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P. O. Box 128  
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Facility: Millstone Nuclear Power Station, Unit 3

Inspection at: Waterford, CT

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Region I

## EXECUTIVE SUMMARY

### **Millstone Nuclear Generating Station, Units 2&3 NRC Inspection Report 50-336/99-10 and 50-423/99-10**

#### Introduction

An on-site team inspection of the Engineering area was conducted at the Millstone Nuclear Power Station, during the period of September 7-10, September 20-24 and October 21-22, 1999. The overall objective of the inspection was to determine whether engineering provided proper support for safe operation of the facility. The inspection included 1) an evaluation of the 10 CFR 50.59 safety evaluation program related to changes, tests, or experiments at the plant, and 2) a comparison of operability determinations, safety evaluations, engineering work requests and condition report engineering dispositions between Unit 2 and Unit 3 for the six months preceding the inspection.

The team focused on systems with high risk significance. The target systems for the inspection were selected from a list of the ten most significant systems, avoiding those systems reviewed by the Operational Safety Team Inspection. The systems selected were auxiliary feedwater, 4160VAC electrical distribution, 125VDC electrical distribution, service water, feedwater, and refueling water storage tank.

#### Engineering

- Design change modifications were properly designed and implemented. The safety evaluations provided sufficient bases to demonstrate that no unreviewed safety questions were involved in the modifications. The design change documents were well written and thorough. The post modification tests were conducted appropriately to test the systems prior to declaring the system operable. The supporting calculations, where applicable, were appropriate to justify the design changes. Affected documents were appropriately updated to reflect the design changes. (Section E1.1)
- Temporary modifications were properly designed and implemented. The design changes correctly addressed the concerns for which the modifications had been developed. The evaluation, installation, post-modification-test requirements, and safety reviews provided by engineering presented adequate technical basis for the modifications. (Section E1.2)
- Overall, the sampled Operability Determinations (OD), Safety Evaluations (SE), Design Change Request (DCR) summaries, root cause analyses and 10 CFR 50.59 assessments were found to be acceptable, adequately managed and timely. Technical discussions were well written, adequately supported and thoroughly referenced. Applicable root cause analyses were detailed and the depth of the analyses was commensurate with the significance of the issues. When compared to Unit 2, Unit 3 ODs, 10 CFR 50.59 assessments, root cause evaluations, DCR Summaries and SEs

were found to be more detailed, more clearly written and better supported by reference. These differences contributed to the perception of a difference in overall review quality between the two units, although, no significant difference in engineering support was identified. (Section E2.1)

- Discrepancies in the calculation for the Unit 3 containment sump trisodium phosphate concentration used to support the Technical Specification requirements resulted in an unresolved item (URI 50-423/99-10-01). (Section E2.1)
- Based on the quality of the selected Engineering department work products and training/qualification documentation supplied from various sources, the team concluded that the sampled Engineering department engineers and supervisors who provided technical information, analysis and operational support possessed adequate technical expertise to provide the engineering service. (Section E4.1)
- The Independent Safety Engineering Group (ISEG) provided valuable feedback to the line organizations regarding the operation of the Millstone facility. The ISEG had been effective in identifying deficiencies and areas for improvement. The ISEG also determined that corrective actions for some prior deficiencies were ineffective or untimely. A specific example was the identified deficiency associated with the training documentation of engineering personnel that was not corrected in a timely manner to prevent a recurrence of the problem. The failure to correct conditions adverse to quality in a manner to prevent recurrence was a non-cited violation (NCV 50-423/99-10-02). (Section E7.1)
- In general, NNECO's corrective action process, the Condition Report (CR) program, adequately controlled, tracked, identified, resolved, and prevented recurrence of problems identified in Engineering department self assessments, Operability Determinations, Design Change Report summaries, Safety Evaluations and Nuclear Oversight reviews. No significant difference in overall CR program implementation quality was identified between the two units. (Section E7.2)
- NNECO Nuclear Oversight adequately performed assessments of Engineering department related activities. Assessment activities and findings were appropriately oriented toward maintaining the design basis of the units, ensuring the operability of safety related equipment, identifying conditions of increased risk, and maintaining NNECO quality standards. Most Nuclear Oversight assessment findings were administrative and/or process related in nature and the most significant assessment findings were generally related to inadequate corrective actions for a previously identified CR condition. (Section E7.3)

NNECO Engineering department self assessments were detailed, varied in scope, well supported, thoroughly referenced and safety oriented. Many of the self assessment findings were of a technical nature, but most were administrative. Assessment findings were assigned to the CR process, given appropriate CR significance, adequately tracked and managed, and corrected in a timely manner. Typical self assessment issues were assigned CR significance levels of 2 or 3, and had no immediate impact on the safe operations of the units. (Section E7.4)

## TABLE OF CONTENTS

	<u>PAGE</u>
I. ENGINEERING .....	1
E1 Conduct of Engineering .....	1
E1.1 Plant Design Modifications .....	1
E1.2 Temporary Modifications .....	3
E2 Engineering Support of Facilities and Equipment .....	4
E2.1 Operability Determinations, Safety Evaluations, Design Change Request (DCR) Summaries and 10 CFR 50.59 Assessments .....	4
E4 Engineering Staff Knowledge and Performance .....	7
E4.1 Engineering Knowledge and Performance .....	7
E7 Quality Assurance in Engineering Activities .....	9
E7.1 Independent Safety Engineering Group .....	9
E7.2 Problem Identification and Resolution .....	10
E7.3 Nuclear Oversight of Engineering .....	11
E7.4 Engineering Self-Assessments .....	12
II. MANAGEMENT MEETINGS .....	13
X1 Exit Meeting Summary .....	13
X2 Management Meeting Summary .....	13

## Report Details

### I. ENGINEERING

#### E1 **Conduct of Engineering**

##### E1.1 Plant Design Modifications

###### a. Inspection Scope (37550)

The team reviewed the preparation and implementation of selected permanent plant design modifications installed during the last refueling outage to verify the design change process complied with the applicable plant administrative procedures and regulatory requirements, and to evaluate the effectiveness of Northeast Nuclear Energy Company's (NNECo's) engineering activities in ensuring the plant design bases were maintained, and operational safety was assured. The team also conducted walkdowns of selected installations to verify their conformance with applicable documents.

###### b. Observations and Findings

Permanent plant design changes at the Millstone Nuclear Power Station were governed by design control manual DCM-03. This manual outlined the process by which design change records and minor modifications were required to be prepared, reviewed, approved, implemented and closed. The team found the established modification procedures contained adequate detail to provide appropriate guidance for the engineering organization to evaluate, develop, and document the essential elements of the design changes.

Overall, the modifications were well designed and documented. The team found that the design change packages contained detailed design and installation requirements; including the bases of the current design, method of change, design inputs, and adequate procurement requirements. With the exception noted below, the packages included proper safety evaluations, implementation and operational considerations, and the post modification test requirements. The team determined that installation instructions were detailed with appropriate acceptance tests and acceptance criteria clearly specified. The team found that the applicable design documents, procedures, and calculations had been updated to reflect the design changes, as required by the design control procedures. The team reviewed a portion of the applicable drawing revisions and vendor manual changes and determined the modifications had been captured into the controlled documents system. A walkdown of selected installations revealed no problems.

One modification, M3-98-039, Service Water Piping Modification, was scheduled for installation during the last refueling outage; however, the implementation of the design change had been delayed. This modification involved the installation of a pair of flanges on each ten inch line that connects the service water system to the auxiliary feedwater system to facilitate spool piece removal. The spool pieces were intended to allow internal inspections that were required to meet commitments made in response to NRC Generic Letter 89-13, and to detect erosion, corrosion, and biofouling. Currently, NNECo is in the process of re-evaluating the necessity of this proposed modification.

#### DCR M3-99004, Auxiliary Feedwater Pump Design Changes to 3FWA\*P2

The governor valve for the Auxiliary Feed Water (AFW) pump turbine had a poor operational history due to binding attributed to corrosion of the governor valve stem. The review of safety evaluation S3-EV-99-0009, which supported the modification, revealed a weakness in the technical basis for the replacement of the governor valve stem base material. The replacement material was recommended by the valve vendor who indicated the material change would increase corrosion resistance of the stem. The safety evaluation performed by the licensee provided no technical discussion regarding the suitability of this material for service other than reference to the vendor recommendation as "suitable in form, fit and function". The licensee provided further that "the material change can only improve reliability and reduce the probability and consequences of equipment malfunction and/or accidents previously evaluated in the SAR [safety analysis report]".

The team noted during review of the modification package and interviews of licensee personnel that the vendor had made previous recommended material changes for this application which proved to be unsatisfactory. Interviews with licensee personnel revealed that there were early efforts to produce an "equivalency evaluation" of this specific stem material change recommended by the vendor to confirm expectations that this material (Inconel 718) would be suitable for service. This effort was not formally concluded and therefore was not considered a basis to support the material change.

Installation of the replacement material at other nuclear facilities revealed that this stem material was susceptible to "binding" with the surrounding steel washers and carbon spacers, as identified in NRC Information Notice 98-24, "Stem Binding in Turbine Governor Valves in Reactor Core Isolation Cooling (RCIC) and Auxiliary Feedwater (AFW) Systems." The binding was attributed to thermal expansion of the stem upon heat up to component operating temperature as there had been no compensating change in the spacer hole size. The replacement material exhibited a thermal expansion rate considerably in excess (40%) of prior valve stem materials (type 410 stainless steel). The stem, washers and carbon spacers were not installed at the Millstone site until after the material thermal expansion problem had been identified and corrected by the Vendor (10 CFR 21 report, April 16, 1998). The team found that the vendor had identified, as part of its 10 CFR 21 investigation, that the valve stem binding problems which were described in the information notice all occurred with valve stems manufactured by a third party, to incorrect dimensions provided by another utility from reverse-engineering a spare stem. Since NNECo purchased their valve stem from the

original equipment vendor, and the certificate of compliance provided with the stem specifically stated that the parts "...are compatible and interchangeable with their original equipment..." the team concluded that the lack of a specific evaluation of material properties was acceptable.

c. Conclusions

Overall, design change modifications were properly designed and implemented. The safety evaluations provided sufficient bases to demonstrate that no unreviewed safety questions were involved in the modifications. The design change documents were well written and thorough. The post modification tests were conducted appropriately to test the system prior to declaring the system operable. The supporting calculations, where applicable, were appropriate to justify the design changes. Affected documents were appropriately updated to reflect the design changes.

E1.2 Temporary Modifications

a. Inspection Scope (37550)

The team reviewed a sample of temporary modifications (TM) to determine whether the TMs were properly designed and implemented in compliance with plant established administrative procedures and regulatory requirements. The TMs were also reviewed to determine the extent of engineering involvement, quality of design inputs, implementation of safety evaluations, and post installation testing requirements.

b. Observations and Findings

The team reviewed several TMs, including both open and closed modifications. The TMs reviewed were found to be prepared and implemented in compliance with the licensee's procedure (WC-10, Temporary Modifications) which governed the TM process. The team reviewed each TM to determine if the required safety evaluation screening process had been completed and when required, the safety evaluation was completed, reviewed and approved. The safety evaluations were reviewed to determine the extent and quality of engineering involvement. The team found the safety evaluation screening process provided a logical approach with good technical bases for the conclusions. The team reviewed the completed safety evaluations and found them to provide adequate analysis of the affect on plant safety and licensing requirements. The team noted that the modifications had been prepared with good engineering involvement in providing design inputs, technical evaluations and specification of installation and post work testing requirements.

The team observed that the modification packages were adequately prepared and documented, and conformed to the station's procedural requirements. The modification packages included relevant drawings, safety evaluations, PORC approvals, and the installation verification instructions for the TMs.

The station had fourteen outstanding TMs at the time of this inspection, with a goal of ten. At the time of the inspection, the number of TMs installed in the plant was trending down.

c. Conclusions

The temporary modifications were properly designed and implemented. The design changes correctly addressed the concerns for which the modifications had been developed. The evaluation, installation instructions, and safety reviews provided by engineering presented adequate technical bases for the modifications.

**E2 Engineering Support of Facilities and Equipment**

E2.1 Operability Determinations, Safety Evaluations, Design Change Request (DCR) Summaries and 10 CFR 50.59 Assessments

a. Inspection Scope (37550, 92903)

The team reviewed a sample of Operability Determinations (ODs), Safety Evaluations (SEs), Design Change Request (DCR) summaries and 10 CFR 50.59 Assessments, to assess the adequacy of engineering involvement in and support for the resolution of operating, technical and regulatory issues.

b. Findings and Observations

Overall Quality of ODs, SEs, 50.59 Assessments and DCR Summaries

Based on the sample of ODs, SEs, DCR summaries, root cause evaluations and 10 CFR 50.59 assessments, the team found the resolution of the selected issues to be technically adequate, generally well written and documented, technically well supported, thoroughly referenced, and completed in a timely manner. Issues were adequately administered and tracked in accordance with NNECO procedures. Operability was routinely discussed and evaluated in terms of the ability of the components to perform their safety functions and within the context of the design and licensing bases. Root cause analyses were usually detailed and were accomplished at a depth commensurate with the safety significance of the issues. Followup actions were delineated as Condition Reports (CRs), entered into the corrective action process, and assigned appropriate levels of significance. Based on the sampled activities, engineering support for ODs, SEs, DCRs and 10 CFR 50.59 assessments was determined to be adequate.

### Comparison of Work Products Between Units

The Engineering department support activities of both units were based on the same reference NNECO procedures and policies. When compared to Unit 2, the Unit 3 ODs, 10 CFR 50.59 assessments, DCR summaries, root cause evaluations, and SEs were found to be more detailed, more clearly written and better supported by reference. These differences contributed to the appearance of a difference in overall analysis quality between the two units, although no significant difference in engineering support, technical content or work product quality was identified by the team.

### Safety Evaluation, S3-EV-99-0009 - Auxiliary Feedwater Pump Rotating Assembly and Governor Valve Stem Material Replacement

S3-EV-99-0009 addressed, among other things, a replacement stem for the turbine-driven auxiliary feedwater pump governor valve, 3MSS-MCV5. The material for the stem was changed from a nitrided 410 stainless steel to an Inconel 718 alloy. The design change associated with this SE was discussed in Section 1.1 of this report. The assessment did not address thermal expansion or other mechanical properties of the new stem which were critical attributes and differed from those of the replaced stem. The safety evaluation relied on an assertion of "fit, form, and function," from the vendor. As discussed in Section 1.1, stem binding issues were identified and resolved prior to purchase of the parts for Millstone 3, and the vendor certificate of compliance stated the parts were compatible and interchangeable with the original equipment.

### Safety Evaluation, E3-EV-98-0006 - Auxiliary Feedwater (AFW) Flow Following a Steam Generator Tube Rupture (SGTR)

The team identified what appeared to be an incorrect post accident flow assumption in E3-EV-98-0006, concerning motor driven AFW flow following a SGTR. The licensee provided the team with DCR summary M3-98-007 and Engineering Work Request (EWR) 96-0389. The DCR summary amended the SE assumption and concluded that AFW flow was not evenly divided between all four steam generators following a SGTR, but that the assumption was conservative from the standpoint of offsite dose. The DCR summary evaluated the impact of the assumption on the associated post SGTR heat transfer model and found it to not be significant. This issue was adequately resolved by the licensee prior to the team's finding and no violation of NRC requirements was identified.

### DCR Summary M3-97083 - Setpoint Revision for Reactor Coolant Pump Underspeed Reactor Trip

The team identified what appeared to be an incorrect assumption, concerning reactor coolant pump coast down rates following an FSAR, chapter 15, design basis, Loss of Flow transient. The DCR summary concluded that two low frequency cases were bounded by the equilibrium 60 Hz case discussed in the FSAR. Subsequent to the writing of this DCR summary and prior to the team identifying this issue the licensee documented a grid frequency variance problem in its CR process and resolved the problem through an FSAR update. No violation of NRC requirements was identified.

### Evaluation and Approval of US(B)-350, Unit 3 Containment Sump Trisodium Phosphate (TSP) Concentration and Iodine Partition Coefficient Calculations

The team reviewed the calculations, analyses and operational controls used by the licensee to establish and maintain the amount of TSP needed to keep the containment sump in a desired pH range following a Loss of Coolant Accident (LOCA). Several observations were made by the team concerning these activities:

- Section (2) of the calculations stated that long term containment sump pH of 7.1 was specified for the determination of the amount of TSP to be installed inside the containment and that the calculations were to include assumptions 1 through 4. Assumption 1 stated that all boric acid liquid sources would be dumped without considering spray hold up or delay. The team determined that the calculations did not document a treatment of the boric acid storage tanks, the volume control tank, or the pressurizer relief tank volumes. Based on conversations with NNECO engineers, NNECO determined that an assumption of 2900 ppm for RCS boric acid concentration was conservative. It was not clear that this assumption was validated in the calculations.
- Assumption 4 stated that the calculation was to establish the TSP basket volumes. Step 2 on page 14 of the calculation assumed a cross sectional area for the twelve baskets without reference or validation. In addition, the calculation failed to verify that the fill line was appropriately marked to account for the desired volume of TSP. Subsequent to this calculation and prior to the team's observation, the licensee identified and analyzed two related problems with TSP basket volumes. The first problem was that the mixture settled and dropped below the fill level. The second problem was that baskets were overfilled following the licensee discovery that the material had settled.
- Calculation Input Section 3, item 1 assumed an RCS LOCA starting temperature of 583.5 degrees F, which approximately correlates to a 100% full power condition in the RCS. This assumption is not conservative with respect to maximizing the density of RCS coolant and its impact on containment sump pH. The team determined that the maximum RCS coolant density should occur at about 0% power or approximately 557 degrees F.

- There was an assumption included in the TSP titration analysis that stated a pH of 7.13 was needed to ensure that a pH of 7.10 was maintained. Aside from this statement there was no treatment or statistical analysis of measurement error or variation in the calculation on the mass requirement of TSP.
- The pH calculations addressed HCl and HNO<sub>3</sub> post-LOCA contributions, but did not address pH contributions from other sources in containment, such as: emulsified coatings (other than top coating); concrete degradation, dust or damage; corrosion materials; insulation materials; or other chemicals inside containment.

The team identified five discrepancies in calculation US(B)-350, Unit 3 Containment Sump Trisodium-phosphate (TSP) Concentration and Iodine Partition Coefficient, which supports the Millstone Unit 3 Technical Specification (TS) requirements for TSP volume. This issue is unresolved, pending review of additional information from the licensee to resolve the five apparent discrepancies and ensure that the TS requirements have adequate supporting calculations for the bases. (URI 50-423/99-10-01)

c. Conclusions

Overall, the sampled Operability Determinations (OD), Safety Evaluations (SE), Design Change Request (DCR) summaries, root cause analyses and 10 CFR 50.59 assessments were found to be acceptable, adequately managed and timely. Technical discussions were well written, adequately supported and thoroughly referenced. Applicable root cause analyses were detailed and the depth of the analyses was commensurate with the significance of the issues. When compared to Unit 2, Unit 3 ODs, 10 CFR 50.59 assessments, root cause evaluations, DCR Summaries and SEs were found to be more detailed, more clearly written and better supported by reference, although, no significant difference in quality of engineering support was identified.

Discrepancies in the calculation for the Unit 3 containment sump trisodium phosphate concentration used to support the technical specification requirements resulted in an unresolved item (URI 50-423/99-10-01).

**E4 Engineering Staff Knowledge and Performance**

E4.1 Engineering Knowledge and Performance

a. Inspection Scope (93802, 37550)

Based on a licensee developed list of risk significant systems, the team conducted system reviews; inspected selected training records, qualification standards and summaries; evaluated NNECO Nuclear Oversight audits of Engineering department activities including training and qualification, and reviewed selected Engineering department self assessments. The reviews performed by the team were intended to evaluate the actual experience and training of selected responsible engineers and supervisors with technical approval responsibility, and to assess their effectiveness in

assuring the design basis and operability of risk significant systems. The team also evaluated the coordination, tracking and administration of Engineering department training/qualification records to determine if the current NNECO qualification record management procedure (TQ-1, Personnel Training Qualification) was being adequately implemented.

b. Observations and Findings

The team selected several systems that appeared in recent CRs as a result of specific events or system performance. Documentation reviews included selected Operability Determinations (ODs), Safety Evaluations (SEs), root cause analyses, Special Procedures (SPROC), Design Change Request (DCR) summaries and 10 CFR 50.59 Assessments. The team's review found that the events had been well documented, and thoroughly evaluated, including both equipment and human performance considerations. Based on the quality of the selected Engineering department work products and training/qualification documentation supplied from various sources, the team concluded that the engineers supplying the technical information and operational support possessed the technical competency to perform the engineering service. The training documentation reviewed by the team included various descriptions of technical experience, training, qualification, professional education, and professional certification.

The team reviewed the technical qualifications of a sample of engineering supervisors who had technical approval responsibility. The team determined that the sampled supervisors possessed an adequate depth of technical experience, training, qualification, and professional education; were responsive to site operational and regulatory needs; were directly involved in troubleshooting and/or coordinating the resolution of technical issues; and routinely interfaced with other departments during the resolution of technical issues. Based on the resolution of specific issues, the team determined that interfaces among engineering groups were good and the communication between engineering and operations was generally effective.

The team found that Engineering qualification and training records were administered and managed in a diverse manner, depending on the engineering organization (section or group) and/or the type of training/qualification record being maintained. Summaries for some records were located in the Northeast Utilities Training Information Management System (NUTIMS). Training and qualification records were also located in the Nuclear Document Services system, the Nuclear Training department and local Engineering department supervisor files.

The team determined that the quality of engineering support to plant operations, within the management control processes established by NNECO, was dependent on the application of appropriately qualified and trained engineers, independent reviewers, and supervisors who were responsible for technical approval of engineering products. In the case of ODs the ultimate authority for determining operability was the responsibility of the Operations Shift Manager (OSM). However, in many cases the technical engineering support supplied to the OD was outside/beyond the immediate expertise of the OSM and is dependent on the technical competency of the Engineering department personnel

supplying the support. To ensure the quality of engineering support NNECO established a process of task and process qualification which was dependent on specific training. Procedure TQ-1, "Personnel Training Qualification," established the methods and means to document, store and tabulate professional training in the Engineering department.

The team reviewed a sample of the ODs and SEs referenced in CRs M2-99-0683, M2-99-0684, and M3-99-2575, to determine if the identified training record deficiencies (see section E7.1) affected the technical quality of the analyses or work product. The team was not able to identify any technical or work product errors that were related to the identified deficiencies in the Engineering department training and qualification records. A sample of Engineering department self assessments was also reviewed by the team. None of the Engineering department self assessments identified technical or work product errors related to the failure to fully implement TQ-1. The team interviewed two members of the ISEG task group that performed the audit which produced CRs M2-99-0683, M2-99-0684, and M3-99-2575, in order to determine if the ISEG had identified training record deficiencies that affected the technical quality of an analysis or work product. Based on discussions with the ISEG, the team determined that a technical product review had not been an attribute of the ISEG audit, and the ISEG task group had formed no opinion concerning the technical quality of the SEs identified in its report. The team concluded that there was no identified connection between the failure to fully implement TQ-1 and the technical quality of the analyses and/or other supporting work products.

c. Conclusions

Based on the quality of the selected Engineering department work products and training/qualification documentation supplied from various sources, the team concluded that the sampled Engineering department engineers and supervisors who provided technical information, analysis and operational support possessed adequate technical expertise to provide the engineering service.

**E7 Quality Assurance in Engineering Activities**

**E7.1 Independent Safety Engineering Group**

a. Inspection Scope (37550)

The team reviewed Independent Safety Engineering Group (ISEG) reports which had been issued during the past year to evaluate the scope of reviews and the significance of the findings, reviewed technical specifications relating to ISEG, and discussed line organization response to ISEG findings with several members of the engineering organization.

b. Observations and Findings

The ISEG function was fulfilled by a group of individuals within Nuclear Safety Engineering (NSE) for Millstone Unit 3. The Unit 3 Technical Specifications, Section 6.2.3.1 also assigns the function of operating experience reviews to the ISEG. ISEG activities are governed by procedure NOQP 3.04, Revision 3, "Nuclear Safety Engineering Group Functions and Responsibilities - Independent Safety Engineering Group and Operating Experience Assessment."

The ISEG activities described in the reports reviewed were a combination of preplanned, requested, and spontaneous observations of activities at the facility. The activities included engineering work, conduct of operations, and maintenance.

Independent Safety Engineering Group (ISEG) report, AR 98020656, "Engineering Qualification," dated February 9, 1999, and associated Condition Reports M2-99-0683, and 0684 identified that the training and qualification records for some Engineering department personnel, who performed Safety Evaluations (SEs) and Operability Determination (ODs), did not meet the requirements of procedure TQ-1, "Personnel Training and Qualification." In addition, the CRs and ISEG report identified ten CRs and an Engineering department self assessment that had previously identified similar training record quality problems. Subsequent to the closure of CRs M2-99-0683 and 0684, Engineering Department self assessments and numerous additional CRs continued to identify training and qualification record problems, and the failure to fully implement TQ-1. On July 7, 1999, the ISEG initiated CR M3-2575, to re-address the failure to fully implement TQ-1. On September 22, 1999, the Millstone Management Review Team (MRT) reviewed CR M3-99-2575 and initiated corrective actions to address the training records problems initially identified by the ISEG in February 1999.

The ISEG reports reviewed provided valuable insights into the work processes, included recommendations for improvement, and identified a number of deficiencies. The most significant deficiencies identified by ISEG were related to previously identified problems which had not been adequately corrected, or, in some instances, corrected in a timely manner. A specific example was the identified deficiency associated with the training documentation of engineering personnel that was not corrected in a timely manner to prevent a recurrence of the problem. Therefore, NNECO failed to implement the requirements of procedure TQ-1, Personnel Training Qualification. Other deficiencies that NNECO identified that were not properly corrected was the adverse trend in reactivity management and control and outage Risk Management weakness from 3RFO5 which recurred during 3RFO6 (schedule did not contain a section to identify critical safety systems and structures that must be available to maintain defense in depth, some prerequisites required by procedures OM-1 and OM-2 had not been performed).

The failure to adequately respond to and correct conditions adverse to quality in a manner to prevent recurrence was a violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions". This Severity Level IV violation was treated as a Non-Cited Violation, consistent with Appendix C of the NRC Enforcement Policy, these issues are in the licensee's corrective action program as CR M3-99-2575, CR M2-99-0776 and CR M3-99-1624. (NCV 50-336&423/99-10-02)

c. Conclusions

The team concluded that the ISEG provided valuable feedback to the line organizations regarding the operation of the Millstone facility. The ISEG had been effective in identifying deficiencies and areas for improvement. The ISEG also determined that corrective actions for some prior deficiencies were ineffective or untimely. A specific example was the identified deficiency associated with the training documentation of engineering personnel that was not corrected in a timely manner to prevent a recurrence of the problem. The failure to correct conditions adverse to quality in a manner to prevent recurrence was a non-cited violation.

E7.2 Problem Identification and Resolution

a. Inspection Scope (40500)

The team conducted a performance based evaluation to determine the effectiveness of the licensee's Condition Report (CR) program in identifying, resolving, and preventing problems that were identified in Engineering department self assessments, ODs, DCR summaries, SEs and Nuclear Oversight assessments.

b. Observations and Findings

The team determined that the assignments of the CR significance levels and classifications were generally appropriate and in accordance with the CR program guidance. More significant issues received detailed reviews, including a root cause analysis, while those of lower significance received less investigation and on occasion administrative closure.

The team found communications between the Operations departments, the Engineering department and the Management Review Team (MRT), regarding CR issues, to be adequate. New CR issues were presented at the daily MRT meetings. The issues were classified by the responsible department managers, and discussion of the CR topics was usually good. The CR performance indicators provided a good overview of CR program effectiveness, which appeared to be acceptable. The team determined that in general, the licensee's CR program adequately identified, resolved, tracked and prevented problems that were identified in a selected sample of Engineering department self assessments, ODs, DCR summaries, SEs and Nuclear Oversight assessments. An exception to this general finding was the resolution of the CRs related to ISEG report AR

98020656, which is discussed in section E7.1 of this report. The team noted that although the ISEG was aggressive in the pursuit of resolution of issues identified in AR 98020656, it did not fully employ the conflict resolution processes that were available to it, including one process that was internal to the Nuclear Oversight organization.

c. Conclusions

In general, NNECO's corrective action process, the Condition Report (CR) program, adequately controlled, tracked, identified, resolved, and prevented recurrence of problems identified in Engineering department self assessments, Operability Determinations, Design Change Report summaries, Safety Evaluations and Nuclear Oversight reviews. No significant difference in overall CR program implementation quality was identified between the two units by the NRC or NNECO Oversight.

E7.3 Nuclear Oversight of Engineering

a. Inspection Scope (37550)

The team reviewed a sample of Nuclear Oversight assessments to determine the adequacy of Nuclear Oversight's involvement in and support for the resolution of operating, technical and regulatory issues associated with Millstone Engineering department activities. Oversight assessments were evaluated to determine Nuclear Oversight's contribution towards maintaining the design basis of the units, ensuring the operability of safety related equipment, establishing conditions of reduced risk, and maintaining NNECO quality standards.

b. Observations and Findings

Based on a sample of Nuclear Oversight assessment activities, the team determined that Nuclear Oversight assessments were detailed, oriented towards those systems/ processes with the greatest impact on safety and risk, and maintained NNECO quality standards. Most of the findings and CRs that resulted from the sampled Nuclear Oversight assessments were administrative and/or process related. Assessment findings were assigned appropriate CR significance, and corrective actions were complete. Most significant assessment findings were related to inadequate corrective actions for a previously identified CR condition.

Nuclear Oversight findings with less significance contributed to an existing backlog of CR issues which was more pronounced on Unit 2 than on Unit 3. No significant differences in Nuclear Oversight assessment quality, number of findings, or finding significance were noted between units.

c. Conclusions

NNECO Nuclear Oversight adequately performed assessments of Engineering department related activities. Assessment activities and findings were appropriately oriented toward maintaining the design basis of the units, ensuring the operability of safety related equipment, identifying conditions of increased risk, and maintaining NNECO quality standards. Most Nuclear Oversight assessment findings were administrative and/or process related in nature and the most significant assessment findings were generally related to inadequate corrective actions for a previously identified CR condition.

E7.4 Engineering Self-Assessments

a. Inspection Scope (37550)

The team evaluated the effectiveness of Engineering department self-assessments in supporting the resolution of operating, technical and regulatory issues.

b. Observations

Based on a sample of Engineering department self assessments, the team determined that engineering self assessments were detailed, varied in scope, well supported, thoroughly referenced and safety oriented. Many of the self assessment findings were of a technical nature, but most were administrative. Assessment findings were assigned to the CR process, given appropriate CR significance, adequately tracked and managed, and corrected in a timely manner. Some low level Engineering department assessment findings have contributed to existing CR backlogs on both units. Based on the sample of Engineering Department assessments reviewed by the team, findings were typically of the CR significance level 2 and 3, with no immediate impact on the safe operations of the units.

c. Conclusion

Sampled NNECO Engineering department self assessments were detailed, varied in scope, well supported, thoroughly referenced and safety oriented. Many of the self assessment findings were of a technical nature, but most were administrative. Assessment findings were assigned to the CR process, given appropriate CR significance, adequately tracked and managed, and corrected in a timely manner. Typical self assessment issues were assigned CR significance levels of 2 or 3, and had no immediate impact on the safe operations of the units.

#### IV. MANAGEMENT MEETINGS

##### **X1 Exit Meeting Summary**

The results of the inspection were discussed with members of the engineering staff at a meeting on September 24, 1999. At that time, the inspection findings were not contested. Additional discussions were held on October 22, 1999 regarding the AFW turbine stem binding issue.

The inspection team did review several proprietary documents. Those documents identified as being proprietary were returned to NNECo at the end of the inspection.

##### **X2 Management Meeting Summary**

A meeting was held August 27, 1999, in the Region I office to describe the reorganization of the engineering department for the Millstone station, and discuss NNECo's strategy for improving performance in engineering. A brief discussion of the engineering backlog reduction program was also conducted. The NNECo slides used during the presentation are included as an Attachment to this report.

#### PARTIAL LIST OF PERSONS CONTACTED

B. Wilkins	Director, Design Engineering
G. Olsen	Manager, Millstone 3 Design Engineering
D. Smith	Manager, Regulatory Affairs
D. Dodson	Supervisor, Millstone 3 Licensing
B. Young	Supervisor, Design Engineering
D. Aube	Supervisor, Millstone 3 Instrumentation and Controls Design
G. Tardif	Supervisor, Engineering Assurance
D. Van Dyne	Supervisor, Civil/Structural Engineering
P. L'Heureux	Supervisor, Mechanical Systems Engineering
L. Salyards	Nuclear Oversight Auditor
B. Bohmbach	Instrumentation and Controls Engineer, Millstone 3
T. Cleary	NRC Coordinator
D. Harris	NRC Coordinator
L. Arzamarski	Licensing Assistant

#### INSPECTION PROCEDURES USED

IP37001	10 CFR 50.59 Evaluation Program
IP37550	Engineering

## ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

- URI 50-423/99-10-01      Inconsistencies in calculation for required trisodium phosphate inventory in Unit 3 containment sumps
- NCV 50-336&423/99-10-02      Failure to correct identified conditions adverse to quality

Closed

- NCV 50-336&423/99-10-02      Failure to correct identified conditions adverse to quality

Discussed

None

## LIST OF ACRONYMS USED

AFW	Auxiliary feedwater
CFR	Code of Federal Regulations
CR	Condition Report
DCR	Design Change Record
EWR	Engineering Work Request
FSAR	Final Safety Analysis Report
ISEG	Independent Safety Engineering Group
LOCA	Loss of Coolant Accident
MRT	Management Review Team
NNECo	Northeast Nuclear Energy Company
NUTIMS	Northeast Utilities Training Information Management System
OD	Operability Determination
OSM	Operations Shift Manager
PPM	Parts Per Million
RCS	Reactor Coolant System
SE	Safety Evaluation
SCTR	Steam Generator Tube Rupture
SPROC	Special Procedure
TM	Temporary Modification
TSP	Trisodium Phosphate

## ATTACHMENT 1

### List of Documents Requested from Northeast Nuclear Energy Company

List of Temporary Modifications currently open, as of September, 1999

List of Temporary Modifications restored within previous year

List of Permanent Modifications completed within previous year

#### Open Temporary Modifications

3-99-026, Installation of Check Valve 3SWP\*V109 without internals

3-98-045, Control Building Service Water Pipe Chase Closure Plate Control Room Habitability Seal

3-96-069, 3SWP\*V298 Repair per NCR 396-318

#### Restored Temporary Modifications

3-99-019, Defeat Automatic Closure of 3RCS\*LCV460 in accordance with OP 3216

3-99-014, Temporary Power to 3BYS\*PNL-2V

3-99-013, Temporary Power to 3BYS\*PNL-1V

3-98-068, Leak Repair Valve 3FWS\*CTV41B

3-98-063, Service Water Strainer Blowdown

3-97-026, Belzona® seat on 3SWP\*TV35B

#### Permanent Modifications

EWR NO.	Document No.	Description
M3-97163	MSEE 0-1130-98	Modification to Service Water Pump Discharge Valve
M3-95-061A	MMOD M3-98039	Service Water MMOD 98039 - Additional Flanges - Task #7
M3-93020	PDCR 3-93-020	Grounding Stud Replacement on 4.16/9.6 kV Switch PMR 3-92-030-00
M2-94212	MSEE 0-1127-98	Bypass QSS-P1A/B Auto Trip on Low RWST Temperature
M3-93143	MSEE 0-0939-98	Level Switch Vibration Study
M3-95029	DCR M3-98047	Replacement of 'D' S/G AFW Check Valves and Addition of AFW Isolation Valves
M3-95302	DCR M3-99004	Aux Feedwater Pump Design Changes to 3FWA*P2

#### Plant Procedures

Design Control

Temporary Modifications

Safety Assessment

Work Control

Configuration Management

Independent Safety Engineering Group

#### Other Documents

Engineering Self-Assessments performed during the prior year

QA Audit reports of reviews of Engineering during the previous year

ISEG reviews performed during the prior year

## ATTACHMENT 2

### List of Documents Reviewed During Inspection

#### Nuclear Oversight Engineering Assessments

##### Unit 2

Engineering Periodic Assessment for December 1998  
Engineering Periodic Assessment for January 1999  
Engineering Periodic Assessment for February 1999  
Engineering Periodic Assessment for March 1999  
Engineering Periodic Assessment for April 1999  
Engineering Periodic Assessment for May 1999  
Engineering Periodic Assessment for June 1999  
Engineering Periodic Assessment for July 1999  
Nuclear Oversight Assessment Report, Calculation Assessment, dated April 6, 1999  
Recovery Oversight Assessment of Unit 2 System Engineering Effectiveness, dated March 19, 1999  
Recovery Oversight Assessment of Unit 2 Design Engineering Safety Evaluation Application, dated April 5, 1999  
Recovery Oversight Assessment of Unit 2 Design Change Implementation, dated May 3, 1999  
Independent Safety Engineering Report (AR 98020656, dated 2/9/99, Recovery Oversight Request MP2, TQ1, MEPL, NUTIMS)

##### Unit 3

Nuclear Oversight Verification Plan - Conduct of Engineering, dated January 7, 1999  
Nuclear Oversight Verification Plan - Conduct of Engineering, dated February 9, 1999  
Nuclear Oversight Verification Plan - Conduct of Engineering, dated March 11, 1999  
Nuclear Oversight Verification Plan - Conduct of Engineering, dated April 16, 1999  
Nuclear Oversight Verification Plan - Conduct of Engineering, dated April 28, 1999  
Nuclear Oversight Verification Plan - Conduct of Engineering, dated June 10, 1999  
Nuclear Oversight Verification Plan - Conduct of Engineering Training, dated September 10, 1999  
MP-98-A20           Material Equipment and Parts Lists (MEPL)  
MP-99-A03           Plant Modifications  
MPS -ES-99-002     Plant Engineering Assessment for July 1999, dated 8/10/99  
MPS -ES-99-003     Plant Engineering Assessment for July 1999, dated 8/12/99  
MP-99-A12           Procurement  
MP-99-A08           Special Nuclear/Licensed Materials  
MP-99-A07           Process Control/Radwaste  
MP-99-A01           Document Control and Quality Records  
MP-99-A05           Special processes Programs (Welding, Non-destructive Examination, Coatings and Freeze Sealing)  
MP-99-A06           Corrective Action Program  
MP-99-A14           Unit 3 Refueling Activities  
PES-98-040          Acceptance of Quality Calculations and Analyses

### Operability Determinations

#### Unit 2

MP2-235-96 Emergency Diesel Generator Fuel Limit  
 MP2-255-96 Emergency Diesel Generator Bearing Failure  
 MP2-255-96 Emergency Diesel Generator Ventilation System Fan Test Failure  
 MP2-019-97 Emergency Diesel Generator Fuel Limit  
 MP2-037-98 Spent Fuel Pool Siphon Breakers  
 MP2-003-99 Loss of Normal Feedwater Accident Analysis  
 MP2-206-96 Emergency Diesel Generator Room Drains  
 MP2-021-98 Non-QA Parts in Safety Related Systems (MEPL)  
 MP2-029-98 Fire Pump Drain Line Check Valve  
 MP2-005-99 Reactor Building Penetration Leakage  
 MP2-045-99 4160 Switchgear Room Cooling  
 MP2-042-99 Charging Pump Line Crack

#### Unit 3

MP3-208-96 Component Cooling water Relief Valve Setpoints  
 MP3-209-96 Emergency Diesel Generator Logic  
 MP3-211-96 Emergency Diesel Generator Fuel Oil Delivery  
 MP3-028-98 Service Water Cubicle Ventilation  
 MP3-031-98 Recirculation Spray System Injection Pathway  
 MP3-036-96 Emergency Diesel Generator Thermal Performance Testing  
 MP3-039-98 Recirculation Cubicle Sumps  
 MP3-048-98 Non-Q Bearings Installed under Automatic Work Orders  
 MP3-019-99 Solenoid Failures  
 MP3-026-99 Recirculation Cubicle Sump Pump Test Failure  
 MP3-071-98 Main Steam Atmospheric Relief Isolation Valves  
 MP3-084-98 Hydrogen and Nitrogen Gas accumulation in the Charging System  
 MP3-004-99 Recirculation Spray Pump Mechanical Seal  
 MP3-011-99 Volume Control Tank Isolation Valves  
 MP3-030-99 Motor Operated Valves Missing T-Drains  
 MP3-003-99 Control Room Habitability

### Special Procedures (SPROC) and Other Plant Procedures

Safety Injection System MOV Dynamic Test, SPROC MOV98-3-03, revision 0, dated 1/21/98

Boric Acid Batching Methods, SPROC EN98-3-07, revision 1, dated 5/8/98

Spent Fuel Pool Cooling System Vortex Suppressor, SPROC EN98-3-09, revision 0, dated 5/11/98

Immediate Boration, AOP 3566, revision 5 dated 6/14/98

Freeze Seal Repair of Unit 3 Reactor Coolant System Valve 3RCS-V132

Emergency Diesel Generator Voltage and Frequency Transient Monitoring, SPROC EN98-3-03, revision 1, dated 4/28/99

Spent Fuel Pool Vortex Suppressor Performance, SPROC EN98-3-14, revision 0, dated 5/30/98

Turbine Driven Auxiliary Feedwater Pump Operational Readiness Test, SP 3622.3

Millstone Unit 3, Operator Round Sheet 12, Revision 4 Change 4  
 Titration of Boric Acid with Trisodium Phosphate, dated November 3, 1994  
 Titration and Bulk Density of Trisodium Phosphate , dated March 21, 1995

**Design Change Requests (DRS.), 10 CFR 50.59 Assessments  
 and Associated DCR Summaries**

Unit 2

M2-97026 Pressure Relief Modification for the Containment Sump Pump  
 M2-97025 Emergency Core Cooling Systems Pump Coolers Piping Modification

Unit 3

M3-971480 Actuator Gear Replacement for the Emergency Boration Bypass Isolation Valve  
 M3-98007 Reduced AFW Flow Rates to Support Final Safety Analysis Report, Chapter 15 Analysis  
 M3-98053 Main Steam Isolation Valve Solenoid Design Upgrade  
 M3-97109 Boric Acid Tank Alarm Setpoint Change  
 M3-97083 Setpoint Revision for Reactor Coolant Pump Underspeed Reactor Trip  
 M3-97026 Rerate of Auxiliary Feedwater System Inside Containment  
 M3-97095 4.16KV Feeder Circuit Fault Clearing Time  
 M3-96077 ECCS Orifice and Throttle Valve Balancing  
 M3-98028 Cycle 6 Reload Safety Evaluation  
 M3-98034 Setpoint Change for Pressure Control Valve 3GSN-PCV-106ECCS  
 M3-97219 RHR Suction Relief Valve Capacity  
 M3-97135 Filling Unit 3 Tri-sodium phosphate Baskets  
 M3-99004 Turbine Driven Auxiliary Feedwater Pump Stem and Rotating Assembly Replacement

**Engineering Self Assessments**

Unit 2

CM-SA-99-007 DCR Quality  
 M2-DE-99-002 Management Effectiveness  
 PES-97-032 Post Modification Test Plans  
 CM-SA-99-014 Engineering Support Training Accreditation

Unit 3

PES-SA-98-003 Engineering Plant Design Data System (PDDS) Relief Valve Setpoint Process  
 3DE-SA-99-02 Work Management Effectiveness  
 3DE-SA-99-05 Work Document Validation and Verification  
 DE-3-98-006 Controlled Manual Updates  
 DE-3-98-004 Temporary Modifications  
 DE-3-98-005 Personnel Qualifications  
 PES-SA-98-039 Engineering Attention to Quality  
 PES-SA-98-008 Temporary Modifications

M3-97-1217	Assessment of Twelve Electrical Protection Calculations
M3-97-0119	Assessment of Voltage Profile Analysis
CM-SA-99-006	Configuration Management Team
ENG-SA-99-001	Personnel Qualifications for Design Activities
ESAR-98-010	Engineering Work Requests (EWR) and Engineering Work Assignments (EWA) Validation and Verification
3DE-SA-98-08	Design Engineering Effectiveness
PES-SA-98-040	Acceptance of Purchased Quality Calculation and Analyses
ESAR-98-007	Design Engineering Personnel Qualification Records
ESAR-98-003	Review of FSAR Chapters 3 and 6 for Consistency
DE-SA-98-002	Review of Unit 3 Outage Modifications

### Safety Evaluations and associated Calculations

#### Unit 2

S2-EV-98-0163	Insituform Service Water Liner Defects
S2-EV-98-0178	MEPL
S2-EV-96-018	Service Water Flow Calculations
S2-EV-98-0162	Engineering Functions

#### Unit 3

S3-EV-99-0009	Auxiliary Feedwater Pump Rotating Assembly and Governor Valve Stem Material Replacement
FSAR 99-MP3-92	Tri-sodium phosphate Storage
S3-EV-97-0323	Tri-sodium phosphate
USB-350 Revision b	Tri-sodium phosphate pH Calculations
Hydraulic Model Study of Millstone Unit 3 Spent Fuel Pool Cooling Vortexing, dated January 1, 1998	

### ISEG Reports

AR No. 98013465, Reactivity Management Events  
 AR No. 98011449, Organizational Communications  
 AR No. 98013467, Millstone Unit No. 3 Operator Work-Arounds  
 AR No. 98013456, Reactivity Management Events  
 AR No. 98013764.02, Millstone Unit 2 Refueling Preparations  
 AR No. 98013766, Use of Industry Operating Experience  
 AR No. 98019669, Feedwater Heater System Water Hammer Events  
 AR No. 98020656, Engineering Qualification  
 AR No. 99000535, Circulating Water Pumphouse Ventilation Fan 10A/B Failures  
 AR No. 99002025, Problem Identification  
 AR No. 99003018, NSE ISEG Walkdown of MP-3  
 AR No. 99004486, MP-3 Spent Fuel Pool Cooling Outage  
 AR No. 99005612, Spontaneous ISEG of MP-3 125 VDC Circuit Breaker Corrective Actions

AR No. 99007195, Preventing the Use of a Procedure in the Revision Phase

AR No. 9900850, Reactor Head Removal Pre-Job Brief

AR No. 99008109, MP-3 S/D Risk Management

### References

#### **NNECO References**

TQ-1	Personnel Training Qualifications
RAC 5	10 CFR 50.72 Notifications
RP 4	Corrective Action Program
RP 5	Operability Determinations
RAC 12	Safety Evaluations
NGP 2.3 rev. 6	Differing Professional Opinions
NOQP 1.06 rev. 1	Nuclear Oversight Issues Resolution
NOQP 3.04 rev. 3	Independent Safety Engineering Group Operating Experience Assessment

Northeast Utilities Memo, Corrective Action Escalation Policy, dated 6/9/97

#### **Other References**

10 CFR 50, Appendix B Criterion III, Design Control  
 10 CFR 50, Appendix B Criterion XVII, Quality Assurance Records  
 10 CFR 50.59, Changes, Tests, and Experiments  
 10 CFR 50.2, Design Bases  
 ANSI N18.7-1976, Administrative Controls and Quality Assurance for the Operations Phase of Nuclear Power Plants  
 ANSI N45.2.9, Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants  
 NRC Policy Statement, Availability and Adequacy of Design Bases Information at Nuclear Power Plants," August 10, 1992  
 SECY-91-364, Design Document Reconstitution

### Condition Reports (CRs) and Adverse Condition Reports (ACRs)

#### Unit 2

M2-97-0275	Training Records - NUTIMS
M2-97-0679	Training Records - ANSI Standards
M2-98-1896	Training Records - NTM
M2-98-2900	Training Records - NUTIMS
M2-98-3029	Training Records - NUTIMS
M2-98-2357	Training Records - MEPL
M3-99-2575	Corrective Actions for the Resolution of Engineering Training Records
M2-98-2709	Secondary Water Chemistry Control
M2-99-1561	Special Nuclear Material Control Area Labeling

Unit 3

M3-98-0459	Tri-sodium phosphate Sump Concentrations
M3-012327	Tri-sodium phosphate Sump Concentrations
M3-99-2575	Corrective Actions for the Resolution of Engineering Training Records
M3-99-0974	Ineffective Corrective Actions for the Resolution of Organization Changes Related to the license Basis
M3-99-2233	Welder Qualification Records
M3-99-2507	Training Records
M3-99-2964	Security Officer Training Records
M3-99-0939	TQR Record Deficiency
M3-99-1200	Radiological Waste Worker Qualification
M3-99-0542	Ineffective Corrective Actions for the Resolution of Organization Changes Related to the License Basis
M3-99-0286	Ineffective Corrective Actions for the Control of Radiographs
M3-99-0646	Corrective Actions to Prevent Recurrence of Software Control Deficiencies.
M3-99-1511	Corrective Actions for Environmental Composite Discharge Samples
M3-99-1639	Corrective Actions for the Control of DCR Records
M3-98-4426	MEPL Deficiencies
M3-98-2357	Nuclear Oversight Training and Qualification
M3-99-3144	Preventive Maintenance Program
M3-98-2357	Training Records - MEPL
M3-99-0616	Training Records - Engineering Support

# **Northeast Nuclear Energy Company**

## **NNECO Engineering Services Presentation to NRC Region I Staff**



**Northeast  
Utilities System**

# Agenda

- Introduction  
Objectives  
Engineering Organization  
Dave Amerine - *Vice President  
Engineering Services*
- Engineering Plan  
Mike Bain - *Director  
Nuclear Engineering*
- Operational Focus  
Gary Swider - *Manager  
Unit System Engineering*
- Backlog Workload  
Mark Etre - *Project Manager  
Backlog Work-off*
- Oversight Assessment  
Mike Ahern - *Manager  
Nuclear Oversight*
- Summary  
Dave Amerine - *Vice President  
Engineering Services*



**Northeast  
Utilities System**

# Meeting Objectives

- **Introduce NRC Staff & New NNECO Engineering Team Representatives**
- **Present NNECO's Plans and Responsibilities**
- **Unveil "Going Forward" Strategy for Becoming "Best of Best" in Engineering Services Area**



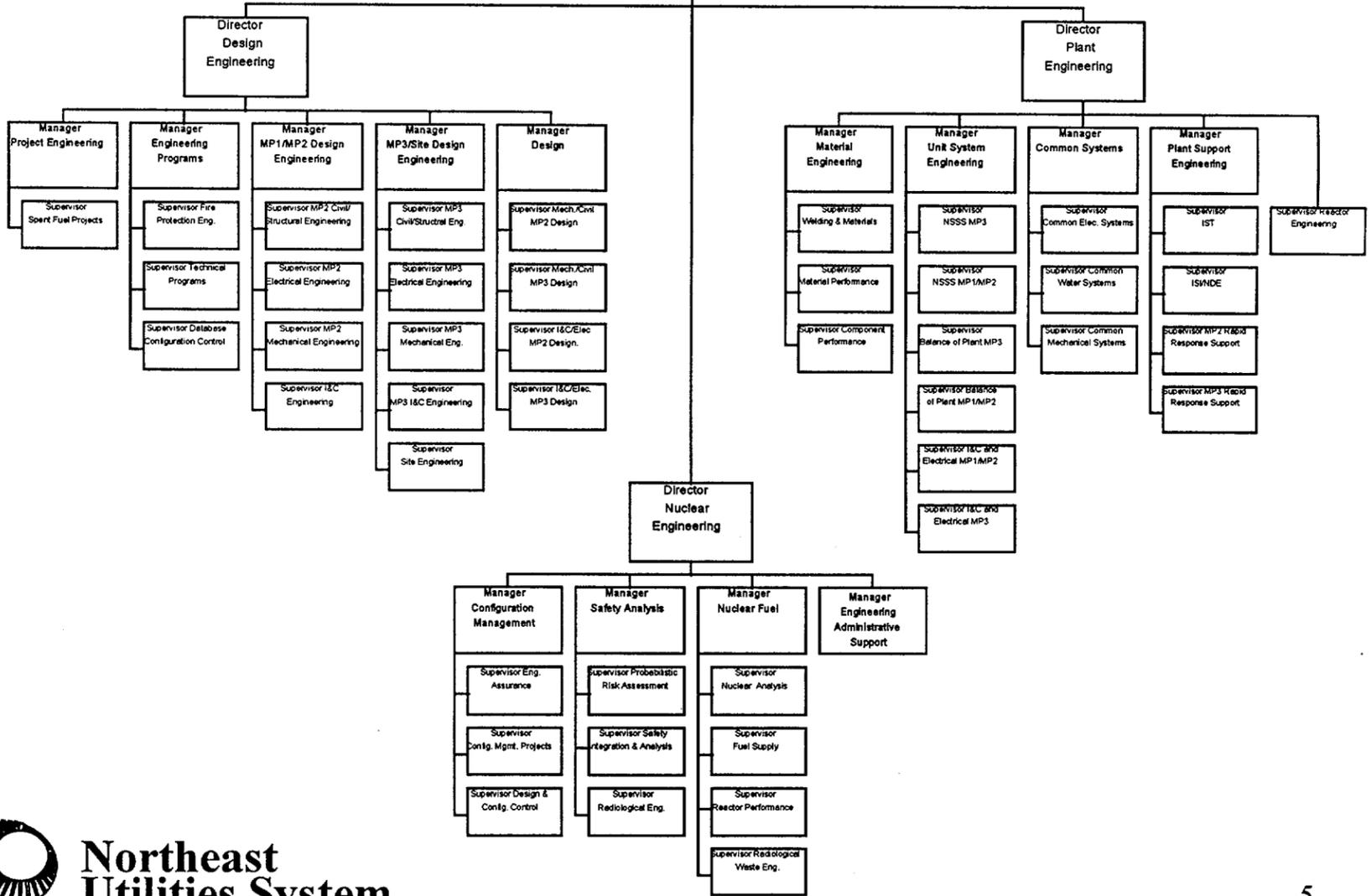
# Engineering's Role in Millstone Focus

- **The Foundation - *A Strong Operational Focus***
- **First Stake in the Ground -- "Focus '99" *Safe Event Free Operation***
- **Second Stake -- *Positive Nuclear Safety Index***
- **Engineering is the Conscience of and Provider to Production in Achieving These Goals**
- **Revised Organization is a Step to Strengthen the Engineering Organization.**



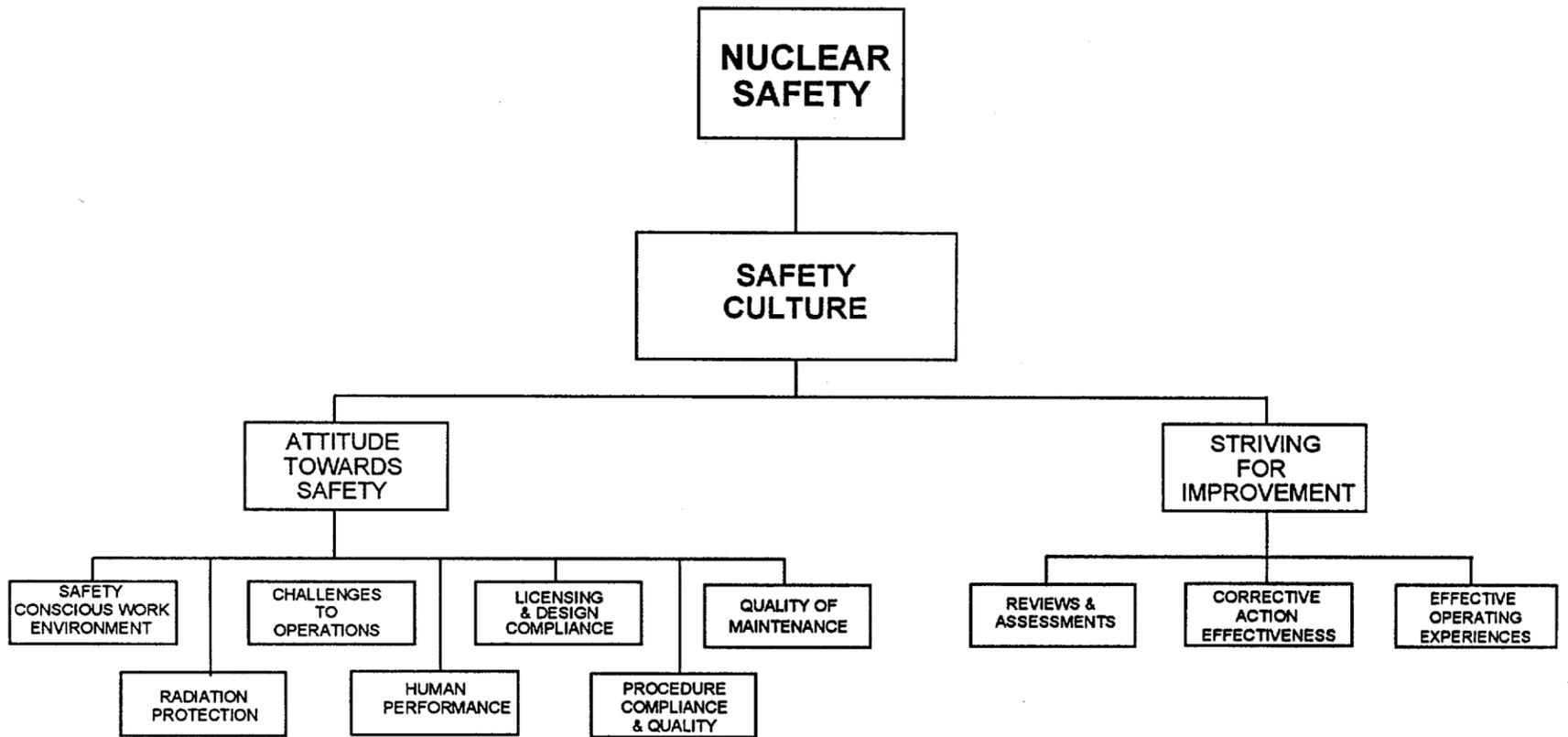
# Engineering Services

Vice President  
Engineering  
Services  
D. Amerine



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# The Nuclear Safety Indicator (NSI)



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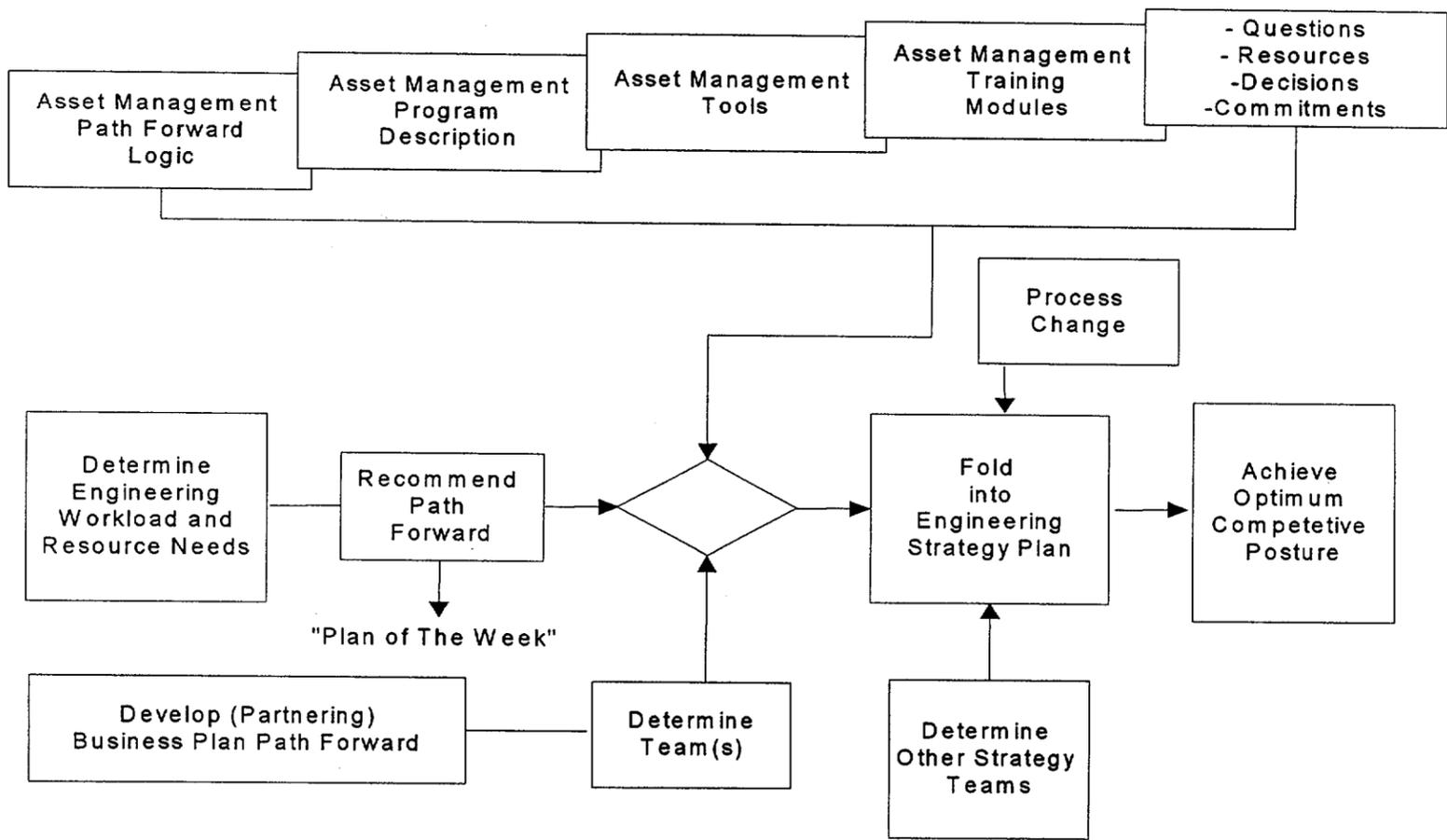
# **Engineering Plan**

**Mike Bain**  
**Director, Nuclear Engineering**



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# Engineering Path Forward Overview



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# 1999 Initiatives to Move Engineering Forward

## Engineering Services Strategic Goals Implementation Plan Sections

- 1.0 Increase Focus & Attention on Safety
- 2.0 Improve Quality of Engineering Products
- 3.0 Increase Focus on Training
- 4.0 Improve Operational Focus for Engineering
- 5.0 Improve Fiscal Accountability
- 6.0 Improve Management Tools
- 7.0 Clarify Roles & Responsibilities
- 8.0 Improve Process Efficiency
- 9.0 Increase Focus on Personnel Development



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# **Operational Focus**

**Gary Swider**  
**Manager, Unit Systems Engineering**



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# **We Are Working To Improve Our Operational Focus**

- **Enhanced Rapid Response Team**
- **Quality Review Board - Improving product quality**
- **Engineering Duty Manager**
  - **Single point of contact for all day-to-day operational support (including backshift coverage)**
  - **Extending planning horizon**
- **Developing integrated engineering schedules**
- **Project prioritization process**
- **Aggregate impact resolution**



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# Engineering Capabilities Are Being Improved

- Increased focus on supervisory ownership of training: lesson content, management observation, and attendance
- Quarterly System Engineering position-specific training
- Quarterly Engineering Support training
  - Reinforce management's expectations
  - Additional emphasis on Operating Experience
- Sharing knowledge
  - Rotational assignments
  - Operator License Certification Class



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# **We Have Improved The Consistency of Plant Support**

- **System Engineering issue ownership**
- **Conduct of System Engineering procedure (common site approach)**
- **Common System Engineering meetings to pool knowledge and resources**
- **Reorganization**
  - **Plant engineering consolidated**
  - **Refocused leadership team**
- **Standardizing expectations**



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# **Backlog Workload**

**Mark Etre**

**Backlog Work-Off Project Manager**



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# **Workload Priority Selection Supports Operational Focus**

- **Structured approach for control and disposition of backlog items**
- **Same approach used for new work to assure proper priority**
- **Assures management focus on safe and event free unit operation**



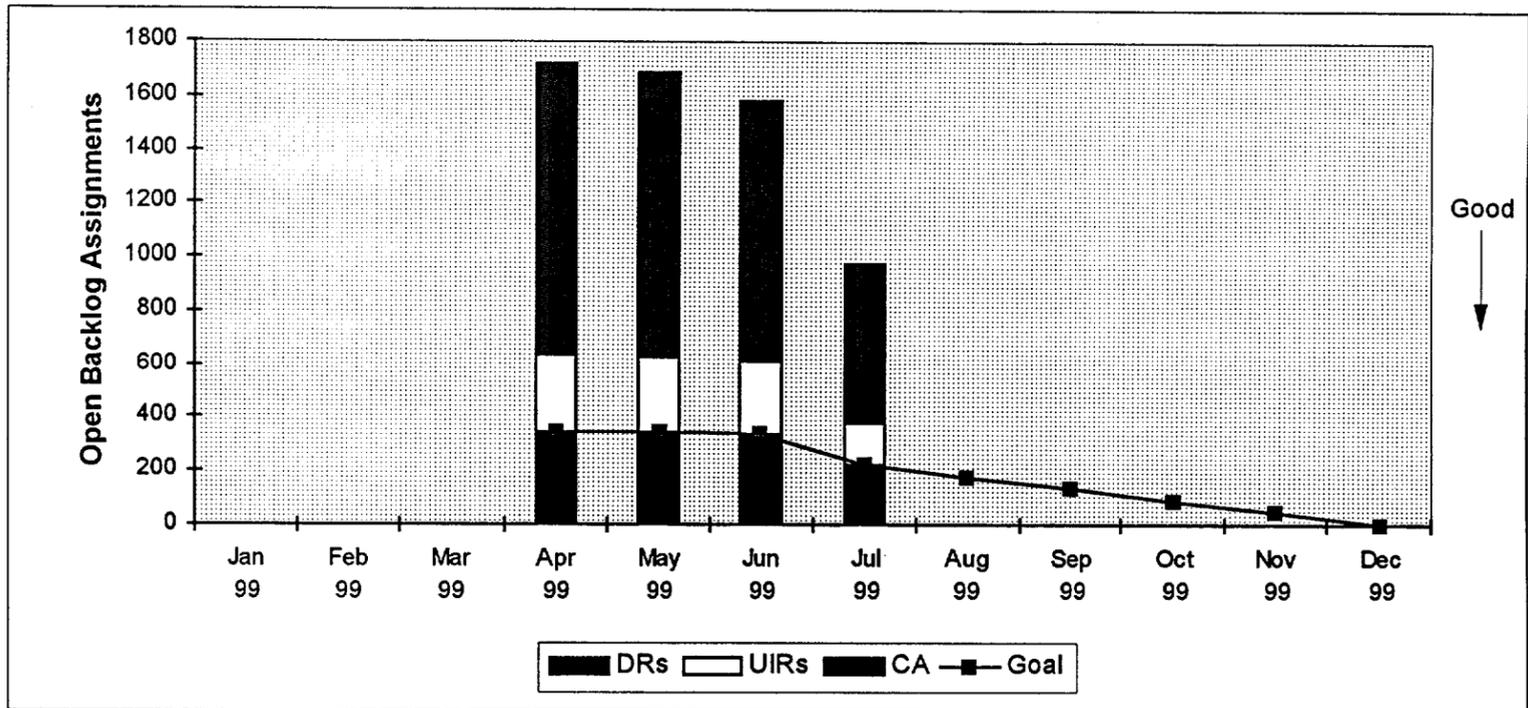
# **Backlog Assessed to Assure Operational Focus**

## **Backlog Assessment and Scheduling**

- **Integrated review to ensure no safety significant items outstanding**
- **Significant backlog quantity out-sourced to allow operational focus**
- **Represented in engineering schedule**

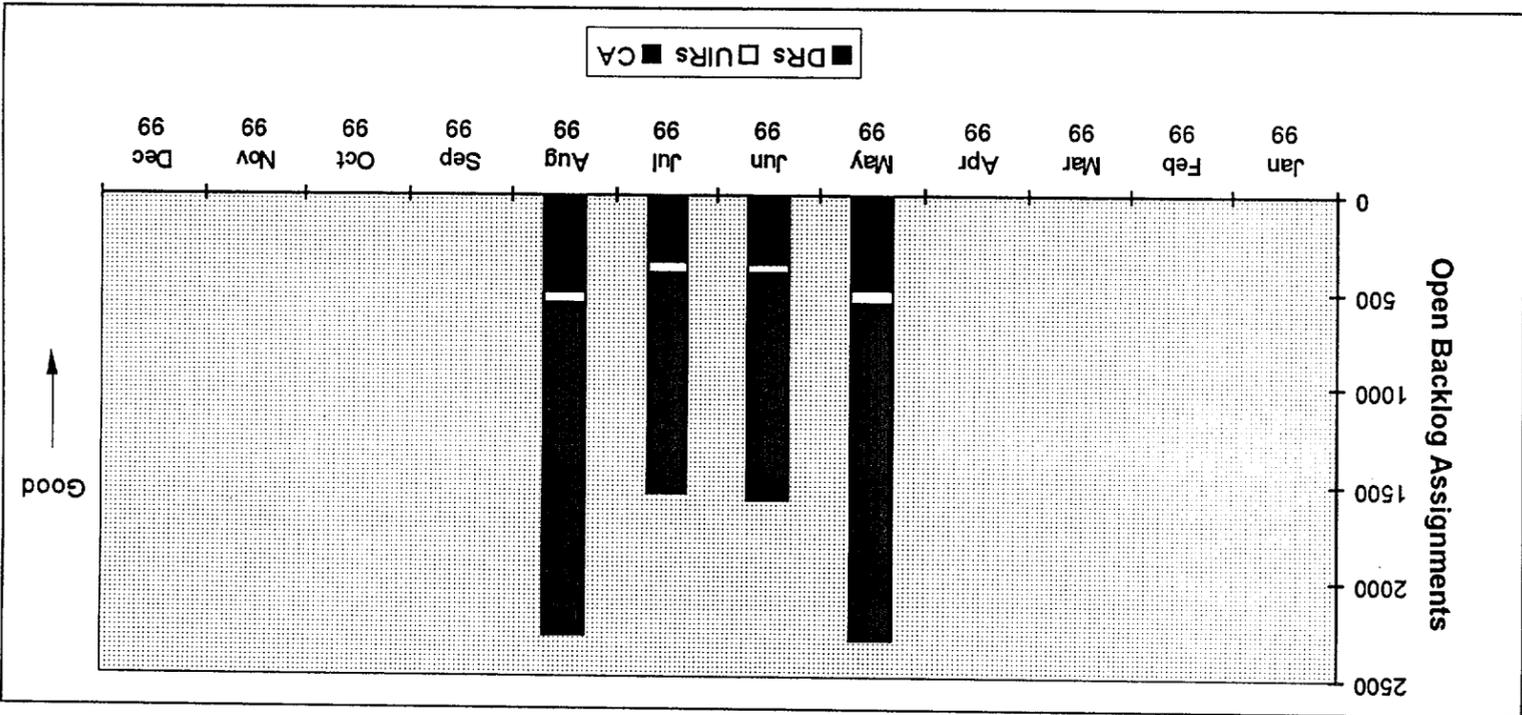


# Deferrable Recovery Backlog Items Millstone 3 Engineering Services

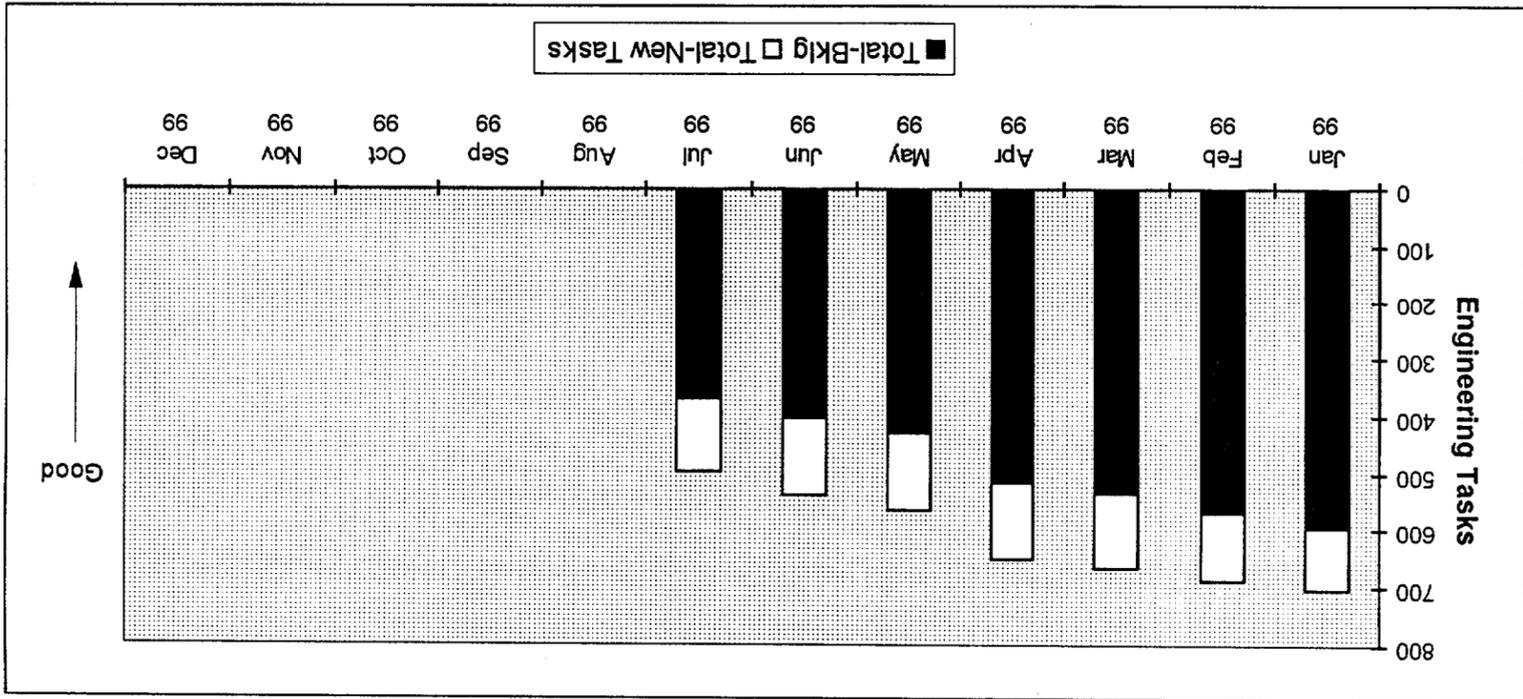


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# Deferrable Recovery Backlog Items Millstone 2 Engineering Services

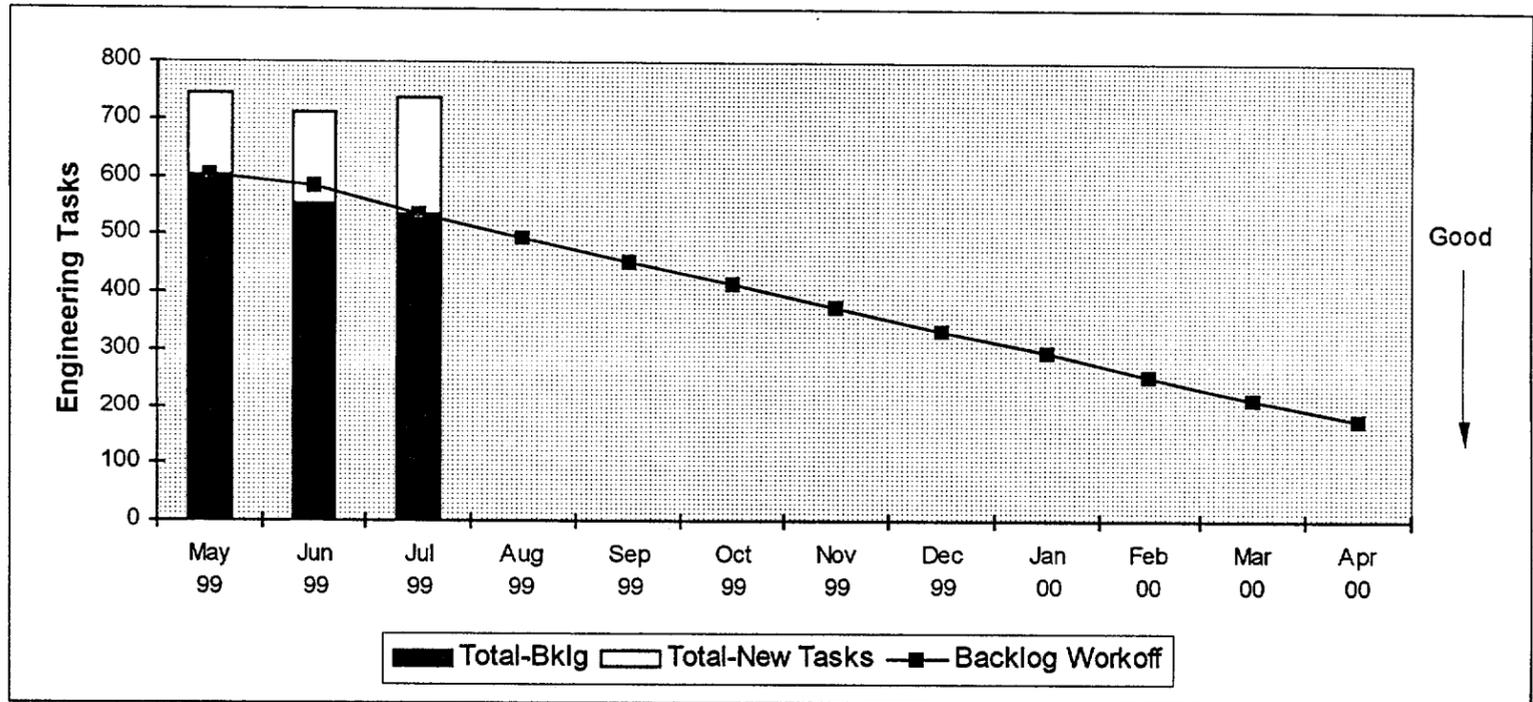


# Current Backlog Items Milestone 3 Engineering Services



# Current Backlog Items

## Millstone 2 Engineering Services



**Northeast  
Utilities System**

# **Oversight Assessment**

**Mike Ahern**  
**Manager, Nuclear Oversight**



**Northeast  
Utilities System**

# Oversight Perspective

- Engineering performance improving
  - Quality Review Boards
  - Engineering Duty Manager role
- Additional improvement needed
  - Planning horizon
  - Consistent System Engineering performance
  - Consistent responsiveness to plant problems
- Engineering is responsive to Oversight input



# Oversight Focus Areas

- **Planning**
- **Safety Conscious Work Environment**

# **Integrated Plans In Place for “Best of Best”**

- **Important points**
  - **Operations focus/backlog reduction**
  - **Strategy goals/performance management**
  - **Oversight/self assessment**
  
- **Conservatively paced movement from recovery to operations**
  - **Safety paramount to successfully participate in competitive market**
  - **Preserve design and licensing bases and maintain high system reliability**

