# U.S. NUCLEAR REGULATORY COMMISSION OFFICE OF NUCLEAR REACTOR REGULATION

Report No .:	50-423/98-205					
Docket No.:	50-423					
License No.:	NPF-49					
Licensee:	Northeast Nuclear Energy Company					
Facility:	Millstone Unit 3					
Location:	Millstone Nuclear Power Station 156 Rope Ferry Road Waterford, Connecticut 06385					
Dates:	February 23 - March 6, 1998					
Inspectors:	Stephen Tingen, ICAVP, Leader Special Projects Office Hershell Walker, Special Projects Office Michael Shylamberg, Mechanical Engineer, Contractor* James Leivo, Instrumentation &Control Engineer, Contractor* Ray Cooney, Electrical Engineer, Contractor* Andrew du Bouchet, Mechanical Components Engineer, Contractor*					
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Approved by:	Peter Koltay, ICAVP, Leader, Team 3 Special Projects Office Office of Nuclear Reactor Regulation					

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### EXECUTIVE SUMMARY Millstone Nuclear Power Station Inspection Report 50-423/98-205

From February 23 through March 6, 1998, a team from the U.S. Nuclear Regulatory Commission (NRC), Special Projects Office, Office of Nuclear Reactor Regulation, conducted a corrective action implementation inspection at Millstone Nuclear Power Station Unit 3.

As part of its oversight of the Independent Corrective Action Verification Program (ICAVP) and to gain further insights into the effectiveness of the licensee's Configuration Management Plan (CMP), the NRC initiated the inspection of a sample of ICAVP and CMP-related corrective action.

The ICAVP corrective action inspection is being conducted in several phases as Northeast Nuclear Energy Company (NNECO) completes corrective action. The scope of the corrective action inspection includes reviewing (1) corrective action for issues that have been identified by the licensee during their CMP, (including items that were identified within the 15-system review scope, and items that were not in the scope of the ICAVP); (2) corrective action for all confirmed Level 3 discrepancies identified by the ICAVP contractor; (3) corrective action implemented in response to findings identified during the NRC inspections associated with the NRC oversight of the ICAVP, including inspections IR 50-423/97-206, the "out of scope" system inspection; IR 50-423/97-209, "Tier 2/3" inspection; and IR 50-423/97-210, the "in scope" system inspection; and (4) corrective action for design-related Licensee Event "Paports (LERs) associated with the recirculation spray system (RSS).

In a letter to the licensee, dated January 30, 1998, the NRC stated that possible ICAVP scope expansion for individual findings will be based on the specific finding, and the effectiveness of the licensee's corrective action. For individual Level 3 findings, effective licensee corrective action needs to address both the specific "defect" as well as any broader implications for other systems.

This inspection focused on the corrective action assigned to Condition Reports (ARs), Adverse Condition Reports (ACRs), LERs, and NRC inspection report violations, unresolved items, and inspector followup items related to the CMP.

Three violations are addressed in this inspection report. The one violation identified by NNECO during the CMP is not being cited because enforcement discretion is being exercised pursuant to VII.B.2 of the NRC's Enforcement Policy. The other violations identified by the team, are examples of failure to take adequate corrective action.

Overall, the team found that the implementation of corrective action during the CMP to be acceptable in that in the majority of the instances, conditions adverse to quality were identified and corrected, in accordance with 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action." Based on the results of this inspection, it is the conclusion of the tearn that the expansion of the scope of the ICAVP is not warranted at this time.

## 1.0 Introduction

The ICAVP corrective action inspection is being conducted in several phases as corrective action is completed by Northeast Nuclear Energy Company (NNECO). The scope of the corrective action inspections includes reviewing (1) corrective action for issues that have been identified by the licensee during their CMP (including items that were identified within the 15- system review scope and items that were not in the scope of the ICAVP); (2) corrective action for all confirmed Level 3 discrepancies identified by the ICAVP contractor; (3) corrective action implemented in response to findings identified during the NRC inspections associated with the NRC oversight of the ICAVP, including inspections IR 50-423/97-206, the "out of scope" system inspection; IR 50-423/97-209, "Tier 2/3" inspection; and IR 50-423/97-210, the "in scope" system inspection; and (4) corrective action for design-related Licensee Event Reports (LERs) associated with the recirculation spray system (RSS).

From February 23 through March 6, 1998, a team from the NRC's Special Projects Office, conducted a corrective action implementation inspection at Millstone Nuclear Power Station Unit 3. In conducting this phase of the corrective action inspection, the team focused on the corrective action assigned to Condition Reports (CRs), Adverse Condition Reports (ACRs), LERs, and NRC ICAVP inspection report violations, unresolved items, and inspector followup items. NRC inspection Procedures 92701, "Followup," and 92702, "Followup on Corrective Action For Violations and Deviations," were used to accomplish this inspection.

## 2.0 Corrective Action

In a letter to the licensee, dated January 30, 1998, the NRC stated that possible ICAVP scope expansion for individual findings would be based on the specific finding and the effectiveness of the licensee's corrective action. For individual Level 3 ICAVP findings, effective licensee corrective action needs to address both the specific "defect" as well as any broader implications for other systems.

2.1 Adverse Condition Reports and Condition Reports

#### 2.1.1 Scope of Review

In a letter dated April 16, 1997, the NRC requested that the licensee identify the significant items needed to be accomplished prior to restart. In a letter dated January 29, 1998, the licensee identified the significant restart items. The team reviewed a sample of the CMP-related CRs and ACRs listed as significant restart items in the January 29, 1998, letter, and verified that the following aspects of corrective action were properly performed:

- Licensee management assigned responsibility for implementing corrective action, including any necessary changes in procedures and practices.
- Corrective action were appropriate and implemented.
- A root-cause analysis was performed when appropriate.
- Repetitive deficiencies were identified and corrected.
- Operability and reportability issues were properly dispositioned.

- Expansion of the scope of corrective action to include applicable related systems, equipment, procedures, and personnel action was performed when appropriate.
- Deferred items and interim resolutions were acceptable.
- Corrective actions were scheduled to be implemented before entering the appropriate mode of
  operation.

The team reviewed 53 ACRs and 36 CRs which are listed in Appendix C.

#### 2.1.2 Findings

(a) Containment Sump Deficiencies

ACRs M3-96-1008, M3-96-1101 and M3-97-0314 dispositioned containment sump deficiencies identified by the licensee. The licensee determined that these deficient conditions could have potentially caused the recirculation spray and emergency core cooling system (ECCS) to become inoperable. In LER 50-423/96-039-00, "Recirculation Spray and Emergency Core Cooling Systems Potentially Inoperable Following a Postulated LOCA - Due to Existing Debris in RSS Sump and Improper Configuration of Sump Cover Plates," dated November 14, 1996, the licensee reported the following:

- Inspections of the RSS pump containment sump suction lines identified foreign material consisting of sand, mud, soft sludge, fibers, rubber, bird feathers, two tie wraps, small segments of weld slag, several pumice stones, pieces of cement (one and a quarter by three quarters inch), two rocks (about one inch in diameter) and two pieces of sheet metal cuttings (one-half inch square and the other one inch square).
- Inspectior: of the containment sump cover deck plates identified gaps that were approximately 1/4 inch which is larger than the 3/32 inch screen size.
- 3. Inspection of the containment sump screens identified gaps larger than the design limits. The largest of the gaps were approximately 2 by 8 inches and 2 by 6 inches. There were four gaps 1 inch square and a number of gaps that exceeded the 3/32 inch screen size.

The team (1) reviewed MMOD M3-97580, "Modifications to RSS Sump Enclosure," Revision 0, (2) walked down the containment sump enclosure, (3) discussed corrective action with the appropriate system engineer, (4) verified that debris in the sump suction lines was removed, and (5) verified that the excessive gaps in the screens and cover plates were repaired. The team reviewed the RSS sump configuration and cleanliness deficiencies identified by the licensee during the CMP that were reported in LER 50-423/96-039-00 and determined that a violation of Technical Specification (TS) 3.5.2, 3.5.3, and 3.6.2.2 requirements occurred. However, after consultation with the Director, Office of Enforcement, it was determined that enforcement discretion can be exercised pursuant to VII.B.2 of the NRC's Enforcement Policy and to not issue a formal Notice of Violation because the violation was (1) based on licensee activities prior to the events leading to the shutdown; (2) not classified higher than a Severity Level II; (3) not willful; and (4) plant restart requires NRC concurrence. Discretion is appropriate because a formal restart plan is currently providing a broad-based evaluation of Millstone readiness for restart that will confirm that the licensee has taken corrective action for this issue; therefore, further enforcement action is not necessary to achieve

remedial action. This violation is noncited because enforcement discretion pursuant to ViI.B.2 was exercised (NCV 50-423/98-205-01).

One corrective action specified in LER 50-423/96-039-00 was for developing and implementing a procedure to ensure that the RSS sump deck plates were properly installed after being removed to perform maintenance in the RSS sump. The team reviewed Maintenance Form 3704A-727, "Preventive Maintenance Technique RSS Sump Deck Plate Removal and Installation," dated July 3, 1997, discussed the use of Maintenance Form 3704A-727 with a work planner, and reviewed AWO M3-95-12527, "Remove/Install the RSS Deck Cover Plates to Support Testing." The team concluded that while the work instructions in Maintenance Form 3704A-727 were adequate to assure proper reinstallation of the deck plates, the work planner was not aware that the work instructions existed and the automated work order (AWO) M3-95-12527 that was issued to accomplish the job was not updated to incorporate the new maintenance instructions detailed in Maintenance Form 3704A-727. 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires that corrections adverse to quality be identified and corrected. The failure to incorporate the new maintenance instructions into AWO M3-95-12527 was identified as a violation (Example 1 - VIO 423/98-205-02).

Another corrective action specified in LER 423/96-039-00 was to revise the containment sump inspection procedure to enhance the containment sump inspection. The team reviewed Surveillance Procedure SP 3612A.1, "Containment Closeout Inspections," Revision 13, Change 1, dated March 21, 1997, and the requirements of TS 4.5.2.d.2. This TS requires that each ECCS subsystem be demonstrated operable at least once each refueling interval by a visual inspection of the containment sump and verification that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) shows no evidence of structural distress or abnormal corrosion. The licensee stated that SP 3612A.1 did not meet TS 4.5.2.d.2 surveillance requirements in that SP 3612A.1 performed an external inspection of the sump, while an internal inspection of the sump is also needed in order to meet TS 4.5.2.d.2 requirements. 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires that conditions adverse to quality be identified and corrected. The failure of the corrective action to incorporate an internal inspection of the RSS sump was identified as a violation (Example 2 - VIO 423/98-205-02).

## (b) Relay Setting Documents Not Revised

The licensee identified that changes made to relay settings for quench spray pump 3QSS\*P3B were not incorporated into all the necessary design documents. The licensee issued CR M3-97-1557 to correct this deficiency. The licensee had completed their corrective action and CR M3-97-1557 was closed. The team identified that the corrective action specified in CR M3-97-1557 to revise documents to reflect the circuit relay setting change for quench spray pump 3QSS\*P3B were incomplete in that the switchgear vendor drawings for the 4.16KV switchgear 3ENS\*SWG-A/B (Drawings 25212-31525, Sheet 6; 2512-39010, Sheet 418; and 25212-39010, Sheets 447 and 460) were not revised to reflect the relay setting change. Additionally, the relay setting change was not entered into the Control Document Library copy of Specification SP-EE-321 (the official copy of record).

10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires that corrections adverse to quality be identified and corrected. Failure to implement the corrective action for the deficiencies identified in CR M3-97-1557 was identified as a violation (VIO 423/98-205-03).

# 2.2 Violations, Unresolved Items, Inspector Followup Items and Licensee Event Reports

#### 2.2.1 Scope of Review

The team reviewed violations (VIOs,) unresolved items (URIs) and inspector followup items (IFI's) identified in NRC ICAVP inspection report 50-423/97-206 and LERs. For IFI's and URIs, the team evaluated the additional information provided by the licensee and determined if conditions adverse to quality existed. For VIOs and LERs, the team verified that adequate corrective action were taken, root-causes identified, generic implications addressed, and that the licensee's quality assurance procedures and practices were appropriately strengthened to prevent recurrence of these issues.

#### 2.2.2 Findings

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#### (a) Response Spectra Analysis

(Closed) URI 423/97-206-15, "Response Spectra Analysis." In NRC Inspection Report 50-423/97-206, the staff identified a concern that piping analysis could be performed in accordance with the licensing and design commitments to analyze piping systems without documenting why a 50 mode or 50 Hz cutoff for a stiff piping system would be acceptable. The licensee issued CR M3-97-4623 to resolve this concern. The corrective action assigned to this CR requires that NETM-44, "Pipe Stress Analysis Criteria Document," be revised to ensure that adequate system response in all piping reanalysis is documented. This corrective action is scheduled to be performed after the Unit 3 restart. The team concluded that this corrective action would be an enhancement to NETM-44 and that there was not a violation of NRC requirements.

## (b) Masses Not Considered in Analyzing Containment Annulus Pipe Rack Structures

(Closed) VIO 423/97-206-16, "Masses Not Considered in Analyzing Containment Annulus Pipe Rack Structures." The licensee did not consider the entire mass of the attached piping in their analysis of the annulus pipe rack structure and did not justify the assumption that the rack structure was rigid in Calculation 03705-SEO-S52.31, "Steel Load Re-verification Program Annulus Pipe Rack Framing Analysis Containment Building," Revision 0. On March 3, 1998, the licensee issued Calculation Change Notice (CCN) No. 2 to Calculation 03709-SEO-S52.31. The change notice documents fundamental frequencies for a representative rack that are in the rigid range for a conservatively estimated mass of piping and adequately predicts the imposed seismic loadings on the rack structure. The team reviewed the CCN to Calculation 03709 SEO-S52.31 and concluded that the CCN and the rack design were acceptable.

## (c) Potential Cable Damage Due to Short Circuit

(Closed) IFI 423/97-206-08, "Potential Cable Damage Due to Short Circuit." This issue relates to potential 4.16KV cable damage under maximum short-circuit conditions. The maximum short-circuit can occur only when an emergency diesel generator is connected to 4.16KV bus 34C or 34D during a full load test. The 4.16 KV aluminum cables previously had a short-time rating of 250° C, below which no damage occurs. The licensee referenced Factory Mutual Lab test results that indicated these cables can withstand temperatures up to 370° C. The team reviewed Factory Mutual Lab test results and concluded that 370° C is an acceptable short-time rating value.

## (d) Undervoltage Circuit Time Delay of 1.8 Seconds Not Justified

(Closed) URI 423/97-206-11, "1.8-Second Time Delay in Undervoltage Circuit Not Justified." The original design of the 4KV system relied upon overcurrent relays on the supply and tie breakers to clear a fault on the bus. The undervoltage circuit is used to initiate a slow transfer from the Normal Station Service Transformer to the Reserve Station Service Transformer. In addition to initiating a slow bus transfer, the undervoltage circuit is used to start the diesel generator after 1.8 seconds. The 1.8 seconds is to allow breaker peration to clear any faults such as a stuck feeder breaker and to allow the slow transfer to occur before starting the diesel generator. The licensee wrote CCN 2 to Calculation NL-040, "Undervoltage Protection Scheme Relay Setting," Revision 1, to provide an explanation of how the 1.8-second setting was derived. The team reviewed the revised calculation and concluded that it justified the 1.8-second time delay.

# (e) Qualification of Containment Systems Following a Design Basis Accident

(Closed) LER 423/96-044-00, "Qualification of Containment Systems Following a Design Basis Accident." The licensee identified that certain portions of systems might not comply with Final Safety Analysis Report (FSAR) commitments for post-accident operability. Parts of the Auxiliary Feedwater System (AFS) in containment classified as a "closed" system were not rated at the required containment design temperature. The LER stated the following corrective action (1) perform a design review of the AFS and associated components before entry into Mode 4, (2) install design modifications required to restore the system to its design basis before entry into Mode 4, (3) restore the system to its design basis requirements before declaring it operable for all modes of plant operation, and (4) maintain the reactor coolant system (RCS) at less than 200 °F until the design basis requirements are restored. The licensee developed Scoping and Criteria documents that defined the scope of the plant systems and components required to function in response to a Design Basis Accident and the criteria to which these systems and components were to be evaluated to ensure their operability. The licensee completed and submitted these documents to Stone & Webster for review. The team reviewed Design Change Report (DCR) M3-97026, "Rerate of Auxiliary Feedwater System Inside Containment," Revision 0, and verified that the AFS inside containment, including the containment penetrations' design temperatures were changed from 100 °F to a design temperature of 280 °F. The team reviewed DCR M3-97091, "FWA Pipe Support Modifications," Revision 0, AWO MP3-97-20082 and AWO MP3-97-04667, and verified that the pipe supports were modified. The team reviewed OP 3201, "Plant Heatup," OPS Form 3201-3, "Administrative and Regulatory Review Prior to Entering Mode 4," dated May 28, 1997, and verified that the procedure instructed operators to maintain the RCS at less than 200 °F until design basis requirements were restored for the auxiliary feedwater system. The team concluded that these corrective actions were adequate.

However, the failure to design the auxiliary feedwater system to the conditions expected to occur during an accident was identified as a violation of 10 CFR 50, Appendix B, Criterion III, Design Control. This licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy. (NCV 50-423/98-05-04)

(f) Piping Supports for Portions of the Residual Heat Removal System in a Condition Inconsistent With the Design Installation Details

(Closed) LER 423/97-16-00, "Piping Supports for Portions of the Residual Heat Removal System in a Condition Inconsistent With the Design Installation Details." The licenses determined that piping

supports for portions of the residual heat removal system (RHS) were in a condition inconsistent with the design installation details. As corrective action, the licensee restored the piping supports to their designed configuration. In addition, the licensee sampled other safety related pipe supports in accordance with American Society of Mechanical Engineers (ASME) Section IWF, Paragraph 2430, to determine if conditions existed that would cause similar piping supports not to perform as intended. The licensee examined an additional 28 RHS supports per AWO M3-97-09123 and concluded that 27 of the 28 supports met the acceptance criteria of ASME Code Case N491-1, Paragraph 3410. The only deficiency identified during the review was that no threads were showing in the peep hole at the top of the strut for pipe support 3 RHS-1-PSST-010, but the licensee concluded that the support was operable in the as found condition. The strut was adjusted to gain full thread engagement at the peep holes. The team concludes that licensee's corrective actions were adequate.

However, the failure to install the residual heat removal system supports in accordance with design installation details was identified as a violation of 10 CFR 50, Appendix B, Criterion III, Design Control. This licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy. (NCV 50-423/98-05-05)

(g) Recirculation Spray System Containment Sump Deficiencies

(Closed) LER 423/96-039, "Recirculation Spray and Emergency Core Cooling Systems Potentially Inoperable Following a Postulated LOCA - Due to Existing Debris in RSS Sump and Improper Configuration of Sump Cover Plates." The corrective action associated with this LER were discussed in Section 2.1.2(a).

(h) Review Closure Package for LER 423/96-039

(Closed) IFI 423/97-203-08, "Review Closure Package for LER 423/96-039." The corrective action associated with this LER are discussed in Section 2.1.2(a).

## 3.0 Conclusion

Although examples of failure to take adequate corrective action were identified during the inspection, the team found that the implementation of corrective action during the CMP to be adequate in that in the majority of the instances conditions adverse to quality were identified and corrected. Examples of failure to take corrective action were identified as violations of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action" (VIO 423/98-205-02 and 423/98-205-03). The deficiencies identified in LERs 50-423/96-039-00, 96-044-00 and 97-016-00 during the CMP, were identified as a non-cited violations (NCV 423/98-205-01, 423/98-205-04 and 423/98-205-05). The team found that the corrective action for the violations, unresolved items, inspector followup items, and LERs met the requirements of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action." Based on this inspection, an expansion of the scope of the ICAVP is not recommended.

## 4.0 Entrance and Exit Meetings

Upon arriving onsite, the team conducted an entrance meeting to brief the licensee on the scope and duration of the inspection. After completing the onsite inspection, the team leader conducted an exit meeting with the licensee on April 9, 1998, that was open for public observation. Appendix B present a partial list of persons who attended the exit meeting.

# Appendix A

# Summary of Inspection Results

# Violations Identified During the Inspection

item Number	Туре	Section	Status	Title
423/98-205-01	NCV	2.1.2(a)	closed	RSS Containment Sump Discrepancies
423/98-205-02	VIO	2.1.2(a)	open	Failure to Implement Adequate Corrective Action, Two Examples
423/98-205-03	VIO	2.1.2(b)	open	Failure to Implement Adequate Corrective Action
423/98-205-04	NCV	2.2.2(e)	closed	Failure to Design the Auxiliary Feedwater System to the Conditions Expected to Occur During an Accident
423/98-205-05	NCV	2.2.2(f)	closed	Failure to Install the Residual Heat Removal System Supports in Accordance with Design Installation Cetails

Closed Unresolved Items, Inspector Followup Items, Licensee Event Reports and Violations

Item Number	Туре	Section	Status	Title
423/97-206-08	IFI	2.2.2(c)	closed	Potential Cable Damage due to Short Circuit
423/97-206-11	URI	2.2.2(d)	closed	Time Delay in Undervoltage Circuit Not Justified
423/97-206-15	URI	2.2.2(a)	closed	Response Spectra Analysis
423/97-206-16	VIO	2.2.2(b)	closed	Masses Not Considered in Analyzing Containment Annulus Pipe Rack Structures
423/97-203-08	IFI	2.2.2(h)	closed	Review Closure Package for LICENSEE EVENT REPORT 96-039
423/96-039	LER	2.2.2(g)	closed	RSS Containment Sump Deficiencies
423/96-044	LER	2.2.2(e)	closed	Qualification of Containment Systems Following a Design Basis Accident
423/97-016	LER	2.2.2(f)	closed	Piping Supports for Portions of the Residual Heat Removal System in a Condition Inconsistent With the Design Installation Details

### Appendix B

#### **Exit Meeting Attendees**

## NAME

Richard Laudenat Raymond Necci Allen Price Martin Bowling Harry Miller Drexel Harris Michael Ahern John Swientoniewski Carol Pietriyk Joe Fougere Neal Madden Paul Grossman

Gene Imbro Stephen Tingen Peter Koltay Harold Eichenholz Ralph Architzel Beth Korcolo

#### ORGANIZATION

NNECO-ICAVP Director, Configuration Management Plan Director, MP2 MP2 Recovery Officer Director, Unit Services Regulatory Compliance Manager, Design Engineering Director, MP2 Nuclear Safety ICAVP Team Coordinator Manager, ICAVP ICAVP, Unit 3 Director, Engineering

NRC/Deputy Director ICAVP/SPO NRC/ICAVP/SPO NRC/ICAVP/SPO NRC/ICAVP/SPO NRC/ICAVP/SPO NRC/ICAVP/SPO NRC/Resident Inspector

#### Appendix C

#### List of Documents Reviewed

1. Averse Condition Reports/ Condition Reports

ACR 161, "Fan 3HVQ\*FN5A/6A Does Not Reflect Logic"

- ACR 842, "Torquing Technique for Westinghouse Swing Check Valves"
- ACR 1162, "Qualified Life for Component Cooling System Surge Tank Level Switches"

ACR 3675, "Qualification of Narrow Range Resistance Temperature Detectors"

ACR 4556, "Auxiliary Building Ventilation Vent Monitor Locked Up"

ACR 5225, "Steam Generator Blowdown Monitor Locked Up"

ACR 5785, "Starting Large Loads on Balance of Plant Diesels"

- ACR 6159, "Wrong Schedule of Pipe Issued to Field; Pipe Incorrectly Labeled in Warehouse"
- ACR 7349, "Logic Chip Failure in Radiation Monitor for Hydrogen Recombiner Vent"
- ACR 7705, "Failure of Radiation Monitor Power Supply Resulted in Inoperable Hydrogen Recombiner"
- ACR 8314, "Valves 3RHS\*MV8701A and 3RHS\*MV8702B Susceptible to Pressure Locking"
- ACR 8425, "Operators Exceeded Component Cooling Temperature Limits During Cooldown"
- ACR 8571, "Intermittent High Voltage Failures of Hydrogen Recombiner Vent Radiation Monitor"
- ACR 8644, "Potential for Moisture Intrusion into Core Exit Thermocouples"
- ACR 8907, "Inconsistencies in Specified Auxiliary Feedwater Flows and Pressures"
- ACR 10573, "Water Dripping From Spare Electrical Conduit in the Engineer Safeguards Features Building"
- ACR 10783, "Tube Steel (Totally Encapsulated) Exposed to 45 Pounds per Square Inch External Pressure"

ACR 12332, " Fuel Drop Monitor Locked Up"

ACR 13427, "Loss of Air to RHS Flow Control Valves."

ACR M3-96-0012, "Inconsistencies in Specified Auxiliary Feedwater Flows"

ACR M3-96-0607, "Main Control Board Electrical Separation Problems"

ACR M3-96-0072, "Vital Bus Feeder Cable Size Verification"

ACR M3-96-0080, "Wiring of Manual Reactor Trip Switches Did Not Meet Separation Criteria"

ACR M3-96-0081, "Potential Separation Nonconformances Involving Solid State Protection System Wiring"

ACR M3-96-0086, "Water Dripping Through Conduits onto Battery Breaker in Battery Panel 3"

ACR M3-96-0204, "Fuel Drop Monitor Locked Up"

ACR M3-96-0229, "Hydrogen Recombiner Vent Monitor Locked Up"

ACR M3-96-0275, "Temporary Channel Supports Used for Instrument Air Lines"

ACR M3-96-0326, "Maximum Component Cooling Water Temperatures"

ACR-M3-96-0426, "Appendix R Audit Issues"

- ACR M3-96-0569, "Communication with Majority of Radiation Monitors in One Data Loop Failed Because of Connector Corrosion"
- ACR M3-96-0689, "Casual Factors and Corrective Actions Need to be Tied into Past Emergency Diesel Generator ACR'S"

ACR M3-96-0713, "Power Range Nuclear Instrumentation Was not Being Tested in Accordance with FSAR Commitments"

ACR M3-96-0884, "Fuel Drop Monitor Locked Up"

ACR M3-96-0310, "Auxiliary Building Ventilation Heaters Not Added to Station Blackout Diesel Generator Loads"

- ACR M3-96-0898, "Failure of Non-Seismic Spent Fuel Pool Lines Could Drain Spent Fuel Pool Below Cooling Suction Lines"
- ACR M3-96-0937, "Loose Pipe Clamp was Identified on Pipe Support 3RCS-1-PSSP0832"
- ACR M3-96-0987, "Loose Bolt Found on Pipe Support Clamp (Snubber) 3RCS-1-PSSP-0840"
- ACR M3-96-1008, "Containment Sump Deficiencies"

ACR M3-96-1101, "Containment Sump Deficiencies"

ACR M3-96-1078, "Systems Subject to Secondary Loading Concerns"

ACR M3-96-1146, "Loose Pipe Supports on Pressurizer Safety Relief Valve Lines"

- ACR M3-96-1133, "Hydrogen Recombiners Have Non-Quality Assurance Temperature Switches"
- ACR M3-96-1247, "Power Supply Failure in Radiation Monitor for Turbine Building Floor Drains"
- ACR M3-96-1344, "Inconsistencies in Specified Auxiliary Feedwater Flows and Pressures"

ACR M3-97-0040, "Engineering Calculations for Pipe Supports Not Current"

ACR M3-97-0089, "Failed Snubber 3RCS-1-PSSP1093"

ACR M3-97-0226, "Structures Monitoring Program Lacks Performance Criteria"

ACR M3-97-0256, "Pipe Support 3-SWP-4-PSR 121 Has Dimensional Baseplate Discrepancies"

ACR M3-97-0287, "Non-Quality Assurance Parts Used Without MEPL Evaluation"

- ACR-M3-97-0522, "Inadequate Voltage at 480V Main Control Center during Degraded Grid"
- ACR M3-97-0314, "Containment Sump Deficiencies"
- ACR M3-97-0564, "Stock Codes for Insulation do not Invoke any Specifications or Technical Requirements"

CR M3-97-0604, "Inconsistencies in Specified Reactor Cavity Water Levels"

- CR M3-97-0730, "Emergency Diesel Generator Voltage limits in TS Do Not Agree With Design"
- CR M3-97-0794, "Loss of Communication with Emergency Safeguards Feature Building Exhaust Radiation Monitor"
- CR M3-97-1077, "Drawing EE-1CKN Not Consistent With OPS Form or Electrical Alignment"
- CR M3-97-1151, "Containment Paint Blistering"
- CR M3-97-1278, "EOPs Did not Consider Instrument Uncertainties in Auxiliary Feedwater Flow Indicators Resulting from Containment Accident Environment"

CR-M3-97-1361, "Direct Current Calculation Discrepancies"

- CR M3-97-1388, "Unit 3 Technical Library Contains Controlled Documents for Systems 3306 and 3346A That Do Not Have Current Changes"
- CR M3-97-1444, "Basis for Temperature Alarms for Emergency Generator Load Sequencer Room"
- CR M3-97-1525, "Twenty Change Documents Found With FSAR Figures Changed Without Safety Evaluations"
- CR M3-97-1541, "Ambient Temperature Range in Instrument Rack Room and Effect on Equipment Qualification"
- CR M3-97-1621, "Lack of Seismic Qualification Program Instructions"
- CR-M3-97-1802, "Fuel Building Exhaust Fan Singlo Failure"
- CR-M3-97-2011, "Verification of Emergency Diesel Generator Auto Start Signal"
- CR M3-97-2041, "Radiation Monitor Background not Reading Correctly"
- CR M3-97-2088, "Auxiliary Feed Calculated Operating Pressures Greater than Design"
- CR M3-97-2178, "Stress Calculation Identifies a Higher Temperature than Design and is Missing Line 3-SVV-150-212-04 (Calculation No. SDP-SVV-01369M3, Revision 3"
- CR M3-97-2190, "Instrumentation and Control and Maintenance and Test Equipment Discrepancies"

- CR M3-97-2235, "Environmental Quality Discrepancies Identified During Walkdowns"
- CR M3-97-2251, "Review of AWOs indicated Non-Quality Parts Used Without MEPL Evaluation"
- CR M3-97-2252, "Review of AWOs Indicates Deficiencies in Production Maintenance Management System"
- CR M3-97-2253, "Review of AWOs Indicates Insufficient Documentation in AWOs"
- CR M3-97-2474, "Is Re-Coating of Previously Reworked Welds Inside Containment Liner Considered a Code Repair"
- CR-M3-97-2764, "Elevation Separation in Cable Spread Room"
- CR M3-97-2874, "Corrective Action Trend Report Results"
- CR M3-97-2998, "Hydrogen Monitor Operational Requirements"
- CR M3-97-3205, "Embedded Plate Calculation Discrepancy"
- CR-M3-97-3413, "4KV Fault Clearing Times"
- CR M3-97-4015, "Tornado Dampers May Not Reopen Following a Tornado"
- CR M3-97-4513, "Masses Not Considered in Analyzing Containment Annulus Pipe Rack Structures"
- CR M3-97-4622, "Structural Steel Pipe Whip Restraints"
- 2. Plant Design Change Documents
- PDCR MP3-95-036, "Pressure Locking Modifications to Valves 3RHS\*MV8701A and 3RHS\*MV8702B, Revision 0"
- MMOD M3-97580, "Modifications to RSS Sump Enclosure, Revision 0"
- DCN DM3-00-0490-97, "Modifications Required From Engineering RSS Sump Inspections," dated August 9, 1997
- DCN DM3-00-537-97, "Spent Fuel Pool Purification Modification," dated July 18, 1997
- DCN DM3-00-970-97, "Structural Modifications to Alleviate Interferences," dated November 11, 1997

- DCN DM3-00-1040-97, "Spent Fuel Pool Purification and Reactor Water Storage Makeup Pipe support Modifications," dated July 21, 1997
- DCN DM3-00-0281-97, "Insulation Requirements for General Thermal Insulation Specification SP-ME-691," dated February 27, 1997
- DCN DM3-00-460-97, "Incorporate the Latest Field Verified Suppressor Cold Sets into SP-ME-570," dated April 3, 1997
- DCN DM3-00-1600-96, "Incorporation of Field Verified Information for Supports for Stress Problem 12179-NP (B)-X1907," dated December 19, 1996
- DCR M3-97091, "Auxiliary Feedwater Pipe Support Modifications, Revision 0"
- DCR M3-97026, "Rerate of Auxiliary Feedwater System Inside Containment," Revision 0
- DCR M3-96065, 3RHS\*HCV 606 and 607 "Failure and Adverse Effect on Component Cooling Piping," Revision 1
- DCR M3-96075, "Component Cooling Piping System Design Temperature and Support Modifications," Revision 2
- DCR M3-97015, "Component Cooling Piping Supply & Return Piping Temperature Re-Evaluation," Revision 1

NETM 44, "Pipe Stress Analysis Criteria Document," Revision 2, Change 4

- 3. Operating Procedures
- OP 3305, "Fuel Pool Cooling System Valve Lineup," Revision 4
- OP 3313A, "Hydrogen Recombiners, Hydrogen Monitors and Recombiner Building Ventilation," Revision 13

OP 3210A, "Refueling Preparation," Revision 11

OP 3310A, "Residual Heat Removal System," Revision 14

OP 3353.MB1D, "Main Board 1D Annunciator Response," Revision 2

Op 3353.MB1E, "Main Board 1E Annunciator Response," Revision 2

OP 3250.62, "Restoring Radiation Monitor to Service," Revision 6

EOP 3505A, "Loss of Spent Fuel Pool Cooling," Revision 4

4. Surveillance Procedures

SP 3612A.1, "Containment Inspections," Revision 13, Change 1

IST 3-97-007, "B" Train Post Modification Test," Revision 0

SP 31138, "Snubber Visual Inspection," Revision 2

5. Maintenance Documents

- Maintenance Form 3704A-727, "Preventive Maintenance Technique RSS Sump Deck Plate removal and Installation," Revision 0
- AWO M3-95-12527, "Removal of Containment Sump Cover Plates," dated September 7, 1998

MP 3766AH, "Westinghouse Swing Check Valve Repair," Revision 2, Change No. 2

"Millstone Unit 3 Maintenance Rule System Basis Document-Structures (All)," Revision 1

Station Procedure OA 10, "Millstone Station Maintenance Rule Program," Revision 1

"Maintenance Rule Action Plan for the Radiation Monitoring System," Revision 3

"Maintenance Rule Functional Failure Report for Radiation Monitoring (3404)," dated January 1998.

CMP 714C, "Mechanical Snubber Removal & Installation", Revision 0, Change 1

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FSACR M3-97-0426, dated February 27, 1998.

FSACR M3-97-0090, dated March 19, 1997

NUREG-1031, Millstone Power Station, Unit 3.

7. Calculations

.

Calculation 96-0012, "Flow Rates For Steam Generator Pressures 900-1329 Pounds Per Square Inch," Revision 0

Calculation 86-089-133M3, "Loss of Normal Feedwater," Revision 1

- Calculation 96-ENG-1260-M3, "MP3 Steam System Pressure Based on Safety Valve Accumulation and Setpoint Drift," Revision 1
- Calculation 97-ENG-01378C3, "Review and Documentation of Snubber Data," Revision 0
- Calculation 3ENG-212, "Snubber "C" Dimension Ranges," dated March 31, 1997
- Calculation 12179-NP(F)-Z19A-121, "Design of Pipe Support: 3-SWP-4-PSR121," Revision 7, Change 3
- Calculation 12179-CFSK-732E-E66, "Qualification of Embedded Plate," Revision 1
- Calculation SDP-FWA-01347M3, "FWA Stress Data Package," Revision 6, Change 1
- Calculation 12179-SEO-S52.31, "Steel Load Re-Verification Program Annulus Pipe Rack Framing – Containment Building Between Column Lines 17 & 20," Revision 0, Change 2
- Calculation 12179-SP-3HVP-5, 3HVP\*TIC29A & B, "Temperature Indicating Controller Maintaining the Diesel Generator Enclosure During Diesel Operation," Revision 0, Change 1
- Calculation W3-517-981-RE, "Millstone 3 EOP Setpoint Documentation," Revision 7
- Calculation SP-3RCS-8, "3RCS-TE400 and 3RCS-TB400 Setpoint," Revision 0, Change 1
- Calculation EEQ-TRA-230.0, "Aging/Qualified Life Evaluation for Component Cooling Pump Surge Tank Level Switches," Revision 0
- 8. Drawings

12179-EM-112A-34, "Low Pressure Safety Injection"

- 12179-EM-121A-26, "Reactor Plant Component Cooling System"
- 25212-39624, Sheet 431, "Radiation Monitoring System Block Diagram," Revision A
- 9. Miscellaneous Documents
- Memorandum NMDM-98-035, "ACR#006159 Issue of Incorrect Pipe," dated March 3, 1998
- "Nuclear Production Materials Monthly Storage Surveillance Report," dated August 1997

- "Nuclear Production Materials Monthly Storage Surveillance Report," dated September 1997
- "Nuclear Production Materials Monthly Storage Surveillance Report," dated October 1997
- Memorandum CS-MP3-97-19, "Snubber 1-23837 Failure Analysis," dated January 27, 1997
- Memorandum NL-97-209, "Safety Evaluations for Drawing Changes," dated August 21, 1997
- Memorandum MP3-DE-97-1359, "Review of Service Water System Piping Components in Lines 3-SVV-150-134/137/140/143-04," dated September 19, 1997
- Memorandum MP3-DE-98-0017, "Review of Containment Steel Due to Thermal Expansion – Millstone Unit 3," dated January 10, 1998

Memorandum Titled, "Follow-up on CR M3-97-4622," dated March 5, 1998

- Memorandum MP3-DE-98-0003, "Review of Design Pressure Data for Auxiliary Feedwater System Contained in Design Documents – Documentation of Results (Reference AR #97016488-02)," dated January 2, 1998
- ERC No. 25212-ER-97-0252, "Millstone Unit 3 Evaluation of "Category B" Piping Systems," Revision 0
- "Nuclear Materials Management Department Procedure NMMI-002," Storage of Items, Revision 3
- "Engineering Procedure EN 31098, MP3 Condition Monitoring of Structures," Revision 1
- "Nuclear Group Procedure NGP 5.19, Seismic Qualification Reviews," Revision 5
- NGP 6.10, "Use of the Production Maintenance Management System Identification System Database," Revision 8
- MPM 1.00, "Requesting Items and Services," Revision 2, Change 4
- "Checklist for Process Monitor Troubleshooting," dated September 26, 1995

"Checklist for Troubleshooting," dated January 20, 1997

NOQP-3.04, "Nuclear Oversight Department Quality Procedure, Nuclear Safety Engineering Group Functions and Responsibilities, Independent Safety Engineering Group and Operating Experience Assessment, Figure 8.2, Vendor Information Flow Chart," Revision 1 Station Procedure DC 16, "Vendor Equipment Technical Information Program," Revision 0

- Procedure WC-8, "Control and Calibration of Measuring and Test Equipment," Revision 2
- "Safety Evaluation S3-EV-0584 to Support FSARCR 97-MP3-581," dated December 11, 1997
- "Engineering Self-Assessment Report PES-97-005, Engineering Self-Assessment of the Electrical Equipment Qualification Program, Millstone Nuclear Power Station, Unit 3," dated April 12, 1997
- "Master Setpoint List Entry for 3HVP\*TIC29A & B," dated March 3, 1998
- "Memo MP3-DE-97-1640, Subject: Category I Controller Setpoints," December 18, 1997

"Master Setpoint List Entry for 3RCS-TB400," dated March 3, 1998

"Westinghouse Letter NEU-96-554," dated June 7, 1996

Memo MP3-DG-96-232, W. J. Hayes to M. S. Kai, dated September 26, 1996

EQR 230-0-1, "Equipment Qualification Record for 3CCP\*LS196A & B," Revision 0

EQR 132-1-1, "Equipment Qualification Record for Narrow Range RTDs," Revision 1

EQR 132-1-4, "Equipment Qualification Record for Wide Range RTDs," Revision 0

ESAR PES-97-027. "Engineering Assurance Assessment - Review of 10 CFR 50.59 Safety Evaluation Screenings," dated June 24, 1997

10. Specifications

Specification SP-ME-691, "Specification for General Thermal Insulation (Design and Installation) for MNPS – Unit 3," Revision 0

Specification M345, "Specification for Removable Thermal Insulation," Revision 1

Specification SP-ME-570, "Design Specification for Field Fabrication and Erection of Piping and Supports," Revision 3

#### 11. Automated Work Orders

AWO MP 96 C3834, dated 10/7/96. AWO MP 96 17245, dated 10/16/96. AWO MP 96 17339, dated 10/18/96. AWO MP 96 17886, dated 10/30/96. AWO MP 96 18150, dated 11/30/96. AWO MP 96 18567, dated 11/14/96. AWO MP 96 18569, dated 11/14/96. AWO MP 96 18570, dated 11/14/96. AWO M3 97 11023, dated 7/1/97. AWO M3 97 11023, dated 7/1/97. AWO M3 97 11247, dated 7/1/97. AWO M3 97 11368, dated 6/30/97 AWO M3 97 09123, dated 5/09/97

# Appendix D

# List of Acronyms

ACR	adverse condition report
ASME	American Society of Mechanical Engineers
AWO	Automated Work Order
С	Centigrade
CFR	Code of Federal Regulations
CMP	Configuration Management Plan
CR	Condition Report
DCN	Design Change Request
DCR	Design Change Report
EOP	Emergency Operating Procedure
ERC	Engineering Record of Correspondence
EWR	Engineering Work Request
F	Fahrenheit
FSACR	Final Safety Analysis Change Request
FSAR	Final Safety Analysis Report
ICAVP	Independent Corrective Action Program
IFI	Inspector Followup Item
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
KV	Kilovolts
MEPL	Material Equipment and Parts List
NCV	Noncited Violation
PDCR	Plant Design Change Request
RCS	Reactor Coolant System
RHS	Residual Heat Removal System
RSS	Recirculation Spray System
SPO	Special Projects Office
TS	Technical Specification
URI	Unresolved Item
VIO	Violation