U.S. NUCLEAR REGULATORY COMMISSION
REGION I
MEETING REPORT

Docket/Report No.: 50-336/85-26

License No.: DRP-36

Licensee: Northeast Nuclear Energy Company
P. O. Box 270
Hartford, Connecticut 06101

Facility Name: Millstone Nuclear Power Station, Unit 2

Meeting Date: July 18, 1985

Reported by: _____ 8/6/85
E. C. McCabe, Chief, RPS 3B — Date

Approved by: for _____ 8/7/85
E. C. Wenzinger, Chief, Projects Branch No. 3 — Date

Summary:

Management meeting conducted on July 18, 1985 in NRC Region I to discuss design changes made during the recently completed Millstone 2 outage. The event of initial concern was identification of the connection of each of the two pressurizer spray valves to the controller for the opposite spray valve (i.e., valve HIC 100E was connected to the HIC 100F controller, and vice versa). This occurred as a result of a faulty design change. The licensee presented his rationale for concluding that other modifications made during the outage had no errors and that the modifications involved had been properly tested. Review of the spray valve controller design change by the Haddam Neck Design Change Task Group was committed to by the licensee. NRC Region I concurred that the licensee's evaluation provided a reasonable assurance that facility operation could be resumed without adverse affect from recent design changes.

DETAILS

1. Meeting Attendees

Northeast Utilities

R. Kacich, Licensing Supervisor
J. Kelly, Millstone 2 Superintendent
E. Mroczka, Vice President, Nuclear Operations

NRC Region I

L. Bettenhausen, Chief, Operations Branch, Division of Reactor Safety (DRS)
S. Ebneter, Director, DRS
J. Gutierrez, Regional Counsel
W. Kane, Deputy Director, Division of Reactor Projects (DRP)
E. McCabe, Chief, Reactor Projects Section 3B, DRP
J. Robertson, Reactor Engineer, Reactor Projects Section 3B, DRP
R. Starostecki, Director, DRP
E. Wenzinger, Chief, Projects Branch No. 3, DRP

2. Meeting Presentation

The licensee presented his analysis of the design change which improperly connected the pressurizer spray valves to the opposite spray valve's controller and the results of his review of other design changes (Appendix 1 to this report with Attachments 1 and 2).

3. Licensee Commitment

The licensee committed to a review of the containment spray controller design change by the Haddam Neck Design Change Task Group.

4. NRC Position

NRC Region I concluded that the licensee's review of this matter provided reasonable assurance that Millstone Unit 2 operation could be resumed without adverse affect from the design changes made during the recent completed refueling outage.

APPENDIX 1

NRC MANAGEMENT MEETING

JULY 18, 1985

MILLSTONE UNIT NO. 2

REACTOR TRIP OF JULY 15, 1985

Millstone Unit No. 2

Reactor Trip - July 15, 1985

Initiating Event

At approximately 1525 on Monday, July 15, 1985, with the unit at 100% power, 886 MWe, pressurizer pressure began to decrease from a steady state value of 2270 psia. Approximately two minutes later the operators were alerted to the condition when reactor protection system pretrips for thermal margin/low pressure annunciated at 2225 psia. Initial actions included verifying spray valves, power operated relief and safety valves were closed. Turbine load was reduced in an attempt to recover pressure. Despite the lack of abnormal indications and the reduction of turbine load, the unit tripped at 1533 on thermal margin low pressure when pressurizer pressure decreased below 2155 psia.

The unit responded routinely to the reactor and turbine trip from 100% power with the exception of pressurizer pressure and steam generator level. The steam generators were slightly over-fed due to the actions prior to the trip but level was restored to an indicated band within ten minutes. Pressurizer pressure decreased during the post trip transient to 1790 psia, recovered to 1860 psia ten minutes after the trip and then slowly decreased to 1725 psia. During the decrease it was determined that a stuck spray valve was the initiating event and the valve controllers were placed in manual and given a full close signal. This was done as insurance since the controllers for both valves indicated a full close demand. In addition, a containment entry was initiated to manually isolate the spray valves. Prior to obtaining the Radiation Work Permit for the containment entry, pressurizer pressure decreased to 1725 psia and the operators secured two reactor coolant pumps, which resulted in a significantly reduced spray flow, and allowed the pressurizer heaters to restore pressure to 2250 psia.

After the containment entry was complete, the spray valves were isolated sequentially in an attempt to identify the affected valve. When it was determined that both valves were partially opened, the isolation valves were all closed and the two secured reactor coolant pumps restarted. During this troubleshooting it was determined that the control room pressurizer spray controllers HIC 100E and 100F controlled the opposite valve. This discrepancy is addressed in the attached report.

Cause

The trip resulted when the pressurizer spray valve opened sufficiently to overcome the capability of the pressurizer heaters to maintain pressurizer pressure of 2270 psia. While it is assumed that one or both valves were partially open during the week of operation, an unknown event caused the F valve to open further at 1525, initiating the transient. This initiating event is assumed since the F valve was found stuck open when the operators entered the containment.

Concerning the E valve's failure to close and any initial F valve problems, these discrepancies were not noted during the week of operation since pressurizer spray flow was desired and induced by use of the pressurizer heaters. The power ascension test requires this spray flow to equalize boron concentration between the pressurizer and the remainder of the reactor coolant system. When the test was completed at noon on July 15 and the pressurizer pressure controls were returned to normal, the inability to maintain pressurizer pressure was observed and two backup heater groups were energized. A trouble report was issued to investigate pressurizer heater output, and the possibility of pressurizer spray valve leakage was discussed. To obtain stable pressure control, spray was forced as it had been for the preceeding week, pending resolution of the problem. There was no active investigation of the problem at the time of the trip.

Corrective Action

The spray valves were functionally checked while isolated. The E valve operated smoothly and its stroke was adjusted so that it would go fully closed. The F valve would not stroke and was completely disassembled. The only defects found were some wear marks on the plug and one ring of packing slightly misaligned. The plug was cleaned and the valve repacked and assembled.

Other maintenance completed included repair of the reactor protection system matrix test relay switch which was discovered during startup testing, repair of a tear in the condenser boot seal and a balancing shot on the turbine generator.

Action to Prevent Recurrence

Since there were no obvious defects in the spray valves and the reactor/turbine trip were normal, no action to prevent recurrence is planned at this time. The spray valve preventive maintenance program and the addition of remotely controlled spray valve isolation valves will be evaluated.

Reversed Wiring of Pressurizer Spray Valves

Initiating Event

Plant design change requests were implemented during the 1985 refuel outage to the pressurizer pressure and level instrumentation and controls. The modification upgraded the original GEMAC equipment to Foxboro components. This is part of a long term and recently completed program to comply with 10 CFR 50.49.

The modification was installed during March and April, calibrated in May and tested in June. The plant design change request was properly followed for the installation, the calibration completed using revised unit procedures and the test performed using an approved Inservice test. The discrepancy was discovered during the investigation following the reactor trip of July 15, 1985.

Cause

As indicated on the simplified sketch, three of the drawings included in the plant design change request contained the discrepancy which resulted in the wiring reversal. Sheet 50D identified wires N/P as carrying loop E signals while wires L/M carry the loop F signal. However, sheet 50E reversed the wires such that wires N/P supply the F loop and wires L/M supply the E loop. This reversal was repeated on sheet 50F in that ouput wires Q/R and S/T switched from F to E and E to F respectively.

As a result of these wire reversals, the CO3 and C21 controllers, which were reflected on sheet 50E, were wired such that the E controller operated the F valve and the F controller operated the E valve. This discrepancy was not discovered during testing since valve operation was not verified. Rather, test meter deflections were observed. These meter deflections were observed at test points identified on the same prints which resulted in the reversal.

Corrective Action - Specific

When the wiring error was discovered an addendum was initiated to the plant design change request to correct the discrepancy. The change consisted of reversing the wires on the CO3 controllers and reversing the nameplates on the C21 controllers. To understand why the corrective actions are different the design of the control boards must be considered. On C21, facility separation is by a metal divider which splits the back panel in half. On CO3, three feet of space provides the separation.

Concerning the original modification to CO3, identical controllers were placed in a new section of control board for the two valves. The labeling of these controllers was consistent with the design layout drawing which maintained the system mimic on the remainder of the panel. However, the design layout drawing reflected the mistake made on sheet 50E and the wrong wires were connected to the controllers. Therefore, the corrective action is to reverse the wires.

The modification on C21 consisted of identical controllers being placed in two holes in the control board. One of the holes was on each side of the divider plate. Since one hole was on each side of the divider plate and one cable was pulled to each side of the plate, the connections were made without reference to the layout drawings or connection drawings which were in error. The layout drawing was used for labeling, however, and the controllers were mislabeled. Thus, the C21 corrective action is to reverse the labels.

It should be noted that no cable separation was violated since the cable routing drawings were accurate.

To ensure the revised design change is correct, testing has been performed which verified the adequacy of the addendum. The test will physically stroke the valves and ensure they operate to maintain the appropriate pressurizer pressure. It will also verify the E controllers on C21 and CO3 operate the E valve and the F controllers on C21 and CO3 operate the F valve.

Corrective Action - General

Since testing after plant modifications should identify design deficiencies, all plant design change requests (PDCR's), which were implemented during the 1985 outage, were reviewed for testing adequacy. This was done in a two step process. All PDCR'S were reviewed to determine a need for a thorough review. Attachment 1 contains the list of design changes whose testing was not reviewed and the reason that the review was not required. Attachment 2 contains the list of design changes whose tests were reviewed, a description of the tests and the status of completion. The Millstone Unit 2 Plant Operations Review Committee and the Nuclear Review Board have reviewed this matter and have concluded that it is acceptable to re-start the unit.

Action to Prevent Recurrence

The plant design change request program has recently been revised to increase the controls on plant modifications. In general, these procedure changes have resulted in more thorough reviews and more complete documentation for modifications. They have been effective and confidence exits that over sixty modifications were completed and tested in an appropriate manner during the past Millstone Unit 2 outage.

The major discrepancy noted with the pressurizer spray valve change was the failure of the test to discover the error. This is directly attributed to inadequate testing in that the operation of the valve was not verified. In light of other events in the NU system and the status of other related, ongoing initiatives, the following corrective actions are planned:

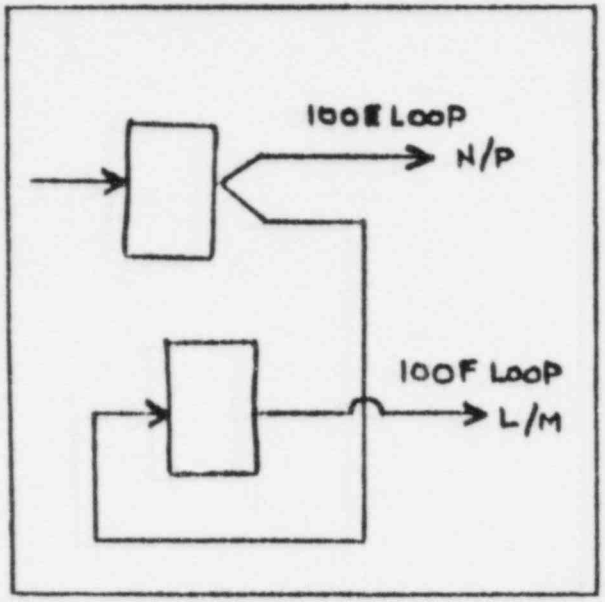
1. More education (as distinguished from training) is needed to ensure that the intent of a thorough pre-operational test is conducted for all design changes. For Millstone Unit No. 2, this education will be completed prior to implementation of any additional design changes. For Connecticut Yankee and Millstone Unit No. 1, this will be completed by September 30, 1985.

2. A memorandum from the Senior Vice President, Nuclear Engineering and Operations, will be issued to all NE&O personnel involved in the design change process which will focus on the lessons learned from this problem. Increased emphasis will be placed on the need for a thorough pre-operational test which directly demonstrates the operability of the entire system. This memorandum will be issued by August 21, 1985.

3. The CY Plant Design Change Task Group (PDCTG) will include in their review the plant design change which caused this problem at Millstone Unit 2. It is noted that the PDCTG has previously committed to evaluate the adequacy of the design change related procedures issued on November 1, 1984. This review will be completed on the schedule required by the Order dated December 13, 1984.

4. The PDCR's identified in Attachment 1 will be re-reviewed, to confirm the adequacy of the testing conducted, by September 30, 1985.

5. For Connecticut Yankee and Millstone Unit No. 1, plant design changes implemented between November 1, 1984 (the date of issuance of the new procedures) and the conclusion of the next refueling outages (currently scheduled to commence January 4, 1986 and October 19, 1985 respectively) will be reviewed to confirm the adequacy of pre-operational testing. The scope of the review will be comparable to that being completed for Millstone Unit 2. This review will be completed prior to startup from the upcoming refueling outages.



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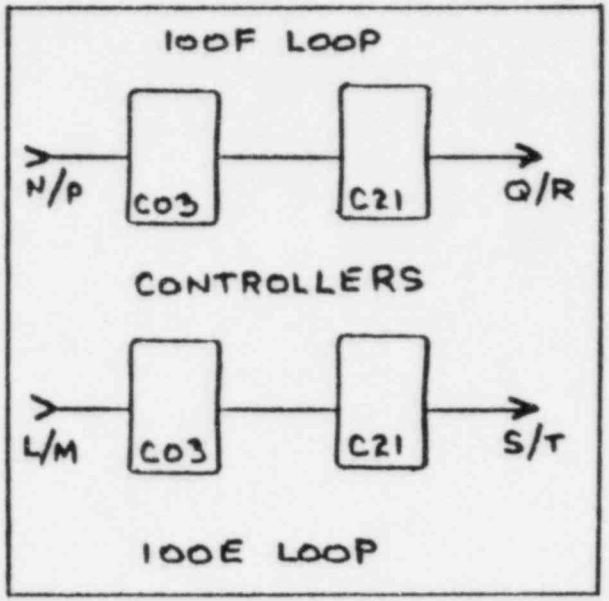

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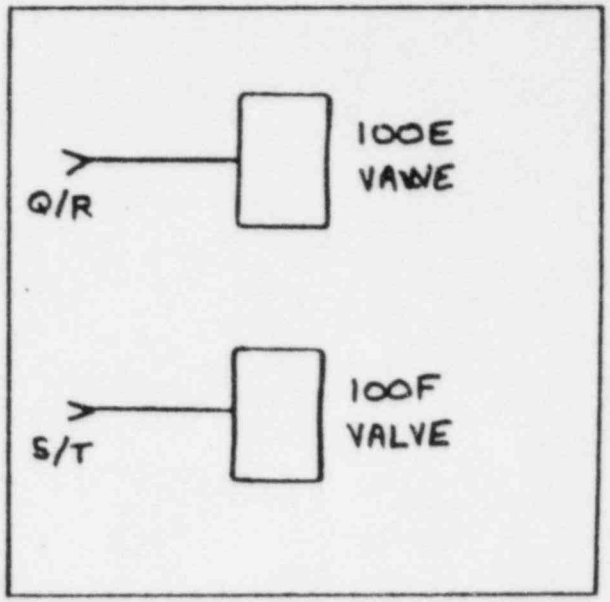

25203-28500
SHEET 50F

Attachment 1

1985 OUTAGE PDCR'S NOT REVIEWED FOR TESTING ADEQUACY JULY 15-17, 1985

PDCR NO./DESCRIPTION	REASON REVIEW NOT REQUIRED
2-20-83/Provide hydrolazer power supply.	No effect on system operation due to normal electrical protection.
2-57-83/Piping improvements in nitrogen system.	Passive modifications; normal system usage verified proper operation.
2-71-83/Installation of main generator tagging compound analyzer.	No control functions or safety-related indications affected.
2-113-83/Installation of CRT for control board indication.	Normal system usage verified proper operation.
2-4-84/Reinstallation of refuel pool ladders.	Passive modification - no operational verification required.
2-12-84/Provide alternate power to MP-3 Security.	Work in progress.
2-15-84/Addition of elapsed time indicators for transformer oil pumps.	No control functions or safety-related indications affected.
2-20-84/Replace main generator watt-hour meter.	No control functions or safety-related indications affected.
2-23-84/Addition of spare pump in CPF waste discharge.	Normal system usage verified proper operation.
2-37-84/Replace relief valve 2-SI-466.	Passive modification; normal system usage verified proper operation.
2-42-84/Addition of plant lighting.	No effect on system operation due to normal electrical protection.
2-52-84/Replace feedwater heaters 2A and 2B.	Normal system usage verified system integrity.

PDCR NO./DESCRIPTION	REASON REVIEW NOT REQUIRED
2-54-84/Replace wide range Ni power supplies.	Normal surveillance testing verified system operability.
2-58-84/ Addition of plant telephone.	Normal system usage verified proper operation.
2-60-84/Feedwater control system upgrade.	Normal system usage verified proper operation.
2-62-84/Addition of strainer to refuel pool drains.	Passive modification - no verification required.
2-63-84/Leak repair on lube water piping.	Passive modification; normal system usage verified proper operation.
2-66-84/Construction of shell for future radwaste reduction facility.	Work in progress; passive modification - no operational verification required.
2-3-85/Addition of crane warning lights in Turbine Building.	No control functions or safety-related indications affected.
2-6-85/Upgrade shutdown cooling loop instrumentation.	No control functions or safety-related indications affected.
2-10-85/Replace RPS bistable power supplies.	Normal surveillance testing verified system operability.
2-11-85/Upgrade feedwater heater gage glasses.	Passive modification; normal system usage verified proper operation.
2-13-85/Replace capacitors in inverters 3 and 4.	Normal system usage verified proper operation.
2-15-85/Addition of heater drains tank gage glass.	Passive modification; normal system usage verified proper operation.
2-18-85/Chemical cleaning of steam generator secondary side.	Normal system usage verified proper operation.
2-20-85/Replace terminal block in containment penetration.	Normal surveillance testing verified system operability.

PDCR NO./DESCRIPTION	REASON REVIEW NOT REQUIRED
2-21-85/Modify power supply for containment temporary power.	Normal system usage verified proper operation.
2-23-85/Relocate plant door 207.	Passive modification - no operational verification required.
2-24-85/Core fuel reload for Cycle 7.	Normal surveillance testing and in-service tests verified system operability.
2-25-85/Seismic qualification of refuel pool drain lines.	Passive modification - no operational verification required.
2-26-85/Installation of chlorine system filters.	Passive modification; normal system usage verifies proper operation.
2-27-85/Reactor cavity seal test equipment repair.	Normal system usage verified proper operation.
2-28-85/Addition of fuel oil test laboratory.	No effect on system operation.
2-31-85/Steam generator tube sleeving.	Normal system usage verified proper operation.
2-33-85/Upgrade electrical facilities in snubber test room.	No effect on system operation due to normal electrical protection.
2-37-85/Replace overcurrent devices in 480V breakers.	Normal surveillance testing verified proper operation.
2-38-85/Replace discs on 2-AC-54 and 2-AC-55.	Normal surveillance testing verified system operability.
2-39-85/Replace service water piping.	Passive modification; normal system usage verified proper operation.
2-40-85/Steam generator tube plugging.	Normal system usage verified proper operation.
2-42-85/Addition of instrument root valves for service water to TBCCW.	Normal system usage verified proper operation.

PDCR NO./DESCRIPTION	REASON REVIEW NOT REQUIRED
2-44-85/Replace service water piping in intake structure.	Passive modification; normal system usage verified proper operation.
2-45-85/Replace valves 2-MS-12A and 2-MS-12B.	Passive modification; normal system usage verified proper operation.
2-46-85/Control room console replacement.	Passive modification - no operational verification required.
2-47-85/Addition of high radiation area access control gates.	Passive modification - no operational verification required.
2-48-85/Repair and upgrade snubbers.	Passive modification - no operational verification required.
2-49-85/Restoration of RCS RTD's to RPS.	Normal surveillance testing verified system operability.
2-50-85/Chemical decontamination of steam generator primary heads.	Normal system usage verified proper operation.
2-51-85/Upgrade power feed to warehouse.	No effect on system operation due to normal electrical protection.
2-52-85/Upgrade site evacuation alarm for MP-3.	Normal system usage verified proper operation.
2-53-85/Addition of refuel pool drain filter.	Passive modification; normal system usage verified proper operation.
2-54-85/Replace cable vault drain header.	Passive modification - no operational verification required.
2-57-85/Replace ICI guide tube assembly.	Passive modification - no operational verification required.

PDCR NO./DESCRIPTION	REASON REVIEW NOT REQUIRED
2-58-85/Replace mechanical snubbers.	Passive modification - no operational verification required.
2-59-85/Addition of maintenance phone jack.	Normal system usage verified proper operation.
2-60-85/Steam generator tube removal and plugging.	Normal system usage verified proper operation.
2-61-85/Upgrade secondary sample sink instrumentation.	Normal system usage verified proper operation.
2-62-85/Addition of sightglass on CPF tank.	Passive modification; normal system usage verified proper operation.
2-63-85/Upgrade steam generator snubbers.	Passive modification - no operational verification required.
2-65-85/Addition of EPRI/UCONN test materials in loop area.	Passive modification - no operational verification required.
2-68-85/Addition of constant temperature bath in CPF.	Normal system usage verified proper operation.
2-69-85/Addition of sodium analyzers and constant temperature bath for hotwell samples.	Normal system usage verified proper operation.
2-72-85/Addition of sightglass in CPF tank vent line.	Passive modification; normal system usage verified proper operation.
2-73-85/Repair hanger base plate in containment.	Passive modification - no operational verification required.
2-74-85/Blowdown vent line modification.	Passive modification; normal system usage verified proper operation.

Attachment 2

1985 OUTAGE PDCR'S REVIEWED FOR TESTING ADEQUACY

PDCR DESCRIPTION	TESTING REQUIRED	TESTING STATUS & REMARKS
PDCR 2-22-85: To perform EEQ replacement of solenoids and limit switches on valves on the secondary plant [2-MS-266B, 2-MS-265B, 2-SW-8.1A, 2-SW-8.1B, 2-SW-8.1C 2-SW-3.2A, 2-SW-3.2B, 2-LRR-61.1, - Solenoids] [2-SW-8.1A, 2-SW-8.1B, 2-SW-8.1C, 2-LRR-61.1, 2-EB-88, 2-EB-89 - Limit Switches]	Proper valve operation to be verified by testing consisting of cycling each valve three times using its respective control switch while observing each limit gives correct valve position.	Testing completed satisfactorily, under listed AWO's: M2-85-05462, 05463, 05464, 05466, 05468, 05469, 05471, 07148, 06781, 06783.
PDCR 2-7-85: To improve Control Room habitability during certain incidents by giving redundant air recirc initiation controls, adding 3 new dampers, adding new air supply radiation detectors and replacing chlorine detectors.	1. Recirc air flow rate at 2500 ± 250 CFM. 2. Redundant initiation of Recirc mode. 3. Radiation detectors respond to radiation and will initiate recirc. at 2 MR/hr. 4. Chlorine detectors respond to chlorine and will initiate recirc at 1 ppm.	1. Airflow Test Sat. - OP 2609F-1. 2. Facility I & II Test - OP 2609A-1, 2609B-1 - Sat. 3. Radmonitor Test and Calibration IC 2410K-1 - Sat. and 2401J-1. 4. Chlorine Monitor Test and Calibration - Sat. IC 2431B-1, IC 2409-1.
PDCR 2-8-85: To replace pressure transmitters PT-100X & PT-100Y with EEQ rated devices, and to replace pressure control loop devices with new upgraded (SPEC 200) components.	1. Channel calibration of all loop components. 2. Pressurizer pressure control loop operation.	1. Calibrations Sat. - IC 2418C. 2. Control loop operations - Sat. - T84-34. REMARKS: Additional inservice tests: T85-28 has been written to verify that the expected control device does actually operate its associated spray control valve. T85-29 will verify performance of the pressure control system.
PDCR 2-34-85: Replace the Auto/Manual controllers for Auxiliary Feedwater Flow control loops, HIC-5276A&B and HIC-5279A&B with Manual loading stations. Modifies the loop electronics to provide valve position indication for 2-FW-43A & 2-FW-43B which is consistent with normal plant convention, i.e: 0% valve full closed, 100% valve full open. Eliminates auto flow control feature which is not utilized.	1. Channel calibration of all loop components. 2. Verification of Aux. Feedwater Initiation circuitry and Flow Control Valve position circuitry.	1. Channel calibration Sat. - SP 2402D*. 2. AAFWIS Operability per OP 2610C - Sat. * During calibration review, it was noted by visual determination in the Control Room (C05F) that 0% controller output corresponds to a closed valve.

PDCR DESCRIPTION	TESTING REQUIRED	TESTING STATUS & REMARKS
PDCR 2-43-85: Replaces non-qualified custom component pressure switches PC-224X,Y,Z; PS-6119A,B,C, with Category 1E, Environmentally qualified replacements. PC-224: Charging Pump Suction Pressure PS-6119: RBCCW Pump Suction Pressure	1. Leak check of process tubing following installation. 2. Calibration of pressure switches per I&C 21003.	1. Installation* and leak test - Sat. per AWO M2 85 6432 and M2 85 06433. 2. Calibration - Sat. - IC 21003. *Functions tested by tripping charging pump using low vacuum device, and by tripping RBCCW pump on decreasing suction pressure.
PDCR 2-64-85: Installation of an ATI Bypass circuit for the ATI portion of the containment purge valves in the ESAS. The circuit will allow the operators to bypass tripped purge valves for the ATI test sequence and thus eliminate a nuisance alarm for ATI fault.	Special test, to include verifying operation in the normal or unbypassed mode to check ATI pattern and presence of ATI fault if called for. Also to verify ATI Bypass does not prohibit any ESAS functions, but does prevent a tripped bistable from causing an ATI fault.	1. Work complete; Testing not yet performed. ATI bypass circuit not placed in service until testing is completed. 2. ATI calibration IAW IC 2430A complete and sat. 3. ATI functionally tested daily IAW OP 2619A.
PDCR 2-48-84: Replace service water strainer Differential Pressure (DP) switches and changes to pressure setpoint for start of backwash and hi DP alarm, for increased reliability.	Functional test to verify initiations and operation of the backwash cycle and the alarm in the control room. Initial service leak test to verity pipe and tube integrity.	1. Switches replaced and tested under AWO M2-85-02371 for service water strainers B and C, and tested Sat.* (A strainer not done yet). 2. AWO's 03400 & 03401 document leak test results, as sat. *Visually verified pressure switches sensing lines are tied in correctly to strainer high & low sides.

PDCR DESCRIPTION	TESTING REQUIRED	TESTING STATUS & REMARKS
PDCR 2-9-85: To replace Pressurizer Level transmitters LT-110X & LT-110Y with EEQ rated devices and to replace level control loop devices with new, upgraded (SPEC 200) components.	1. Letdown instrument calibration. 2. Pressurizer level instrument calibration. 3. Pressurizer level control operation.	1. Calibrations: Sat.: IC2418D and SP 2402E.* 2. Control loop operations - Sat. per Inservice Test T84-40.** * Copies available in NPRF. ** T85-19, Power Ascension Test noted that level controls functioned properly.
PDCR 2-16-85 Installation of new instrumentation to sense and display indications of Inadequate Core Cooling including reactor vessel level (in %), Core Exit Thermocouple (CET) temperatures and, coolant subcooling or superheat. Installations included reactor vessel level sensor (2) and two signal processing and control cabinets which received the signals from level sensors, CET's and RCS loop temperature and pressure for calculation of coolant subcooling/superheat.	1. Field structural welds visual exam. 2. Electrical checks per SP-EE-076. 3. ICC factory test per NUSCo 908. 4. HJTC vendor test per ICE-35231. 5. Functional test of CRT terminal. 6. Pressure boundary inspections a. LP on seal weld. b. Visual leak check c. Locking mechanism d. LLRT on new electrical penetrations.	1. NUSCo - 908 factory test sat. - copy in unit Engineers files. 2. HJTC test ICE-35231 sat. - copy in unit Engineers files. 3. Functional testing of vessel level display (HJTC) during RCS filling, under T85-26. Results - Sat. - Copy in unit Engineers files.* 4. Pressure boundary inspections: a. Visual leak check performed during 10 year ISI 110% test with satisfactory results. b. LLRT on new electrical penetrations performed prior to ILRT. 5. Functional test of CRT still ongoing due to occasional lockup of display when memory overflows. 6. CET temperature display results show ICC display for CET's high by up to 12°F. Needs final resolutions. * A functional test of CET/subcooling display functions remains to be completed.

PDCR DESCRIPTION	TESTING REQUIRED	TESTING STATUS & REMARKS
PDCR 2-85-83: Various process radiation monitors to be modified as follows: 1. RM9049 (Clean Liquid Radwaste), RM 9116 (Aerated Liquid Radwaste) and RM4262 (Steam Generator Blowdown) to be relocated to a low background radiation area. 2. RM 6038 (RBCCW) to have its shielding replaced. 3. Sample pumps to be added to RM 9116 and RM9049. 4. Flush water capability to be added to RM9116 and RM 9049. 5. RM 9049, RM 9116, RM 4262 and RM 6038 detectors and signal processing units to be replaced with units having improved shielding and electronics.	1. Radmonitors to be calibrated and functionally tested. 2. Hydrostatic test to be performed on new piping and flush water systems for RM 9049 and RM 9116.	1. Hydrostatic test of RM 9049 and RM 9116 performed in accordance with T84-24 with sat. results. 2. Calibration and function testing of RM 9049 and RM 9116 performed by T84-26 with sat. results. 3. RM 6038 calibrated by IC 2422E with sat. results. 4. RM 4262 calibrated by SP 2404P with sat. results. 5. Hydrostatic test by vendor sat. 6. AWO #M2-85-02063 installed RM 4262 AWO #M2-85-02064 installed RM 6038 7. Special Procedures 84-2-7, 84-2-8 verify initial calibration.
PDCR 2-32-85: To install manual loading (control) stations on the normal and high level dump valves for the heater drains tank and feedwater heaters 1A, 1B, 2A, and 2B.	1. Inservice leak test to verify that no air leaks are present. 2. Full operability of these loading stations to be demonstrated by changing from manual to automatic control and automatic to manua. control.	1. No formal test prepared for leak test or functional test, required testing was performed by AWO #M2-85-04757 with satisfactory results.
PDCR 2-36-85: To relocate the heater drains tank high level drain valve controller (LC-5061) 4 inches higher than its present location.	1. Visual inspection of welds. 2. Inservice leak test on joints. 3. Controller calibration IAW I&C procedures.	1. Calibration was performed under AWO #M2-84-03825 and completed sat. 2. Weld inspection and leak test was performed utilizing AWO #M2-85-04559. No other formal testing was completed. AWO inspection and leak test was sat.

PDCR DESCRIPTION	TESTING REQUIRED	TESTING STATUS & REMARKS
PDCR 2-19-85: To replace five existing 480 volt loadcenter transformers (22A, 22B, 22C, 22D and 22F) with new Brown Boveri transformers.	1. Complete transformer test program to be performed for each transformer prior to connecting to bus work.	1. The following testing was performed: - Doble insulation test - Excitation - current test - Winding megger tests - Connection Ducter tests - Tap setting verification - Cable hypot test 2. Functional testing of cubicle heaters, fans and alarms was also performed by "red line" verification. No other formal testing was documented although input and output breakers were tested.
PDCR 2-41-84: Modifies the reactor trip circuit breaker controls by adding a test switch that alarms in the test position and which allows testing of the undervoltage trip coils separately from the shunt trip coils.	1. Ensure alarm sounded when switch placed in test position. 2. Ensure shunt trip coil restored after test completion. 3. Ensure separate testing of shunt and UV trip coils.	Testing performed per AWO M2-85-03423, and matrix logic testing, found to be sat. NOTE: Procedure PT 21432 will periodically test this feature. Matrix logic testing (normal surveillance testing) will verify restoration conditions after each performance.
PDCR 2-14-85: Removes the seal-in circuit for the Terry Turbine Steam inlet valve motor operator controls to allow the valve to be throttled.	Retest per OP 2322, Section 7.2 and document per SP 2601B.	Tested Sat. - SP 2601B-1 and SP 2601B-2.
PDCR 2-32-84: Modify the Existing Enclosure Building Differential Pressure Channels. (PDT-8060C and PDT-8060J) to provide automatic shutdown of the Containment Purge Supply Fan (MF23) and closure of the Enclosure Building Exhaust Valve (HV8128).	1. Calibration of PDT-8060C & PDT 8060J. 2. Functional test of Fan F-23 and Damper HV-8128.	1. Calibration Sat. AWO M2-85-04902. 2. Functional Test Sat: T84-31.

PDCR DESCRIPTION	TESTING REQUIRED	TESTING STATUS & REMARKS
PDCR 2-70-85: Modify the "B" Charging Pump power supply crossover interlock circuitry by wiring in a spare contact from relay 3-1 and 3-2 in series with the Load Sequence Zero contact.	1. Test plan to verify the "B" Charging Pump would start during a partial or full LNP. 2. Retest per Operation Procedure 2601G and 2601H.	1. Testing performed per AWO M2-85-07732 testing was completed as sat. 2. Testing Sat. OPS Form 2601G-1 and OPS Form 2601H-1. 3. AWO #'s M2-85-07732, 07594 performed installation.