms, the ISI department forwards the WR to the QA department.
- 5.8.1.3 If the component is security hardware located outside the plant facilities (I&C and computer only), the WR is forwarded to the Security Shift Supervisor. The Security Shift Supervisor shall signify acceptances by completing lines 36 and 39 of the WR and checking the "Supv" block. Lines 37 and 38 are not applicable. The WR shall not be forwarded to the QA department and Operations department for final acceptance. The blue copy of the WR is retained by the Security department, or a representative. The completed yellow copy of the WR is forwarded to the WTS clerk for closeout per 5.8.6.
- 5.8.2 The Quality Assurance department shall enter the final verification signature in line 35. This signature indicates that Quality Assurance Operations certifies that maintenance and associated maintenance tests has met the Quality Assurance requirements and the equipment is acceptable for operation pending any post-maintenance tests indicated on line 37.
- 5.8.2.1 The Quality Assurance department shall verify that documentation is received from both the lead departments (yellow copy) and support departments (white copies) indicated on line 3. The QA department shall attach support department copies (white) to the WR.
- 5.8.2.2 The QA clerk enters the QA login date on WTS and, after verification by QA, enters name and date of the QA representative doing verification prior to delivering the yellow and blue copies of the WR to S.S.S.
- 5.8.3 The SSS/ASSS shall review, verify, and correct, as necessary, what post-maintenance test shall be performed for safety related equipment by the Operations Department prior to making the equipment "operable" as defined in Technical Specifications. The ASSS/SSS shall indicate the tests on line 37 and sign line 36. Where a specific test is not written to complete the applicable post-maintenance testing, a Post-Maintenance Test Report (Figure 5) shall be prepared and attached. During the Unit 2 test program and prior to Operations acceptance of the system, any subsequent retest required will be performed by the test engineer; and thus, lines 37 and 38 are not applicable. The Operations department clerk should enter the applicable tests in the Work Tracking System.
- 5.8.4 When the post maintenance tests on line 37 are completed, the person verifying completion shall sign line 38 and forward the WR to the SSS.
- 5.8.5 For all work other than that noted in 5.8.1.3, the signature of the Station Shift Supervisor is required on line 39 prior to making the equipment "operable" as defined in Technical Specifications. This signature indicates that the SSS is satisfied that the equipment is ready for service. In no case shall safety related equipment be made "operable" prior to acceptance by the Station Shift Supervisor.



- 5.8.5.1 The blue copies of completed work requests originating in the Station Shift Supervisor's Office may be retained by the SSS at this time. Blue copies of other work requests should be returned to the person originating the work request. The green copy of the WR should be removed from the WR Book in the SSS office. During the Unit 2 test program and prior to Operations acceptance of the system, the blue and green copies are forwarded to the Test Engineer. After S.S.S. approval on line 39, department clerk enters S.S.S. logout date on WTS prior to delivering the WR to WTS clerk.
- 5.8.5.2 If protective mark ups are cleared/surrendered by the maintenance organization and the equipment does not qualify for operation according to Technical Specifications, the SSS is responsible that a mark up or yellow hold out tag is retained on the equipment until final acceptance for operation is documented. (See AP-3.3.1)
- 5.8.5.3 If the Station Shift Supervisor does not find the equipment satisfactory upon turn over by Quality Assurance and/or Maintenance, he shall mark "No" on line 39 of the work request and originate a new work request. Mark the new work request number on the closed out form as: "See W.R. No. 8384".
- 5.8.6 Following all sign-offs, the completed yellow copy and attachments of the work request are returned to WTS clerk for close-out and to verify the WTS equipment history record is a true summary and/or key to the WR information delivered to the Equipment History File.
- 5.8.7 Following WR close-out, the WTS clerk the delivers completed WR to Rx. Physics Department, where the NPRD section is completed (line 40). For Unit 2, NPRD's tracking is not required until fuel load. The WR is then returned to the WTS clerk. Completed WR's along with all attachments are then delivered to Document Control for filming (line 41). After filming, the documents are returned to the central files.

6.0 POST MAINTENANCE TEST REGISTER

The Technical Support Department will maintain a register of recommended maintenance tests and post-maintenance tests. The register will be administered in accordance with a Technical Support departmental procedure. The register will generically list the type of component, type of maintenance performed, and type of test required. The register will be used to insure appropriate tests are performed and for development of departmental procedures and interfaces between departments.

7.0 CORRECTIVE MAINTENANCE REVIEW

The Maintenance Review Program consists of regularly scheduled annual reviews of all Corrective Maintenance actions involving safety related structures, systems and components and those whose loss limits or prevents power production.



7.1

Annual Reviews

Electrical and Mechanical Maintenance Superintendents, Instrument and Control Supervisor, Chemistry and Radiation Protection Supervisor, and the Reactor Analyst Supervisor shall annually review the log of all Work Requests issued to their departments involving safety-related structures, systems, or components and those whose loss limits or prevents power production. The review may consist of, but not be limited to, the following:

- a. A review of the Work Request Log, paying particular attention to the number of Work Requests issued for each item and each group of similar items.
- b. For those items which, based upon the frequency and type of operation and age of the item, exhibit a high incidence of failure. A review of the completed Work Requests or equipment histories will be made in an effort to determine the cause of the failures.
- c. A written, signed statement shall be prepared stating that the annual review has been conducted and summarizing significant findings and recommendations. (See Figure 1 attached).
- d. The original of this statement shall be sent to the Station Superintendent for review and action. After Station Superintendent review, the Corrective Maintenance Review Statement shall be sent to the Technical Superintendent and an analysis performed per 8.0.

7.2

Periodic Reports

The ISI Superintendent, or designee, shall provide periodic reports of corrective maintenance on ASME XI components to the Station Superintendent. These reports shall summarize corrective maintenance and associated failures. One report shall be completed after a refueling outage or an extended outage.

8.0

PERFORMANCE ANALYSIS

The Technical Superintendent will review the department Corrective Maintenance Review Reports in conjunction with the results of the Test and Inspection Program. He will make recommendations for improvements in the T & I Program and/or equipment based upon equipment failure rates, trends in equipment performance, and analysis of the causes of equipment malfunction and failure. These recommendations shall be presented to the Operations Assessment Committee for review and assignment.



9.0 ATTACHMENTS

- 9.1 Figure 1 - Corrective Maintenance Review Statements
- 9.2 Figure 2 - Work Request
- 9.3 Figure 3 - Work Request - Support Department
- 9.4 Figure 4 - Maintenance Evaluation Report
- 9.5 Figure 5 - Post Maintenance Test Report
- 9.6 Appendix A - System Codes, Unit 1
- 9.7 Appendix B - System Codes, Unit 2
- 9.8 Appendix C - NPRDS Codes



FIGURE 1

CORRECTIVE MAINTENANCE REVIEW STATEMENT

I hereby certify that I have performed the required review of corrective maintenance assigned to my department and I have the following comments:

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper appears to be from a notebook or a standard sheet of stationery. There is no handwriting or other markings on the page.

Signature/Date

Department

Station Superintendent/Date

Technical Superintendent/Date

OEA Committee Chairmen/Date



FIGURE 2

NIAGARA NINE MILE MOHAWK POINT		WORK REQUEST		1. DATE _____ / _____ / _____		2. W.R. NO. 100000	
3. DEPARTMENT TO DO WORK <input type="checkbox"/> ELECTRICAL MAINTENANCE <input type="checkbox"/> MECHANICAL MAINTENANCE <input type="checkbox"/> INSTRUMENTATION & CONTROL <input type="checkbox"/> COMPUTER <input type="checkbox"/> ISI <input type="checkbox"/> SECURITY I & C <input type="checkbox"/> FIRE <input type="checkbox"/> METER & TEST <input type="checkbox"/> OTHER _____		4. PRIORITY OF WORK <input type="checkbox"/> EMERGENCY <input type="checkbox"/> URGENT (<1 DAY) <input type="checkbox"/> NECESSARY (<7 DAYS) <input type="checkbox"/> AS TIME PERMITS (>7 DAYS) <input type="checkbox"/> NEXT UNIT OUTAGE <input type="checkbox"/> NEXT REFUELING OUTAGE		5. UNIT: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> SITE 6. SYSTEM CODE _____ 7. COMPONENT NUMBER _____ 8. BIP NUMBER _____		18. SAFETY CLASS <input type="checkbox"/> SR <input type="checkbox"/> Q <input type="checkbox"/> NSR 19. EQ <input type="checkbox"/> YES <input type="checkbox"/> NO 20. ASME COMPONENT <input type="checkbox"/> YES <input type="checkbox"/> NO 21. CLEANNESS CLASS _____	
9. EQUIPMENT TITLE: _____							
10. FAILURE DESCRIPTION AND LOCATION 11. NPRDS. SYMPTOM CODE <input type="checkbox"/> DESCRIPTION _____							
12. ORIGINATOR _____ DATE _____ / _____ / _____							
13. APPROVED _____ DATE _____ / _____ / _____							
14. W.R. RECEIVED _____ DATE _____ / _____ / _____							
15. PROCEDURE NOS. / _____ / _____ / _____ / _____ / _____ / _____ / _____							
16. <input type="checkbox"/> QA NOTIFIED BY SUPV. _____ DATE _____ / _____ / _____ TIME _____ QA NAME _____ NOT <input type="checkbox"/> REQUIRED							
17. ACCOUNT ACCOUNT SUB LEDGER ACTIVITY/ORDER COST CENTER BUD CAT COST COMP LOCATION SUB ACCT PROJ COST ACCT NO. _____							
22. QA REVIEW QA _____ DATE _____ / _____ / _____ 23. INSPECTION REQUIRED <input type="checkbox"/> YES <input type="checkbox"/> NO INIT <input type="checkbox"/>							
24. STAGED BY _____ DATE _____ / _____ / _____ <input type="checkbox"/> PARTS <input type="checkbox"/> PROCEDURE <input type="checkbox"/> DRWG <input type="checkbox"/> MARKUP <input type="checkbox"/> RWP <input type="checkbox"/> NA INIT <input type="checkbox"/>							
25. ASSIGNED TO _____ DATE _____ / _____ / _____							
26. NOTIFICATIONS: QC DATE _____ / _____ / _____ TIME _____ <input type="checkbox"/> NA QA INIT. _____ SSS DATE _____ / _____ / _____ TIME _____							
27. CORRECTIVE ACTION 28. NPRDS CORRECTIVE ACTION CODE <input type="checkbox"/> DESCRIPTION _____							
29. CAUSE OF FAILURE 30. NPRDS FAILURE CODE <input type="checkbox"/> DESCRIPTION _____							
31. ATTACHMENTS <input type="checkbox"/> MATERIAL ISSUES <input type="checkbox"/> PROCEDURE CHECKLISTS <input type="checkbox"/> INSPECTION REPORTS <input type="checkbox"/> LAS <input type="checkbox"/> _____							
32. MARK UP NO'S / _____ / _____ RWP NO'S / _____ / _____ QCIR NO'S _____ NCR NO'S _____							
33. CORRECTIVE ACTION COMPLETED BY _____ DATE _____ / _____ / _____ INIT <input type="checkbox"/>							
34. SUPERVISOR REVIEW BY _____ DATE _____ / _____ / _____ INIT <input type="checkbox"/>							
35. WORK ACCEPTED BY QA _____ <input type="checkbox"/> NA DATE _____ / _____ / _____ INIT <input type="checkbox"/>							
36. PMT REVIEW BY _____ <input type="checkbox"/> ASSS/SSS <input type="checkbox"/> SUPV. DATE _____ / _____ / _____ INIT <input type="checkbox"/>							
37. PMT PROCEDURE NO'S. _____ <input type="checkbox"/> PMT TEST REPORT <input type="checkbox"/> NOT REQUIRED INIT <input type="checkbox"/>							
38. PMT COMPLETE VERIFIED BY _____ <input type="checkbox"/> NA DATE _____ / _____ / _____ INIT <input type="checkbox"/>							
39. ACCEPTED BY _____ <input type="checkbox"/> SSS <input type="checkbox"/> SUPV. DATE _____ / _____ / _____ INIT <input type="checkbox"/>							





FIGURE 4

MAINTENANCE EVALUATION REPORT

INITIAL DETERMINATION

Inspection of ASME Section XI component indicates that only minor repairs as specified in Step 3.1.1. are required to effect the necessary restoration.

☐ Yes ☐ No*

*If NO, answer Questions 1 thru 6.

MAINTENANCE EVALUATION

1. Was component/item damaged as a result of foreign particle inclusion? (weld slag, debris, etc.) ☐ Yes ☐ No
2. Is component/item damage a result of normal erosion, corrosion, use? ☐ Yes ☐ No
3. Was component/item damaged during the disassembly activity? ☐ Yes ☐ No
4. Does damaged component/item require welding, grinding, or machining on a pressure boundary surface? (Except as allowed during normal maintenance by existing procedure or manufacturer's instructions.) ☐ Yes* ☐ No
5. Does inspection (visual, NDE, other) indicate that stress cracks or other design deficiencies exist? ☐ Yes* ☐ No
6. Engineering evaluation is requested to determine cause of failure and/or repair techniques.
(Check YES if YES is checked in Questions 4 and/or 5, or if further evaluation is desired.) ☐ Yes ☐ No

Submitted: _____ / _____
Maintenance Supervisor Date

Concurrence: _____ / _____
Maintenance Engineer Date

EVALUATION REPORT DISPOSITION

(Required only if box for statement 6 is checked YES.)

Transmitted to Engineering: _____ / _____
Name Date

Returned to Maintenance Supervisor: _____ / _____
Name Date



FIGURE 5

POST MAINTENANCE TEST REPORT

WR _____

1. Test _____

Acceptance Criteria _____

Test Complete ☐ Sat ☐ Unsat Verified By _____ Date _____

2. Test _____

Acceptance Criteria _____

Test Complete ☐ Sat ☐ Unsat Verified By _____ Date _____

3. Test _____

Acceptance Criteria _____

Test Complete ☐ Sat ☐ Unsat Verified By _____ Date _____

4. Test _____

Acceptance Criteria _____

Test Complete ☐ Sat ☐ Unsat Verified By _____ Date _____

Tests and Acceptance Criteria:

Prepared By _____ Date _____

Reviewed by ASSS _____ Date _____

Approved by SSS _____ Date _____

Test Completion:

Reviewed by ASSS _____ Date _____

Approved by SSS _____ Date _____



APPENDIX A

SYSTEM CODES UNIT 1

SYSTEM CODE	TITLE
01	Main Steam (Reactor Outlet to External Isolation Valve Outlet)
02	Main Steam (External Isolation Valve Outlet to Turbine Inlet)
03	Turbine By-Pass Valve System
04	Spar
05	Emergency Condenser Vent to Main Steam Line
06	Steam Supply to Air Ejector
06.1	Steam Supply to Mixing Jet and Off Gas preheaters after pressure reducing vlv
07	H.P. Steam Supply to Seal Regulator
08	H.P. Steam Supply to 2nd Reheater
09	2nd Stage Reheater Drains & Vents
10	Hot Reheat Steam to L.P. Turb. (From Moisture Separator Outlet to L.P. Turbine
11	Spare
12	Cold Reheat Steam to Reheater (From H.P. Turb. to Moisture Separator)
13	Extraction Steam to 1st Reheater
14	Extraction Steam to 5th Feedwater Heater
15	Extraction Steam to 4th Feedwater Heater
16	Extraction Steam to 3rd Feedwater Heater
17	Extraction Steam to 2nd Feedwater Heater
18	Extraction Steam to 1st Feedwater Heater
19	Spare
20	Turbine Steam Seal Regulator (Low Pressure System)
21	Leak-off From Steam Seal Regulator to 1st Extraction Line & Relief Valve Discharge Line to Condenser
22	Gland Seal Exhaust From Turbine to Gland Seal Condenser
23	Misc. Steam Line Drains
24	Moisture Separator Drains & Vents (to 4th Heater & Condenser)
25	1st Stage Reheater Drains & Vents
26	Feedwater Heater Drains
27	Reactor Head Spray
28	Control Rod Drive Hydraulic Pump to Strainer
29	High Pressure Reactor Feedwater (From Reactor F. W. Pumps to 5th Ext. F. W. Heater Stop Valve
30	High Pressure Reactor Feedwater (5th Heater to Ext. Isol. Valve)
31	High Pressure Reactor F.W. From Ext. Isolation Valve to Reactor Inlet (Nuclear Reactor Code Section)
32	Reactor Recirculating
33	Reactor Cleanup (Reactor to PCV & CU Recirc. Pumps to Reactor)
33.1	Reactor Cleanup (Reactor to PCV & CU Recirc. Pumps to Reactor)
34	Head Spray
35	Reactor Cleanup (PCV to Pumps)
36	Reactor Instrumentation (Press, Level, etc. Controls)
37	Reactor Misc. Connections (Reactor Vent & Drain to Last Isolation Valve-Reactor Water Sample)
38	Reactor Shutdown Cooling (350° After Ext. Isolation Valve)
39	Emergency Condenser - Steam Supply & Condensate Return



APPENDIX A (CONT'D)

SYSTEM CODES UNIT 1

<u>SYSTEM CODE</u>	<u>TITLE</u>
40	Reactor Core Spray (Ext. Isolation Valve to Reactor)
41	Liquid Poison From Tank to Positive Displacement Pumps & From Relief Valve Discharge to Tank
42	Liquid Poison From Pumps to Outlet External Isolation Valve
42.1	Liquid Poison From Reactor to External Isolation Valve
43	Resin Transfer
44	Control Rod Drive Hydraulic After Strainer
44.1	Control Rod Drive Hydraulic Isolation to Reactor
45	Radioactive Waste Disposal (Corrosive Service)
45.1	Radioactive Liquid Waste Disposal Corrosive Service
45.2	Radioactive Liquid Waste Disposal Corrosive Service
46	Sulphuric Acid Transfer Storage Tank to Mixing Tee
46.1	Sulphuric Acid Transfer
46.2	Sulphuric Acid Transfer
46.3	Sulphuric Acid Transfer
47	High Pressure N ₂ For Drywell & Torus (From Tank to P.S.V.) (Not Used)
48	Control Rod Drive N ₂ Gas
49	Condensate Pumps Inlet, Spray System & Misc. Condenser Piping
50	Condensate Pump Discharge to Reactor F.W. Booster Pump Inlet & to Condensate Storage Tanks
51	Reactor F.W. (Booster Pumps Disch. to F.W. Pumps Inlet)
51.1	Reactor F.W. Booster Pump Discharge for Moist. Sep. Cooling
52	H.P. Hydro Pump Discharge
53	Condensate Normal Supply to Control Rod Drive Pumps
54	Fuel Pool Cooling Filtration & Drains
55	Demineralized Make-Up Water
55.1	Demineralizer Drains
56	Spare
57	Condensate Storage & Transfer
57.1	Condensate Storage & Transfer
58	Condensate Make-Up to Torus (From Condensate Transfer Sys. BV)
58.1	Condensate Make-Up to Torus (Torus to 1st B.V.)
59	Condensate Make-Up to Main Condenser (From Storage - Surge Tanks)
60	Emergency Condenser Make-Up
60.1	Emergency Condenser Shell Vent, Drain & Overflow
60.2	Emergency Condenser Overflow
61	Spare
63	Reactor Clean-Up Sys, Safety Valve Discharge (to Check Valves at Torus)
63.1	Reactor Clean-Up Safety Valve Discharge (Torus to Check Valve)
64	Feedwater Heater & Line Vents to Condenser
65	Feedwater Safety Valve Discharge
66	Main Steam Line Power Operated Relief Valve Discharge
67	Misc. Contaminated Vents Drawing & Leak-Offs
68	Drywell & Torus Vacuum Relief (Vessel to 1st B.V.)
69	Misc. (not Contaminated) Vents Drains & Leak-Offs



APPENDIX A (CONT'D)

SYSTEM CODES UNIT 1

<u>SYSTEM CODE</u>	<u>TITLE</u>
70	Reactor Bldg. & Waste Bldg. Closed Loop Cooling (Deaerated Demineralized water)
70.1	Waste Bldg. Closed Loop Cooling
71	Turbine Bldg. - Closed Loop Cooling (Deaerated Demineralized Water)
72	Service Water
72.1	Lawn Sprinkling System
72.2	Lawn Sprinkling System
73	Screen Washing
74	Main Condenser Circ. Water
75	Main Condenser Circ. Water Box Vents
76	Main Condenser Air Removal
77	Condenser Off Gas From Jet Air Ejectors
77.1	Condenser Off Gas (Recombiner Inlet to Recombiner Condenser Inlet)
77.2	Condenser Off Gas (Recombiner Outlet to existing Connection at Chimney)
77.3	Condenser Off Gas (Inlet to Vacuum Pumps to Outlet of the Off-Gas Moisture Separator)
77.4	Condenser Off Gas (Mixing Jet Inlet to Recombiner Inlet)
77.5	Condenser Off Gas (Chillers to deicing water buffer tank, tank outlet)
78	Turbine Gland Seal Exhaust
79	Diesel Generator Cooling Water
80	Containment Sprays Outside Drywell
80.1	Containment Spray Inside Drywell
81	Reactor Core Spray
81.1	Reactor Core Spray After Topping Pump
82	Fuel Oil Handling & Storage
83	Drywell Pump Discharge Piping (Outside 1st External Isolation Valve)
83.1	Drywell Sump Piping (Drywell Sump to Extra I.V.)
84	Reactor Building Sump Discharge Piping
85	Radioactive Waste Disposal (Non-Corrosive)
86	Mis. Building Sump Discharge Piping
87	Caustic Soda Transfer
88	Misc. Line Drains in Drywell After Last Valve
89	Misc. Line Drains in Reactor Bldg. After Last Valve (Piping Upstream of Last Valve to be Same as Principle Line or Source)
90	Misc. Line Drains in Reactor Bldg. After Last Valve (Piping Ustream of Last Valve to be Same as Principle Line or Source)
91	Sealing Water (Condensate or Filtered)
92	Incore Monitoring
93	Containment Spray Cooling Raw Water
94	Instrument Air-Atmos. to Dryer
95	House Service Air
96	Diesel Generator Starting Air



APPENDIX A (CONT'D)

SYSTEM CODES UNIT 1

<u>SYSTEM CODE</u>	<u>TITLE</u>
97	Turbine Oil Storage & Purification
97.1	Turbine Oil Vents
98	Electric Steam Boiler #11
98.1	Electric Steam Boiler #12 (Condensate Return)
98.2	Electric Steam Boiler #12 (Saturated Steam)
98.3	Liquid Waste System Cleaning (Hot mixture of Condensate & Steam)
99	CO ₂ (Fire Protection & Generator Purging)
100	Fire Protection - Water & Foam
101	Transformer Fire Protection
102	Spare
103	City Water (Cold)
103.1	City Water (Hot)
104	Roof & Floor Drains (Non-Radioactive)
105	(Gravity Flow Drains) Equipment Drains
106	Sanitary Sewerage
107	L.P. Inst.
108	H.P. Inst.
109	Misc. Inst.
110	Samples
111	Hydrogen (H ₂) Supply for Generator
111.1	Hydrogen (H ₂) Vent & Drain
112	Condenser Off Gas & Stack Gas Samples
113	Instrument Air (After Dryer)
114	Breathing Air (After Filter)
115	Yard Drainage
116	Low Pressure Air
117	Laboratory Drains
117.1	Laboratory Drains Where Noted
118	Gas Supply to Lab
119	Laboratory Vac. Sys.
190	Freon Refrigeration System for Off Gas Chillers
201	Reactor Containment Cooling, Air Purge
201.1	Drywell Vent & Purge Air & N ₂ (Drywell to 1st I.V.)
201.2	Reactor Containment N ₂ Purge & Fill
201.3	Truck Fill Conn. to N ₂ Vaporizer
201.4	Reactor Cont. N ₂ Purge & Fill Where Specified
201.5	Leak Rate Monitoring Inside Drywell Vessel
201.6	Leak Rate Monitoring Outside Drywell to & Including Auto Isolation Valve



APPENDIX A (CONT'D)

SYSTEM CODES UNIT 1

<u>SYSTEM CODE</u>	<u>TITLE</u>
201.7	Containment Radiation Monitoring
201.8	Reactor Containment (Drywell & Torus) Inert Gas (N ₂) Supply #12
201.9	Reactor Containment (Drywell & Torus) Inert Gas (N ₂) Supply #11
201.11	Reactor Containment (Drywell & Torus) Inert Gas (N ₂) Supply #11 (Between Sys. 201.9 & 201.2)
202	Reactor Bldg. Ventilation Exhaust System
202.1	Misc. Equipment Vents Connected to Bldg. Ventilation Duct
203	Turbine Building Ventilation Exhaust System
204	Waste Disposal Building Ventilation Equipment
206	Sewerage Treatment & Equipment (Outside of Plant)
208	Reheater Drying System Equipment (Downstream of Last Blocking Valve)
209	Miscellaneous
210	Control Room Heating, Vent & Air Conditioning
211	Add. Building Air Conditioning, Heating & Ventilating System

The above system numbers reflect mechanical piping numbers to designate the electrical portion of these systems, place a capital "E" after the number. For example, 34E would concern itself with some electrical apparatus in the head spray sys.



APPENDIX A (CONT'D)

SYSTEM CODES UNIT 1

<u>SYSTEM CODE</u>	<u>TITLE</u>
ADM	Administration Building Misc.
ANN	Annunciator
AMPM	Area Monitors-Process Monitors
BB	Battery Board
COMP	Computer
CONT	Control Room Miscellaneous
DG	Diesel Generators
DWMI	Drywell Miscellaneous
ELM	Electrical Monitors
FBF	Flat Bed Filter
FP	Fire Protection
FWC	Feedwater Controls
GEN	Generator Miscellaneous
INST.	Instrument Miscellaneous
LAB	Laboratory Miscellaneous
NEU	Neutron Monitors (SRM's, IRM's, LPRM's)
PAGE	Paging System
PWRB	Power Boards
PCAL	Performance Calculation
RFBR	Refuel Bridge
RSD	Reheat Steam Drains
RST	Reactor Servicing Tools
RXVE	Reactor Vessel
RXVI	Reactor Vessel Instrumentation
RXBM	Reactor Building Miscellaneous
SB	Station Batteries
SEC	Security
SHM	Screen House Miscellaneous
SEOI	Seal Oil
STWT	Stator Water
SWYD	Switchyards
TIP	Transverse Incore Probe
TRNA	Transformers
TSI	Turbine Supervisory Instruments
TBM	Turbine Building Miscellaneous
WBM	Waste Building Miscellaneous
WI	Wind Instruments
WS	Weather Station
YDS	Yards



APPENDIX B
SYSTEM CODES UNIT 2

<u>SYSTEM CODE</u>	<u>BIP NUMBER</u>	<u>SYSTEM DESCRIPTION</u>
AAS	20	BREATHING AIR
ABD	48	AUXILIARY BOILER-BLOWDOWN
ABF	48	AUXILIARY BOILER-FEEDWATER AND CONDENSATE
ABH	48	AUXILIARY BOILER-CHEMICAL FEED
ABM	48	AUXILIARY BOILER-STEAM
ABS	20	AUXILIARY BOILER - SYSTEM
ADS	34	AUTOMATIC DEPRESSURIZATION-SYSTEM
ARC	9	AIR REMOVAL-MAIN CONDENSER
ASR	40	AUXILIARY STEAM-RADWASTE
ASS	1	AUXILIARY STEAM-NUCLEAR-STEAM
ATX	71	TRANSFORMER, AUX PWR INCLUDING AUXILIARIES
BWS	92	BATTERY-24V-STATION
BYS	73,74	BATTERY-125V-STATION
CCP	11,13	COMPONENT COOLING-REACTOR
CCS	14	COMPONENT COOLING-TURBINE PLANT
CEC	103	COMMON ELECT EQUIP-CONTROL RM COMPLEX
CES	31	COMMON ELECT-SYSTEM
CMS	82	CONTAINMENT ATMOSPHERE MONITORING-SYSTEM
CNA	25	CONDENSATE-AUXILIARY CONDENSATE
CND	5	CONDENSATE-DEMINERALIZER
CNM	3	CONDENSATE-MAIN CONDENSATE
CNO	3	CONDENSATE-PUMP LUBE OIL SYSTEM
CNS	4	CONDENSATE-MAKEUP, DRAWOFF
COJ	76	COMMUNICATIONS (MAINTENANCE)



APPENDIX B (Cont.)

SYSTEM CODES UNIT 2

<u>SYSTEM CODE</u>	<u>BIP NUMBER</u>	<u>SYSTEM DESCRIPTION</u>
COP	76	COMMUNICATIONS (PAGING)
COS	76	COMMUNICATIONS (SOUND POWERED)
CPS	61	REACTOR CONTAINMENT (PURGE)
CRS	21	COLD REHEAT-SYSTEM
CSH	33	CORE SPRAY-HIGH PRESSURE
CSL	32	CORE SPRAY-LOW PRESSURE
CWS	10A	CIRCULATING WATER
DCS	102	DECONTAMINATION-SYSTEM
DER	63,67	DRAINS-REACTOR BLDG EQUIP
DET	64	DRAINS-TURBINE BLDG EQUIP
DFD	66	DRAINS, FLOOR-DIESEL GEN BLDG
DFE	66	DRAINS, FLOOR-SERVICE AREA
DFM	66	DRAINS, FLOOR-MISC BLDGS
DFR	63,67	DRAINS, FLOOR-REACTOR PLANT
DFT	64	DRAINS, FLOOR-TURBINE PLANT
DFW	65	DRAINS, FLOOR-RADWASTE BLDG
DMS	35, 74	MOTOR CONTROL CENTER DC-SYSTEM
DRS	60	DRYWELL COOLING-SYSTEM
DSM	2	DRAINS-MOISTURE SEPARATOR
DSR	2	DRAINS-MOISTURE SEPARATOR REHEATER
DTM	66	DRAINS-TURBINE PLANT MISCELLANEOUS
DWS	50	DOMESTIC WATER-SYSTEM
EGA	100A,100B	GENERATOR, EMER-AIR COMPR-DIESEL STARTING AIR
EGF	100A,100B	GENERATOR, EMER-FUEL SYSTEM



APPENDIX B (Cont.)

SYSTEM CODES UNIT 2

<u>SYSTEM CODE</u>	<u>BIP NUMBER</u>	<u>SYSTEM DESCRIPTION</u>
EGO	100A,100B	GENERATOR, STBY LUBE OIL SYSTEM
EGP	100A,100B	GENERATOR, EMER-PROTECTION (INCLUDE ACB & INST)
EGS	100A,100B	GENERATOR, EMER-SYSTEM
EGT	100A,100B	GENERATOR, STANDBY, TEMPERATURE
EHC	23	ELECTRO HYDRAULIC CONTROL
EHS	72	MOTOR CONTROL CENTER-EMERGENCY-SYSTEM
EJA	72	UNIT SUBSTATION-EMERGENCY-AC CONT & HTR SUPPLY
EJS	72	UNIT SUBSTATION-EMERGENCY-SYSTEM
ENS	72	SWGR, EMER, 4160V-SYSTEM
EPS	29	SWGR, STBY, 13.8KV - SYSTEM
ERF	40	EMERGENCY RESPONSE FACILITY
ERS	90	EARTHQUAKE RECORDING SYSTEM
ESS	8	EXTRACTION-SYSTEM
EXC	68	EXCITATION-MAIN GENERATOR-SYSTEM (COOLING)
EXS	68	EXCITATION-MAIN GENERATOR-SYSTEM (POWER CKT'S)
FNR	39	FUEL-NUCLEAR - REFUELING
FNS	39	FUEL HANDLING-SYSTEM
FOF	43	FUEL-OIL - ENGINE DRIVEN FIRE PUMP
FPF	44	FIRE PROTECTION - FOAM SYSTEM
FPG	46	FIRE PROTECTION - HALON
FPL	45	FIRE PROTECTION - LOW PRESSURE CO2
FPM	47	FIRE PROTECTION - SUPERVISION SYSTEM
FPW	43	FIRE PROTECTION - WATER
FWL	6	FEEDWATER - PUMP & MOTOR OIL SYSTEMS



APPENDIX B (Cont.)

SYSTEM CODES UNIT 2

<u>SYSTEM CODE</u>	<u>BIP NUMBER</u>	<u>SYSTEM DESCRIPTION</u>
FWP	6	FEEDWATER & CONDENSATE PUMP-SEALS & LEAKOFF
FWR	6	FEEDWATER - RECIRCULATION
FWS	6, 7	FEEDWATER - SYSTEM
GMC	26	GENERATOR, MAIN-STATOR COOLING
GMH	27	GENERATOR, MAIN-HYDROGEN & CO2
GML	24	GENERATOR, MAIN-LEADS
GMO	22A	GENERATOR, MAIN-SEAL OIL
GMS	68	GENERATOR, MAIN-SYSTEM
GSN	88	GAS-NITROGEN - SYSTEM
GTS	61	GAS TREATMENT, STANDBY-SYSTEM
HCS	62	HYDROGEN RECOMBINER SYSTEM (POST DBA)
HDH	8	HEATER DRAINS - HIGH PRESSURE
HDL	8	HEATER DRAINS - LOW PRESSURE
HRS	21	HOT REHEAT - SYSTEM
HTS	40,41,82	HEAT TRACING-SYSTEM
HVC	53,54,59A	AIR COND. - CONTROL BLDG OR AREA
HVE	59C	VENTILATION - SERVICE BLDG
HVG	49	GLYCOL HEATING - SYSTEM
HVH	49	HOT WATER HEATING - SYSTEM
HVI	59C	VENTILATION - AUX BOILER ROOM
HVK	53	CHILLED WATER - CONTROL BLDG
HVL	59B	AIR CONDITIONING - SERVICE BLDG
HVN	54	CHILLED WATER - VENTILATION
HVP	57	VENTILATION - DIESEL GEN BLDG



APPENDIX B (Cont.)

SYSTEM CODES UNIT 2

<u>SYSTEM CODE</u>	<u>BIP NUMBER</u>	<u>SYSTEM DESCRIPTION</u>
HVR	52	VENTILATION - REACTOR PLANT
HVT	55	VENTILATION - TURBINE PLANT
HVW	56	VENTILATION - RADWASTE BLDG
HVY	58,59C	VENTILATION - YARD STRUCTURES
IAS	19,34	INSTRUMENT AIR SYSTEM
ICS	35	REACTOR CORE ISOLATION COOLING - SYSTEM
IHA	103	INFORMATION HANDLING - ANNUNCIATOR
IHC	91,103	INFORMATION HANDLING - COMPUTER
IHS	40	INFORMATION HANDLING - SECURITY
ISC	28	INSTRUMENTATION SYSTEM - NUCLEAR BOILER
ISG	77	GROUNDING SYSTEM
LAC	75	LIGHTING, AC-CONTROL ROOM (MAIN)
LAD	75	LIGHTING, AC-DIESEL GENERATOR ROOM
LAH	75	LIGHTING, AC-COOLING TOWER & POND AREA
LAK	75	LIGHTING, AC-MISC BLDGS
LAN	75	LIGHTING, AC-RADWASTE BLDG
LAR	75	LIGHTING, AC-REACTOR BLDG
LAS	75	LIGHTING, AC-SYSTEM (SUPPLY)
LAT	75	LIGHTING, AC-TURBINE AREA
LAW	75	LIGHTING, AC-SCREENWELL AND PUMPHOUSE
LAX	75	LIGHTING, AC-AUXILIARY BOILER ROOM
LAY	75	LIGHTING, AC-SWYD OR SUBSTA (INCLUDING CONT HSE)
LAZ	75	LIGHTING, AC-SERVICE BLDG
LMS	81	LEAKAGE MONITORING SYSTEM



APPENDIX B (Cont.)

SYSTEM CODES UNIT 2

<u>SYSTEM CODE</u>	<u>BIP NUMBER</u>	<u>SYSTEM DESCRIPTION</u>
LOS	22B	LUBE OIL (TREATMENT AND STORAGE ONLY) - SYSTEM
LPM	86	LOOSE PARTS MONITORING - SYS.
LWS	40	LIQUID WASTE (RADIOACTIVE) - SYSTEM
MDS	101	MOTOR OPERATED DOORS - SYSTEM
MHK	101	MAT HANDLING (CRANES, HOISTS, ETC) - MISC BLDGS
MHN	101	MATERIAL HANDLING - RADWASTE BLDG
MHR	84	MAT HANDLING(CRANES, HOISTS, ETC)- REAC BLDG(CONTNMT)
MHS	101	MAT. HANDLING (CRANES, HOIST) SYSTEM
MHT	101	MAT. HANDLING (CRANES, HOISTS, ETC)-TURBINE AREA
MHW	101	MAT HANDLING(CRANES, HOISTS, ETC)- SCREENWELL & PP HSE
MMS	108	METROLOGICAL MONITORING SYSTEM
MSS	1,21,85	MAIN STEAM SYSTEM
MTX	69	MN TRANS INCL AUXILIARIES (COOLERS, LTC, ALARMS, ETC)
MWS	16	MAKEUP WATER - SYSTEM (RAW WATER)
NHS	71A	MOTOR CONTROL CENTER, NORMAL - SYSTEM
NJS	71A,71B	UNIT SUBSTATION - SYSTEM
NME	92	NEUTRON MONITORING SYSTEM
NMI	92	NEUTRON MONITORING SYSTEM (INTERMEDIATE)
NMP	92	NEUTRON MONITORING SYSTEM (POWER)
NMT	94	NEUTRON MONITORING (TRAVERSE INCORE PROBE)
NMS	92	NEUTRON MONITORING (SOURCE)
NNS	71A	SWGR, NORMAL, 4160V-SYSTEM



APPENDIX B (Cont.)

SYSTEM CODES UNIT 2

<u>SYSTEM CODE</u>	<u>BIP NUMBER</u>	<u>SYSTEM DESCRIPTION</u>
NPS	71A	SWGR, NORMAL, 13.8KV-SYSTEM
OFG	42	OFF GAS
PBS	51	SANITARY SEWERAGE FACILITIES - SYSTEM
PCS	77	PROTECTION, CATHODIC-SYSTEM
RCS	29,71A	REACTOR RECIRCULATION
RDE	18	ROOF DRAINS (HANGERS)
RDS	30	REACTOR ROD DRIVE - SYSTEM
RHS	31	RESIDUAL HEAT REMOVAL - SYSTEM
RMS	79,80	RADIATION MONITORING - SYSTEM
RPM	71B	REACTOR PROTECTION SYSTEM - M-G SET
RPS	97	REACTOR PROTECTION - SYSTEM
RRS	106	REDUNDANT REACTIVITY SYSTEM
RSS	78	REMOTE SHUTDOWN SYSTEM
RTX	70	RES STA SERV TRAN INCL AUXILIARIES
SAS	19	SERVICE AIR - SYSTEM
SCA	71	STA CONT BUS (NONVITAL)-AC SUPPLY INCL TFMR & TRANS SWITCH
SCI	71B	STA CONT BUS (NONVITAL)-INDICATION
SCM	72	STATION CONTROL MONITORING (VITAL) - INDICATION
SCV	72	STA CONT BUS (VITAL)-AC SUPPLY
SFC	38	SPENT FUEL-FUEL POOL CLG & CLEANUP (INC. POOL & AUX)
SLS	36	STANDBY LIQUID CONTROL (POISONING) - SYSTEM
SPF	70	RESERVE STA SERVICE LINE
SPG	68	STATION PROTECTION - GENERATOR
SPI	70	STATION PROTECTION - GEN, MN TFMR, STA SER BUS

AP-5.0 -31 February 1986



APPENDIX B (Cont.)

SYSTEM CODES UNIT 2

<u>SYSTEM CODE</u>	<u>BIP NUMBER</u>	<u>SYSTEM DESCRIPTION</u>
SPM	69	STATION PROTECTION - MAIN TRANSFORMER
SPR	70	STATION PROTECTION - RES STA SERV TRANS
SPS	70	STATION PROTECTION - STA SERV TRANS
SPU	68	STATION PROTECTION - UNIT
SPX	71A	STATION PROTECTION - AUX PWR TRANS
SRH	21	TURBINE REHEAT (HANGERS)
SRR	18	STORM SEWER - ROOF DRAINAGE
SSP	17	SAMPLING SYSTEM - POST ACCIDENT
SSR	17	SAMPLING SYSTEM - REACTOR PLANT
SST	17	SAMPLING SYSTEM - TURBINE PLANT (NUCLEAR)
SSW	17	SAMPLING SYSTEM - RADWASTE BLDG
STX	70	STA SERV TRANS NORMAL INCL AUXILIARIES
SVH	8	STEAM VENTS - FEEDWATER HEATER RELIEF VENT & DRAINS
SVV	1	STEAM VENTS - SAFETY VALVES
SWP	11	SERVICE WATER - SYSTEM
SWQ	11	SERVICE WATER - SYSTEM (HANGERS)
SWR	40	SEEL WATER - RADWASTE
SWT	12	SERVICE WATER - TRAVELING SCREENS - WASH & DISPOSAL
SXS	105	STARTUP TEST INSTRUMENTATION - SYS
SYD	100A	SYNCHRONIZING - DIESEL GENERATOR
SYG	68	SYNCHRONIZING - MAIN GENERATOR
SYS	71A	SYNCHRONIZING - STATION SERVICE
TMA	21	TURBINE, MAIN-ALARMS AND TRIPS
TMB	23	TURBINE, MAIN-CONTROL (EHC)
TME	25	TURBINE, MAIN-GLAND SEAL & EXHAUST STEAM



APPENDIX B (Cont.)

SYSTEM CODES UNIT 2

<u>SYSTEM CODE</u>	<u>BIP NUMBER</u>	<u>SYSTEM DESCRIPTION</u>
TMG	22A	TURBINE, MAIN-TURNING GEAR
TMI	21	TURBINE, MAIN-SUPERVISORY INSTRUMENTATION
TML	22A	TURBINE, MAIN-LUBE OIL
TMS	21	TURBINE, MAIN-SYSTEM
TRD	18	ROOF DRAINS (HANGERS)
VBA	72	VITAL BUS - AC SUPPLY (TO BUS)
VBB	71B,75	VITAL BUS - DC SUPPLY (TO INVERTER)
VBS	72	VITAL BUS-SYSTEM(INCOMING SUPPLY FROM INVERTER)
VTP	26,22A	VENTS, TURBINE PLANT EQPT
WCS	37	REACTOR WATER CLEANUP - SYSTEM
WOS	22C	WASTE OIL DISPOSAL - SYSTEM
WPS	71B	WELDING POWER-SYSTEM
WSS	41	SOLID WASTE (RADIOACTIVE) - SYSTEM
WTA	10B	WATER TREATING - ACID TREATMENT
WTH	10C	WATER TREATING - HYPOCHLORITE
WTS	10A,15	WATER TREATING - SYSTEM
YUB	70	115KV SWYD/SUB STA-BUS DIFF/PT's
YUC	70	115KV SWYD/SUBSTA
YXC	69	345KV SWYD/SUBSTA



APPENDIX C

NPRDS CODES

NPRDS FAILURE SYMPTOM CODE

The code indicating the first effect of the failure observed when the failure was discovered. Choose one of the following:

- A - Physical Fault - A failure is characterized by a changed physical condition, physical configuration, fracture or damage, often resulting in a loss of integrity or ability to hold a contained fluid or electrical current. This category includes blocked or stopped flow, cracks, fractures or breaks, collapses, physical distortion or displacement, electrical arcing, open circuit, shorts, or degraded insulation. Leaks are considered a special category (E or F below) due to the number of reported items.
- B - Out of Specification - A failure is characterized by operation outside the permissible range of expected output or response. This category includes out of limits, low or high output or flow, erratic output, premature response, off frequency, off voltage, intermittent operation or failure to synchronize or control.
- C - Demand Fault - A failure is characterized by the responsible system or component failure to actuate, move, or change operating mode upon request, either operator-initiated or from an automatic signal. This category includes failure to stop, close, open, release, run, start/move, operate per demand, respond, record, or instances of no output when an input of some sort demands one
- D - Abnormal Characteristic - A failure is characterized by a type of response or an operating characteristic not considered normal or expected. This category includes such attributes as overheating, unusual noise or vibration, chatter, corrosion, discoloration, and false response (such as non-zero output with zero input).



APPENDIX C

NPRDS CODES

NPRDS FAILURE SYMPTOM CODES (Cont.d)

- E - Released Leakage - A failure is indicated by external leakage of a process fluid from within its normal pressure boundary. This includes leaks to the environment caused by faulty packing glands, mechanical seals, or gasketed joints. Also included in this category are relief valve leakage and heat exchanger tube leaks.
- F - Contained Leakage - A failure is characterized by leakage of the process fluid through a closed isolation device (e.g., a valve) and along a normal flow path. This includes internal flow leaks such as across valve seats. Not included (see code E) are relief valve leaks and heat exchanger tube leaks.



APPENDIX C

NPRDS CODES

NPRDS CORRECTIVE ACTION CODE

The following is a listing of the codes used for corrective action taken to remedy a failure, along with a definition and an example for each of the codes.

AA	Recalibrate/Adjust	To reset a device mechanically or electrically to a prescribed valve or position. An example of this is to calibrate an instrument string. Specifically it would read something like, "Reset outputs of the flow transmitter on the shaft driven feed water pump flow instrument loop". Some keywords to look for: calibrate, recalibrate, adjust, readjust, set, reset.
AC	Temporary Measures	Actions taken to bypass, maintain, or restore a system or component to operation for an interim period. An example of this is to replace a defective part with another component until either conditions permit a proper replacement, or a similar component can be purchased. For example, "Added temporary pressure gauge on feedwater heater high level trip column, until next outage when a proper gauge can be installed". The Key word here is: Temporary.
AG	Repair Component/Part	To refurbish and/or reinstall a component, including such actions as cleaning and or polishing. An example of this would read something like, "Fixed circuit breaker coil and cleaned contacts for diesel generator air start compressor motor starter." Keywords: Repair, fix, refurbish, clean, reinstall, rebuild, reset.



APPENDIX C

NPRDS CODES

NPRDS CORRECTIVE ACTION CODE (Cont.d)

AH	Replace Parts	A piece component or part is removed and a similar or identical part is put in its place. An example of this is "Installed new valve stem and seat in accordance to original specifications." Key words: Replace, install, repair, fix, rebuild, added, refurbish.
AK	Replace Component	To replace the entire component with a similar or identical component. For example, "Replaced defective Rosemont Pressure Transmitter on Feed water line with an identical unit." Keywords: Replace, install, repair, fix, rebuild, added, refurbish.



APPENDIX C

NPRDS CODES

NPRDS CAUSE OF FAILURE CODE

MECHANICAL CAUSES

- AB - Foreign/Incorrect Material - Material not as specified or internal environment containing an unanticipated material (e.g., water).
- AC - Particulate Contamination - Gas or fluid contents, including unexpected buildup of suspended solids.
- AD - Normal/Abnormal Wear - Loss of function due to a gradual loss of configuration or material.
- AE - Lubrication Problem - Frictional failure directly attributable to lack of proper lubrication.
- AF - Weld Related - Weld fracture, crack, or heat-affected zone failure attributable to the welding process.
- AG - Abnormal Stress - Material stress attributable to abnormal load, vibration, temperature, pressure or flow.
- AV - Connection Defective/Loose Parts - Loose mechanical parts or fasteners.
- AZ - Material Defect - Material type as specified, but with integrity compromised due to a flaw or leak.
- BB - Mechanical Damage/Binding - Loss of proper mechanical configuration due to excessive forces.
- BC - Out of Mechanical Adjustment - Loss of proper mechanical alignment, movement limits, or configuration not due to damage. Loose setscrews, locknuts, mechanical stops, and setpoints of adjustable fixtures are included.
- BD - Aging/Cyclic Fatigue - Time-related degradation of mechanical properties without significant loss of material (as through wear). Includes radiation damage, embrittlement, and fatigue cracking of material subjected to stress reversals.
- BE - Dirty - Loss of function due to deposition of extraneous material on operating surfaces such as circuit breaker moving parts, pilot valve seats, etc.
- BF - Blocked/Obstructed - Loss of flow function due to lodged objects or solids. May also be loss of movement due to mechanical interference other than binding.
- BG - Corrosion - Failure attributable to loss of material or buildup of chemical reaction products from electro-chemical or stress-aided corrosion.



APPENDIX C

NPRDS CODES

NPRDS CAUSE OF FAILURE CODE (Cont.d)

ELECTRICAL/ELECTRONIC CAUSES

- AG - Abnormal Stress - Loss of function due to stress-related causes attributable to voltage spikes, oscillations, etc.
- AR - Insulation Breakdown - Loss of electrical circuit integrity, including shorts, arcs, burned windings, etc., attributable to failure of the insulation itself.
- AS - Short/Grounded - Loss of electrical circuit integrity due to a shorted or grounded circuit.
- AT - Open Circuit - Inoperability of electrical circuit due to a break in conductor or contacts not made up.
- AU - Contacts Burned/Pitted/Corroded - Inoperability of electrical circuit due to degradation of electrical contacts.
- AV - Connection Defective/Loose Parts - Electrical terminal connection loose, intermittent, or containing high electrical resistance.
- AW - Circuit Defective - Electrical or electronic circuit fault not attributable to any one subcomponent, component, or part, including unknown electronic faults or failures not reproducible.
- AX - Burned/Burned Out - Loss of electrical circuit integrity, including insulation breakdown due to local combustion, overload, and/or electrical fire.
- AY - Electrical Overload - Loss of function specifically attributable to unanticipated high electrical current.
- AZ - Material Defect - Material type as specified but with integrity compromised by a flaw.
- BE - Dirty - Loss of function due to deposition of extraneous material on operating surfaces such as electrical contacts.
- BG - Corrosion - Failure attributable to loss of material or buildup of chemical reaction products from electro-chemical corrosion.



APPENDIX C

NPRDS CODES

NPRDS CAUSE OF FAILURE CODE (Cont.d)

ADJUSTMENT/HUMAN-RELATED

- AA - Foreign/Wrong Part - Part does not belong in responsible component or system. This includes poor designs and misapplications.
- AL - Setpoint Drift - Electronic drift attributable to poor control setpoint stability. Relief valve setpoint changes during operation due to pilot valve seat bleed rate changes may be included but not changes due to previous repair or mechanical adjustment.
- AM - Previous Repair/Installation Status - Inadequate repair condition resulting from lack of proper previous maintenance, installation, or restoration to operational status.
- AN - Incorrect Procedure - Failure directly attributable to an inadequate or improper instruction or approved procedure.
- BC - Out of Mechanical Adjustment - Loss of proper mechanical alignment, movement limits, or configuration not due to damage. Loose setscrews, locknuts, mechanical stops, and settings of adjustable fixtures are included.
- BH - Out of Calibration - Electrical/mechanical setpoint or response settings (lead, lag, or reset) not in the specified position or range.
- BJ - Incorrect Action - Loss of proper function directly due to human error.

