ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

INSPECTION REPORT NUMBERS 50-245/86-99 and 50-336/86-99

MILLSTONE NUCLEAR STATION, UNITS I & II

ASSESSMENT PERIOD: June 1, 1986 to December 31, 1987

BOARD MEETING DATE: February 25, 1988

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I. INTRODUCTION

A. Purpose and Overview

The Systematic Assessment of Licensee Performance (SALP) program is an integrated NRC staff effort to periodically collect observations and data and evaluate licensee safety performance. SALP supplements the normal regulatory processes used to ensure compliance with NRC rules and regulations. It is intended to be diagnostic enough to provide a rational basis for allocating NRC resources and to provide meaningful input to licensee management on promoting quality and safety of plant operation.

The NRC SALP Board, composed of the members listed below, met on February 25, 1988 to assess licensee performance in accordance with the guidance in NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance". A summary of the guidance and evaluation criteria is provided in Section II of this report.

This SALP assesses the safety performance of the Millstone Nuclear Power Station, Units 1 and 2 from June 1, 1986 through December 31, 1987, a 19 month assessment period. The SALP is organized, except for areas completely common to both units, into functional areas broken down into Unit 1 and Unit 2 subsections.

B. SALP Board Members

W. Kane, Director, Division of Reactor Projects (DRP), Chairman
W. Johnston, Director, Division of Reactor Safety (DRS)*
F. Congel, Director, Division of Reactor Safety and Safeguards (DRSS)
S. Collins, Deputy Director, DRP*
J. Richardson, Deputy Director, DRSS*
L. Bettenhausen, Chief, Projects Branch No. 1, DRP
R. Bellamy, Chief, Emergency Preparedness and Radiological Protection Branch, DRSS*
J. Durr, Chief, Engineering Branch, DRS
E. McCabe, Chief, Reactor Projects Section No. 1B, DRP
J. Stolz, Director, Project Directorate I-4, NRR
M. Boyle, Unit 1 Project Manager, PDI-4, NRR
D. Jaffe, Unit 2 Project Manager, PDI-4, NRR
W. Raymond, Millstone Site Senior Resident Inspector, DRP

*Part time attendees.

Other Attendees

R. Bailey, Physical Security Inspector, DRSS*
S. Chaudhary, Senior Reactor Engineer, DRS*
R. Gallo, Chief, Operations Branch, DRS*
J. Jang, Senior Radiation Specialists, DRSS*
L. Kolonauski, Unit 1 Resident Inspector, DRP
J. Kottan, Laboratory Specialist, DRSS*
W. Kushner, Safeguards Scientist, DRSS*
W. Lazarus, Chief, Emergency Preparedness Section, DRSS*
M. Shanbaky, Chief, Facility Radiation Protection Section, DRSS*
W. Thomas, Radiation Specialist, DRSS*
A. Weadock, Radiation Specialist, DRSS*

*Part time attendees.

II. CRITERIA

Licensee performance is assessed in selected functional areas. Each functional area represents aspects significant to nuclear safety and the environment, and is a normal programmatic area. The following evaluation criteria were used as appropriate.

1. Management involvement and control in assuring quality.
2. Approach to resolution of technical issues from a safety standpoint.
3. Responsiveness to NRC initiatives.
4. Enforcement history.
5. Reporting and analysis of reportable events.
6. Staffing (including management).
7. Training effectiveness and qualification.

Based upon the SALP Board assessment, each functional area is classified into one of three performance categories. These are:

Category 1. Reduced NRC attention may be appropriate. Licensee management attention and involvement are aggressive and oriented toward nuclear safety; licensee resources are ample and effectively used so that a high level of performance with respect to operational safety is being achieved.

Category 2. NRC attention should be maintained at normal levels. Licensee management attention and involvement are evident and concerned with nuclear safety; licensee resources are adequate and reasonable effective such that satisfactory operational safety performance is being achieved.

Category 3. Both NRC and licensee attention should be increased. Licensee management attention or involvement is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appear strained or not effectively used such that minimally satisfactory performance with respect to operational safety is being achieved.

The SALP Board also considered categorizing the performance trend. A performance trend is assigned only if the SALP Board concludes that continuation of a trend may change the performance category. Performance trend categories are:

Improving: Licensee performance was determined to be improving near the close of the assessment period.

Declining: Licensee performance was determined to be declining near the close of the assessment period.

III. SUMMARY OF RESULTS

A. Overall Summary - Unit 1

Performance was consistently good. Safe and conservative plant operation was evident. Operators responded well to plant trips. A high level of safety performance was noted in Plant Operations, Maintenance, Surveillance, Emergency Preparedness, Outage Management, and Training Effectiveness. There was a strong commitment to safety at all levels.

Significant improvements were noted in Radiological Controls, particularly in the radwaste and transportation programs. Performance in this area has increased from Category 3 to Category 2 since the last SALP.

Performance in Security decreased to Category 2 during the SALP period. The NRC found that guards were not identifying deficiencies in meeting basic objectives, and that program oversight needed improvement.

The Licensing Activities performance rating also has decreased from Category 1 to Category 2. Repetitive late submittals without, in some cases, arranging revised submittal dates with the NRC staff were the main reason for the lower rating. Licensing Activities were otherwise found to be well-managed and capably performed.

Engineering support groups displayed good initiative in some issues and were generally effective. On the other hand, weaknesses in environmental qualification, slow response to identification of short pump foundation bolts, and recurring main condenser tube leaks showed that significant engineering support improvements can be made.

The licensee was successful in improving performance on identified problems. Areas given management attention showed marked improvement. As the Security area assessment indicates, however, better self-identification of performance problems is needed to achieve high performance across-the-board.

The prior SALP rated five areas as Category 1, three areas as Category 2, and one area as Category 3. This SALP rated six areas as Category 1 and five as Category 2. It is particularly commendable that the extensive corporate and site management changes made during the past several years have occurred without impacting overall unit safety performance, which remains high.

B. Background

1. Licensee Activities

On June 1, 1986, the SALP period began. Millstone 1 was operating at full power. Normal full power operation, with short power reductions for corrective maintenance (e.g., condenser tube and steam leaks), lasted until November 30, when the unit tripped due to a main transformer ground. The transformer was replaced and the unit was returned to full power after a 15-day outage.

Normal full power operation continued until March 22, 1987, when the unit scrammed from 50% power due to closure of the Main Steam Isolation Valves (MSIVs). Low reactor pressure had resulted when reactor pressure control was shifted from the Electric Pressure Regulator (EPR) to the Mechanical Pressure Regulator (MPR); the resultant primary containment isolation signal caused the MSIVs to close. This trip was attributed to inadequate operator training in shifting from the EPR to the MPR.

Full power operation was resumed until June 4, when a failing Steam Jet Air Ejector necessitated a power drop to 40% to restore Main Condenser vacuum. The unit was then returned to full power until shutdown began on June 5 for a planned 70-day refueling and maintenance outage. In addition to the Cycle 12 reload, outage work included replacement of the jet pump instrumentation nozzles, the process computer, and the motor-operators for certain safety-related valves.

During the Cycle 12 startup on August 14, the unit tripped due to Intermediate Range Monitor Hi-Hi flux created by operator-initiated excessive control rod withdrawal. A subsequent startup began on August 15. Full power was reached on August 20.

A reactor trip from 100% power occurred on August 26 due to personnel error during surveillance of the Average Power Range Monitors (APRMs). Another trip from full power occurred September 3 due to low pressure in the scram pilot air header (equipment failure). Full power was again achieved and continued until November 14, when the unit was taken to cold shutdown for a 64-hour outage to investigate and repair increasing unidentified drywell leakage (a valve packing leak). The unit was returned to full power for the rest of the assessment period.

2. Inspection Activities

The NRC resident and region-based inspections for the 19-month SALP period totaled 2671 hours, a rate of 1687 hours per year.

There were five special inspections during the SALP period to: (1) review licensee response to IE Bulletin 80-11, Masonry Wall Design; (2) review check valve testing; (3) observe two annual emergency exercises, and (4) review compliance with 10 CFR 50 Appendix R fire protection requirements. An inspection summary (Table 1A) is attached to this report.

The NRC senior resident inspector for Millstone 1 and 2 was reassigned in September 1987. A new senior resident inspector was assigned to all three Millstone units in July 1987. The Millstone 1 and 2 resident inspector was reassigned in September 1987. A new resident inspector for Unit 1 reported in November 1987.

C. Facility Performance Analysis Summary - Unit 1

Functional Area		Last Period (3/1/85 - 5/31/86)	This period (6/1/86 - 12/31/87)	Recent Trend
A.	Plant Operations	1	1	--
B.	Radiological Controls	3	2	--
C.	Maintenance	2	1	--
D.	Surveillance	1	1	--
E.	Emergency Preparedness	1	1	--
F.	Security and Safeguards	1	2	--
G.	Outage Management	None#	1	--
H.	Assurance of Quality	2	2	--
I.	Engineering Support	None#	2	--
J.	Training Effectiveness	2	1	--
K.	Licensing Activities	1	2	--

Not assessed as a separate area in the last SALP

D. Overall Summary - Unit 2

Facility performance was good. Safe and conservative plant operation was evident. Operators responded well to plant trips. A high level of safety performance was noted in Maintenance, Emergency Preparedness, Outage Management, and Training Effectiveness. There was a strong commitment to safety at all levels.

Significant improvements were noted in Radiological Controls, particularly in the radwaste and transportation programs. Performance in this area has increased from Category 3 to Category 2 since the last SALP.

Performance in Security decreased to Category 2 during the SALP period. The NRC found that guards were not identifying deficiencies in meeting basic objectives, and that program oversight needed improvement.

Surveillance performance decreased to a Category 2 rating primarily because, after a refueling outage, the plant was restarted without correcting steam generator tube flaws needing repair. A subsequent outage was required for corrective maintenance. Licensee management responded positively and conservatively to this operational safety concern.

The Licensing Activities performance rating also has decreased from Category 1 to Category 2. Repetitive late submittals without, in some cases, arranging revised submittal dates with the NRC staff were the main reason. Licensing Activities were otherwise found to be well-managed and capably performed.

Engineering support groups displayed good initiative in some issues and were generally effective. A need for improvement was, however, evident from deficiencies in the Fire Protection Program, from weaknesses in Environmental Qualification, and from two reactor trips related to design deficiencies.

The licensee was successful in improving performance on identified problems. Areas given management attention showed marked improvement. As the Security area assessment indicates, however, better self-identification of performance problems is needed to achieve a high level of performance across-the-board.

The prior SALP rated seven areas as Category 1, two areas as Category 2, and one area as Category 3. This SALP rated four areas as Category 1 and seven as Category 2. The lower ratings do not represent a significant safety degradation. Therefore, the extensive corporate and site management changes made during the past several years have occurred without significantly impacting overall unit safety performance.

E. Background

1. Licensee Activities

On June 1, 1986, Millstone 2 tripped from full power. The trip was due to operator error during transfer from the Reserve Station Service Transformer (RRST) to the Normal Station Service Transformer (NSST). That caused the loss of a 6.9 KV bus and subsequent underspeed of a reactor coolant pump.

Power operation was resumed and continued until increasing Reactor Coolant System (RCS) leakage necessitated a power reduction for RCS inspection within containment. On August 12, during preparations to reduce power, the unit tripped from full power due to low steam generator (SG) level caused by the loss of an auxiliary oil pump for the associated steam generator feed pump (SGFP). A four day maintenance outage was then conducted.

Full power operation was resumed until September 3, when the unit tripped due to low SG level caused by the loss of both SGFPs due to the failure of the reheater drain pump discharge header flow control valve. Full power operation resumed on September 5. The unit entered a two-week coastdown period prior to the planned refueling outage, which began on September 20.

On December 23, during power ascension testing for Cycle 8, the unit tripped from 50% power when a transformer alignment problem caused a SGFP underspeed. The unit was returned to power. It next tripped, from 100% power, on January 2, 1987 due to low SG level caused by the failure of a feedwater regulating valve (FRV) solenoid. The unit was returned to full power on January 5.

Full power operation continued until January 29, when there was a normal shutdown to correct primary to secondary leakage. The outage was extended to repair other SG tube defects not previously corrected because of faulty Eddy Current Testing (ECT) review. The unit then operated at full power from February 16 until tripping on April 16 due to a main generator trip from an undetermined cause.

Normal full power operation was resumed until July 23, when the unit tripped from 80% power because a pressurizer spray valve malfunction caused low SG level. The unit was returned to and remained at full power until on September 2, FRV failure (valve plug and stem separation) caused low SG level and a reactor trip.

The unit returned to full power until November 11, when the same [illegible], this time because a valve positioner fault caused [illegible] a reactor trip.

The unit was returned to and remained at full power until, on December 6, coastdown for a planned refueling outage began. The unit was brought to cold shutdown on December 9, 1987.

2. Inspection Activities

The NRC resident and region-based inspections for the 19-month SALP period totaled 2595 hours, a rate of 1639 hours per year.

There were three special inspections during the assessment period to: (1) observe two annual emergency preparedness exercises; and (2) review licensee response to IE Bulletin 80-11, Masonry Wall Design. An inspection summary (Table 1A) is attached to this report.

The NRC senior resident inspector for Millstone 1 and 2 was reassigned in September 1987. A new senior resident inspector, assigned to all three Millstone units, reported in July 1987. A Millstone 1 and 2 resident inspector was reassigned in September 1987. A new resident inspector for Unit 2 reported in January 1988.

F. Facility Performance Analysis Summary - Unit 2

Functional Area	Last Period (3/1/85 - 5/31/86)	This period (6/1/86 - 12/31/87)	Recent Trend
A. Plant Operations	1	2	--
B. Radiological Controls	3	2	--
C. Maintenance	1	1	--
D. Surveillance	1	2	--
E. Emergency Preparedness	1	1	--
F. Security and Safeguards	1	2	--
G. Outage Management	1	1	--
H. Assurance of Quality	2	2	--
I. Engineering Support	None#	2	--
J. Training Effectiveness	2	1	--
K. Licensing Activities	1	2	--

Not assessed as a separate area in the last SALP

IV. PERFORMANCE ANALYSIS

A. Plant Operations

General and Common Aspects

This functional area includes overall plant operations, housekeeping, fire protection, staff performance, review committee activities, event reporting and corrective actions.

The licensee's station and offsite review committees functioned as required by the plant technical specifications, and in conformance with the applicable procedure. The licensee regards committee membership to be a serious commitment, as was evident by the attendance record. The licensee's commitment to conservatism and safety was evident in committee review of complete modification packages in addition to the safety evaluation reviews required by the technical specifications. The committees displayed a probing, questioning approach in resolution of safety and technical issues.

Licensee Event Reports (LERs)

For both units, LERs were thorough and well written. They adequately described events, equipment, failures and corrective actions. Previous similar occurrences were referenced. Root causes were clearly identified. Updated LERs highlighted new information. NRC review of LERs identified no recurring problems and no inattentiveness to problem identification and correction. Event safety assessments improved significantly during the recent assessment period. One case (Unit 2 LER 86-10) of not updating an LER within the planned six months was identified as an exception to normal practice. Overall, LER quality was high.

1. Plant Operations - Unit 1 (1019 hours, 38%)

The previous SALP rated this area as Category 1. Significant strengths noted were response to abnormal conditions (Hurricane Gloria), management oversight of operations, and operating staff stability and professionalism.

Operator alertness was routinely observed during day and back shifts. Overall, operating shift functioning was evaluated as smooth and professional. Control room distractions were neither allowed nor observed. Activities were conducted carefully and with sufficient formality. Shift turnovers were consistently thorough and effective. Operators were strong proponents of control room formality and actively ensured a professional atmosphere was maintained. Operators' attitudes were excellent during operations and outages. Briefings for tests and infrequent evolutions, especially during the outage period, were detailed and involved frequent interaction among team members. Frequent observance of evolutions showed that written

procedures were routinely followed. Administrative support of plant operations was effective, with logs and records found to be generally discrepancy free.

Two reactor scrams occurred as a result of operator performance problems. One of these was a result of continuous withdrawal of a high worth control rod during reactor startup. Inadequate procedural addressal of the rod worth condition contributed to this event. The other such scram was due to problems with the transfer of turbine pressure control between the mechanical pressure regulator (MPR) and the electrical pressure regulator (EPR). [This latter scram is also evaluated in Section IV.J, Training Effectiveness.] The licensee took appropriate action to clarify operating procedures and to provide additional operator training on the EPR/MPR. Appropriate corrective actions were also taken to instruct operators on the caution needed when withdrawing control rods in high worth regions on new cores. Operator responses involving scrams were otherwise good.

Management attention to operations and active involvement in oversight was evident in frequent plant superintendent control room and plant tours. Routine NRC inspection also consistently noted strong management involvement in response to plant trips and other problems. Monthly detailed plant material and housekeeping walkdowns generated departmental action lists which were actively discussed at Plant Operations Review Committee meetings. Listed items were corrected. Management commitment to operator training was demonstrated by a successful performance record in operator licensing. As noted in Section IV.J, Training Effectiveness, 16 of 18 operator license candidates passed the NRC examinations and received licenses.

There was good communications between operations, upper management, and other plant groups. The licensee demonstrated a strong safety orientation in problem resolution and a conservative approach to plant operations. Professionalism was evident at all levels.

Performance of the Plant Operations Review Committee (PORC) was a major strength. PORC members routinely exhibited probing and questioning attitudes. Extensive discussions were used to focus attention on the safety implications of design changes and evolutions. Active interplay among members contributed to a team approach to making informed and correct decisions. Special presentations were highly effective in ensuring PORC understanding of technical issues. PORC routinely exhibited a conservative and safety-oriented approach to plant operation. Excellent PORC performance was especially evident during the outage.

Overall, operating procedures were good. No major procedure inadequacies were found. Personnel routinely followed procedures and properly identified and proposed appropriate changes. The periodic procedure review program ensured that improvements, clarifications and simplifications were implemented. This period saw a marked emphasis on implementation of "human factors" type procedure improvements.

A fire protection team assessed compliance with 10 CFR 50 Appendix R requirements with respect to the ability to safely shut down in the event of a fire. Aggressive attention by corporate and site management to fire protection issues was evident, with priority given to problems requiring hardware fixes.

Several plant modifications were completed to comply with Appendix R Section III.G separation requirements. The fire hazard analysis was thorough, detailed and technically adequate. The licensee had redundant means of achieving safe shutdown in the event of a fire. Also, the licensee had developed adequate procedures, including detailed repair procedures, and demonstrated that the procedures would work. Good planning and training were evident with respect to the procedures. The NRC concluded that the licensee's fire protection program was good. Major contributing factors were the rapport maintained by the fire protection staff and management and the increased awareness of plant personnel to fire protection concerns.

Inspection of radiological housekeeping identified deficient control of issued respirators, of used protective clothing, and of contaminated material bags. Later observation found much improvement. Overall, the NRC concluded that the licensee maintained plant components in good condition and that housekeeping was satisfactory.

The three violations for this area involved a failure to update technical specification surveillance requirements and snubber tables, and a failure to make a 10 CFR 50.72 report of multiple ADS valve failures. Another violation, not cited because it lacked safety significance, was for failure to update the technical specifications following modifications made in 1987 to change the low pressure ECCS actuation logic. The failure to make the report was still under NRC and licensee review at the end of the SALP period.

Several occurrences during the assessment period, as demonstrated by the events involving reactor scrams (LERs 87-07 and 87-34) and standby gas treatment system initiations (LER 87-05), suggested a need to assure greater attention to detail in plant operations and to ensure lessons are learned from past deficiencies.

Overall, the licensee demonstrated continued excellent performance in plant operations, with strong management involvement and oversight, good performance in operator licensing, clear management support for training, and a successful Appendix R effort. Plant housekeeping, operator professionalism, and safety perspective in problem resolution remained notable strengths. However, the events indicating a need for improved attention to detail and a better lessons learned function also indicate that attention is warranted to assure decreased performance does not occur

Conclusion

Category 1.

Board Recommendations

None.

2. Plant Operations - Unit 2 (1065 hours, 40%)

The previous SALP rated this area as Category 1. Strengths included plant management interfaces with operating personnel and operator professionalism.

Operator alertness was routinely observed during day and backshift inspections. Operating shifts presented an efficient and professional attitude in the control room. The unit had a dress code, instituted to reflect this attitude. Business was conducted in a manner that clearly showed that the control room is not a gathering place. The operations department effectively limited personnel in the control room.

Nine unplanned trips from power occurred; the overall trip rate was about six per year. Operator response to all trips was satisfactory. One of the trips resulted from operator error during breaker switching. Appropriate operator retraining was conducted.

Overall, operating procedures were good. No major procedure inadequacies were found. Operators followed procedures and proposed appropriate changes when discrepancies were identified. Good operator knowledge of and regard for procedural requirements and administrative controls was evident. Periodic procedure reviews effectively ensured that improvements were implemented.

Plant management was observed to be in the plant frequently, and to be discussing activities with the operating staff. Thorough knowledge of plant conditions was routinely exhibited by plant management during daily management meetings and during discussions with NRC inspectors. Routine inspection consistently showed plant management attention to operations and effective daily involvement to coordinate operating activities and resolve problems. Also, site and corporate management attention to operations and active oversight of operating activities was evident in plant visits and plant tours.

There was good communications between operations, management, and other plant groups. Management involvement following plant trips and events was evident during meetings and discussions with the inspectors. A strong safety approach was taken in the resolution of problems. There was a generally conservative approach to plant operations. Professionalism was generally evident at all levels.

Plant Operations Review Committee (PORC) members exhibited a probing, questioning approach to technical issues, and discussions focused on the safety implications of events, design changes, and evolutions. Good interactive discussions were consistently observed and special

presentations were effectively used to fully evaluate technical issues. Excellent PORC performance was evident during outages and after events or transients. The PORC function was highly effective.

In April 1987, a pilot program for operating shift rotation was put into effect. The program reduces the shift changes over a twelve week cycle, provides additional days off around weekends, and provides longer continuous periods of off time. Because it also provides 12-hour shifts on two consecutive days, specific back shift inspections were made to observe plant operators on 12-hour shifts. No problems were observed. This program appears to be accepted by operators and management as a markedly improved shift rotation.

Appendix R inspection found fire protection actions generally acceptable. There were two violations, one for a missing fire damper and the second for insufficient separation between the auxiliary feedwater heaters and their isolation valves. Also, fire coating material was found unacceptable (LER 87-10), additional compensatory measures were taken. The licensee has an adequate fire protection staff, but no one person has been made responsible for overseeing fire protection. (See Section IV.I, Engineering Support, for assessment of the fire protection program.)

Fourteen of 17 operator license candidates passed the NRC examination and received licenses. With regard to training in Appendix R modifications, however, some operators had difficulty in performing tasks such as locating some safe shutdown equipment and removing some breakers. (See Section IV.J, Training Effectiveness, for evaluation of training aspects.)

The control room and control board interiors were generally clean. In the plant, however, the licensee did not remove boron encrustation after leak repairs. That did not contribute to the otherwise good work practices, but the pipe and valve leakage control program now addresses this. Overall, housekeeping was evaluated as fair.

Extended inoperability of the ventilation coolers for the vital DC switchgear rooms was identified. The licensee compensated for the inoperable equipment by prescribing additional operator actions in plant procedures, but these procedures lost detail over various revisions. Licensee actions on this item were not indicative of the generally conservative approach taken to equipment operability. There was little safety significance because operator actions would have provided adequate cooling of the rooms. Nonetheless, operational and plant management review of plant conditions should have prompted earlier resolution of cooler inoperability.

In summary, the licensee demonstrated continued good performance in plant operations, with strong management involvement and oversight, good performance in operator licensing, and a generally suc-

cessful Appendix R effort. Operator competence was evident, and their professionalism and safety perspective in problem resolution remained notable strengths. Plant housekeeping was acceptable but can be improved.

Conclusion

Category 2.

Board Recommendations

Licensee:

-- Improve equipment operability overview.

-- Assure proficiency in shutdown equipment operation.

-- Improve housekeeping.

B. Radiological Controls - Unit 1 (297 hours, 11%)
- Unit 2 (265 hours, 10%)

The licensee's Radiological Controls Program was rated Category 3 during the previous assessment period. Significant weaknesses in the radwaste/transportation areas resulted in multiple NRC violations. These reflected a lack of management involvement, inadequate QA, and ineffective corrective action. Deficiencies were also noted in control of high radiation areas, the ALARA program, and implementation of in-the-field changes to Radiation Work Permits (RWPs).

A total of twelve inspections in the Radiological Controls area were conducted during the current period. Two violations were identified, both in the radiological safety area.

Radiological Safety

The licensee's radiological safety organizational structure was clearly defined and adequately staffed. Effective procedures and policies were in place. Adequate staffing upgrades were made to support outage activities. The resume review and qualification process for contractor technicians was effective and well-documented.

Training of radiation workers and contractor technicians was performed effectively. Deficiencies were noted, however, with the level of supervision of temporary personnel performing station health physics support activities (whole body counting, respirator issue, etc.). As a result, minor problems were noted with whole body counting control charts, source check records and temporary personnel training and qualification records.

Audits of the Radiation Safety Program were performed by the corporate staff. Review indicated that, although procedural requirements were met, audits were compliance-oriented rather than performance-oriented, in that procedure adherence was audited but not procedure and program adequacy. Concerns were also identified with the independence of auditors, specifically in the dosimetry area. Both the auditors and the dosimetry group reported to the same supervisor. The licensee committed to change this.

Posting and control of high radiation areas (HRAs) continued to be a Unit 1 weakness during the current period. An unlocked HRA door was identified by the NRC during the Unit 1 outage; additionally, several temporary HRAs were noted to be inadequately posted.

Weaknesses in radiological area posting and radioactive material labeling were also noted during the Unit 1 outage. There was a violation for failure to label radioactive material. These concerns suggest an inappropriate level of control and supervision over radiological field activities during the Unit 1 outage. Posting and labeling practices at Unit 1 during routine operations and at Unit 2 were noted to be effective. Subsequent to the identification of the above concerns, the licensee in-

stituted a policy requiring more frequent surveillance of controlled areas. A significant increase in upper-level station management attention and involvement in the implementation of the radiological safety program was also noted in the last third of this period.

Several high-exposure work activities were effectively controlled by the licensee during the current period. Appropriate pre-work surveys were taken and Radiation Work Permits (RWPs) prescribed effective work controls. Survey information was available and was communicated to radiation workers. Engineering controls were effective in minimizing airborne radioactivity. Support services, including respiratory protection and dosimetry, continued to adequately support the program. Several minor examples of failure to follow the RWP procedure were noted during the Unit 1 outage, and resulted in a violation. These examples indicated a lack of HP technician and supervisor attention to detail and to effective control of the RWP system during the Unit 1 outage. No difficulties were observed with Unit 1 RWPs during routine operations. Unit 2 implementation of the RWP system was effective.

While improvements were noted in the ALARA program during the current period, continuing effort in this area is needed. Deficiencies in the ALARA goal-setting methodology were noted at the beginning of the period; ALARA goals were being developed exclusively by the corporate group and often did not reflect the specific scope of work planned. It was noted during the Unit 2 outage that widely discrepant site and corporate derived goals were in place for the same activities. Goals are now being proposed by the corporate group, based partly on input from the site; the site then reviews and adjusts as necessary.

A significant scope of work was undertaken during the period, including refueling at both units, jet pump nozzle work and torus decontamination at Unit 1, and steam-generator repair and fuel pool re-racking at Unit 2. Adequate pre-job planning was typically in place. It was noted, however, that poor feedback from some station work groups resulted in delays in ALARA planning during the 1986 Unit 2 outage. Daily outage exposure tracking was performed effectively and represented an improvement over the previous period. Exposure reduction techniques typically utilized included steam-generator channel head decontamination, mock-up training, temporary shielding, and effective contamination control. Additional licensee initiatives in the ALARA area included the institution of a station cobalt reduction plan and adoption of a zinc passivation process at Unit 1 to reduce overall dose rates.

Unit 1 exposure during the current period reflects a significant improvement over previous periods. In 1986, a non-refueling outage year, exposure totaled 162 person-rem. In 1987, Unit 1 exposure totaled 710 person-rem, most of which was attributable (approximately 613 person-rem) to the refueling outage.

Unit 2 exposure continued to be high during outage years and totaled 962 person-rem in 1986. The majority of this exposure (879 person-rem) resulted from the outage. A significant scope of work generated much of this exposure; however, several equipment and performance problems contributed to overall exposure. These included significant difficulties with steam generator (S/G) nozzle dam installation, relative ineffectiveness of the S/G channel head decontamination, and remote equipment limitations during tube plugging. These problems contributed to the steam generator inspection and maintenance exposure exceeding the ALARA estimate by approximately 120 person-rem. The NRC staff noted improved performance in the installation of steam generator nozzle dams during the 1988 outage (after the SALP period). This was directly related to careful preoperational testing of the dams and detailed training of the workers involved. These program improvements, along with the use of remote manipulation equipment for tube pulling and nondestructive testing inside the steam generator primary channel heads, contributed significantly to lowering outage exposures. Licensee efforts in this area should continue to be directed towards increasing the effectiveness of pre-work planning and reducing the incidence of equipment malfunction and rework.

Unit 2 exposure for 1987, primarily an operational year, exhibited improvement over previous operational years and totaled approximately 154 person-rem.

Chemistry

A clear corporate commitment to and support for an effective water chemistry control program was evident in review of the Unit 1 program. The organization was clearly defined, suitably staffed with qualified personnel, and functioned smoothly in its interfaces with other plant groups. The licensee was responsive to NRC suggestions for improved valve maintenance debris control and actions when contaminant levels exceed administrative limits. The ongoing cobalt reduction program showed a proactive management approach to corrosion product source term reduction. In-line instrumentation and sampling was adequate for corrosion and impurity ingress monitoring. Overall, the chemistry program effectively supported plant operations.

Chemical measurement capability was evaluated against technical specification and other regulatory requirements. The licensee was adequately staffed and had state-of-the-art equipment for nonradiological chemistry. Weaknesses in laboratory calibration techniques indicated minor inattention to detail, however.

The gaseous and liquid effluent control programs were inspected during this assessment period. The Chemistry group was responsible for program implementation. Clear corporate support for effective implementation was evident. Management controls were evident in the procedures for controlling discharges as well as for scheduling surveillances. Effluent

control instruments were maintained and calibrated in accordance with regulatory requirements. Air cleaning systems were also inspected during this assessment. All release records were completed and well maintained. Improvements had recently been made to vendor laboratory QA controls including the assignment of one chemistry staff member to review and implement in this area. Management audits of the program were generally comprehensive and technically sound.

During this assessment period one independent measurement inspection was performed using the NRC:I Mobile Laboratory. All split sample results were in agreement between the licensee and the NRC.

During this assessment period, the licensee's whole body counting facility was examined. One deficiency in the whole body counting QC program indicated a lack of attention to detail in this area. The licensee stated that this area would be reviewed and timely corrective action taken. The licensee's corrective action was not reviewed during this assessment period.

Transportation

Two transportation inspections were conducted during this assessment period. Following incidents which resulted in several violations and weaknesses in the last assessment period, the licensee restructured the organization responsible for packaging and shipping radioactive materials. The responsibilities and authorities of the Radioactive Material Handling (RMH) Department were defined adequately. Job-related procedures and QA audit procedures have been revised and improved. The frequency and scope of QA audit activities has also improved. The Radwaste Review Committee has been reactivated. Documentation of shipments has been improved, and all paperwork for a given shipment is now kept together as required.

Following violations pertaining to radwaste transportation training during the last assessment period, licensee modules were completely rewritten. All staff received required training except for an individual who could not complete the course due to health problems. The training and qualification contributed a positive direction to the effectiveness of RMH group's function. Close management attention to planning and implementing the program was noted, with strong peer review of the technical aspects of preparation, packaging and shipping activities.

Summary

Licensee performance during the current period reflects substantial improvement in the radwaste and transportation areas. The in-plant radiological safety program was generally effective; however, a deficiency in the level of control and supervision of field activities was identi-

fied and led to weaknesses, primarily in Unit 1 outage performance. Improvements in ALARA were achieved; continuing licensee attention should be directed in this area.

Conclusion

Category 2.

Board Recommendation

Licensee:

-- Improve control and supervision during outages.
-- Improve pre-job planning and work efficiency.
-- Continue improving the ALARA program.

C. Maintenance

The licensee's maintenance program provided effective planning, controlling and trending of maintenance activities through the licensee's Production Maintenance Management System (PMMS). The system has been a good planning tool that helped to assure proper coordination of maintenance activities. The tracking function of the program ensured that maintenance activities were properly closed out.

1. Maintenance - Unit 1 (174 hours, 7%)

The previous SALP rated Maintenance as Category 2, Consistent. An area identified as requiring increased emphasis and management attention was addressal of aging components. Examples identified included the scram solenoid pilot valves, the emergency gas turbine generator (EGTG), and the main turbine mechanical pressure regulator (MPR). There has been improved performance of the scram pilot valves. The EGTG maintenance program was improved, and the EGTG exhibited much improved reliability. Also, extensive maintenance on the MPR improved its performance and reliability.

During this SALP period, maintenance was routinely reviewed by resident inspectors and occasionally by region-based inspectors. One scram (9/3/87: low scram air header pressure) was attributed to maintenance. Safety system readiness and reliability, and In-Service Testing (IST) performance evidenced the effects of good preventive and corrective maintenance. Consistently satisfactory "as found" surveillance results also indicated successful maintenance.

Management attention in this area was evident at Unit 1 by an on-line updating of maintenance activities on a per-shift basis. Also, the maintenance department used data trending techniques in reviewing and analyzing the preventive and corrective maintenance records. This was a positive step toward improving effectiveness of maintenance activities.

Corrective maintenance was generally performed in strict accordance with policies, procedures and work orders. Troubleshooting and significant supervisory involvement led to accurate problem assessment and formulation of proper corrective actions. Work was thorough and technically sufficient. Rework was seldom required. A comprehensive trending program was established and well implemented. Only one maintenance inadequacy was observed: the "as-found" containment integrated leak rate test (CILRT) failed on August 6, 1987 due to leakage through isolation condenser steam vent valves. The root causes were poor post-maintenance valve stroke adjustment and an inadequate post-maintenance test. Following valve overhaul, maintenance personnel had failed to set valve stroke sufficient to en-

sure positive seating. Licensee planning to implement a training program to cover proper post-maintenance valve adjustment was appropriate to correct the deficiency.

The maintenance department was staffed with well trained, competent and dedicated mechanics, electricians and machinists. Additional maintenance assistance was available from the other Northeast Utilities plants on an "as needed" basis. Observations and discussions showed maintenance supervisors and managers to be knowledgeable, as well as active in quality assurance activities. Highly effective planning minimized outage and operational scheduling impacts. The strength and flexibility of the organization was particularly evident in excellent outage performance. Also, coordination with other departments was excellent.

Licensee performance of maintenance during the 1987 outage was particularly noteworthy. A very significant outage work load was completed. The maintenance activities were well planned and executed. Licensee attention to plant cleanliness during the outage and during routine power operation was very good.

Licensee performance in the maintenance area has significantly improved over the assessment period.

Conclusion

Category 1.

Board Recommendations

None.

2. Maintenance - Unit 2 (181 hours, 7%)

The previous SALP rated the maintenance area as Category 1. Strengths included machinery history, modification testing, preventive maintenance, procedural compliance, safety, work practices and documentation.

During this SALP period the licensee's performance on major job tasks displayed excellent knowledge of systems and the details of modifications. These activities included the installation of a new containment pedestal crane to support faster crane evolutions in high radiation areas, a pilot fuel consolidation project, replacement of Turbine Building Closed Cooling Water heat exchangers, and renewal of containment isolation valve seats. In addition, support to Steam Generator Non-Destructive Examination (NDE) inspections and the replacement of the main condenser added unusually heavy workloads for maintenance supervision. The jobs were nonetheless well managed.

Maintenance management kept the work backlog at minimum levels. In addition, use of thermography surveys of electrical equipment detected a loose connection on a Reactor Coolant Pump (RCP) penetration, and corrective action was taken prior to cable failure or malfunction. Detailed involvement of quality control personnel, supporting engineering groups, purchasing, material, and construction groups was evident. Examples of thorough QC overview were noted in fuel reconstitution and fuel consolidation, activities which were supported by the maintenance department.

Upper management support of maintenance was demonstrated in the construction of new Unit 2 maintenance facilities. The I&C shop was expanded. In addition, a new snubber repair and test facility was added.

Better performance by the Production Test Department appears to be needed. This group was responsible for three events, including two reactor trips. One was a loss of normal power (LNP) while shut down (LER 86-20); one was a LNP/reactor trip from 50% power (LER 86-22). These were both caused by improper closure of a 4 KV bus potential transformer drawer, resulting in misaligned stabs. One trip was caused by inadequate review of the effects of a design change to a fire protection system module on the main boards (LER 87-02).

Two trips during the period were attributed to feedwater regulating valve failures. Two other trips occurred due to equipment problems, one involving the pressurizer spray valve and a second involving an apparently spurious opening of the main generator field breaker. These four equipment problems were not correlated to maintenance deficiencies.

The maintenance program was staffed by dedicated, thoroughly trained, knowledgeable engineers, mechanics and technicians. Corporate management commitment to training was shown by the purchase of RCP seals and a diesel for training purposes.

A positive approach was demonstrated by implementing a preventive maintenance program to systematically maintain containment isolation valves such that containment leak rate is minimized. One of the associated actions was replacement of the T-ring seats for Fisher valves. Also, for two globe valves in the containment sump, the licensee proposed installation of screens to prevent debris accumulation which previously contributed to valve degradation and leakage.

Unlike Unit 1, the Unit 2 Maintenance Department has not implemented a comprehensive trending program. Unit 2 trending was done on a selected component basis.

One issue identified at the end of the SALP period and still under NRC review involved inadequately maintained seals on ventilation system joints and access doors. The worn seals provided an unintended control room air inleakage path, and airborne noble gas activity from the auxiliary building entered the control room. Licensee short term actions to correct the worn seals were appropriate.

In summary, good licensee performance in this area was demonstrated by good management and control of maintenance by a qualified staff. Initiatives to address recurring charging system maintenance problems were noted as was the management commitment to improvement of the maintenance facilities. Improvements can be realized by implementing a more comprehensive trending program, by improving Production Test Department performance, and by reducing the number of plant trips due to equipment problems. Although no significant performance change was noted late in the performance period, and although the equipment problems encountered may require engineering support resolutions, licensee attention may be needed to assure that maintenance performance does not decrease during the next SALP period.

Conclusion

Category 1.

Board Recommendations

None.

D. Surveillance

The licensee's calibration and surveillance program has been well defined and administratively controlled. The program was well managed and effectively implemented. Surveillances and calibrations were controlled and scheduled via automated work orders, and complex surveillances were identified as such. Records were well maintained and complete. Completed surveillances were routinely forwarded to records storage on a monthly or quarterly basis. Surveillance and calibration procedures were found to be technically adequate.

Test personnel were adequately trained and well versed in procedural and regulatory requirements. Supervision was involved in the conduct and review of completed test results. Measuring and test equipments (M&TE) used for surveillances and calibrations were found to be calibrated, and well controlled when not in use. M&TE was routinely returned to storage after each shift or upon completion of the activity.

Each department onsite was responsible for maintaining a status list of surveillances they are responsible for per administrative procedure. These lists were up-to-date and well maintained. Management also effectively used QA/QC to monitor surveillance program implementation. An example was QC surveillance of I&C Department control of M&TE, requested as a result of a transfer in responsibility for the control of M&TE. As expected, several problems were noted. These were quickly resolved and corrected.

The program for calibration of installed instrumentation was accurate, clearly described and well managed. Both the computerized scheduling at Unit 1 and the schedule sheets used at Unit 2 controlled the assignment and completion of tasks. The I&C staff and supervision had a clear understanding of the administrative control system.

Technicians performing calibrations knew their duties and the procedures being used. Execution of work steps was done conscientiously and in a confident manner. A notable human factors improvement in the conduct of in-plant calibration of instrumentation was the use of a personal computer at Unit 2 to display work steps, guide the technicians, determine acceptability of results, automatically initiate corrective action documents when appropriate, prompt and require workers to follow procedural steps, and retain results for record purposes.

Management involvement and support was evident and reflected in the quality of the established program, the manner in which it was implemented and being improved, and the effort to enhance QA overview effectiveness.

1. Surveillance - Unit 1 (438 hours, 16%)

The surveillance program at Millstone 1, including In-Service Inspection and Testing, received resident and region-based inspection. During the preceding SALP assessment period, a rating of Category 1 was assigned.

A large number of surveillance tests were observed by the NRC with little or no warning. The depth of knowledge and the pride in workmanship displayed by individual technicians was noteworthy. An active licensee review and upgrade program existed, and the quality of procedures used in surveillance testing was generally good. However, as evidenced by occasional inspector-identified procedural deficiencies (especially in long standing, frequently used procedures; e.g., weekly station battery checks), the upgrading system was not fully effective.

The Unit 1 Containment Integrated Leak Rate Test (CILRT) was well planned and organized, as evidenced by the availability of calibrated instruments and sensors, approved test procedures, and trained personnel. QA coverage of the test also was well planned and implemented. Leak inspections were well organized and properly coordinated by the test director. Test documentation was adequate and plant evolutions during the test were well documented as evidenced in the official test log book and control room shift supervisor's log book. Even though the "as found" CILRT failed due to leaks through Isolation Condenser valves, the test was well controlled and executed. The good overall test performance reflected the licensee's emphasis on detailed planning of surveillances.

The program for calibrating technical specification-related instrumentation included identification of instruments needed to satisfy the technical specifications, and verification that these were calibrated and in the calibration program. Data sheets had been developed and maintained for such instrumentation. The program for control and calibration of portable measurement and test equipment was adequate to provide for calibration frequency, accuracy and history of use of the equipment. Administrative controls over this equipment were effective.

While the overall surveillance program was good, follow-up on identified concerns needed more emphasis. This was evident by the delay in the resolution of short hold down bolt concern in the Low Pressure Coolant Injection (LPCI) and Core Spray systems. (This is evaluated in the Engineering Support Area, Section IV.I).

The use of technically qualified (NDE Level III) personnel to surveil ISI vendor activities was a positive way of assuring that these activities were performed in accordance with requirements. Management involvement in plant activities was evidenced by the consist-

ency with which the licensee informed the NRC, prior to performing examinations, of how NRC requirements regarding the detection of intergranular stress corrosion cracking (IGSCC) would be met. Pre-outage meetings were held to discuss compliance with applicable requirements. Effective licensee control of contractors was demonstrated by the licensee training given to In-Service Inspection (ISI) vendor personnel, who were further required to demonstrate their ability to detect IGSCC prior to performing work.

Surveillance activities contributed to operational events during the 1987 outage and upon startup. The events included: (i) an RPS actuation while shut down, due to failure of I&C technicians to adequately verify initial conditions during Main Steam Isolation Valve (MSIV) functional testing (LER 87-28); (ii) an actuation of LPCI with discharge to the reactor vessel due to inattention to detail and failure to provide required independent verification during surveillance (LER 87-33); and, (iii) an Engineered Safety Feature actuation as a result of inadequate control of surveillance testing (LER 87-36).

The one violation for this area (IR 87-21) involved what appeared to be a declining personnel performance trend. Licensee corrective actions appeared effective, in that no further problems have occurred.

Four licensee event reports involved missed or past due surveillances (LERs 87-04, 35, 37, and 39) and a fifth addressed a deficient test method used for the standby gas treatment system (SGTS) flow distribution (LER 87-44). The appropriate corrective action for the SGTS test method requires further licensee and NRC review, but it appears that the test method used was adequate. In regard to the missed surveillances, four in 19 months was not considered significant in view of the total number scheduled and completed satisfactorily. However, attention may be warranted to assure a declining trend does not develop.

The licensee had established procedures to implement Technical Specification related Surveillances and the ISI program. Planning, scheduling and conduct of the surveillances and ISIs were found to be adequate and met Technical Specification requirements. The individuals performing these activities were adequately trained and indoctrinated. Surveillance and ISI documentation was properly reviewed, approved and controlled. I&C was reviewing I&C procedures to incorporate current and accurate information and references.

The licensee also established off-normal procedure ONP-514B to enhance their winterization program. In addition, the plant operations staffs periodically made rounds and verified that safety-significant equipment, systems, and process lines were adequately protected against cold weather.

Staffing and staff training were evaluated as sufficient and effective.

In summary, the calibration and surveillance program for safety-related equipment was well established, and implemented by qualified personnel. Involved supervision provided program oversight and used the QA/QC function effectively. Performance of surveillance personnel was generally good. Performance of the Containment Integrated Leak Rate Test and the Inservice Inspection Program was notable. The three operational events related to surveillance activities were not assessed by the board as indication of a declining trend. However, attention is warranted to assure decreased performance does not result from missed surveillances or from surveillance-related plant events.

Conclusion

Category 1.

Board Recommendations

None.

2. Surveillance - Unit 2 (397 hours, 15%)

During the preceding SALP assessment period, this area was rated Category 1. The surveillance test program was considered a notable strength.

Surveillance activities inspected during this assessment period included: surveillance testing and calibration control; in-service inspection; seismic instrumentation; and steam generator work.

Performance of local leak rate testing (LLRT) and the supervision exercised over it were very good. LLRT technicians were competent and familiar with their assignments. Technicians were supervised by an operations engineer to assure procedural adherence and engineering oversight. The planning and test results evaluation was the responsibility of another engineer, who also provided overall program oversight. Good planning and effective administrative control of LLRT reflected the licensee's commitment to enhance the surveillance program.

A comprehensive steam generator (SG) tube maintenance program was implemented, including monitoring and control of secondary-water chemistry, inspection of condenser tubes, and performing material accountability to avoid leaving foreign objects in the SGs. The inspection sample size established by the licensee exceeds that required by technical specifications. These licensee activities represented good initiatives, and indicated a strong and aggressive management involvement in activities affecting safety and quality.

Procedures and planning for steam generator surveillance were good. The eddy current test (ECT) procedures were sufficiently detailed and emphasized precautions necessary for satisfactory performance of the measurement. Testing personnel were required to demonstrate their ability to complete their assignment in a safe and timely manner during on-site training before the actual work, in order to minimize radiation exposure and potential contamination.

After returning to power operation after to the 1986 outage, the licensee identified a leak, within acceptable limits, in steam generator SG-1, and initiated a plant shutdown. Hydrostatic test determined that a hot-leg tube was leaking. Re-review of ECT data showed a 31% through wall indication at the leakage location. The re-review of outage ECT data also disclosed that a defective cold-leg tube had not been plugged in SG-1. Thorough re-analysis of the ECT data identified 36 additional tubes (29 in SG-1, 7 in SG-2) with defects, some in excess of technical specification limits, which the licensee decided to plug. The testing deficiencies exhibited ineffective QA/QC review of the earlier eddy current data reduction and evaluation. The licensee generally maintained good control over

contractor activities, but this failure to identify tubes needing plugging prior to returning to operation was in part the result of failure to adequately monitor a contractor.

The licensee took the conservative action of plugging the tubes surrounding the leaking tube to safeguard against the leaking tube causing other tubes to fail if it severed. The licensee thoroughly assessed the cause of the failure to identify the pluggable steam generator tubes and implemented appropriate corrective actions.

Additionally, after the present SALP period, surveillance during the 1988 outage identified 3 defective steam generator tubes that were to have been plugged during the 1986 outage. They were not plugged due to an error in indexing the inspection equipment. This was a second example of the need to better control contractor activities.

In addition to normal in-service inspection, the licensee initiated an aggressive program to assess wall thinning due to erosion/corrosion in secondary system high-energy piping. The licensee has voluntarily funded a three year research project at the Massachusetts Institute of Technology to develop methodologies for such inspection and analyses. This is a good initiative and results of the research may benefit plant operations and the industry as a whole.

The licensee has established both preventive maintenance (PM) and corrective maintenance (CM) procedures. NRC review of surveillance testing found that the PMMS system was tracking TS requirements and that testing was being performed on time. Surveillance procedures were well written and had the necessary controls to assure that test data and system work were controlled and monitored by supervision. Maintenance and I&C supervisors were considered knowledgeable and well informed in the surveillance area. Also, the I&C staff appeared to be well trained and to have sufficient personnel to perform their task.

The quality control organization was notified of safety-related work being performed and inspected on a sampling basis.

In summary, the calibration and surveillance program for safety-related equipment was well established and implemented by qualified personnel. Involved supervision provided program oversight and used the QA/QC function to monitor program implementation. Performance of local leak rate testing was notable, and the steam generator tube inspection and maintenance program was generally very good. However, there was a need to improve contractor control and assure quality in the correct interpretation of steam generator tube eddy current data. The importance of this aspect is such that it was a major element of performance in the surveillance area.

Conclusion

Category 2.

Board Recommendations

Licensee:

-- Improve the evaluation of ECT data.

-- Improve contractor oversight and control.

E. Emergency Preparedness - Unit 1 (138 hours, 5%)
- Unit 2 (148 hours, 6%)

During the previous assessment period, licensee performance in this area was rated as Category 1.

Emergency preparedness is a site function with common Emergency Plans, facilities and personnel. This assessment covers the June 1, 1986 through December 31, 1987 period. It represents an evaluation of all three Units, but does not repeat applicable parts of the three unit assessment in the Millstone 3 SALP for the period ending February 28, 1987. During the current assessment period, a partial-participation exercise was observed, one routine safety inspection was conducted, and changes to emergency plans and procedures were reviewed.

The routine safety inspection was performed in June/July, 1987. This inspection examined all major areas of the licensee's emergency preparedness program. Weaknesses were identified in the independent audit program, specifically related to audit checklist preparation, auditor qualifications, and content of audits. Additionally, the NRC had difficulty determining which organization, corporate staff or on-site staff, had overall responsibility for evaluation of and corrective action on audit findings. The licensee resolved program responsibilities before the end of the inspection. The licensee had undertaken corrective action on previously identified weaknesses, as well as actions to strengthen the overall program. Included in these actions was a complete Emergency Action Level review incorporating, as appropriate, plant specific parameters, human factors reviews, and training.

A partial-participation exercise was conducted on October 8, 1987. The licensee demonstrated a good emergency response capability. This performance was improved over the previous annual exercise. Actions by plant operators were prompt and effective. Event classification was accurate and timely. Personnel were generally well trained and qualified for their positions. No significant exercise weaknesses were identified.

The licensee's training program has been effective as demonstrated by their performance in the annual emergency exercise. Management involvement has been generally effective as evidenced by the timely completion of correction actions, as well as a willingness to upgrade program capabilities. However, the interface between the Corporate Staff, on-site emergency preparedness staff, and on-site management could more be clearly defined, particularly in regards to audit program responsibilities. Northeast Utilities continues to maintain a very good relationship with all off-site agencies.

Conclusion

Category 1.

Board Recommendations

None.

F. Security and Safeguards - Unit 1 (77 hours, 3%)
- Unit 2 (84 hours, 3%)

During the previous SALP, the licensee's performance in this area was Category 1. That rating was largely influenced by the timely completion of Unit 3 systems and equipment and integration of those with the existing systems and equipment for Units 1 and 2, while still maintaining an effective security program at Units 1 and 2. During this assessment period, four routine unannounced physical security inspections were performed by region-based inspectors. Routine inspections by the resident inspector continued throughout the period. Six violations were identified during the physical security inspections. Several of those violations had existed for an extended period and should have been obvious to knowledgeable and attentive security personnel.

Corporate security management involvement in site security program matters was apparent early in the period. It included visits to the site by the corporate staff to provide assistance, program audits and direct support in the budgeting and planning processes affecting program modifications and upgrades. Corporate security management personnel also continued to be actively involved in the Region I Nuclear Security Association and other industry groups engaged in nuclear plant security matters. This demonstrated program support from upper level corporate management. However, an apparent reduction in the oversight and audit function occurred as a result of the loss of two key corporate personnel during the period, as discussed in the following paragraph.

During the previous assessment period and in the early part of this assessment period, the licensee was heavily involved in integrating the Millstone Unit 3 security program into the existing program for Units 1 and 2. This was accomplished with minimum impact on the overall security program. The licensee decided that, with the integration of the Unit 3 program, modifications to and restructuring of the proprietary and contract organizations would be necessary to accommodate the increased work load. While that decision was made in late 1985, it was never formally instituted and does not appear to have been actively pursued. Several proprietary supervisory positions to which the licensee had committed were filled on a rotating basis without ensuring that the incumbents understood their duties and responsibilities and without properly monitoring their performance. Therefore, the majority of the increased workload, which the licensee previously had identified, remained the responsibility of one individual on-site. As a result, effective oversight, interface and communications between the licensee and the contractor organization began to degrade. Concurrently, it appears that a complacency with program implementation and an insensitivity to NRC requirements began to occur. These conditions were identified during an NRC inspection late in the SALP period. That inspection resulted in a civil penalty. While the individual violations were of low significance, they represented a significant lapse in management attention to, and control of, the security program at Millstone.

The annual audit of the security program, performed by the licensee's quality assurance group, appeared to be comprehensive in scope and depth. However, the number of violations identified by NRC during the period, several of which had existed for some time, calls into question the effectiveness of the audit relative to the security program meeting NRC objectives.

Review of the licensee's security event reports and reporting procedures found them to be consistent with the NRC regulation (10 CFR 73.71) and implemented by personnel knowledgeable of the reporting requirements. The reports were generally clear and contained sufficient information for NRC assessment. The licensee's actions following each of the events were prompt and appropriate, reflecting the proper degree of management oversight. During the previous SALP period, 10 security event reports (SERs) resulted from security computer-related problems. The licensee established a dedicated security maintenance group. There were 7 computer-related SERs during this period. The remaining SERs, including seven degradations of vital barriers, were not causally linked.

As previously stated in this assessment, some problems were encountered with the licensee's oversight of the contractor's security force. Several of the violations identified by the NRC should have been obvious to trained and attentive security personnel. Members of the security force, as well as licensee supervisors, patrol the site frequently and should be alert for deficiencies. Of significance is that the violations were not previously identified by security force members. There was also a number of performance related events reported during the period. The licensee needs to determine the root cause(s) of this problem and increase its oversight of the contractor to preclude recurrence.

Staffing of the contractor's security force is adequate. The training and requalification program appears sound and well developed, but because of the problems identified during this assessment period, it needs to be reviewed along with the manner in which it is being implemented.

During the assessment period the licensee submitted two revisions to the Millstone Nuclear Power Station Security Plan and one revision to the Guard Training and Qualification Plan under the provisions of 10 CFR 50.54(p), and provided a response to the Miscellaneous Amendments to 10 CFR 73.55, codified by the NRC in August 1986. These inputs were of good quality and indicated knowledge and understanding of NRC security program objectives.

In summary, the licensee's security program, when properly implemented, is sound and effective as evidenced by the licensee's past performance record. The NRC believes that the decreased level of performance exhibited by the licensee during this period can be attributed to a reduction in management oversight and involvement in the program as evidenced by not carrying out plans to restructure the organization to accommodate

the increased workload from Unit 3, by not filling vacant positions promptly, and by not recognizing early indications of potential program degradations.

Conclusion

Category 2.

Board Recommendations

Licensee:

-- Re-evaluate effectiveness of security self-assessment function, assuring that program adequacy aspects are evaluated in addition to program compliance.

-- Reassess effectiveness of management overview of security.

-- Reassess adequacy of the security training program and its implementation.

NRC: Review licensee security program to assess the effectiveness of corrective actions on the security inadequacies which resulted in escalated enforcement action.

G. Outage Management

1. Outage Management - Unit 1 (265 hours, 10%)

Planning for the 1987 refueling outage began shortly after the conclusion of the 1985 outage. Early planning helped to ensure that critical items were included in the outage work package and that long lead time procurements were initiated to avoid unnecessary impact on the outage schedule. This also smoothed pre-outage schedule development and supported early identification of safety significant issues. Early and increasingly frequent formal outage planning meetings, coupled with extensive multi-disciplinary attendance and participation, aided in early problem identification and resolution. These meetings also promoted interdepartmental cooperation and the disciplined and cohesive team that existed at the commencement of outage activities.

The licensee committed personnel and financial resources to computer-based outage planning. The detail provided by this system proved to be a key to successful outage management. The flexibility of the system was tested when senior management determined shortly before the outage that two weeks needed to be trimmed from the schedule and outage commencement was required one week earlier than previously planned. These changes were incorporated with minimal impact. Detailed outage activity reviews by the NRC concluded that schedule compression and early commencement had not adversely impacted work quality or proper attention to safety issues.

Outage staffing was designed to respond to the increased pace and complexity of outage activities. Operations Department shift staffing was increased to ensure adequate activity coverage and coordination, and maintenance of a safety perspective. Establishment of an Outage Coordinator early in the planning phase strengthened the scheduling process. During the outage, the coordinator provided supervisory oversight of activities, plant evolutions and conditions, and inter-departmental liaison. A management representative augmented Outage Coordination during the outage. This position was filled on a shift basis by unit department heads and other management level personnel. This representative brought a management perspective to outage activities and implemented problem identification, resolution, and expediting activities. The overall staffing plan proved highly effective in ensuring the quality of safety-related activities.

Real-time management of outage activities was provided during regularly scheduled twice-daily status meetings. Current project progress as well as an expanded time-base printout of the projected events during a one week window was provided daily to supervisors. Daily meetings were characterized by accurate assessments of work in progress and resolution of conflicts. Special meetings were

scheduled as necessary to focus sufficient and appropriate resources on specific problems. During these meetings, the licensee displayed c[illegible]neration and a very positive attitude toward both nuclear safety a[illegible]d high quality work. The Plant Operations Review Committee (PORC) provided excellent oversight of outage activities and issues (IR 87-12, Detail 21). The inspector noted, however, that valuable PORC time was spent reviewing routine procedure changes and other items that could have been accomplished prior to the outage. Although a certain amount of such review is expected, efforts should be made to clear routine work prior to outage commencement.

The success of outage planning was demonstrated by several activities which demonstrated excellence in outage coordination and the licensee's maintenance of a safety perspective. These examples include: response to loss of Jet Pump "K" flow indication as a result of installing new instrument nozzles; torus repair/painting; Motor-Operated Valve Automated Testing System (MOVATS) testing during initial implementation of the program; the lack of coordination problems as evidenced by maintenance of proper plant conditions to support outage activities; success of the Emergency Core Cooling System (ECCS) Integrated Test; and success of the Start-up Test program.

A few isolated instances (e.g., ESF actuations) of less effective control occurred during the outage. The events appear as a minor perturbations in a successful outage program. Overall, there was good planning and oversight of outage activities.

Conclusion

Category 1.

Board Recommendations

None.

2. Outage Management - Unit 2 (280 Hours, 10%)

Previous licensee performance in this area was rated Category 1.

Cycle 8 pre-refueling activities were reviewed by the resident inspector during monthly pre-outage meetings. Detailed planning for major evolutions were reviewed in the areas of material availability, personnel requirements, ALARA reviews, design change packages status and the time allotment for the completion of each activities. Management involvement in the early planning stages contributed to a well run 1986 refueling/maintenance outage.

Refueling and outage activities were reviewed, including refueling operations, steam generator nondestructive testing, replacement of the Turbine Building Closed Cooling Water (TBCCW) heat exchanger, local leak rate testing, and replacement of the main condenser internals and associated feed heaters and piping.

The licensee outage management organization included twenty-four hour coverage by outage coordination and senior licensed personnel (Management Representatives), including shift supervision and staff assistants on all shifts as Containment Coordinators. Dedicated department coordinators and planners for I&C, operations, maintenance, and Betterment Engineering were assigned to support operations. Routine, twice-daily management meetings contributed to effective control of the schedule and to the prompt identification of new problems.

During the outage, critical activities that were not meeting schedules were identified for resolution. Corrective actions were applied in the form of additional manpower, changes in job activities, and additional shifts. The Production Maintenance Management System (PMMS) with its ability to address plant maintenance activities in the areas of boundaries, tag controls, activity status and required retests contributed to effective tracking of major and minor repairs.

Major outage efforts involved steam generator nozzle dam installation and removal, secondary and primary side hydrolazing for reduction of exposure during ultrasonic testing of steam generators, the replacement of the TBCCW heat exchanger, and the replacement of the main condenser tubes (with titanium ones), tubesheets and condenser end bells, and its associated heaters. The new condenser tubes were a critical path item. Completion of this major project, which removed copper-bearing material from feedwater systems, eliminated a source of material for sludge formation in the secondary side of the steam generators. This program was an excellent example of management effectiveness, initiative, and good control of the work in a short outage. All phases of engineering, material acquisition, and personnel planning were coordinated to complete this project on schedule. Approximately 90% of copper-contributing materials

have been removed. In addition, make-up water modifications to control secondary plant impurities to comply with EPRI guidelines were completed. Direct management supervision was excellent. Goals for installation and retests were met. The secondary water chemistry has since shown marked improvement in maintaining low concentrations of solids.

The licensee eddy current testing (ECT) of steam generator (SG) tubes indicated a reduction in the number of needed tube repairs (28 tubes plugged and 225 sleeves installed). Most defects were between the top of the tubesheet and the first tube support. The SGs were hydrostatically tested and found satisfactory.

SG local leak rate testing (Types B & C) during the outage identified leakage in excess of the technical specifications. The licensee therefore increased the scope of repairs to renew T-ring seats on butterfly valves during every other outage. Post-outage precritical, low power physics and power ascension tests were well coordinated and performed, with active involvement of QA/QC.

The unit returned to power on December 19, 1986 and was shutdown on January 29, 1987 due to primary to secondary leakage. Subsequently, reanalysis of steam generator ECT data, (see Surveillance, Section IV.D of this SALP) revealed tube defects that should have resulted in tube plugging. Additional analysis resulted in an 18-day outage for data review and plugging of an additional 81 tubes.

The NRC noted lapses in control of overtime during the January-February 1987 outage: there were seven examples of overtime in excess of established guidelines without the requisite management approvals. Licensee actions were responsive and will be reviewed for effectiveness during the next SALP period. This appeared to be a minor deviation from the effective program established to manage outage activities.

Conclusion

Category 1.

Board Recommendations

None.

H. Assurance of Quality - Unit 1
- Unit 2

Assurance of quality is addressed as a separate functional area even though it is an evaluation criteria in the other functional areas. The defined quality assurance program is included, but the assessment primarily addresses the effectiveness of licensee management efforts to assure quality in day-to-day activities. Worker performance, attitudes, involvement by supervisors, and the adequacy and use of management and administrative controls were used as performance indicators.

High quality in the operating and outage activities for both units was evident in good worker attitudes and pride in their work at all levels. Procedures and administrative requirements were generally well established and implemented by a qualified staff. Plant personnel approached their work with the idea of doing the job right the first time, and there was good regard for the quality assurance function.

A professional attitude was exhibited by the operating departments at all levels. Safety conservatism was demonstrated in the resolution of problems and in routine activities. There was good regard for meeting commitments and regulatory requirements. Site and corporate management were effective, by example and leadership, in establishing safety as well as efficiency as the goal of operations.

The Plant Operational Review Committees (PORC) for both units functioned as required by the Technical Specifications and the applicable procedure. The licensee regards membership in the committee as a serious commitment, as evidenced by the attendance record. The licensee's commitment to conservatism and safety was displayed by committee review of completed modification packages in addition to the safety evaluations required by Technical Specifications.

First line technical supervisors were actively involved with work in the plants. The effectiveness of this supervision was reflected in good plant performance records, general success of operating activities, and low rework in maintenance, testing, and modification activities. There was a good regard for established administrative controls and a good record of following plant procedures.

As noted in the other functional areas, there are several areas where improvements can be realized: reductions in Unit 2 trips, more effective self-assessment by the security force, especially first line supervisors; control of Unit 1 locked high radiation area doors, and the posting and control of Unit 1 radiation areas. Licensee management recognized the problem areas, was responsive to NRC initiatives, and aggressively pursued corrective actions.

The licensee's quality assurance program for procurement control (purchase, receipt, storage, and handling) was adequate, although additional attention is needed to control over shelf life for materials that age

in storage. Other aspects of material storage and control were adequate. Access control, housekeeping and cleanliness in the warehouse, and receipt documentation were acceptable.

The licensee's audit program was comprehensive and included all facets of plant operation. The audits were planned and scheduled, and had well organized check lists. They were in-depth and conclusive. Research and analyses of the QC inspection results history to prioritize QC surveillance and to more effectively use resources was commendable. An auditing improvement was also evident in the more frequent use of discipline engineers to evaluate of the acceptability of completion of an activity. This enhanced effectiveness of the QC function.

The design change program, though satisfactory, needed more attention to documentation and recordkeeping. Design change request packages contained sufficient information but completed packages were disorganized, records were misplaced and, in some cases, there was a lack of orderliness. While Engineering provided thorough QC overview of the fuel consolidation project, in other engineering projects a lack of follow-up was evidenced by the failure to adequately review the Unit 2 SG ECT data and oversee the contractors, by delayed resolution of the short hold-down bolts for the Unit 1 low pressure ECCS pumps, and by weaknesses in EQ.

NRC review of the licensee's response to IEB 80-11, Masonry Walls, found the licensee's engineering and field activities technically thorough and responsive.

A marked improvement was noted in radwaste transportation. Frequency and scope of associated QA audits also improved.

Ongoing failures to comply with the submittal schedules established with the NRC Licensing Project Manager adversely affected the performance rating for Licensing Activities.

In summary, both plant management and staff were committed to high quality in operations as evidenced by effective implementation of the formal QA function, diligent and conservative PORC sessions, and the general success of operations and activities in direct support of operations. However, significant inadequacies were noted in several engineering projects and in repeated failure to submit licensing amendments on a timely basis.

Conclusion

Category 2.

Board Recommendations

None.

I. Engineering Support

This is the first evaluation of this SALP functional area for Millstone 1 and 2. The area encompasses technical activities in addition to those provided by the operations, maintenance, and instrumentation and controls (I&C) departments.

Northeast Utilities maintained an appropriately sized engineering staff in both the operating company (NNECO) and the support company (NUSCO). The NNECO engineering department included onsite reactor, mechanical, and electrical engineering groups. Each group has a NNECO engineer as supervisor. Onsite groups reported to unit management; offsite groups reported to management at utility headquarters. Additional technical support was provided by the Production Test Group. These electrical and electronic technicians and engineers, mainly concerned with generation and distribution equipment, were used for complex troubleshooting and repair problems. The groups were composed of technically knowledgeable personnel with skillful, seasoned supervision. They exhibited perseverance and dedication while performing tasks correctly the first time. Having the Engineering Supervisor and his assistants hold operator licenses improved coordination with the operating staff.

Based on the inspection of the environmental qualification program, management involvement was inadequate, in that it had not recognized the extent of the EQ effort. Responsiveness to NRC environmental qualification (EQ) initiatives was poor. An example was the licensee letter dated December 10, 1986, which addressed a comprehensive walkdown of Unit #2 EQ equipment, the resulting findings and the corrective actions. To determine the significance of the issues and the adequacy of the corrective action, the inspectors asked for the supporting documents for the corrective actions. Two violations, one on wire nuts and the other on spray pump motor terminations, resulted from this inquiry. The referenced letter also incorrectly stated that the motor terminations were replaced with NUREG 588 qualified terminations when the licensee used Bishop splices (IR 87-15). Also, the licensee was unable to produce auditable documentation on Limitorque wiring data after two days effort. A third violation concerned inadequate qualification of Curtis I-type terminal blocks in a Unit 1 valve operator. Further, the licensee did not have an effective tracking program to follow-up on EQ issues raised by NRC. This resulted in lack of traceability of corrective actions on management commitments to NRC in the EQ area.

Two licensee efforts to enhance the availability of preferred normal and backup emergency power supplies were notable. These were modifications completed during the 1986 outage to provide a 4 KV, Unit 1 to Unit 2 cross-tie capability to enhance the ability to handle a loss of offsite power/blackout event. Additionally, the licensee was coating the insulators in the 345 KV switchyard to decrease sensitivity to salt water

spray, and developed a new controlled shutdown procedure with the Connecticut Valley Exchange (CONVEX). Both of these efforts were positive steps toward improved electrical power availability.

Appended Table 4 lists 11 forced power reductions and shutdowns (both units) involving steam, condenser tube, and packing leaks; a generator breaker trip, a stuck open pressurizer spray valve, and feedwater regulating valve problems. Some of these occurrences were attributed to Engineering Support. Many had no SALP area assignment. Nonetheless, careful Engineering Support review of all such occurrences could prompt changes beneficial to facility and Engineering Support performance.

1. Engineering Support - Unit 1 (263 hours, 10%)

   Millstone 1 had a generally strong engineering staff. The extensive work and effort put into each project was evident. Support of major outage design changes and projects was very good. ISI/IST was very good with a strong commitment to a quality program as evidenced by Intergranular Stress Corrosion Cracking (IGSCC) and Pump and Valve programs (IR 87-16).

   Success of the fire protection program (as evidenced by IR 87-19) was due to thorough engineering work. Voluntary establishment of the General Electric Zinc Injection Passivation (GEZIP) system (IR 87-05) as supported by Engineering demonstrated a well-planned approach to and an innovative method for reducing drywell radiation. Also, parallel engineering review of diesel fuel system design deficiencies (IR 87-04) demonstrated a comprehensive and aggressive program for early identification and processing of generic items.

   There were delays in upgrading the electrical bus undervoltage scheme in response to NRC degraded electrical grid voltage concerns. The associated design change has been in the works since 1984, and final installation was to have been in 1987. Verification of the design using the simulator revealed flaws, and implementation was deferred. While timely resolution of this issue remains a concern, engineering reviews of the issue showed effective use of simulator and the probabilistic risk assessment (PRA) process to thoroughly evaluate proposed plant modifications.

   Comprehensive review of generic issues was generally evident for Service Information Letter (SILs), Information Notices (INs), NRC Bulletins (IEBs), and INPO notepad items . These reviews were almost always in-depth analyses. Often the issue proved to be not applicable with the review raising other questions that were actively pursued. An example was IN 85-45 on seismic II/I concerns for incore flux mapping systems. Although this IN was not applicable to Unit 1, licensee follow-up identified a comparable situation of the Traversing Incore Probe (TIP) ball and shear valves being mounted on the same "table" as the heavy shield box. A seismic

event could cause the whole table to fail, resulting in the potential loss of the associated containment isolation valves. The licensee developed a design change to address this. Some examples of less satisfactory engineering support are noted below.

In 1984, NNECO identified the potential for short foundation bolts for Low Pressure Injection and Core Spray pumps. NUSCO engineering was slow to respond to associated site initiatives and slow to recognize that the problem existed. The presence of short bolts was not confirmed and corrected until 1987.

The recurrence of main condenser tube leaks requiring frequent power maneuvers to identify and repair needs design resolution (see Table 4A). A contributing cause for the August 1987 reactor scram was the failure to incorporate appropriate new core design precautions into the operating procedures. These examples show the need for better engineering support initiatives to resolve long standing, recurrent problems, and to assure timely completion of design inputs into operating controls.

Engineering incorrectly concluded that inoperable ADS check valves (multiple common mode failures) were not reportable to the NRC. This issue, which was issued as a violation in Inspection 87-33, reflected a need for greater licensee sensitivity to reporting requirements.

A review of Licensee Event Reports (LERs) showed that fifteen events were the result of lack of follow-through by the technical staff. For example, the inadequate fire coating of the diesel generator ceiling, nonconforming foundation anchors for the low pressure coolant injection and core spray systems, and failure to obtain a Technical Specification change for removal of the low pressure injection and core spray pump start logic permissive switches showed a lack of thoroughness in engineering reviews. Also, preventive engineering measures could have eliminated or reduced problems with source range monitor drive relays affecting the intermediate range monitors and with Target Rock main steam line safety/relief valve setpoint drift.

In summary, the engineering and technical support groups were competent and actively involved in plant modifications, design improvements, and resolving problems. The onsite and corporate engineering staffs exhibited an in-depth commitment to safety. Engineering support effectiveness was clearly evident in the success of the Appendix R program. While initiative was shown in the addressal of issues, improvements could be realized in resolving long-standing problems, and in assuring design inputs/changes are correctly translated into operating procedures and the license.

Conclusion

Category 2.

Board Recommendations

None.

2. Engineering Support - Unit 2 (277 hours, 10%)

The onsite engineering department consisted of a department supervisor and 20 engineers and technicians. In general, they performed in-depth reviews of information notices, bulletins, and vendor information. These on-site engineers and technicians were thoroughly knowledgeable and put safety concerns to the fore during projects and day-to-day decision making. The engineering staff generally supported other unit departments effectively.

The NRC attended numerous plant operating review committees meetings on design changes. Engineering staff inputs were essential to changes that reflected safety-significant commitments. In addition, the engineering department program for balance of plant piping inspections led to repairs which allowed the unit to operate through cycle eight with no leaks in any large bore piping on the extraction steam, feedwater and condensate systems.

Examples of significant engineering staff actions were found in the areas of fuel reconstitution and consolidation. The fuel reconstitution program was managed by the engineering staff and consisted of a new approach to eddy current testing. The vendor fuel was not designed for reconstitution. New techniques were used to rotate fuel assemblies on end and replace failed fuel with stainless steel rods. Fourteen assemblies were reconstituted, with the engineering staff monitoring all phases of the project.

The Engineering Department and Corporate Enginsering successfully completed a pilot Fuel Consolidation Program. This project was groundwork for extending nuclear plant spent fuel pool capacity throughout the nuclear industry. Six fuel assemblies were included in the first successful "hot" demonstration of a 2:1 consolidation process using irradiated assemblies. Six spent fuel assemblies were consolidated into three storage boxes. Engineering provided successful designs and evaluations. There were no procedural violations.

During the previous SALP period the licensee's review of plant design changes was faulted due to a miswiring of pressurizer spray controls. During this SALP period, the NRC attended a number of licensee design change reviews and found that the reviewers were knowledgeable. In-depth and technically sound discussions were observed. On a number of occasions, design changes were sent back for additional review. Design changes that were safety significant included the replacement of the "C" Reactor Coolant Pump (RCP) motor with one with a more reliable upper bearing design, installation of a new control room computer while still maintaining control room programs with the old computer in service, addition of a new fire damper, and the previously described fuel reconstitution and pilot fuel consolidation program.

Several fire protection problems are identified in Section IV.A, Plant Operations. Also, as is evident from the Appendix R correspondence, the licensee has not effectively resolved Fire Protection and Safe Shutdown matters. Six years after the Appendix R regulation was issued, the licensee was still submitting exemptions revising their Fire Hazard Analysis and was still asking for issue clarifications. Installation records for components required for shutdown showed that items such as emergency lighting that were to be installed in 1983 were installed in late 1986 or early 1987. Fire protection will require additional review after the 1988 outage.

The licensee has not been notably attentive to NRC fire protection initiatives. For example, the NRC issued Information Notices in 1983 concerning problems with the installation of fire dampers. In 1986, the licensee issued an LER describing a fire damper installation problem. This slow response could have been avoided by timely addressal of the information notices.

The licensee has conducted in-depth reviews on both minor and major modifications. Safety concerns and the effects of modifications on operations were addressed. Management displayed awareness of the significance of design changes that effected nuclear and balance-of-plant operations.

Design changes that increased safety and reliability included: installing a pressurizer pressure deviation alarm; placing a containment tendon grease pressurization system in service to eliminate water intrusion; and a change to the electrical system to allow a cross-tie between Unit 1&2 to supply shutdown power from an alternate source.

Although numerous projects were successfully completed by the engineering staff, the steam generators were returned to service without correction of tube defects. In this case, the ECT data review elements were not specified and depended on vendor review. Results review for tube defects did not include review of conflicting interpretations, and faulty resolution of a conflicting interpretation resulted in the start-up with tube defects in excess of repair criteria. The licensee aggressively took steps to correct this and to eliminate further problems through a training program, with testing, and with additional corporate involvement in determining status of steam generators prior to their return to service.

Two reactor trips during the assessment period were caused in part by design deficiencies. One involved an air line on the reheater drain control valve that was not adequately supported (12/23/86 scram). The second involved the improper overcurrent trip setpoint on plant electrical buses powering the pressurizer heaters. Follow-up actions to identify and correct these deficiencies were proper.

A problem with charging pump discharge blocks, which have continued to exhibit cracking, has been addressed by obtaining three pre-stressed (shot-peened) blocks. Also, the licensee is assessing the feasibility of modifying the charging system by adding a fourth centrifugal charging pump. These are steps toward resolution of this long-term problem.

A review of Licensee Event Reports (LERs) showed ten events were the result of lack of follow-through by the technical staff. For example, technical support inadequacies were shown by inconsistency of the reactor coolant pump requirements with the safety analysis assumptions for Modes 3, 4, and 5, an error in the service water flow through RBCCW heat exchanger FSAR Table, and inadequate fire protection for charging pump supports in the main cable vault and raceway.

In summary, the engineering and technical support groups were competent and actively involved in design modifications, plant improvements, and in resolving problems. Good initiative was shown in the fuel reconstitution program. Engineering support resulted in an acceptable Appendix R program, but improvement was needed in responding to NRC initiatives and achieving timely resolution of long-standing regulatory issues. The onsite and corporate engineering staffs exhibited an in-depth commitment to safety.

Conclusion

Category 2.

Board Recommendations

None.

J. Training Effectiveness - Unit 1
- Unit 2

During the previous SALP period, this area was rated as Category 2. A general strength was noted in training with the exception of training in radwaste shipments. That training has since been found to have been improved substantially.

The effectiveness of training and qualification, as evidenced by the performance of licensee personnel, is integral to all aspects of plant operation. As such, the assessment of training effectiveness is compiled from the assessments of the other SALP areas.

Major training areas included INPO accreditation, non-licensed staff training, and licensed operator training. All applicable training programs for Millstone 1 and 2 were accredited by INPO during the SALP assessment period.

In this assessment period, there was evidence of increased emphasis by licensee management on non-licensed technical training. The licensee increased the training staff and added and upgraded training facilities in this aspect. The licensee also implemented management changes in the training organization to enhance its effectiveness.

Training effectiveness was demonstrated in many specific aspects including local and containment integrated leak rate test programs, the emergency plan and implementing procedures; the conduct of outage related surveillances, maintenance, fuel shuffle and design change activities; and plant operating procedures and administrative controls.

The licensee also instituted departmental Training Program Control Committees, each consisting of a first line supervisor and members of the training staff. This allows better communication in establishing and prioritizing training needs The licensee also provided intensified training for first line supervisors, realizing that effective management requires more than technical proficiency.

The training and requalification program for the security force was generally well developed and implemented. However, NRC-identified problems and the associated escalated enforcement action showed that additional attention was needed to assure the force is adequately trained in basic program objectives and is capable of detecting deficiencies in meeting those objectives.

Unit 1 management support of training and recognition of operator proficiency was evident. Northeast Utilities developed an excellent training facility housing a modern plant specific simulator and the in-house training staff. Management involvement in training was evident in their knowledgeable discussions with NRC personnel, in their interaction with the training staff, and in their observance of training activities.

Evidence of sound Unit 1 non-licensed technical training was observed during this SALP period. The maintenance department had a well trained staff as evidenced by the absence of maintenance-related scrams or challenges to protective systems. The maintenance department demonstrated effective training in the repair of equipment associated with 10 CFR 50 Appendix R requirements. Training of staff engineers effectively improved the quality of LERs, as noted in the operations section. In response to NRC findings, the Instrumentation and Control Department expanded its on-the-job training program and training on significant industry events.

A training inadequacy was identified when the unit scrammed in March 1987 while transferring reactor pressure control from the EPR to the MPR. Subsequently, the operators routinely transferred pressure control between the regulators when routine power reductions were performed to increase their experience with this manipulation. There were no further plant transients as a result of faulty EPR/MPR transfers.

During this assessment period, the NRC administered replacement examinations in December 1986 and September 1987 for Unit 1. Nine senior reactor operator (SRO) candidates, and nine reactor operator (RO) candidates were examined. Seven SRO and all RO candidates successfully completed the examinations and were licensed.

During the Unit 1 1986 examination, the NRC identified some generic weakness in the training program for licensed operators. These weaknesses were: 1) knowledge of location and use of drawings; 2) familiarity with refueling interlocks; and 3) the use and interpretation of Technical Specifications. In 1987, the examiners noted proficiency in the use and interpretation of Technical Specifications; drawing use and refueling interlock knowledge were not identified as continuing weaknesses.

The simulator was a valuable asset in providing high quality training. However, several problems were encountered during the 1987 simulator examinations due to inadequacies in the cause and malfunction book and failures of a computer board and an electrical power supply to a specific panel. The malfunction book did not include sufficient detail in describing the effects of certain malfunctions. For example, loss of DC power did not include recirculation pump trips as one of the effects. The malfunction and cause book needed more management attention and review. Except for the simulator cause and malfunction book, the Unit 1 training program was effective. Sufficient management attention was provided to further improve the program. The licensee was generally responsive to NRC initiatives, and effective corrective actions were implemented to solve problems.

During this assessment period, Unit 2 sponsored 17 candidates for hot licenses, with 14 candidates recommended for licenses. Replacement examinations were administered in July 1986 and December 1986. Nine senior

reactor operator candidates were examined; eight passed. Eight reactor operator candidates were examined; six passed. Weaknesses noted in July 1986 were not found in December 1986. In general, the overall performance in the operating exams was considered good. This indicated that the training department was able to properly prepare personnel for their operating licenses and took action to correct weak areas.

In December 1986, a training program inspection consisted of the parallel grading of written examinations for 20% of the licensed operators and audits of three simulator examinations and one oral examination. Overall, the requalification program was found to be satisfactory with some minor exceptions. The format of the simulator examinations did not allow for adequate followup questioning to distinguish individual weaknesses from group weaknesses. In one isolated case, the program did not adequately train the operators on the applicable Technical Specifications associated with the remote shutdown panel. This weakness was previously identified during the 1985 requalification cycle. Subsequent training was inadequate as shown by operator errors described in LER 86-07 relative to the Technical Specifications for this panel. The training department has since acceptably addressed this area as demonstrated on the SRO examination in December 1986.

During the examinations, several procedures were found to have errors or to conflict with other procedures. These were discussed with the licensee during the exit meeting in July 1986 and were corrected prior to issuance of the examination report. This demonstrated quick addressal of NRC concerns. Overall, the operator training program was rated as satisfactory based in the results of the replacement examinations and the evaluation of the requalification program.

Evidence of good Unit 2 non-licensed technical training was observed during this SALP period. The maintenance department demonstrated effective training in the repair of equipment associated with 10 CFR 50 Appendix R requirements. Training of staff engineers has effectively improved the quality of LERs issued by the licensee, as noted in the operations section. The need for improvement in the training on fire protection modifications was identified, in that some operators had problems locating safe shutdown equipment and removing certain breakers.

An extensive eddy current testing (ECT) training program has been instituted. Cognizant site and corporate engineers have received additional formal training and have formulated a training program for the ECT inspectors who will examine steam generators at the next outage. Management commitments to ensure proper outage item repair to the committed training programs have been reflected in good control of design changes.

In summary, training effectiveness was demonstrated in the overall good performance noted in the various functional areas, with significantly improved performance in the area of radwaste packaging and transportation.

Management support and commitment to high quality training was demonstrated in initiatives to improve the non-licensed training, and in the success of the licensed operator and requalification programs.

Conclusion

Category 1.

Board Recommendations

None.

K. Licensing Activities

1. Licensing Activities - Unit 1

During the previous SALP period, the licensee was rated Category 1, Consistent. The previous SALP noted that the licensee continued to show good management overview of licensing activities, which are conducted by a competent staff with ready access to the various technical resources that contribute to the effective resolution of safety issues. These activities were also supported by a knowledgeable, experienced, and dedicated plant operating staff. However, that SALP also noted that schedules for written commitments should be improved.

At the beginning of the current SALP period, the licensing backlog for Millstone 1 was 43 items, representing a mixture of licensee and NRC staff initiatives. During the SALP period, 38 licensing actions were completed including 13 amendments to the operating license. A backlog of 41 items remained at the end of the SALP period.

During the current SALP period, the licensee continued to to be actively involved in the assurance of quality in licensing activities. Most submittals by the licensee showed good evidence of prior planning in that they were substantially complete and supported the proposed licensing position. A good example of the licensee's prior planning, as indicated in submittals to the staff, was the deterministic and probabilistic Integrated Safety Assessment Program (ISAP) evaluations together with the licensee's proposed integrated assessment of issues. These submittals required not only good prior planning for the individual issues, but also a substantive effort in the preparation of the proposed integrated assessment of all issues. Another example of prior planning was the Full Term Operating License, which was issued on October 31, 1986. A third example was the December 24, 1986 application for a full 40-year operating license. The licensee showed initiative by providing corresponding information for Millstone Unit 1 if questions on a similar license request was asked for by the staff for Millstone Unit 2 or Haddam Neck.

Although most NRC/licensee interactions were at the working level, the licensee's upper management followed licensing activities and became involved as needed. An example was licensee executive vice president involvement in ISAP meetings with the NRC staff.

The licensee demonstrated a desire for open and frank communication with the NRC. Licensee management participated in keeping the NRC aware of current and projected licensing activities.

With regard to the resolution of technical issues, at the conclusion of the review of each licensing action (license amendment, exemption, code relief, etc.) the adequacy of the licensee's technical expertise was particularly evident during interactions with the staff. An example was response to staff questions regarding the startup of Millstone Unit 1 from its 1987 refueling outage with less than all twenty jet pumps operable.

With regard to responsiveness to NRC initiatives, the licensee experienced problems in providing timely responses to NRC requests for information during most of the current SALP period. The licensee's tardiness in their submittals tended to slow the pace in a number of key licensing actions. In the case of changes to the Technical Specifications for Primary Containment Isolation submitted as a corrective action for a Region I Violation (50-245/87-05-01), the submittal was unduly late since the violation cited the untimely application for TS changes. In another instance, the licensee applied for a change to the Technical Specifications to reflect the deletion of the low pressure switches from the emergency core cooling system (core spray and low pressure coolant inspection) pump start logic. These switches were deleted during the 1987 refueling outage and the request for technical specification changes was not submitted until two months after plant restart. This delay was due to an oversight by the licensee.

During the current SALP period, the NRC staff initiated its Safety Issues Management System (SIMS) to improve tracking of Safety issues. The licensee was responsive to the SIMS initiative and met with the staff to help bring the Millstone 1 SIMS data up to date.

With regard to Staffing and Training, the licensee maintains a qualified and trained staff to pursue both the licensee and NRC initiatives, recognizing the need to prioritize such initiatives. As an example, the licensee's participation in ISAP has been outstanding. Their initiatives in probabilistic risk assessment have provided greater in-house analysis capability that has provided the plant operations staff with new insights on the plant's vulnerabilities and strengths. The licensee's staff continues to be active in industry groups and, accordingly, its submittals tend to reflect industry viewpoints in addition to their own.

In summary, the licensee maintained a well-managed and knowledgeable licensing staff, but delayed the submittal of information needed by the NRC for resolution of safety issues. In some cases, the licensee requested delays in submittal dates. More often, however, the licensee simply notified the NRC that their submittals would be delayed.

In dealing with the NRC, the licensee proved to be mostly cooperative. The licensee continued to maintain an informal policy which permitted the use of licensing contacts with the NRC technical staff with the knowledge of the NRC Project Manager.

Conclusion

Category 2.

Board Recommendations

Licensee: The licensee should identify any needed schedule delays to the NRC staff at regularly scheduled quarterly meetings rather than adopt such delays unilaterally.

NRC: The NRC staff should closely monitor the licensee's progress in meeting their licensing obligations and commitments.

2. Licensing Activities - Unit 2

During the previous SALP period, the licensee was rated as Category 1, consistent, in this functional area. The previous SALP noted that the licensee had demonstrated considerable technical capabilities in licensing activities; however, the NRC staff expressed the view that responses to NRC initiatives could be further improved.

At the beginning of the current SALP period, the licensing backlog for Millstone Unit 2 was 30 items, representing a mixture of licensee and NRC staff initiatives. During the SALP period, 31 licensing items were completed including 11 license amendments. A backlog of 17 licensing items remained at the end of the SALP period.

During the current SALP period, licensee management was actively involved in the assurance of quality in licensing activities. Most submittals showed good evidence of prior planning in that they were substantially complete and supported the licensee's licensing position. One example of the licensee's prior planning, as indicated in a submittal, was the December 22, 1986 application concerning a full 40-year operating licensee (OL); this submittal effectively integrated economic, safety and environmental inputs. A similar instance of good prior planning was the May 21, 1986 submittal concerning consolidation of spent fuel, which was also actively reviewed during the current SALP period.

Although most NRC/licensee interactions were at the working level, the licensee's upper management followed licensing activities and became involved as needed. One example of the licensee's management involvement was the December 10, 1987 meeting on the 40-year OL between the NRC staff and the licensee. This meeting involved active licensee participation at the vice president level.

The licensee demonstrated a desire for open and frank communication with the NRC. Licensee management participated in keeping the NRC aware of current and projected licensing activities.

With regard to the resolution of technical issues, at the conclusion of each licensing action (license amendment, exemption, code relief, etc.), the principal reviewer provided comments concerning the adequacy of the licensee's technical approach to the resolution of safety issues. These comments were generally favorable during the current SALP period. The licensee's technical expertise was particularly evident during the March 5, 1987 steam generator tube leakage meeting during which the licensee prescribed and interpreted an extensive body of data on steam generator tube degradation.

During the SALP period, in July 1987, the NRC audited the safety evaluations prepared by the licensee in support of facility changes, tests and experiments undertaken without prior commission approval.

The licensee maintained adequate procedural controls to determine the existence of unreviewed safety questions in accordance with 10 CFR 50.59, "changes, tests and experiments." The evaluation concerning Plant Design Change Request 7-89-85 (Spent Fuel Pool Rerack Project) was particularly noteworthy for its completeness and in-depth evaluations.

During this SALP period, it was determined that the vital chilled water system which provides cooling for the vital DC switchgear rooms had been inoperable for more than 3 years. The associated 10 CFR 50.59 safety evaluation was adequate but lacked detail and rigor to support the continued inoperability of the vital chilled water system. The licensee stated that the vital chilled water system safety evaluation had been prepared prior to upgrading the procedures for preparation of 10 CFR 50.59 safety evaluations, and that the procedures presently in effect are more thorough and comprehensive. The NRC concurred with this.

With regard to responsiveness to NRC initiatives, the licensee experienced significant problems in providing timely responses to NRC requests for information during most of the current SALP period. The licensee's tardiness in their submittals tended to slow the pace in a number of key licensing actions. In one case, involving changes to the Technical Specifications associated with TMI Action Items (Generic Letter 83-37), the licensee was over two years late in responding.

The weakest area, in terms of responsiveness during the current SALP period, was the licensee's fire protection program. During 1986, the licensee alerted the staff that they would submit a revised 10 CFR Part 50, Appendix R analysis for Millstone Unit 2. The NRC staff made a number of attempts to encourage the licensee to make a timely submittal in order to assure that any needed exemptions could be issued prior to a statutory due date which corresponded to the end of the January 1987 refueling outage. Following the refueling outage, a February 24, 1987 meeting was held at NRC Region I to discuss the submittal schedule. It was not until May 29, 1987 that the fire hazards analysis was submitted. The lateness of the licensee's submittal prevented the NRC staff from fully utilizing their resources during the subsequent fire protection inspection at Millstone Unit 2 during the week of July 10-17, since no prior review of the submittal could be made. (See Section IV.I, Engineering Support, for assessment of the fire protection program.)

Near the end of the SALP period, prior to the refueling outage, the licensee failed to submit licensing requests in a timely manner. These requests included two changes to the Technical Specifications and an exemption associated with use of the "mass point" method for calculating containment leakage. Although the licensee was aware

of the need for these licensing actions well before the refueling shutdown, they delayed their submittal, thus requiring expedited review by the NRC staff.

By letter dated May 12, 1987, the NRC staff directed the licensee's attention to four reviews where the licensee was late in responding to requests for information. These reviews were: Relief Valve and Safety Valve Testing, Regulatory Guide 1.97, Secondary Water Chemistry, and Reporting of Relief Valve and Safety Valve Failures and challenges. In the licensee's response dated June 15, 1987, a schedule was provided for the necessary information and a commitment was provided toward improving responsiveness in the future. Initial indications were that responsiveness on the part of the licensee had improved.

During the current SALP period, the NRC staff initiated its Safety Issues Management System (SIMS) to improve its tracking of implementation schedules associated with safety issues. The licensee was responsive to the SIMS initiative and provided several SIMS updates, most recently on October 8, 1987.

With regard to Staffing and Training, the licensee maintained a qualified and trained staff to pursue both licensee and NRC initiatives, recognizing the need to prioritize these.

The licensee's staff continued to be active in industry groups, most noticeably the Combustion Engineering Owners Group and the Seismic Qualification Utility Group. Accordingly, the licensee' submittals often reflected wider industry viewpoints in addition to those of their own.

In summary, the licensee continued to maintain a well managed and knowledgeable licensing staff. During the SALP period, the licensee has delayed the submittal of information required for resolution of safety issues. In some cases, the licensee requested delays in submittal dates. More often, however, the licensee delayed submittals on their own initiative without renegotiating the submittal date with the NRC. This has become a chronic problem.

In dealing with the NRC, the licensee has proved to be mostly cooperative. The licensee continued to maintain an informal policy which permits the use of licensing contacts with the NRC which exclude the NRC Project Manager.

Conclusion

Category 2.

Recommendations

Licensee: The licensee should identify any needed schedule delays to the NRC staff at quarterly meetings rather than adopt such delays unilaterally.

NRC: The NRC staff should closely monitor the licensee's progress in meeting their licensing obligations and commitments.

V. SUPPORTING DATA AND SUMMARIES

A. Supporting Data and Summaries - Unit 1

1. Allegation Review

Allegations about Millstone 1 were:

-- Main steam check valve base plate attachments were inadequate. This was unsubstantiated.

-- That an individual was fired for failing to submit to urinalysis testing upon being fired. This was confirmed and found to be consistent with licensee practice. This individual also alleged improper security badge usage by another person and improper installation of a conduit hanger; these allegations were unsubstantiated.

-- That there was radioactive material in an unlabeled box outside the radiological area, in the turbine building. This was unsubstantiated.

2. Escalated Enforcement Actions

Civil Penalty

$25,000 - IR 87-22, Physical Security

3. Management Conferences

-- On June 18, 1986, an enforcement conference was held at the NRC Region I Office to discuss repetitive radwaste transportation problems.

-- On November 3, 1987, an enforcement conference was held at the NRC Region I Office to discuss station security violations.

4. Licensee Event Reports

a. Tabular Licensing

Type of Events

A.	Personnel Error	24
B.	Design/Mfg/Construction/Install Error	21
C.	External Cause	2
D.	Defective Procedure	5
E.	Component Failure	12
X.	Other	0
	TOTAL	64

A tabulation of Licensee Event Reports (LERs) by functional area, and an LER synopsis, is attached as Table 3.

Licensee Event Reports Reviewed

LER Nos. 86-17 through 86-32 and 87-01 through 87-44.

b. Causal Analysis

Unit 1 LERs 86-19, 86-29, 87-05, 87-08, 87-13, 87-24, 87-29 and 87-44 cover the standby gas treatment system; 3 events concerned system activities due to spurious radiation signals, and 1 event concerned an inoperable system due to personnel error; 1 event concerned an incomplete surveillance test method.

LERs 86-28, 86-32, 87-21, 87-32 and 87-40 addressed degraded performance of various safety systems due to drift of component actuation setpoints.

LERs 87-04, 87-37, 87-39, 87-42 and 87-44 addressed surveillance testing deficiencies; 3 events involved surveillance not done on time; 2 events involve system tests that were incomplete when compared to the Technical Specification requirements.

LERs 87-08, 87-28, 87-31, 87-33, and 87-36 concern reactor trip signals or ESF actuation signals caused during surveillance testing by either technical error or procedure problems.

5. Licensing Activities

a. Exemptions Granted

--	Valve motor operators	06/08/87
--	Appendix R Sections III.G and III.J	06/17/87
--	Appendix J Section III.A.3	10/15/87

b. License Amendments

Number	Title	
111*	Fire Protection Audit	09/09/86
--	Full Term Operating License	10/31/86
1	Multiple Requests	01/29/87
2	Halon 1301 Fire Suppression System	02/20/87

3	Addition of Water Suppression systems to TS 3.12.B.1	06/05/87
4	RWCU system Isolation Setpoint	07/17/87
5	Standby Liquid Control System	07/30/87
6	Cycle 12 Core Reload	08/06/87
7	Emergency TS Change - Jet Pumps	08/06/87
8	Control Rod Drive Removal	08/14/87
9	Revision to P-T Limits	08/20/87
10	Maintenance Responsibility for Switchyard Batteries	09/01/87
11	Containment Primary Isolation	09/08/87
12	Main Steam Line Radiation Monitors	09/29/87
13	ECCS Pump Start Logic	12/17/87

*This amended the Provisional Operating License.

B. Supporting Data and Summaries - Unit 2

1. Allegation Review

Allegations about Millstone 2 were:

-- That a contractor employee was fired because of his past contacts with the NRC. The Department of Labor found in favor of the alleger, and the employer appealed. Hearing of the appeal has been postponed for an extended period at the alleger's request. NRC review has found no indication of a licensee practice of discriminating against individuals.

-- That fire dampers are undersized. This was unsubstantiated.

-- That Litton-Veam connectors are inadequate in moisture sealing characteristics. No immediate safety implications were identified. The allegation was referred to the vendor inspection branch because of generic considerations.

-- That significant radiation exposures occurred during a spill. This was unsubstantiated; the precipitating event appeared to be a spill drill with no radioactive material involved.

-- That electrical tagging procedures were not followed for non-safety-related activities, and that the contractor involved did not follow procedures adequately. The alleger has provided later information which is still under evaluation. No safety inadequacy has been identified yet.

-- That plant access was denied because of incorrect security information being supplied by the alleger about an arrest involving marijuana. This was confirmed and found to be a normal and acceptable licensee practice.

-- That a person had the wrong security badge and key card for about 8 hours. This allegation is still being evaluated. No significant security hazard has been identified.

2. Escalated Enforcement Actions

Civil Penalties

$25,000 - IR 87-20, Physical Security

3. Management Conferences

-- On June 18, 1986, an enforcement conference was held at the NRC Region I Office to discuss repetitive radwaste transportation problems.

-- On February 24, 1987, a management meeting was held at the NRC Region I Office to discuss the Appendix R status for Unit 2.

-- On November 3, 1987, an enforcement conference was held at the NRC Region I Office to discuss station security violations.

4. Licensee Event Reports

a. Tabular Licensing

Type of Events

A.	Personnel Error	20
B.	Design/Mfg/Construction/Install Error	13
C.	External Cause	2
D.	Defective Procedure	1
E.	Component Failure	17
X.	Other	
	TOTAL	53

A tabulation of Licensee Event Reports (LERs) by functional area, and an LER synopsis, is attached as Table 3.

Licensee Event Reports Reviewed

LER Nos. 86-03 through 86-23 and 87-01 through 87-13.

b. Causal Analysis

Unit 2 LERs 86-03, 86-07, 86-11, 87-01, 87-10 and 87-13 cover deficiencies in the fire protection program and equipment used for hot shutdown; 5 of the events are attributable to either equipment failure(s) or personnel error(s).

LERs 86-04, 86-05, 86-17, 86-20 and 86-22 concern reactor trips and/or loss of normal power events; 4 of the events resulted from personnel errors.

5. Licensing Activities

a. NRR/Licensee Meetings

-- Steam Generator Tube Inspection	11/24/86
-- Steam Generator Tube Leakage	3/05/87
-- Forty-year Operating License	12/10/87

b. NRC Site Visits

Plant tour and Training for site access	6/22/86 - 6/25/86
SALP Meeting	10/02/86
Inspect Diesel Generators	4/5/87 - 4/10/87
Audit of 10 CFR 50.59 Analyses	7/13/87 - 7/17/87
Inspect Service Water System	10/25/87 - 10/30/87
Inspect implementation of SIMS item	11/29/87 - 12/04/87

c. Reliefs Granted

Inservice Testing of Emergency Diesel Generator Auxiliaries (ASME Code, Section XI)	11/02/86

d. Exemptions Granted

Fire Protection - Emergency Lighting (10 CFR Part 50, Appendix R, Section III. J)	1/15/87

g. License Amendments Issued

Amendment	Title	Date
112	Fire Protection Audits	9/9/86
113	Cycle 8 Reload	11/8/86
114	Spent Fuel Pool Temperature	12/19/86
115	Iodine Spikes	2/3/87
116	Number of Reactor Coolant	4/21/87
117	Spent Fuel Consolidation	6/2/87
118	Snubbers	3/1/87
119	Reporting of RV and SV Failures, Secondary Water Chemistry, Control Room Leakage	9/25/87
120	GL83-37 (TMI Technical Specification)	9/28/87
121	Plugging Limit for Sleeved SE Tubes	11/13/87
122	Cycle 8 Coastdown	11/18/87

TABLE 1

INSPECTION HOUR SUMMARY

MILLSTONE 1

AREA	HOURS	% OF TIME
PLANT OPERATIONS	1019	38.2
RADIOLOGICAL CONTROLS	297	11.1
MAINTENANCE	174	6.5
SURVEILLANCE	438	16.4
EMERGENCY PREP	138	5.2
SEC/SAFEGUARDS	77	2.9
OUTAGE MANAGEMENT	265	9.9
TRAINING EFFECTIVENESS	*	*
ASSURANCE OF QUALITY	*	*
ENGINEERING SUPPORT	263	9.8
TOTALS:	2671	100.0

INSPECTION HOUR SUMMARY

MILLSTONE 2

AREA	HOURS	% OF TIME
PLANT OPERATIONS	1065	39.5
RADIOLOGICAL CONTROLS	265	9.8
MAINTENANCE	181	6.7
SURVEILLANCE	397	14.7
EMERGENCY PREP	148	5.5
SEC/SAFEGUARDS	84	3.1
OUTAGE MANAGEMENT	280	10.4
TRAINING EFFECTIVENESS	*	*
ASSURANCE OF QUALITY	*	*
ENGINEERING SUPPORT	277	10.3
TOTALS:	2697	100.0

*The inspection hours for these composite assessments are incorporated in the 8 functional areas.

TABLE 1A

SYNOPSIS OF INSPECTION REPORTS

MILLSTONE UNITS 1 AND 2

REPORT NUMBERS UNIT 1 INSPECTION DATES	UNIT 2	TYPE INSPEC	TOTAL HOURS	DESCRIPTION
86-09 5/20-7/7/86	86-09	RESIDENT	308	PLANT OPERATION, SURVEILLANCE, MAINTENANCE, MAIN TURBINE INSPECTION, AND STATIC "O" RING DIFFERENTIAL PRESSURE SWITCHES
86-10 6/23-27/86	-	SPECIALIST	104	RESPONSE, SUBSEQUENT ANALYSIS AND MODIFICATIONS OF MASONRY WALLS IN RESPONSE TO IE BULLETIN 80-11, MASONRY WALL DESIGN
- 7/7-11/86	86-10	SPECIALIST	0	OPERATOR LICENSING EXAMINATIONS OF 8 SRO AND 7 RO CANDIDATES
86-11 6/2-6/86	86-11	SPECIALIST	48	RADIOCHEMICAL MEASUREMENTS PROGRAM USING REGION I MOBILE RADIOLOGICAL MEASUREMENT LABORATORY
86-12 7/7-11/86	86-12	SPECIALIST	54	PERSONNEL RADIATION TRAINING AND QUALIFICATIONS, EXPOSURE CONTROL, SURVEYS, AUDITS, ALARA, PREVIOUSLY IDENTIFIED ITEMS
86-13 7/8-8/18/86	86-13	RESIDENT	190	PLANT OPERATION, SURVEILLANCE, MAINTENANCE, RADIATION PROTECTION, PHYSICAL SECURITY, FIRE PROTECTION, IE BULLETINS
- 7/7-11/86	86-14	SPECIALIST	31	SURVEILLANCE TESTING AND PROCEDURES, CALIBRATION CONTROL, QA/QC CONTROL INTERFACES AND PREVIOUS INSPECTION FINDINGS
86-14 7/7-10/86	86-15	SPECIALIST	36	NOTIFICATION AND COMMUNICATION EQUIPMENT, PROCEDURES, FOLLOW-UP OF EMERGENCY PREPAREDNESS ITEMS FROM PREVIOUS INSPECTIONS
86-15 7/14-18/86	86-16	SPECIALIST	40	IMPLEMENTATION OF INTEGRATED SITE SECURITY PROGRAM
86-16 7/21-8/8/86	86-17	SPECIALIST	70	QUALITY ASSURANCE PROGRAMS FOR RECEIPT/ STORAGE & HANDLING OF FUEL, PROCUREMENT CONTROL, PLANT DESIGN CHANGES, MODIFICATIONS

Table 1A

REPORT NUMBERS UNIT 1 UNIT 2 INSPECTION DATES	TYPE INSPEC	TOTAL HOURS	DESCRIPTION
- 86-18 8/11-14/86	SPECIALIST	57	PREPARATIONS FOR REFUELING INCLUDING NEW FUEL RECEIPT AND TRAINING FOR REFUELING
86-17 86-19 8/18-9/29/86	RESIDENT	91	OPERATION, SURVEILLANCE, MAINTENANCE, RADIATION PROTECTION, SECURITY, FIRE PROTECTION, IE BULLETINS, & U-1 STANDBY GAS TREATMENT SYSTEM
86-18 - 9/22-26/86	SPECIALIST	33	MAINTENANCE PROGRAM AND PROCEDURES, ELECTRICAL, MECHANICAL AND INSTRUMENTATION MAINTENANCE TASKS, QA/QC CONTROL INTERFACES
- 86-20 10/6-10/86	SPECIALIST	45	MANAGEMENT CONTROLS, PERSONNEL SELECTION, QUALIFICATION & TRAINING, EXTERNAL EXPOSURE CONTROL, ALARA
86-19 86-21 9/30-11/3/86	RESIDENT	271	U-1 OPERATIONAL SAFETY AND MAINTENANCE: U-2 REFUELING OUTAGE INCLUDING REFUELING OPERATIONS, LOCAL LEAK RATE TESTS, SAFETY VALVE TESTING
86-20 - 10/19-11/20/86	SPECIALIST	0	CANCELLED
- 86-22 12/16/86-1/30/87	SPECIALIST	0	OPERATOR LICENSING EXAMINATION OF ONE RO AND ONE SRO CANDIDATES
86-21 - 12/5/86-2/15/87	SPECIALIST	0	OPERATOR LICENSING EXAMINATIONS OF 9 RO AND 2 SRO CANDIDATES
86-22 86-23 11/4/86-1/5/87	RESIDENT	243	PLANT OPERATION, OUTAGE ACTIVITIES, SURVEILLANCE, PERIODIC REPORTS, AND MAINTENANCE
- 86-24 11/3-7/86	SPECIALIST	34	EDDY CURRENT TESTING OF STEAM GENERATOR TUBES INCLUDING ISI PROCEDURES, EQUIPMENT, QUALITY CONTROL MEASURES, DATA COLLECTION RECORDS
- 86-25 11/12/86-1/31/87	SPECIALIST	0	OPERATOR LICENSING REQUALIFICATION PROGRAM AUDIT
86-23 86-29 11/18-21/86	SPECIALIST	82	OBSERVATION OF LICENSEE'S ANNUAL EMERGENCY PREPAREDNESS EXERCISE OF 11/19/86 AND INGESTION PATHWAY EXERCISE OF 11/20/86

Table 1A

REPORT NUMBERS UNIT 1 INSPECTION DATES	UNIT 2	TYPE INSPEC	TOTAL HOURS	DESCRIPTION
86-24 11/17-20/86	86-26	SPECIALIST	26	NON-LICENSED STAFF TRAINING PROGRAM
- 12/8-12/86	86-27	SPECIALIST	100	LICENSEE RESPONSES, SUBSEQUENT ANALYSES AND MODIFICATIONS OF MASONRY WALLS RELATED TO IE BULLETIN 80-11, MASONRY WALL DESIGN
- 12/2-5/86	86-28	SPECIALIST	22	TEST WITNESSING AND PRELIMINARY RESULTS EVALUATION OF LOCAL LEAK RATE TEST, PREVIOUS ITEMS, COMMITMENTS FOR CONTAINMENT ISOLATION VALVE PM
86-25 12/1-5/86	86-30	SPECIALIST	18	OFF-SITE REVIEW COMMITTEE (NUCLEAR REVIEW BOARDS) ACTIVITIES
- 12/8-17/86	86-31	SPECIALIST	67	CYCLE 8 STARTUP PHYSICS TESTING INCLUDING REVIEW OF TEST PROGRAM, PRECRITICAL TESTS, & LOW POWER PHYSIC TESTS
86-26 12/11-12/86	86-32	SPECIALIST	4	DEGRADED PROTECTIVE AREA BARRIER AND LICENSEE'S CORRECTIVE ACTIONS
87-01 1/6-2/9/87	87-01	RESIDENT	117	PREVIOUS ITEMS, U-2 SHUTDOWN, IE INFORMATION NOTICES AND BULLETINS, U-1 LERs, ELECTRICAL BUSWORK INSULATION, OPERATOR REQUALIFICATION
87-02 1/27-29/87	87-02	SPECIALIST	8	PROTECTION OF SAFEGUARDS INFORMATION INCLUDING THE USE OF REQUIRED REPOSITORIES AND HANDLING PROCEDURES
87-03 2/10-3/9/87	87-03	RESIDENT	201	PREVIOUSLY IDENTIFIED ITEMS. U-1 STANDBY GAS TREATMENT INITIATION, U-1 EMER SERVICE WATER, U-1 APRMS, PORC, U-2 FIRE PROTECTION MEETING
- 2/3-6/87	87-04	SPECIALIST	29	EDDY CURRENT EXAMINATION OF STEAM GENERATOR TUBES, PREVIOUSLY IDENTIFIED ITEMS, INSERVICE INSPECTION DATA
87-04 3/10-4/13/87	87-05	RESIDENT	221	OPERATIONAL SAFETY, U-2 FUEL RECONSTITUTION, U-1 ESF ACTUATION, U-1 TRIP, NEW RAD WASTE TREATMENT, EDG FUEL OIL SUPPLY, PORC, REPORTS

Table 1A

REPORT NUMBERS UNIT 1 INSPECTION DATES	REPORT NUMBERS UNIT 2 INSPECTION DATES	TYPE INSPEC	TOTAL HOURS	DESCRIPTION
87-05 4/14-5/18/87	-	RESIDENT	164	PLANT OPERATION, SURVEILLANCE, MAINTENANCE, RAD PROTECTION, SECURITY, FIRE PROTECTION, NEW FUEL RECEIPT, ZINC INJECTION TRIAL PROGRAM
- 4/14-5/18/87	87-06	RESIDENT	111	PLANT OP, RAD PROTECTION, SECURITY, FIRE PROTECTION, SURVEILLANCE/MAINTENANCE, DIESEL GENERATOR, AUXILIARY FEEDWATER, TRIP REVIEWS
87-06 2/23-27/87	87-07	SPECIALIST	22	SECURITY PROGRAM RECORDS, REPORTS, PHYSICAL BARRIERS, PROTECTIVE AREAS, POWER SUPPLIES, ACCESS CONTROL, DETECTION AIDS, ALARM STATIONS
87-07 2/23-27/87	-	SPECIALIST	35	WATER CHEMISTRY CONTROL PROGRAM INCLUDING MANAGEMENT CONTROL, PLANT CHEMISTRY SYSTEM, SAMPLING/MEASUREMENT, PROGRAM IMPLEMENTATION
87-08 3/9-13/87	87-08	SPECIALIST	34	SOLID RAD WASTE CLASSIFICATION, HANDLING, AND TRANSPORTATION, RAD ENVIRONMENTAL MONITORING, RAD CHEMICAL ANALYSIS, AND CHEMICAL QA CONTROL
87-09 4/20-24/87	-	SPECIALIST	96	MAINTENANCE, TESTING, RECORDS, PROCEDURES, AND FLOW DISTRIBUTION OF ASME BOILER AND PRESSURE VESSEL CODE, APPENDIX J, AND CHECK VALVE DISK
- 3/16-19/87	87-09	SPECIALIST	30	MAINTENANCE ORGANIZATION, PROGRAM, ACTIVITIES, MEASURING AND TEST EQUIPMENT, TROUBLE REPORTING, INSULATION DEGRADATION, QA/QC INTERFACES
87-10 5/18-20/87	87-10	SPECIALIST	16	BIOASSAY WHOLE BODY COUNTING PROGRAM INCLUDING RESULT COMPARISON, PROCEDURE REVIEW, DATA COMPARISON
87-11 5/19-6/22/87	-	RESIDENT	136	PLANT OPERATION, SURVEILLANCE, MAINTENANCE, RADIATION PROTECTION, PHYSICAL SECURITY, FIRE PROTECTION, OUTAGE PREPARATION, ALLEGATION

Table 1A

REPORT NUMBERS UNIT 1 INSPECTION DATES	UNIT 2 INSPECTION DATES	TYPE INSPEC	TOTAL HOURS	DESCRIPTION
-	87-11 5/19-6/29/87	RESIDENT	122	PLANT OPERATION, SURVEILLANCES, APPENDIX R MODIFICATION, CONTROL BOARD ENHANCEMENT, ALLEGATION RESPONSE, STEAM GENERATOR ANALYSES
87-12 6/23-8/10/87	-	RESIDENT	183	PREVIOUS ITEMS, PLANT OPERATIONS, SURVEILLANCE, MAINTENANCE, RADIATION PROTECTION, PHYSICAL SECURITY, FIRE PROTECTION, ALLEGATION, EFS
87-13 6/29-7/2/87	87-12	SPECIALIST	21	EMERGENCY PREPAREDNESS PROGRAM
87-14 7/20-24/87	-	SPECIALIST	65	SURVEILLANCE AND CALIBRATION PROGRAM INCLUDING CALIBRATION TESTING, CONTROL OF MEASUREMENT AND TEST EQUIPMENT, QA/QC INVOLVEMENT
-	87-13 6/30-8/17/87	RESIDENT	93	OPERATIONAL SAFETY, UNIT TRIP, PORC REVIEW, SPENT FUEL POOL DIVING, AUXILIARY FEEDWATER SURVEILLANCE, DIESEL SURVEILLANCES, PRE-REFUELING
-	87-14 7/6-10/87	SPECIALIST	40	STEAM GENERATOR SURVEILLANCE, PREVENTIVE MAINTENANCE ACTIVITIES, ACTIONS ON PREVIOUSLY IDENTIFIED NRC ITEMS
87-15 7/6-10/87	87-17	SPECIALIST	117	RADIATION PROTECTION ACTIVITIES ASSOCIATED WITH UNIT 1 OUTAGE, INTERNAL AND EXTERNAL EXPOSURE CONTROL, ALARA, POSTING, LABELING
87-16 7/6-10/87	-	SPECIALIST	36	ISI ACTIVITIES, AUGMENTED EXAMINATION PROGRAM FOR INTEGRATED STRESS CORROSION CRACKING, AND BALANCE OF PLANT EROSION/CORROSION PROGRAM
87-17 7/15-20/87	87-15	SPECIALIST	56	FOLLOW UP ON EQUIPMENT QUALIFICATION INSPECTIONS 50-245/85-30 AND 50-336/85-35 INCLUDING CORPORATE FILES, CORRECTIVE ACTIONS, AND VERIFICATION OF CONFORMANCE WITH 10 CFR 50.49
-	87-16 7/13-17/87	SPECIALIST	154	TEAM INSPECTION OF THE LICENSEE'S EFFORT TO COMPLY WITH 10 CFR APPENDIX R, SECTIONS III.G, J, AND O CONCERNING SAFE SHUTDOWN AFTER A FIRE

Table 1A

REPORT NUMBERS UNIT 1 INSPECTION DATES	UNIT 2	TYPE INSPEC	TOTAL HOURS	DESCRIPTION
87-18 7/31-8/7/87	-	SPECIALIST	73	CONTAINMENT INTEGRATED LEAK RATE TEST WITNESSING AND PRELIMINARY RESULTS EVALUATION
87-19 8/17-21/87	-	SPECIALIST	116	TEAM INSPECTION OF THE LICENSEE'S EFFORT TO COMPLY WITH 10 CFR APPENDIX R, SECTIONS III.G, J, AND O CONCERNING SAFE SHUTDOWN AFTER A FIRE
87-20 8/24-28/87	87-18	SPECIALIST	36	RADIOACTIVE EFFLUENT CONTROL PROGRAM, LIQUID AND GASEOUS WASTE SYSTEMS, PROCESS RAD MONITORING, AIR CLEANING SYSTEMS, AND AUDIT ACTIVITIES
87-21 8/11-9/8/87	-	RESIDENT	89	PLANT OPERATIONS, MAINTENANCE, SURVEILLANCE, RADIATION PROTECTION, PHYSICAL SECURITY, FIRE PROTECTION, PERIODIC AND SPECIAL REPORTS
87-22 8/31-9/4/87	87-20	SPECIALIST	78	PROCEDURES, ORGANIZATION, PROGRAM AUDITS, AND REPORTS, TESTING AND MAINTENANCE, PHYSICAL BARRIERS, LIGHTING, ACCESS CONTROL, SECURITY AIDS
87-23 9/21-10/25/87	-	SPECIALIST	0	OPERATOR LICENSING EXAMINATION OF 7 SRO CANDIDATES
87-24 9/14-24/87	87-21	SPECIALIST	36	STATUS OF PREVIOUSLY IDENTIFIED ITEMS RELATED TO THE CAPABILITY FOR POST-ACCIDENT SAMPLING, MONITORING, AND ANALYSIS
87-25 8/18-9/25/87	87-19	RESIDENT	95	OPERATIONAL SAFETY, AN ALLEGATION, U-1 CONTROL ROOM HALON TESTING, FAILURE OF U-2 DIESEL GENERATOR TO LOAD, U-2 CONTROL ROD ANOMALIES
87-26 10/7-9/87	87-22	SPECIALIST	100	ANNOUNCED EMERGENCY PREPAREDNESS TEAM INSPECTION AND OBSERVATION OF THE LICENSEE'S ANNUAL EMERGENCY EXERCISE PERFORMED ON 10/8/87
87-27 9/26-10/26/87	87-23	RESIDENT	114	FOLLOW UP ON PREVIOUS FINDINGS, PHYSICAL SECURITY, PLANT OPERATIONS, DIESEL GENERATOR TRIPS, SURVEILLANCE, MAINTENANCE, FEEDWATER HYDROGEN INJECTION TESTING, AND IE BULLETIN 87-01

Table 1A

REPORT NUMBERS UNIT 1 UNIT 2 INSPECTION DATES	TYPE INSPEC	TOTAL HOURS	DESCRIPTION
87-28 87-24 11/2-6/87	SPECIALIST	56	NON-RADIOLOGICAL CHEMISTRY PROGRAM INCLUDING MEASUREMENT CONTROL AND ANALYTICAL PROCEDURE EVALUATION
87-29 - 11/3-20/87	SPECIALIST	0	CANCELLED
87-30 87-25 10/27-11/30/87	RESIDENT	138	FOLLOW-UP ON PREVIOUS FINDINGS, SECURITY, OPERATIONS, SERVICE WATER OPERABILITY, DC SWITCHGEAR VENTILATION, UNIT 2 TRIP, SURVEILLANCE, COMMITTEE ACTIVITIES, CONTROL ROOM VENTILATION, FUEL ASSEMBLY PRESSURE DROP TEST, AND LERS
87-31 87-26 11/16-20/87	SPECIALIST	16	PRIMARILY UNIT 3 OUTAGE INSPECTION, BUT WITH SOME UNIT 1 AND 2 REVIEW OF TRAINING, AND INTERNAL AND EXTERNAL EXPOSURE CONTROL
87-32 87-27 11/30-12/4/87	SPECIALIST	103	COMPLEX SAFETY-RELATED SYSTEM, IN-PLANT INSTRUMENT CALIBRATION, MEASURING AND TEST EQUIPMENT, COLD WEATHER PREPARATION, QUALITY CONTROL INTERFACES
- 87-28 11/30-12/4/87	SPECIALIST	14	STEAM GENERATOR EDDY CURRENT INSPECTION, WATER CHEMISTRY CONTROLS, RADIOLOGICAL CONTROLS DURING STEAM GENERATOR INSPECTION/ REPAIR
87-33 87-29 12/1-31/87	RESIDENT	159	PREVIOUS INSPECTION FINDINGS, PHYSICAL SECURITY, PLANT OPERATIONS, IMPLEMENTATION OF LICENSE AMENDMENTS, IE BULLETIN 87-02 - FASTENER TESTING, SURVEILLANCE TESTING, SCRAM DISCHARGE VOLUME MODIFICATIONS, COMMITTEE ACTIVITIES, AND LICENSEE EVENT REPORTS
87-34 87-30 12/7-11/87	SPECIALIST	29	SOLID RADWASTE AND TRANSPORTATION PROGRAM INCLUDING MANAGEMENT CONTROL, SHIPMENTS OF RADIOACTIVE MATERIALS, TRAINING, PROCESSING, PACKAGE SELECTION AND QUALITY CONTROL
87-35 - 12/14-18/87	SPECIALIST	34	LICENSEE'S RESPONSE TO GENERIC LETTER 84-11, INTERGRANULAR STRESS CORROSION CRACKING OF BWR RECIRCULATION SYSTEM AND ASSOCIATED PIPING

TABLE 2

ENFORCEMENT SUMMARY

MILLSTONE 1 VIOLATIONS

AREA	SEVERITY LEVEL 1	2	3	4	5	DEV	TOTAL
PLANT OPERATIONS				1	2		3
RADIOLOGICAL CONTROLS					2		2
MAINTENANCE							
SURVEILLANCE				1			1
EMERGENCY PREP							
SEC/SAFEGUARDS			1	2			3
OUTAGE MANAGEMENT							
TRAINING EFFECTIVENESS							
ASSURANCE OF QUALITY							
ENGINEERING SUPPORT				1			1
TOTALS:			1	5	4		11

MILLSTONE 2 VIOLATIONS

AREA	SEVERITY LEVEL 1	2	3	4	5	DEV	TOTAL
PLANT OPERATIONS				1			1
RADIOLOGICAL CONTROLS							
MAINTENANCE							
SURVEILLANCE							
EMERGENCY PREP							
SEC/SAFEGUARDS			1	2			3
OUTAGE MANAGEMENT					1		1
TRAINING EFFECTIVENESS							
ASSURANCE OF QUALITY							
ENGINEERING SUPPORT				2	2		4
TOTALS:			1	5	3		9

TABLE 2A

SYNOPSIS OF VIOLATIONS

MILLSTONE 1 AND 2

REPORT NUMBERS UNIT 1 INSPECTION DATES	REPORT NUMBERS UNIT 2 INSPECTION DATES	REQUIREMENT VIOLATED	SEVERITY LEVEL	FUNCTIONAL AREA	DESCRIPTION
86-26 12/11-12/86	86-32	MP SECURITY PLAN	4	SEC/SAFEGRDS	DEGRADATION OF THE PROTECTED AREA BARRIER
87-02 1/27-29/87	87-02	10 CFR 73.21(d)(2)	4	SEC/SAFEGRDS	FAILURE TO PROPERLY SECURE UNATTENDED SAFEGUARDS INFORMATION IN A LOCKED SECURITY STORAGE CONTAINER
87-05 4/14-5/18/87	-	APPENDIX B, CRI XVI	5	OPERATIONS	FAILURE TO UPDATE TECHNICAL TECHNICAL SPECIFICATION TABLE 3.7.1 TO INCLUDE CONTAINMENT ATMOSPHERE SAMPLE LINE ISOLATION VALVES
87-05 4/14-5/18/87	-	TECH SPEC 3.6.1.6	5	OPERATIONS	FAILURE TO UPDATE TECHNICAL SPECIFICATION TABLES 3.6.1.A AND 3.6.1.B TO CORRECT SAFETY-RELATED SNUBBER LISTING
87-15 7/6-10/87	-	10 CFR 20.203(f)	5	RAD CONTROL	SHIPPING BOX CONTAINING RADIOACTIVE MATERIAL AND LOCATED IN THE RAILWAY ACCESS AREA WAS NOT LABELED AS REQUIRED
87-15 7/6-10/87	-	TECH SPEC 6.11	5	RAD CONTROL	THREE CASES OF WORKER(S) NOT READING AND/OR FOLLOWING RADIATION WORK PERMITS
- 7/15-17/87	87-15	10 CFR 50.49 (f) AND (k)	4	ENG SUPPORT	INADEQUATE EQUIPMENT QUAL DOCUMENTATION OF GE SIS WIRE USED IN VALVES 2-SI-654, 2-CH-501, & 2-SI-644
- 7/15-17/87	87-15	10 CFR 50.49 (l)	4	ENG SUPPORT	INADEQUATE EQUIPMENT QUAL OF BISHOP CABLE SPLICE ON MOTOR OPERATED VALVE 2-SI-654 ON MAY 31, 1987

Table 2A

REPORT NUMBERS UNIT 1 INSPECTION DATES	REPORT NUMBERS UNIT 2 INSPECTION DATES	REQUIREMENT VIOLATED	SEVERITY LEVEL	FUNCTIONAL AREA	DESCRIPTION
87-17 7/15-17/87	-	10 CFR 50.49 (e)(1)	4	ENG SUPPORT	INADEQUATE EQUIPMENT QUAL OF CURTIS L-TYPE TERMINAL BLOCKS USED IN ISOLATION CONDENSER VALVE I-IC-I
- 7/13-17/87	87-16	APPENDIX R , SEC IIIG2	5	ENG SUPPORT	FIRE BARRIER SEPARATING THE WEST ELECTRICAL PENETRATION ROOM FROM THE AUXILIARY BUILDING DID NOT MEET REQUIREMENTS (NO FIRE DAMPER)
- 7/13-17/87	87-16	APPENDIX R, SEC IIIG1	5	ENG SUPPORT	INADEQUATE DISTANCE SEPARATING THE REDUNDANT AUXILIARY FEEDWATER HEADERS AND THEIR ISOLATION VALVES WITH INTERVENING COMBUSTIBLES
87-21 8/11-9/8/87	-	TECH SPEC 6.8.1.C	4	SURVEILLANCE	FAILURE TO PERFORM INDEPENDENT VERIFICATION OF TEST EQUIPMENT FOR AUTO BLOWDOWN LOGIC AND FAILURE TO IMPLEMENT MAIN STEAM LINE ISOLATION VALVE CLOSURE TEST
87-22 8/31-9/4/87	87-20	MP SECURITY PLAN	3	SEC/SAFEGRDS	MULTIPLE EXAMPLES OF INADEQUATE PROTECTED AND VITAL AREA BARRIERS, TWO EXAMPLES OF VISITORS WITHOUT ESCORT, IMPROPER COMPENSATORY MEASURES, AND OTHER ISSUES
- 10/27-11/30/87	87-25	10 CFR 50 APPENDIX B	4	MAINTENANCE	REDUNDANT VENTILATION COOLERS FOR VITAL DC SWITCHGEAR ROOMS INOPERABLE SINCE 1983
87-33 12/1-31/87	-	10 CFR 50.72(b)(2)	4	OPERATIONS	FAILURE TO NOTIFY THE NRC THAT 8 OF 12 CHECK VALVES IN THE NITROGEN SUPPLY TO THE AUTOMATIC BLOWDOWN SYSTEM FAILED TO PASS THE LOCAL LEAK RATE TEST
12/1-31/87	87-29	TECH SPEC 6.2.2.g	5	OUTAGE MANAGEMENT	FAILURE TO APPROVE EXCESS OVERTIME (7 EXAMPLES) PER GUIDELINES DURING AN OUTAGE

TABLE 3

SUMMARY OF LICENSEE EVENT REPORTS (LERs)

MILLSTONE 1

AREA CODE	AREA	CAUSE CODES A	B	C	D	E	TOTAL
1	PLANT OPERATIONS	3	1		3	3	10
2	RADIOLOGICAL CONTROLS	2				1	3
3	MAINTENANCE	1					1
4	SURVEILLANCE	5	4		1	1	11
5	EMERGENCY PREP						0
6	SEC/SAFEGUARDS	8	5	2	1	7	23
7	OUTAGE MANAGEMENT						0
8	TRAINING EFFECT	1					1
9	ASSURANCE OF QUALITY						0
10	ENGINEERING SUPPORT	4	11				15
	TOTALS:	24	21	2	5	12	64

SUMMARY OF LICENSEE EVENT REPORTS (LERs)

MILLSTONE 2

AREA CODE	AREA	CAUSE CODES A	B	C	D	E	TOTAL
1	PLANT OPERATIONS	3	2			6	11
2	RADIOLOGICAL CONTROLS					1	1
3	MAINTENANCE	5					5
4	SURVEILLANCE	2			1	3	6
5	EMERGENCY PREP						0
6	SEC/SAFEGUARDS	7	3	2		6	18
7	OUTAGE MANAGEMENT	1				1	2
8	TRAINING EFFECT						0
9	ASSURANCE OF QUALITY		2				2
10	ENGINEERING SUPPORT	2	6				8
	TOTALS:	20	13	2	1	17	53

CAUSE CODES

A -- PERSONNEL ERROR
B -- DESIGN, MANUFACTURING, CONSTRUCTION/INSTALLATION
C -- EXTERNAL CAUSE
D -- DEFECTIVE PROCEDURE
E -- EQUIPMENT FAILURE
X -- OTHER

TABLE 3A

SYNOPSIS OF LICENSEE EVENT REPORTS (LERs)

MILLSTONE 1

LER NUMBER	EVENT DATE	CAUSE CODE	AREA CODE	DESCRIPTION
86-17	5/21/86	E*	1	REACTOR MANUALLY TRIPPED FOLLOWING FAILURE OF MECHANICAL PRESSURE REGULATOR DURING PLANNED REACTOR SHUTDOWN TO CONDUCT TURBINE INSPECTION
86-18-01	5/24/86	B*	10	WITH UNIT SHUTDOWN, REACTOR PROTECTION ACTUATION DUE TO SOURCE RANGE MONITOR DRIVE RELAYS CAUSING NOISE SPIKES ON INTERMEDIATE RANGE MONITORS 12 AND 16
86-19	5/31/86	A*	2	STANDBY GAS TREATMENT INITIATION CAUSED BY SPURIOUS UPSCALE TRIP OF THE STEAM TUNNEL VENTILATION RADIATION MONITOR
86-25	11/14/86	B	10	NOTIFICATION THAT FEEDWATER COOLANT INITIATION RELAYS DO NOT CONFORM TO SEISMIC QUALIFICATION
86-27	11/30/86	B	1	REACTOR TRIP ON GENERATOR TRIP CAUSED BY GENERATOR LOCK-OUT DUE TO PHASE-TO-GROUND FAULT OF THE MAIN TRANSFORMER
86-28-01	12/3/86	B*	4	MAIN STEAM LINE LOW PRESSURE SWITCH SETPOINT DRIFT
86-29	12/6/86	E*	2	DURING SHUTDOWN, A STANDBY GAS TREATMENT ACTUATION CAUSED BY REACTOR BUILDING VENT RAD MONITOR FAILING HIGH DUE TO FAILED SENSOR/CONVERTER
86-32	12/30/86	E*	4	SURVEILLANCE OF CONDENSER LOW VACUUM SWITCHES FINDS 2-OF-4 SWITCHES WITH SETPOINT DRIFT DOWNWARD
87-01-01	1/13/87	B	10	CRACKING ALONG THE HORIZONTAL NORYL INSULATORS OF 4160V DISTRIBUTION LOAD CENTER
87-04	2/1/87	D*	4	SURVEILLANCE OF "B" STANDBY GAS TREATMENT OVERDUE BY 6 HOURS FOLLOWING DECLARATION THAT "A" SBGT WAS INOPERABLE
87-05	2/21/87	D*	1	STANDBY GAS TREATMENT SYSTEM INITIATION BY HIGH RADIATION IN THE STEAM TUNNEL DUE TO AIR BEING LEFT IN DEMINERALIZER "B"

Table 3A

LER NUMBER	EVENT DATE	CAUSE CODE	AREA CODE	DESCRIPTION
87-07	3/22/87	A*	8	REACTOR TRIP AND ISOLATION ON LOW MAIN STEAM LINE PRESSURE DUE TO PRESSURE OSCILLATIONS CAUSED BY CONTROL PROBLEMS WITH THE MECHANICAL PRESSURE REGULATOR
87-08	3/10/87	A	3	REACTOR BUILDING VENT ISOLATION AND STANDBY GAS TREATMENT ACTUATION DURING INSTRUMENT TECHNICIAN WORK ON REACTOR BUILDING VENT RADIATION MONITOR
87-12-01	5/19/87	B*	10	EMERGENCY DIESEL GENERATOR CEILING FIRE COATING DISCOVERED INADEQUATE TO PROVIDE THE REQUIRED 3-HOUR FIRE RESISTANT RATING
87-13	5/27/87	D*	1	STANDBY GAS TREATMENT SYSTEM ACTUATED DUE TO HIGH RADIATION ON THE REFUELING FLOOR CAUSED BY AIR IN THE SPENT FUEL POOL COOLING SYSTEM AFTER FILLING AND VENTING
87-15-02	6/6/87	B*	4	SEVENTEEN CONTAINMENT ISOLATION VALVES, INCLUDING TWO MAIN STEAM ISOLATION VALVES, FAIL LOCAL LEAK RATE TEST
87-17	6/10/87	A*	1	REACTOR TRIP ON SCRAM VALVE AIR HEADER LOW PRESSURE DUE TO LARGE DEMAND ON STATION AIR SYSTEM AND TRIPPING OF SULLAIR AIR COMPRESSOR ON ELECTRICAL OVERLOAD
87-19	6/12/87	A	1	WHILE UNLOADING THE REACTOR CORE, FUEL ASSEMBLY LY2729 WAS FOUND MISORIENTED IN CORE LOCATION 43-18
87-20-01	6/26/87	B*	10	INTERGRANULAR STRESS CORROSION CRACKING INDICATION ON RECIRCULATION SYSTEM PIPE TO CAP WELD RMBJ-1
87-21	6/30/87	B*	10	5 OF 6 TARGET ROCK MAIN STEAM SAFETY RELIEF VALVE FOUND WITH SETPOINTS HIGHER THEN ALLOWED BY TECHNICAL SPECIFICATIONS
87-22	7/2/87	B*	10	BASE METAL INCLUSIONS APPROXIMATELY 26 INCHES LONG FOUND IN THE ISOLATION CONDENSER RETURN LINE PIPING
87-23	7-08-87	B	10	AS-INSTALLED CONFIGURATION OF LOW PRESSURE COOLANT INJECTION AND CORE SPRAY SYSTEM PUMP FOUNDATION ANCHORS IN NONCONFORMANCE WITH ORIGINAL DESIGN

Table 3A

LER NUMBER	EVENT DATE	CAUSE CODE	AREA CODE	DESCRIPTION
87-24	7/15/87	A*	2	STANDBY GAS TREATMENT ACTUATION ON REFUELING FLOOR HIGH RADIATION WHILE REPLACING LOCAL POWER RANGE MONITORS
87-26	8/3/87	B*	10	FAILURE OF NINE HYDRAULIC SNUBBER IN THE FIRST FEW 10% SAMPLES REQUIRED ALL HYDRAULIC SNUBBERS TO BE TESTED IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS
87-28	8/13/87	A*	4	REACTOR TRIP SIGNAL GENERATED BY INSTRUMENT TECHNICIAN WHILE PERFORMING MAIN STEAM ISOLATION VALVE CLOSURE FUNCTIONAL TEST
87-29	7/24/87	A	10	STANDBY GAS TREATMENT SYSTEM INOPERABLE DUE TO DEFEATED INTERLOCK ON ATMOSPHERIC CONTROL VALVE 1-AC-10 (VALVE REMOVED FOR MAINTENANCE)
87-30	7/26/87	B*	10	REACTOR TRIP SIGNAL, FROM THE INTERMEDIATE RANGE MONITORS 12 AND 16, WAS GENERATED AS SOURCE RANGE CHANNEL 23 WAS BEING DRIVEN IN
87-31	7/28/87	D*	1	REACTOR TRIP SIGNAL DUE TO INTERMEDIATE RANGE MONITOR SPIKE CAUSED BY INSTRUMENT TECHNICIAN MOVING NUCLEAR INSTRUMENT CABLES UNDER THE REACTOR VESSEL
87-32	8/11/87	B*	4	ALL FOUR TURBINE 1ST STAGE PRESSURE BYPASS SWITCHES FAIL TO MEET TECHNICAL SPECIFICATIONS SETPOINT REQUIREMENTS
87-33	8/12/87	A	4	DURING SHUTDOWN, INADVERTENT ACTUATION OF "A" LPCI SUBSYSTEM DUE TO TEST SIGNAL INJECTION
87-34	8/14/87	A	1	REACTOR TRIP DURING STARTUP ON INTERMEDIATE RANGE HIGH FLUX DURING WITHDRAWAL OF CONTROL ROD 26-31
87-35	8/21/87	A	10	SIX FIRE DETECTION SYSTEM NOT COMPLETELY ELECTRICALLY SUPERVISED AND NOT DEMONSTRATED OPERABLE EACH 31-DAYS PER TECHNICAL SPECIFICATIONS
87-36	8/26/87	A*	4	REACTOR TRIP DURING AVERAGE POWER RANGE MONITOR SURVEILLANCE TESTING
87-37	9/8/87	A*	4	MANUAL REACTOR TRIP FUNCTION SURVEILLANCE NOT PERFORMED ON TIME

Table 3A

LER NUMBER	EVENT DATE	CAUSE CODE	AREA CODE	DESCRIPTION
87-38	9/3/87	E*	1	REACTOR TRIP ON LOW SCRAM HEADER PRESSURE CAUSED BY LOW SERVICE AIR HEADER PRESSURE DUE TO SERVICE AIR COMPRESSOR FAILURE DURING HIGH SERVICE AIR USAGE
87-39	9/21/87	A*	4	SURVEILLANCE FOUND PAST DUE ON AUTOMATIC PRESSURE RELIEF AND LOW PRESSURE CORE COOLING PUMP INTERLOCK
87-40	9/15/87	B*	10	ALL FOUR NEW (INSTALLED DURING 1987 OUTAGE) CONDENSER LOW VACUUM TRIP PRESSURE SWITCHES FAILED TO MEET TS SETPOINT REQUIREMENTS
87-41	10/16/87	A*	10	FAILURE TO REQUEST TECHNICAL SPECIFICATION CHANGE FOR REMOVAL OF LOW REACTOR PRESSURE PERMISSIVE SWITCHES FROM LOW PRESSURE INJECTION AND CORE SPRAY PUMP START LOGIC
87-42	10/27/87	A	10	DURING REVIEW OF IE INFORMATION NOTICE 86-60, IT WAS DETERMINED THAT NO SURVEILLANCE EXISTED FOR TESTING THE POST ACCIDENT SAMPLING SYSTEM PER TECHNICAL SPECIFICATION 6.13
87-43	11/16/87	E*	1	TWO HYDRAULIC SNUBBERS HAD LOW RESERVOIR FLUID LEVELS: BENCH TESTING RESULTED IN DECLARING THEM INOPERABLE DUE TO SLIGHTLY HIGH LOCKUP RATES IN COMPRESSION
87-44	12/29/87	B*	4	TECHNICAL SPECIFICATION REQUIRED TESTING OF GAS TREATMENT SYSTEM NOT FULLY SATISFIED IN THAT NO FLOW DISTRIBUTION TEST WAS PERFORMED ACROSS THE CHARCOAL ABSORBERS

* -- CAUSE CODES HAVE BEEN ASSIGNED BY OR CHANGES FROM THE LICENSEE CODES BY NRC REGION I

TABLE 3B

SYNOPSIS OF LICENSEE EVENT REPORTS (LERs)

MILLSTONE 2

LER NUMBER	EVENT DATE	CAUSE CODE	AREA CODE	DESCRIPTION
86-03-01	5/16/86	B	1	EVALUATION IN RESPONSE TO IE INFORMATION NOTICE 83-69 IDENTIFIES 20 INOPERABLE FIRE DAMPERS
86-04-01	6/1/86	A*	1	REACTOR TRIP ON REACTOR COOLANT PUMP UNDERSPEED CAUSED BY LOSS OF POWER TO BUS 25B DUE TO IMPROPER OPERATION OF BREAKER CONTROL SWITCH 252-25B-2
86-05	8/12/86	B	10	REACTOR TRIP ON #1 STEAM GENERATOR LOW LEVEL AFTER LOSS OF THE "A" FEEDWATER PUMP DUE TO LOSS OF OIL PUMPS WHEN BUSSES 22A AND 22B (CROSS-TIED) LOST POWER
86-06	9/3/86	B	10	REACTOR TRIP ON LOW STEAM GENERATOR LEVEL DUE TO LOSS OF HEATER DRAINS FLOW FOLLOWING FAILURE OF AIR FITTING TO THE HEATER DRAINS CONTROL VALVE CLOSING VALVE
86-07	9/1/86	E*	4	SURVEILLANCE CHECK OF THE REMOTE SHUTDOWN PANEL FOUND TECH SPEC REQUIRED STEAM GENERATOR LEVEL TRANSMITTER LT-1113A OUT OF SERVICE
86-08-01	9/20/86	E*	4	SIX OF 16 MAIN STEAM SAFETY VALVES FAILED THE SIMMER TEST DUE TO SETPOINT DRIFT
86-09-01	9/29/86	A*	3	TWO UNRELATED ESF ACTUATIONS ONE DUE TO PERSONNEL ERROR AND THE OTHER DUE TO NOISE SPIKE IN RAD MONITOR RM-8262A
86-10	10/6/86	A*	10	INCONSISTENCY BETWEEN THE NUMBER OF RCS PUMPS REQUIRED TO BE OPERATING IN MODES 3, 4 AND 5 AND THE ASSUMPTIONS USED IN THE SAFETY ANALYSIS
86-11	10/4/86	A*	1	TWO CASES OF IMPROPER FIRE WATCH COVERAGE REQUIRED BY TECH SPEC 3.7.10.A DURING REFUELING
86-12-01	10/9/86	E*	4	TYPE B AND C LOCAL LEAKAGE RATE LIMITS EXCEEDED
86-13	10/10/86	B*	10	SAFETY INJECTION TANK "A" LEVEL TRANSMITTER FOUND OUT OF SPECIFICATION TO THE LOW SIDE

Table 3B

LER NUMBER	EVENT DATE	CAUSE CODE	AREA CODE	DESCRIPTION
86-14	10/29/86	A*	4	TWO ACTUATIONS OF THE CONTAINMENT PURGE ISOLATION SYSTEM CAUSED BY: 1) ELECTRONIC NOISE IN RM 8123A, AND, 2) TECHNICIAN ERROR
86-15-01	11/14/86	B	10	GENERAL ELECTRIC MODEL 12 DIESEL GENERATOR DIFFERENTIAL RELAYS NOT SEISMICALLY QUALIFIED FOR CLASS 1E SERVICE
86-16	11/4/86	E*	7	SCHEDULED INSERVICE EXAMINATION OF STEAM GENERATORS IDENTIFIED SUFFICIENT NUMBER OF TUBES WITH FLAWS GREATER THAN 40% THROUGH-WALL
86-17	11/5/86	A*	3	DURING SHUTDOWN, LOSS OF POWER EVENT INITIATION BY TESTMAN CAUSING A PERCEIVED MAIN GENERATOR GROUND FAULT RESULTING IN OPENING OF SWITCHYARD BREAKERS
86-18	12/10/86	B*	10	PLANNED REMOVAL OF 14 HYDRAULIC AND 7 MECHANICAL SNUBBERS HAVING MOVEMENTS LESS THAN 1/16 INCH: SNUBBERS WERE REPLACED WITH RIGID SUPPORTS
86-19	11/13/86	D*	4	DURING SHUTDOWN, OPERABILITY SURVEILLANCE OF THREE RUSKIN MODEL HVD-1-173 FIRE DAMPER HAS BEEN MISSED SINCE 1980: WERE NOT ON SP 2618G FORM
86-20	11/29/86	A	3	DURING SHUTDOWN, TWO CASES OF LOSS OF POWER ON LOAD CENTER 24C BEING SENSED BY AN IMPROPERLY INSTALLED BUS VOLTAGE POTENTIAL TRANSFORMER DRAWER
86-21	12/31/86	B	1	DURING SHUTDOWN, 8 VALCOR SOLENOID VALVE IN THE REACTOR COOLANT VENT SYSTEM WERE LEAKING BY DUE TO SPRING FAILURES
86-2	12/23/86	A*	3	REACTOR TRIP ON LOW STEAM GENERATOR LEVEL DUE TO FEEDWATER PUMP SPEED DECREASE TO MINIMUM UPON LOSS OF POWER ON BUS 24C, CAUSED BY IMPROPERLY INSTALLED DRAWER
86-23	12/13/86	B	9	"C" CHARGING PUMP CRACKED BLOCK DUE TO HIGH INTERNAL STRESS CAUSING CRACKS TO INITIATE AT SUB-SURFACE INCLUSIONS
87-01-01	12/22/86	E*	1	FIRE DETECTION/PROTECTION SYSTEMS FOR THE "C" REACTOR COOLING PUMP INDICATED OUT OF SERVICE DUE TO HEAT DETECTOR FAILURE

Table 3B

LER NUMBER	EVENT DATE	CAUSE CODE	AREA CODE	DESCRIPTION
87-02	1/2/87	A*	3	REACTOR TRIP ON LOW STEAM GENERATOR LEVEL FOLLOWING LEVEL CONTROL PROBLEMS DUE TO A HOT JUMPER ARC ON THE FIRE SUPPRESSION ALARM PANEL
87-03	1/29/87	A*	7	POST OPERATIONAL REVIEW OF EDDY CURRENT DATA IDENTIFIED TWO DEFECTIVE STEAM GENERATOR TUBES NOT REPAIRED PRIOR TO STARTUP
87-04-01	2/2/87	E*	2	DURING SHUTDOWN, TWO CASES OF ISOLATION OF CONTAINMENT PURGE SYSTEM OCCURRED DUE TO AUTOMATIC ACTUATION OF ESAS
87-05	3/6/87	B	9	"B" CHARGING PUMP CRACKED BLOCK DUE TO HIGH INTERNAL STRESS CAUSING CRACKS TO INITIATE AT SUB-SURFACE INCLUSIONS
87-06	4/3/87	B*	10	FSAR TABLE ERROR RESULTED IN SERVICE WATER FLOW THRU RBCCW HEAT EXCHANGER BEING INSUFFICIENT FOR DESIGN HEAT REMOVAL
87-07	4/16/87	E*	1	REACTOR TRIP ON TURBINE TRIP CAUSED BY GENERATOR EXCITER FIELD BREAKER AND GENERATOR BREAKERS OPENING, CAUSE UNKNOWN
87-08	6/11/87	A*	4	LATE SURVEILLANCE DUE TO SCHEDULING ERROR FOR BATTERIES 201A&B (SURVEILLANCE 2736B-1)
87-09	9/2/87	E*	1	REACTOR TRIP ON #1 STEAM GENERATOR LOW LEVEL DUE TO FAILURE OF FEEDWATER CONTROL VALVE #2-FW-51A, THE PLUG HAD SEPARATED FROM THE STEM
87-10	7/30/87	A*	10	MAIN CABLE VAULT AND RACEWAY TO CHARGING PUMPS FIRE PROTECTION SUPPORTS NOT ADEQUATELY PROTECTED
87-11	7/23/87	E*	1	REACTOR TRIP ON #1 STEAM GENERATOR LOW LEVEL DURING A DOWN-POWER EVOLUTION IN RESPONSE TO DECREASING REACTOR PRESSURE CAUSED BY STUCK OPEN SPRAY VALVE 2-RC-100F
87-12	11/16/87	E*	1	REACTOR TRIP ON STEAM GENERATOR #1 LOW LEVEL FOLLOWING FAILURE OF FEEDWATER REGULATING VALVE; OTHER PROBLEMS WERE FAILURE OF "A" AUXILIARY FEEDWATER PUMP TO START AND STOPPING OF "A" AND "C" REACTOR COOLING PUMPS DUE TO BUS TRANSFER FAILURE

Table 3B

LER NUMBER	EVENT DATE	CAUSE CODE	AREA CODE	DESCRIPTION
87-13-01	12/19/87	A*	1	FIRE WATCH PATROL FAILED TO CONDUCT AN HOURLY INSPECTION OF CABLE VAULT AREA THAT CONTAINS NON-QUALIFIED CABLE TRAY ENCLOSURES
87-14	12/31/87	E*	1	SIX OF 16 MAIN STEAM SAFETY VALVES FAILED THE SIMMER TEST DUE TO SETPOINT DRIFT

* -- CAUSE CODES HAVE BEEN ASSIGNED BY OR CHANGES FROM THE LICENSEE CODES BY NRC REGION I

TABLE 3C

SYNOPSIS OF SECURITY EVENT REPORTS (SERs)

MILLSTONE SITE

LER NUMBER	EVENT DATE	CAUSE CODE	DESCRIPTION
86-20	8/12/86	E*	SECURITY RELATED EVENT FOR ALL UNITS - LOSS OF COMPUTER POWER
86-21	9/11/86	E*	SECURITY RELATED EVENT FOR UNIT 1 - LOSS OF VITAL AREA BARRIER
86-22-02	10/18/86	B	SECURITY RELATED EVENT FOR ALL UNITS - LOSS OF VITAL AREA BARRIER
86-23-01	10/23/86	B	SECURITY RELATED EVENT FOR UNIT 1 - LOSS OF VITAL AREA BARRIER
86-24	11/14/86	A*	SECURITY RELATED EVENT FOR ALL UNITS - PERSONNEL ACCESS PROBLEM
86-26	11/24/86	A	SECURITY RELATED EVENT FOR ALL UNITS - LOSS OF VITAL AREA BARRIER
86-30-01	12/11/86	A*	SECURITY RELATED EVENT FOR ALL UNITS - LOSS OF PROTECTED AREA BARRIER
86-31	12/23/86	E*	SECURITY RELATED EVENT FOR ALL UNITS - COMPUTER FAILURE
87-02-01	2/6/87	B	SECURITY RELATED EVENT FOR UNITS 1 AND 2 - ACCESS CONTROL PROBLEM
87-03	2/6/87	A*	SECURITY RELATED EVENT FOR ALL UNITS - ACCESS CONTROL PROBLEM
87-06	3/9/87	A*	SECURITY RELATED EVENT FOR ALL UNITS - PROTECTED AREA ACCESS CONTROL PROBLEM
87-09	4/6/87	E*	SECURITY RELATED EVENT FOR ALL UNITS - COMPUTER FAILURE
87-10-01	4/9/87	E*	SECURITY RELATED EVENT FOR UNITS 1 AND 2 - COMPUTER FAILURE
87-11	5/21/87	A*	SECURITY RELATED EVENT FOR UNIT 3 - ACCESS CONTROL PROBLEM

Table 3C

LER NUMBER	EVENT DATE	CAUSE CODE	DESCRIPTION
87-12	9/3/87	B*	SECURITY RELATED EVENT FOR UNIT 1 - BREACH OF VITAL AREAS
87-13	9/5/87	C*	SECURITY RELATED EVENT FOR ALL UNITS - POTENTIAL CIVIL DISTURBANCE
87-14	6/7/87	A*	SECURITY RELATED EVENT FOR UNIT 1 - BREACH OF VITAL AREA
87-14	9/7/87	E*	SECURITY RELATED EVENT FOR ALL UNITS - COMPUTER FAILURE
87-15	10/16/87	A*	SECURITY RELATED EVENT FOR ALL UNITS - UNESCORTED ACCESS TO PROTECTED AREA
87-16	6/11/87	E*	SECURITY RELATED EVENT FOR ALL UNITS - COMPUTER FAILURE
87-16	10/22/87	A*	SECURITY RELATED EVENT FOR ALL UNITS - LOST BADGE
87-18-01	6/23/87	E	SECURITY RELATED EVENT FOR UNITS 1 AND 2 - COMPUTER FAILURE
87-19	11/12/87	A*	SECURITY RELATED EVENT FOR ALL UNITS - GUARD ALLEGEDLY NOT ALERT AT POST
87-19	11/19/87	A*	SECURITY RELATED EVENT FOR ALL UNITS - FAILURE TO MAINTAIN PROTECTED AREA COMPENSATING MEASURES
87-20	11/24/87	A*	SECURITY RELATED EVENT FOR ALL UNITS - LOST BADGE
87-21	12/2/87	D*	SECURITY RELATED EVENT FOR ALL UNITS - ALLEGED ENTRY OF DANGEROUS WEAPON
87-22	12/22/87	A*	SECURITY RELATED EVENT FOR UNIT 3 - UNINTENTIONAL UNAUTHORIZED ENTRY INTO VITAL AREA
87-25	7/24/87	C*	SECURITY RELATED EVENT FOR ALL UNITS - BOMB THREAT
87-27	8/14/87	D*	SECURITY RELATED EVENT FOR UNIT 1 - BREACH OF VITAL AREA

* -- CAUSE CODES HAVE BEEN ASSIGNED BY OR CHANGES FROM THE LICENSEE CODES BY NRC REGION I

TABLE 4

SUMMARY OF FORCED OUTAGES, UNPLANNED TRIPS, AND POWER REDUCTIONS

MILLSTONE 1

AREA	A	B	C	D	E	X	TOTAL
PLANT OPERATIONS	1						1
RADIOLOGICAL CONTROLS							0
MAINTENANCE					1		1
SURVEILLANCE	1						1
EMERGENCY PREP							0
SEC/SAFEGUARDS							0
OUTAGE MANAGEMENT							0
TRAINING INADEQUACY	1						1
ASSURANCE OF QUALITY							0
ENGINEERING SUPPORT					3		3
TOTALS:	3				4		7

SUMMARY OF FORCED OUTAGES, UNPLANNED TRIPS, AND POWER REDUCTIONS

MILLSTONE 2

AREA	A	B	C	D	E	X	TOTAL
PLANT OPERATIONS	1						1
RADIOLOGICAL CONTROLS							0
MAINTENANCE	2				2		4
SURVEILLANCE	1						1
EMERGENCY PREP							0
SEC/SAFEGUARDS							0
OUTAGE MANAGEMENT							0
TRAINING INADEQUACY							0
ASSURANCE OF QUALITY							0
ENGINEERING SUPPORT		2					2
TOTALS:	4	2			2		8

CAUSE CODES

A -- PERSONNEL ERROR
B -- DESIGN, MANUFACTURING, CONSTRUCTION/INSTALLATION
C -- EXTERNAL CAUSE
D -- DEFECTIVE PROCEDURE
E -- EQUIPMENT FAILURE
X -- OTHER

TABLE 4A

SYNOPSIS OF FORCED OUTAGES, UNPLANNED TRIPS, AND POWER REDUCTIONS

MILLSTONE 1

DATE	POWER LEVEL	DURATION	DESCRIPTION	LER NUMBER	CAUSE & AREA*
6/19/86	100%	--	POWER REDUCTION TO REPAIR STEAM LEAK IN "B" SHUTDOWN COOLING HEAT EXCHANGER	--	REPAIR LEAKS (NO AREA ASSIGNED)
6/28/86	100%	--	POWER REDUCTION TO REPAIR CONDENSER TUBE LEAKS	--	REPAIR LEAKS (ENGINEERING SUPPORT)
7/16/86	100%	--	POWER REDUCTION FOR CONTROL ROD PATTERN ADJUSTMENT AND TO REPAIR CONDENSER TUBE LEAKS	--	ADJUSTMENT & REPAIR LEAKS (ENGINEERING SUPPORT)
10/9/86	100%	--	POWER REDUCTION TO REPAIR CONDENSER TUBE LEAKS	--	REPAIR LEAKS (ENGINEERING SUPPORT)
11/30/86	100%	15 DAYS	REACTOR TRIP ON GENERATOR TRIP CAUSED BY GENERATOR LOCK-OUT DUE TO PHASE-TO-GROUND FAULT OF THE MAIN TRANSFORMER	86-27	EQUIPMENT FAILURE (NO AREA ASSIGNED)
3/22/87	50%	27 HRS	REACTOR TRIP AND ISOLATION ON LOW MAIN STEAM LINE PRESSURE DUE TO PRESSURE OSCILLATIONS CAUSED BY CONTROL PROBLEMS WITH THE EPR/MPR	87-07	TRAINING INADEQUACY
4/15/87	100%	--	POWER REDUCTION TO REPAIR STEAM LEAKS IN HEATER BAY	--	REPAIR LEAKS (NO AREA ASSIGNED)
8/14/87	0%	--	REACTOR TRIP DURING STARTUP ON INTERMEDIATE RANGE HIGH FLUX DURING WITHDRAWAL OF HIGH WORTH CONTROL ROD 26-31	87-34	OPERATOR ERROR (OPERATIONS)
8/26/87	100%	21 HRS	REACTOR TRIP DURING AVERAGE POWER RANGE MONITOR SURVEILLANCE TESTING	87-36	TESTING ERROR (SURVEILLANCE)

Table 4A

DATE	POWER LEVEL	DURATION	DESCRIPTION	LER NUMBER	CAUSE & AREA*
9/3/87	100%	44 HRS	REACTOR TRIP ON LOW SCRAM HEADER PRESSURE CAUSED BY LOW SERVICE AIR HEADER PRESSURE DUE TO SERVICE AIR COMPRESSOR FAILURE DURING HIGH SERVICE AIR USAGE	87-38	EQUIPMENT FAILURE (MAINTENANCE)
11/14/87	100%	64 HRS	REACTOR SHUTDOWN TO INVESTIGATE AND REPAIR IC-1 PACKING INSIDE DRYWELL	--	REPAIR LEAK (NO AREA ASSIGNED)

* -- CAUSE AND AREA CODES HAVE BEEN ASSIGNED BY NRC REGION I

TABLE 4B

SYNOPSIS OF FORCED OUTAGES, UNPLANNED TRIPS, AND POWER REDUCTIONS

MILLSTONE 2

DATE	POWER LEVEL	DURATION	DESCRIPTION	LER NUMBER	CAUSE & AREA*
6/1/86	60%	13 HRS	REACTOR TRIP ON REACTOR COOLANT PUMP UNDERSPEED CAUSED BY LOSS OF POWER TO BUS 25B DUE TO IMPROPER OPERATION OF BREAKER CONTROL SWITCH 252-25B-2	86-04-01	PERSONNEL ERROR BY THE OPERATIONS STAFF
8/12/86	98%	112 HRS	REACTOR TRIP ON #1 STEAM GENERATOR GENERATOR LOW LEVEL AFTER LOSS OF THE "A" FEEDWATER PUMP DUE TO LOSS OF OIL PUMPS WHEN BUSES 22A AND 22B (CROSS-TIED) LOST POWER	86-05	PERSONNEL ERROR BY ENGINEERING SUPPORT
9/3/86	100%	26 HRS	REACTOR TRIP ON LOW STEAM GENERATOR LEVEL DUE TO LOSS OF HEATER DRAINS FLOW FOLLOWING FAILURE OF AIR FITTING TO THE HEATER DRAINS CONTROL VALVE CLOSING VALVE	86-06	DESIGN DEFICIENCY BY ENGINEERING SUPPORT
12/23/86	50%	20 HRS	REACTOR TRIP ON LOW STEAM GENERATOR LEVEL DUE TO FEEDWATER PUMP SPEED DECREASE TO MINIMUM UPON LOSS OF POWER ON BUS 24C, CAUSED BY IMPROPERLY INSTALLED DRAWER	86-22	PERSONNEL ERROR BY MAINTENANCE
1/2/87	100%	21 HRS	REACTOR TRIP ON LOW STEAM GENERATOR LEVEL FOLLOWING LEVEL CONTROL PROBLEMS DUE TO A HOT JUMPER ARC ON THE FIRE SUPPRESSION ALARM PANEL	87-02	PERSONNEL ERROR BY AN ELECTRICIAN (MAINTENANCE)
1/29/87	100%	18 DAYS	CONTROLLED SHUTDOWN FOLLOWING INDICATIONS OF A STEAM GENERATOR TUBE LEAK IN THE "A" GENERATOR	--	STEAM GENERATOR TUBE LEAK (SURVEILLANCE)
3/24/87	100%	0 HRS	REACTOR POWER LEVEL WAS REDUCED TO 80% TO REPAIR A STEAM LEAK ON THE "B" FEEDWATER PUMP	--	STEAM LEAK REPAIR (NO AREA ASSIGNED)

Table 4B

DATE	POWER LEVEL	DURATION	DESCRIPTION	LER NUMBER	CAUSE & AREA*
4/16/87	100%	20 HRS	REACTOR TRIP ON TURBINE TRIP CAUSED BY GENERATOR EXCITER FIELD BREAKER AND GENERATOR BREAKERS OPENING, CAUSE UNKNOWN	87-07	EQUIPMENT FAILURE (NO AREA ASSIGNED)
7/23/87	100%	21 HRS	REACTOR TRIP ON STEAM GENERATOR LOW LEVEL DURING DOWN-POWER IN RESPONSE TO DECREASING PRIMARY PRESSURE CAUSED BY A PARTIALLY (1/3 OPEN) STUCK OPEN SPRAY VALVE	--	RANDOM EQUIPMENT FAILURE (NO AREAS ASSIGNED)
9/2/87	91%	34 HRS	REACTOR TRIP ON #1 STEAM GENERATOR LOW LEVEL DUE TO FAILURE OF FEEDWATER CONTROL VALVE #2-FW-51A, THE PLUG HAD SEPARATED FROM THE STEM	87-09	EQUIPMENT FAILURE (NO AREA ASSIGNED)
11/16/87	100%	26 HRS	REACTOR TRIP ON STEAM GENERATOR #1 LOW LEVEL DUE TO LEVEL TRANSIENT CAUSED BY MALFUNCTION OF THE VALVE POSITIONER FOR FEEDWATER REGULATING VALVE #2-FW-51A	87-12	EQUIPMENT FAILURE (NO AREA ASSIGNED)

* -- CAUSE AND AREA CODES HAVE BEEN ASSIGNED BY NRC REGION I