

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

INSPECTION REPORT NUMBER 50-423/85-98

MILLSTONE NUCLEAR STATION, UNIT 3

ASSESSMENT PERIOD: SEPTEMBER 1, 1985 - FEBRUARY 28, 1987

BOARD MEETING DATE: APRIL 16, 1987

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I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) is a periodic, integrated NRC staff effort to collect observations and data and evaluate licensee performance. SALP supplements the normal regulatory processes used to ensure compliance with NRC regulations. SALP is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful guidance to licensee management to promote quality and safety of plant operation.

The NRC SALP Board met on April 16, 1987 to review performance observations and data 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 report addresses performance at the Millstone Nuclear Power Station, Unit 3 from September 1, 1985 through February 28, 1987. The findings and data reflect an 18 month assessment period. Although this includes activities during construction and initial fuel loading, the evaluation of licensee performance has emphasized the period of power operation from January 23, 1986 through February 28, 1987.

The SALP Board was composed of the following:

Chairman:

W. F. Kane, Director, Division of Reactor Projects (DRP)

Members:

W. V. Johnston, Director, Division of Reactor Safety (DRS)
S. J. Collins, Deputy Director, DRP
E. C. Wenzinger, Chief, Projects Branch No. 3, DRP
R. R. Bellamy, Chief, Emergency Preparedness and Radiological Protection Branch, Division of Radiation Safety and Safeguards (DRSS) (Part-Time)
E. C. McCabe, Chief, Reactor Projects Section No. 3B, DRP
E. L. Doolittle, Project Manager, PWR Project Directorate No. 5, Division of PWR Licensing-A, NRR (Part-Time)
J. T. Shedlosky, Senior Resident Inspector

Other Attendees (non-voting):

N. J. Blumberg, Acting Chief, Operational Projects Section, DRS (Part-Time)
E. L. Conner, Project Engineer, DRP (Part-Time)
M. C. Kray, Reactor Engineer, DRP
W. J. Madden, Physical Security Inspector, DRSS (Part-Time)
W. J. Pasciak, Chief, Effluents Radiation Protection Section, DRSS (Part-Time)
J. A. Schumacher, Senior Emergency Preparedness Specialist, DRSS (Part-Time)
A. A. Weadock, Radiation Specialist, DRSS (Part-Time)

II. CRITERIA

Licensee performance is assessed in selected functional areas. These areas are significant to nuclear safety and the environment, and are normal programmatic areas. The following criteria were used as appropriate to assess each area.

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 reasonably effective such that satisfactory performance with respect to operational safety 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 has also categorized the performance trend over the course of the SALP assessment period. The SALP 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.

A trend is assigned only when a definite trend of performance is discernible, and the SALP Board believes that continuation of the trend may result in a change of performance level.

III. SUMMARY OF RESULTS

A. Overall Summary

This assessment found a well-staffed licensee with strong and visibly involved managers. Strengths were observed in self-identification of problems, in response to problems, and in searching for root causes. There was diligent attention to proper performance at all levels, and performance improved as the SALP period progressed.

Operations phase programs, procedures, and management controls were in place and fundamentally sound. Minor setpoint errors and procedure inadequacies in the surveillance area were one of the few weaknesses found. Program implementation was good in all areas.

There were four reactor scrams before initial criticality and 15 more during the subsequent year. While this is a high number, it is consistent with the performance of similar plants during initial operation. Also, licensee responsiveness to these events resulted in a scram frequency decrease of about a factor of two during successive four month operating periods.

Review of scrams and other operating events points to personnel error, equipment characteristics, and component failures (in that order) as the main factors. In many cases, scrams were caused by a combination of personnel error and the high degree of difficulty of steam generator level control. In addition to steam generator level control equipment performance improvement, this SALP identified a need for reducing the number of illuminated control room annunciators and improving the performance of equipment such as the Power Operated Relief Valves. A strong program to reduce personnel errors and improve equipment performance is needed. Improvements in scram and feedwater transient reduction and in the number of lighted annunciators indicate that the licensee's corrective action approach is working.

Licensee command and control was notably good. Activities were carefully planned and conducted, with outages being a noteworthy example. Managers were actively involved and inserted themselves into decision-making and activity direction at appropriate levels. Operating supervisors and plant personnel were knowledgeable and alert, with strong corrective action evident when a discrepancy in performance and supervision occurred.

Overall, this SALP reflects careful and safe performance of initial plant operation.

B. Background

1. Licensee Activities

Millstone 3 received a low power license (NPF-44) on November 25, 1985. Initial criticality was on January 23, 1986. A full power license (NPF-49) was issued on January 31, 1986. Power operation was first attained on February 3. The plant reached 100% power on April 17, was declared commercial on April 23, and completed the 100-Hour Warranty run on April 29.

There were four reactor scrams before initial criticality and 15 reactor scrams during the first year of operation. The major factor in the scrams was difficulty with steam generator level control, which contributed to 10 scrams. There were also two unplanned and three planned outages to correct equipment deficiencies and perform surveillances. These outages and the reactor scrams are tabulated in Section IIID (Page 6) of this SALP. The plant achieved an 86% capacity factor for the commercial operating period beginning on April 23, 1986 until the end of the SALP period on February 28, 1987.

2. Inspection Activities

Two NRC resident inspectors were assigned to the site during the entire 18-month assessment period. The NRC inspections are summarized in Table 1 and represent an inspection effort of 7130 hours (4790 hours per year), distributed as shown in Table 2.

Special team inspections were made of operational readiness (April 14-24, 1986); as-built pipe and supports, electrical, and instrument and controls (September 9-20, 1985); and the site emergency exercise (November 19, 1986.)

This report also assesses "Training and Qualification Effectiveness" and "Assurance of Quality" as separate areas. These separate areas provide a synopsis of these topics, which are also incorporated in other functional areas through their use as evaluation criteria. For example, assurance of quality was assessed on a day-to-day basis by the resident inspectors and as an integral part of all specialist inspections. Although the management tools for measuring quality include QA inspections and audits, quality work is the responsibility of every employee. Major quality factors such as involvement of first-line supervision, safety committees, and worker attitudes are considered in each functional area.

Fire protection was not addressed as a separate area during this SALP because 10 CFR 50, Appendix R implementation has not yet been specifically inspected onsite. Engineering support was added as a functional area to provide better focus on support functions which were previously addressed in several functional areas.

C. Facility Performance Analysis Summary

<u>Functional Area</u>	<u>Last Period (9/1/84- 8/31/85)</u>	<u>This period (9/1/85- 2/28/87)</u>	<u>Recent Trend</u>
A. Plant Operations	2	2	Improving
B. Radiological Controls	2	2	Improving
C. Maintenance	2	1	--
D. Surveillance	3	2	--
E. Emergency Preparedness	2	1	--
F. Security and Safeguards	1	1	--
G. Outage Management	#	1	--
H. Licensing Activities	2	1	--
I. Engineering Support	#	2	--
J. Training and Qualification Effectiveness	#	2	--
K. Assurance of Quality	#	1	--
L. Preoperational Testing	1	##	##
M. Fire Protection and Housekeeping	1	##	##
N. Construction	1	##	##

Not previously assessed as a separate area
 ## Not assessed this period

D. Plant Trips (Scrams) and Unplanned Shutdowns

<u>Date</u>	<u>Power Level</u>	<u>Description</u>	<u>Root Cause</u>	<u>Functional Area</u>
12/15/85	Cold Shutdown	Scram when improper application of a jumper during testing resulted in reversing the steam generator level logic.	Startup testing Procedure inadequacy	Operations
1/16/86	Hot Standby	Scram due to rate compensated steam line low pressure due to too quick opening of atmospheric steam dump valve when MSIVs were shut.	Operator error	Operations
1/18/86	Hot Standby	Scram due to source range monitor spike due to welding cables in proximity to nuclear instrumentation cables.	Construction personnel error-work control	Operations
1/19/86	Hot Standby	Scram due to rate compensated steam line low pressure due to opening of a steam generator relief valve with misadjusted setpoint.	Operator error-high T-avg. compounded by misadjusted relief valve setpoint	Operations
[1/23/86	INITIAL CRITICALITY]			
2/4/86	15%	Scram due to low steam generator level during manual control of feedwater flow.	Operator error	Operations
2/7/86	15%	Scram due to low steam generator level - auxiliary steam relief stuck open.	Improper settings on auxiliary steam relief valve and gain (high) of feedwater regulating bypass valve	Engineering Support
2/10/86	15%	Scram due to low steam generator level. During surveillance, the level set point input to control card faulted to ground. (Probe contacted two test points.)	Faulty design of control card test points, plus I&C technician failure to follow special instructions on probe use.	Surveillance

<u>Date</u>	<u>Power Level</u>	<u>Description</u>	<u>Root Cause</u>	<u>Functional Area</u>
2/12/86	29%	Scram due to low steam generator level - transfer from turbine-driven to motor-driven feedwater pump with only one running condensate resulted in low suction pressure trip of feedwater pump and then feed instability.	Procedure inadequacy	Operations
2/13/86	15%	Scram due to spurious actuation of RPS inoperability protection (General warning annunciator) during surveillance.	Equipment: Cause unknown (possible power supply problem)	--
2/21-3/5/86		Shutdown to lower steam generator chemistry to within owners group guidelines.	Manufacturing or construction residue, or resin injection.	--
3/19/86	10%	Scram due to low steam generator level caused by failure to shift control to feedwater regulating bypass valves following a turbine trip. Remained shutdown through 3/20 to clean transformer insulators.	Procedure inadequacy	Operations
4/10/86	15%	Scram due to low steam generator level - level oscillation started with control rods manually moved to control average RCS temperature during turbine loading.	Operator error	Operations
4/23/86	7%	Scram due to low steam generator level following rapid power reduction from 60% in response to secondary steam leak from moisture separator reheater drain tank manway cover. Steam Generator level control was in manual at the time of the scram. (18 hour outage).	Operator error	Operations

<u>Date</u>	<u>Power Level</u>	<u>Description</u>	<u>Root Cause</u>	<u>Functional Area</u>
5/9/86	80%	Scram automatically followed manual turbine trip caused by decreasing condenser vacuum (92 hour outage).	Management error-poor planning. Fouling of circulating water intake screens while wash system was out of service for maintenance	Operations
7/24/86	20%	Scram due to low steam generator level after feedwater isolation due to overfeeding caused by partially open bypass valves. As one consequence, a planned mid-cycle maintenance outage was begun early. The plant remained shutdown through August 17 (552 hour outage).	Defective valve positioners caused bypass valves to be partially open	--
8/17/86	11%	Scram due to low steam generator level - after shifting to automatic control operators attention was diverted from steam generator while controlling others in manual (13 hour outage).	Operator error compounded by feed control system alignment	Operations
8/17/86	21%	Scram due to low steam generator level after feedwater isolation due to high steam generator level - scram occurred because of inadequate coordination between two operators who opened a feedwater regulating valve as feed pump speed was increased (10 hour outage).	Operator error compounded by feed pump control response time	Operations
9/6/86	80%	Scram due to low steam generator level following spurious closure of a feedwater isolation valve (25 hour outage).	Random equipment failure	--

<u>Date</u>	<u>Power Level</u>	<u>Description</u>	<u>Root Cause</u>	<u>Functional Area</u>
1/13/87	100%	Scram followed low vacuum turbine trip after circulating water pumps tripped due to low lubricating water flow (31 hour outage).	Operator error (improper lubricating water lineup)	Operations
1/14/87	7%	Scram due to high source range neutron flux when trip block was accidentally reset (7 hour outage).	Operator error (brushed against panel switch)	Operations

The below table summarizes scram performance versus time, and shows the decrease in scram frequency as the first year of operation progressed.

WHEN	AT/BELOW 15% POWER		ABOVE 15% POWER		TOTAL
	EQUIP	PERS & PROCED	EQUIP	PERS & PROCED	
Before Criticality	0	4	--	--	4
2/86 - 5/86	2	5	0	2	9
6/86 - 9/86	0	1	2	1	4
10/86 - 1/87	0	1	0	1	2

NOTE: The root causes in these Tables are the opinion of the SALP Board based on inspector assessments and may differ from the LERs.

IV. PERFORMANCE ANALYSIS

A. Plant Operations (1365 Hours, 19%)

1. Analysis

The previous SALP, completed prior to initial fuel loading, rated "Operations Support" as Category 2, consistent. Concerns included control over jumpers and lifted leads, tagging, log keeping, shift turnover adequacy, and root cause addressal. Of these, only equipment tagging presented a concern during the current SALP period. On March 1, 1986, a reactor coolant system (RCS) hot leg injection valve was tagged shut without an effective cross-reference to the subsequent plant heatup. The result was accomplishment of a prohibited change in operating mode during heatup. The licensee then verified proper flow in other systems and reviewed all tagouts and tag clearances. Overlapping management controls were implemented to prevent similar occurrences due to a failure in one management system. These corrective actions were comprehensive. No further tagout problems were observed during the remaining 12 months of the SALP period.

The transition from construction and testing to power operations occurred smoothly, mainly due to the significant nuclear operating experience of Northeast Utilities. Adding to this was an early shift, during construction, in control room activities to that of an operating plant, to the use of a plant-specific simulator for operator training, and to strict adherence to written procedures.

Overall, the startup test program was well managed and controlled. Initially, there were NRC concerns about the number of persons in the control room, about too many tests being done simultaneously, and about the number of last minute procedure changes. When the licensee was informed, prompt and effective action was taken. Excess personnel were not allowed in the control room. More deliberate test conduct was observed. Test preparations and procedures became more thorough and timely. Startup testing proceeded rapidly and in accordance with NRC requirements. Startup personnel were knowledgeable and quickly identified and corrected testing problems. A good interface was evident between startup, operations, reactor engineering, I&C, maintenance, and QA/QC. The entire startup organization was assessed as extremely capable and professional.

As shown in the Supplementary Table in Section IIID (Page 9) of this SALP, there were a high number of scrams, with improvement evident by the decreased scram frequency with time. Fifteen of the 19 scrams were due to personnel and procedures. Eleven of the 15 were at or below 15% power. System and personnel responses to the scrams were proper. The errors were mainly in manual control of steam generator levels. Quick operator response to changing conditions

was evident. Operator performance is considered to have lowered the scram rate substantially because feedwater transients which caused many of the early scrams were handled expertly later on, and scrams were thereby averted. Proficient operator actions which prevented challenges to safety systems included responses to repetitive losses of fourth point heater drain pumps, to feedwater regulating valve failure with a simultaneous motor-driven feed pump minimum flow valve failure, and to loss of turbine plant closed cooling water. Operator excellence was also shown in prompt response to a major steam leak from the moisture separator drain tank and to leaks of turbine electro-hydraulic control system fluid.

Overall, operating shift functioning was evaluated as smooth and professional. Activities were conducted carefully and with sufficient formality. The operators themselves were strong proponents of control room formality. Operator attitudes were assessed as positive. Alertness was routinely observed in operator performance during day and backshift inspections. Distractions such as extraneous reading material were not permitted or observed in the control room. Shift turnovers were observed to be consistently thorough and effective. Briefings for tests and infrequent evolutions were detailed and involved free exchanges of questions and answers. Written procedures were routinely followed. Shift logs and records were found discrepancy free during frequent review.

A high number of main board annunciators were illuminated during operation, with about 100 identified in April 1986. This was largely due to annunciation of conditions which did not affect operation but presented a potential distraction to operators. The licensee has since reduced the lighted annunciators to about 60. This is acceptable progress, but continued attention to this aspect is needed.

Operator technical knowledge was good. During the NRC license examinations given this SALP period, 43 of the 52 license candidates passed. No significant generic weaknesses were noted. This 83% pass rate is a substantial improvement over the previous pass rate of 52% (11 of 21). Also, the operators have consistently exhibited detailed and thorough knowledge of the equipment, its status, and associated requirements. A recent example was shift supervisor (SS) review of surveillance of charging pump suction valve surveillance. The SS recognized that the valves were interlocked such that their cycle times should be added to determine shift-over time between water sources, precipitating licensee reassessment of the associated engineered safety feature response times.

A few minor training weaknesses were observed. The operators did not know how to take local manual control of a feedwater regulating valve upon valve positioner failure (an in-line valve was used as an alternate control instead). Also, an incorrect simulation of

plant configuration contributed to a safety injection when a main steam isolation (MSI) signal was reset with an atmospheric dump set below steam line pressure. In these cases, the training response and initiation of procedure and simulator changes were evaluated as appropriate and timely, and representative of the licensee's overall good approach to correcting problems.

Licensee management support of training and rewarding of operator proficiency has been evident. The facility has a modern plant-specific simulator with a training staff that has been expanded to about 20 individuals. Several experienced operators have been promoted to the training staff. There is a six-shift rotation during power operation, with full-time training for one shift being a regular part of the rotation. Station management involvement in training was evident in their knowledgeable discussions with NRC personnel and in their obvious interaction with the training staff and observance of simulator training.

Management attention to operations was evident in frequent plant superintendent control room tours and detailed weekly plant material walkdowns by a team of Health Physics, Maintenance, and Operations supervisory personnel.

Overall, operating procedures were satisfactory. No major procedure inadequacies were found. Personnel routinely followed procedures and properly proposed appropriate changes. There were many minor changes, as is expected during initial operation. In this case, that is considered reflective of licensee determination to eliminate procedure inadequacies. However, procedure flaws contributed to three operational problems. One was a reactor scram on loss of feedwater flow when an additional condensate pump was not started before shifting feed pumps. A second was an emergency core cooling pump inoperability for over three days when a valve was left shut during surveillance. The third was a feedwater isolation and reactor scram while shutting down without shifting to bypass valve feedwater control prior to tripping the main turbine.

Operations Review Committee performance was very good. Meeting inputs were well prepared and showed a clear understanding of issues. The approach to problem resolution was technically sound, very thorough, and routinely conservative. Root causes of problems were actively pursued. During meetings and in NRC discussions with higher level managers, there was a licensee willingness to face facts and an atmosphere of healthy self-criticism.

Housekeeping was poor at the end of construction and into startup testing. After cleanliness and storage problems were identified to station management, general plant cleanliness was upgraded and attention was placed on removing or securing heavy items near safety-related equipment. Four cubicles in the Engineered Safeguards Features Building were completely cleaned and painted out. Cleanup

efforts and correction of packing leakage diminished the number and size of the radiologically contaminated areas which had begun expanding as the plant progressed into operation. Overall, house-keeping was satisfactory.

Licensee Event Reports were routinely reviewed by the inspection staff and generally found to be complete, accurate, timely and to contain adequate corrective actions. A special NRC Incident Response Branch review of ENS reporting and classification as well as use of event cause codes in LERs found adequate reporting.

Licensee command and control of operations were strong overall. Managers were aware of operating status and details, and actively inserted themselves at the appropriate organizational level. Shift management was knowledgeable and exerted positive control over activities affecting operation. An exception was the three-day emergency core cooling pump inoperability. This involved improper shift supervisor staff assistant (SSSA) performance, inadequate training of SSSAs in valve operating requirements, and an inadequate surveillance procedure. Strong corrective actions were taken. The procedure and training flaws were corrected. Licensee review found a lack of potential for other similar events. The individual and cognizant line management were reprimanded. No similar occurrences were observed.

Licensee management is strong. Corporate and unit goals and policies are detailed and well communicated, and administrative controls are effectively implemented. There is a strong safety first orientation at all levels in the licensee's organization. Licensed operators were professional, knowledgeable and thorough, and their performance became excellent as the initial operating period progressed. The operator errors were assessed to be largely due to inexperience with steam generator level control characteristics and to the high degree of difficulty of manual control of steam generator level. Scram frequency decreased in the latter part of the SALP period. Housekeeping also improved. Concerns identified in the previous SALP were effectively addressed. Overall, operating performance was satisfactory and improving.

2. Conclusion

Category 2, Improving.

3. Board Recommendations

Licensee: Reduce unnecessary annunciations and reactor scrams.

NRC: None.

B. Radiological Controls (845 Hours, 12%)

1. Analysis

The Radiological Controls Program was previously rated Category 2, consistent. There were no major concerns identified.

1.1 Radiation Protection

An effective, well-defined organizational structure is in place to control unit radiological work activities. Adequate levels of supervisory and technician level personnel were available to support routine radiological activities. NRC inspectors observed that Radiation Protection (RP) supervision were accessible to the RP staff and exhibited a strong "in-the-field" presence. RP and Operations supervision regularly perform joint tours of the controlled area to identify sources of contamination and potential radiological concerns, and licensee records and files document actions being initiated as a result. The RP staff performed aggressively in directing decontamination efforts and initiating fixes for identified contamination sources.

The number of audits of radiological operations routinely performed by the RP corporate staff was assessed as good. However, the audits were noted review to station RP activities as a whole without always providing an in-depth review of unit activities. This weakness was identified by the licensee and actions have been started to improve the audit system. Overall, audits were considered satisfactory and the associated audit program corrective actions were good.

Clear procedures and policies were in place and effectively implemented. No procedure deficiencies were found by the NRC.

Radiation Protection personnel were trained and qualified in accordance with a good program. However, RP technician re-qualification training in 1986 contained only a limited discussion of plant systems. That NRC identified aspect was found to be the only significant deficiency. The licensee is reviewing this matter.

Several noteworthy improvements were initiated in the radiological training program. Detailed mockups of the RCP seals and of a radwaste shipping cask have been procured to enhance job-specific radiological training. An elaborate, complete chemistry laboratory has been constructed in the training facility for the instruction of chemistry technicians.

The program for surveying, posting, and controlling radiological areas was found to be well implemented. An extensive and thorough radiation survey program to evaluate shielding effectiveness was performed by the licensee during unit startup. NRC specialist review of the Radiation Work Permit System found it effective in controlling radiological work activities.

A special inspection was conducted to review post-accident sampling. The licensee was able to adequately demonstrate this capability. There were specific concerns with equipment operability, monitor calibration procedures, and handling and analysis of high activity samples. These required licensee response and improvement, but were relatively minor items.

Collective exposure during 1986 was low (approximately 27 person-rem). The monthly exposure average was typically well below the ALARA goal of 5 person-rem/month of operation. During previous review of station ALARA activities, it was noted that sometimes conflicting exposure goals were developed separately by the unit and corporate staffs. The exposure goal-setting process for 1987 has been improved in that the unit ALARA staff provided significant input to the formulation of corporate goals.

Overall, in-plant health physics was a notable licensee strength. This is attributed to a sound program, a capable staff, and supervisory excellence.

1.2 Unit 3 Radioactive Waste Management

Reviews of the liquid waste, gaseous waste and ventilation systems installation and testing found that the systems were installed as described on the Piping and Instrumentation Diagrams in the FSAR and testing was completed in an orderly and timely manner to support initial criticality, power ascension and commercial operation. Design deficiencies in those systems discovered during preoperational and startup testing were resolved with very little impact on plant startup schedules.

There was no operational radwaste management assessment because of the low level radwaste of processing activity during initial operation. (Unit 1 and 2 radwaste considerations were not considered in this Unit 3 SALP.)

1.3 Radiological Effluent Control and Monitoring

Area, effluent and process radiation monitoring capabilities were demonstrated during preoperational and startup testing. There were recurring problems with the adequacy of monitor calibration and licensee performance of Technical Specification

action statements required by monitor inoperability. Procedural inadequacies included the failure of effluent monitor surveillance procedures to adequately test Technical Specification required auto-isolation and alarm annunciation features and also resulted in the non-conservative calibration of containment high-range area monitors. The above deficiencies resulted in the generation of several LERs. Additionally, weaknesses in the comparison of monitor and laboratory sample data and quality control for vendor laboratories were noted, showing inattention to technical detail in procedural development and review. Nonetheless, the licensee's analysis of radioactive samples was in agreement with the NRC values. The licensee provided adequate technical resolution of the weaknesses and promptly updated and corrected the procedures.

1.4 Water Chemistry Controls

The licensee demonstrated a strong commitment to water chemistry control. Chemistry analysis was thoroughly reviewed during the daily management meetings, and operations were thereupon modified to optimize chemistry conditions.

Reviews of the water chemistry control program indicated a generally adequate program was developed and implemented. The licensee was using upgraded analytical procedures and state of the art instrumentation in the laboratory. The training and qualification program for supervisors and technicians included formal classroom training, written demonstration of proficiency and, for technicians, participation in an intra-laboratory spiked sample program evaluated by their supervision. An elaborate chemistry laboratory has been constructed for the instruction of chemistry technicians. The good training and facilities contributed positively to performance.

NRC review found five of twenty-two comparisons of analytical results against NRC standard samples were in disagreement. The differences were due to laboratory control program weaknesses including single point calibrations of instruments, lack of measurement control charts, and sampling errors.

The program for controlling water purity in the primary and secondary coolant loops was adequate. The licensee provided a documented management commitment to and support for the program and closely monitored performance. During testing of plant water systems, the licensee noted and corrected condenser inleakage, closely monitored unusual sulfate levels in the steam generators and administratively controlled contaminants at levels generally well below consensus guidance. However, several occurrences were noted suggesting inadequate design review and failure to note lessons from Unit 2's operating ex-

perience. As a probable result of inadequate delay for Nitrogen-16 decay, the sampling location of the reactor coolant provided high radiation levels with no evidence of failed fuel. Resin retention filters experienced strainer failures due to design problems identified initially at and corrected in Unit 2. In addition, the licensee failed to monitor the feedwater system for metallic transport which could result in excessive sludge buildup in the steam generators.

The licensee proceeded with caution while steam generator secondary chemistry difficulties were being worked out during the power ascension test program. That involved a shutdown from 30% power to drain and refill the steam generators to lower sulfate concentrations below the vendor recommended limit of 20 parts per billion. Also, demineralizer webbing was replaced to prevent resin pass-through to the steam generators. The seven-day shutdown taken in this case is considered representative of the licensee's normal emphasis on safety and quality having priority over operation.

During this assessment period, the licensee implemented a generally effective radiological controls program supporting early commercial operation. Recurring deficiencies were noted, however, with the adequacy of procedures for and calibration of area radiation and effluent monitors. Overall, inasmuch as the low levels of radiation and contamination encountered during initial startup and operation did not present a strong radiation protection challenge, a high performance rating was not considered appropriate. Performance was assessed as satisfactory, and improving as a result of the quality and results of corrective actions.

2. Conclusion

Category 2, Improving.

3. Board Recommendation

Licensee

Improve technical oversight of radiological monitor calibration, and laboratory quality assurance/quality control activities.

NRC

None.

C. Maintenance (359 Hours, 5%)

1. Analysis

The previous SALP rated Maintenance as Category 2, consistent. It was recommended that the licensee schedule completion and implementation of maintenance procedures and training programs. This has since been accomplished.

During this SALP period, maintenance was reviewed during two region-based inspections and by the resident inspectors. No scrams or challenges to protective systems were attributed to maintenance. Safety system readiness and inservice testing (IST) performance evidenced the effects of good preventive and corrective maintenance. An example was the rebuilding of two service water pumps late in the SALP period because of IST results.

Corrective maintenance was generally performed in strict accordance with policies and work orders. Troubleshooting and significant supervisory involvement led to accurate problem assessment and formulation of proper corrective action. Work was thorough and technically sufficient. Rework was seldom required. Only one instance of poor maintenance was observed. A feedwater regulating valve stem packing was tightened enough to retard valve motion. It then failed to close on a Feed Water Isolation signal because the packing was too tight (the next valve downstream did close). Later, the same valve stuck in automatic control and then popped open, causing a feedrate which caused reactor power to exceed 3445 MWth (101% of design). The licensee has since committed to full stroke testing of such control valves after packing adjustments.

There were three instances of breaching or fouling of fire, control building, and Secondary Leak Collection and Recovery System (SLCRS) boundaries by process fluid hoses or staging. Also, there were numerous instances of broken penetration seals, either by work in progress or left over from construction. Increased licensee management attention was applied, and the resident inspectors noted that such occurrences decreased in frequency.

The maintenance department was fully staffed with well trained, competent and dedicated mechanics, electricians and machinists having diverse backgrounds. Maintenance assistance was available from the other three Northeast Utilities plants. Observations and discussions showed maintenance supervisors and managers to be knowledgeable, and active in on-scene oversight of activities. Effective planning minimized outage and operational scheduling impacts. Coordination with other departments was excellent. In fact, communication and cooperation between all departments, both at grass roots and management levels, has been a key to timely and effective troubleshooting and corrective maintenance on numerous occasions.

A computerized maintenance management system (PMMS) has been instrumental in planning, controlling and documenting work. Its machinery history function has been routinely used to trend equipment performance for establishing corrective actions. PMMS is considered an excellent tool for managing maintenance.

Control of maintenance and testing was generally very effective. Outages usually included between 700-900 work activities and tagouts with minimal interference or failures in the control program. Maintenance and modification activities during normal plant operations were controlled and performed within the bounds of Technical Specification Limiting Conditions for Operation. This was evident in the routine daily performance of 6-8 preventive maintenance activities. Infrequent lack of control was observed, however: work on main turbine stop valves commenced without a reapproved work order; staging cross-bracing blocked operation of a Feed Pump turbine trip; and Linear Variable Differential Transformers (LVDTs) were installed on the Feedwater Regulating Valves without Operations Department approval and to installation details modified after PORC approval. These events affected equipment which is not safety-related, were detected and corrected by the licensee, and had no operational consequences.

Removal of a trash conveyor from its foundation created a potential access route to the protected area. This maintenance error was licensee-identified and promptly corrected.

Unavailability of improved replacement parts resulted in delaying troubleshooting for all potential causes of Power Operated Relief Valve (PORV) leakage, and effective repair of leaking PORVs was not timely. As a result, although the valves have undergone a major modification as well as two separate repairs, both PORVs were blocked for a major part of the plant's operation. In addition, due to either PORV and blocking valve leakage or safety valve leakage, the TMI action plan mandated positive indication of safety valve status indicated open safety valves for most of the operating period.

A significant maintenance action involved improper blowdown ring settings on the Main Steam Safety Valves (MSSVs). In response to an NRC information notice, the licensee spent considerable effort verifying the ring settings for all 25 site valves, noting and correcting a related problem of short ring lock pins and readjusting the rings to a common setting. The ring readjustment was based on documented phone conversations to the vendor. These confirmed the technical manual setting values. In this case, maintenance thoroughness significantly improved the assurance of proper MSSV blowdown.

The procurement program was well organized and allowed material traceability to work orders. The warehouse was administratively well controlled and housekeeping was adequate.

In summary, licensee performance in the maintenance area has been good overall, with the discrepancies noted being isolated and non-representative. The maintenance program is properly established, implemented and staffed. Plant equipment has performed with a high degree of reliability.

2. Conclusion

Category 1.

3. Board Recommendations

Licensee: Assure thorough testing after maintenance.

NRC: Maintain current level of inspection.

D. Surveillance (554 Hours, 8%)

1. Analysis

Surveillance was rated Category 3 during the previous assessment period. A major factor was the tardy development of procedures.

This analysis is based on frequent NRC inspections by the resident inspectors and four inspections by regional specialists.

The management program for controlling surveillances was found especially strong in the Instrumentation and Controls (I&C) and Maintenance Departments. Both departments used an automated system to identify up-coming surveillances. Initially, the Operations Department used a manual tracking system. Although it was cumbersome, all required surveillances were completed. Operations is now also using a computer system for tracking surveillances.

The inspectors have found that the technicians or operators conducting a test generally have a very good understanding of both system and procedure requirements. This is particularly significant when the complex electronic systems included in the Unit 3 design are considered, and is a notable strength of the program.

The surveillance procedures are very detailed and form a solid basis from which to build a successful program. Licensee personnel have demonstrated a strong commitment to these procedures by active use of the procedure change system. Changes were requested and drafted by persons working with surveillance tests and processed in accordance with the Technical Specification system for procedure changes.

The surveillance program has been managed conscientiously. Event reports (LERs) documented seven missed surveillances. All were licensee-identified. No single type of surveillance or responsible working group was responsible for the missed tests. LERs also identified some inadequate shift checks and compensatory actions. Inasmuch as the lapses represent seven of several thousand surveillances, and no significant safety degradation was involved, the overall performance of required surveillances was excellent.

Surveillance caused a reactor scram from 15% power when a technician inserted a test probe too far into a test point, contacting another test point and grounding the level set point signal. The potential for such an occurrence had been previously realized, and instructions had been issued to use short (non-standard) test probes for such measurements. After this event, the licensee corrected the basic problem by installing a barrier between the test point rows.

There were also seven instances of incorrect instrument setpoints as the result of inadequacies in surveillance or calibration procedures. Four of these affected Reactor Protection System instru-

mentation setpoints. As a result, non-conservative settings were used in over-temperature differential pressure scram setpoints, intermediate range neutron flux monitor scram setpoints, reactor coolant system flow setpoints and the power range neutron flux P-8 interlock setpoint. Although none of these resulted in exceeding a Limiting Safety System Setting, their existence showed a potential for such an excess. Because of these problems, the licensee re-evaluated Technical Specification setpoints by comparing NSSS Vendor Safety analysis documents to the Technical Specifications and the settings specified in surveillance and calibration procedures. Recalculations were made for each setting; these contained all the conversions needed to track between plant primary parameters and instrument electrical values. These licensee corrective actions were assessed as comprehensive and found no additional inadequacies.

Five other occurrences resulted from inadequate surveillance procedures. These included isolation of service water to safeguards pump heat exchangers without the knowledge of shift supervision; incorrectly set throttle discharge valves in the control room pressurization system; an unnecessary safety injection during Engineered Safeguards Features (ESF) actuation relay testing; application of full Reactor Coolant System (RCS) pressure to low pressure letdown system piping during ESF actuation relay testing; and the failure to carry through a construction design change by deleting references to uninstalled remote shutdown panel transfer switches from the Technical Specifications and the surveillance procedures. While these items are minor from a safety viewpoint, they point out inadequacies in validation of procedures prior to operational use. (A procedure validation program is being considered by the licensee.)

In summary, although the program is sound overall, surveillance procedures have detracted from performance because of setpoint and other problems. This appears to be a carry-over effect from the tardy development of surveillance procedures. The excellence noted in performing prescribed surveillances indicates a potential for a higher rating once it is demonstrated that procedure inadequacies have essentially been eliminated.

2. Conclusion

Category 2.

3. Board Recommendations

Licensee: Continue to emphasize procedure adequacy, and give evaluation of procedure validation priority emphasis.

NRC: None.

E. Emergency Preparedness (173 Hours, 2%)

1. Analysis

During the previous SALP, this area was rated Category 2. Timely resolution of NRC concerns was identified as needing improvement.

Emergency preparedness is a site function with common Emergency Plans, facilities, and personnel. This assessment covers the September 1, 1985 through February 28, 1987 period. It represents an evaluation of all three Units but does not repeat applicable parts of the three unit assessment in the Millstone 1/2 SALP for the period ending May 31, 1986. During the current assessment period, there were two region-based inspections.

Inspection on July 7-10, 1986 closed fifteen emergency preparedness items. Two long lead time items remain open. These are a description of the Offsite Facilities Information System (OFIS) and its maintenance procedure for inclusion in the Emergency Plan, and completion of the installation and testing of the Technical Support Center (TSC) and Operations Support Center (OSC) hardware [OFIS, Area Radiation Monitoring System (ARMS), Safety Parameter Display System (SPDS), and the evacuation alarm]. Initially, a planning date for completion of the procedures was set for January 1986. This is presently projected for completion in June 1987. That schedule is acceptable to the NRC.

The annual exercise was observed on November 19-20, 1986 (full participation, including ingestion pathway). No significant deficiencies were identified, but several minor weaknesses were noted. Two of these were the direct result of a power failure caused by an ice storm. Back-up procedures and equipment worked satisfactorily. Both the Control Room and TSC staffs were knowledgeable and innovative in solving problems presented as part of the exercise scenario. The Control Room staff response was prompt and conservative. They quickly recognized changing plant conditions and were able to anticipate possible corrective actions. The TSC staff demonstrated the ability to promptly identify and classify scenario events and make protective action recommendations to offsite agencies. Emergency Response Organization personnel were well trained and qualified for their positions, and positive command and control of all emergency response facility operations was demonstrated by the respective facility managers. Overall licensee performance on the exercise was good.

Dedicated emergency response facilities are well maintained onsite by the licensee. The Emergency Operations Facility (EOF) and TSC are common facilities for all three units. Both facilities have adequate space and were designed to meet the habitability requirements of NUREG-0696. Units 1 and 2 share a common OSC, with a

separate OSC for Unit 3. All facilities are well equipped to function under emergency conditions. During the November 1986 exercise, the emergency response facilities were promptly staffed and activated by the Emergency Response Organization personnel. Augmentation of the initial response to the emergency facilities was timely.

Contingency planning was evident when a hurricane was carefully anticipated in August 1986. Severe weather preparations were implemented. Shutdown planning was halted when the storm track shifted substantially.

The Emergency Preparedness Staff at Millstone is ample, consisting of a Senior Emergency Preparedness Coordinator and an Emergency Preparedness Coordinator. Both have offices onsite. Additional assistance is available from the Emergency Preparedness Supervisor at the Corporate Headquarters in Berlin, Connecticut. Northeast Utilities continues to maintain an excellent working relationship with the State of Connecticut and local governmental agencies, as evidenced by the continuing cooperation demonstrated during exercises.

Overall, the licensee has a sound emergency preparedness program. Management has adequately focused attention on this area as evidenced by good exercise performance, well-maintained emergency response facilities, and an excellent working relationship with off-site officials. There are few open NRC items.

2. Conclusion

Category 1.

3. Board Recommendations

None.

F. Security and Safeguards (409 Hours, 6%)

1. Analysis

During the previous SALP period, no regulatory concerns were identified and the licensee's performance was assessed as Category 1. The licensee was primarily involved in training and qualifying new security force members and installing and testing new systems and equipment for the integration of the Unit 3 program into the existing program for Units 1 and 2. During the current period, the licensee's staff was involved in monitoring the performance of new security systems and equipment, evaluating the effectiveness of training and assessing the need for changes as a result of implementing the expanded security program.

In the current assessment period, a total of four preoperational reviews, one special inspection and five routine inspections were performed by region-based inspectors. Nine of these inspections involved the licensee's physical protection (security) program and one reviewed the licensee's control of and accounting for special nuclear material.

Corporate and plant management's involvement in and support for the security program was very evident, resulting in the relatively trouble-free integration of Unit 3 into the site security program. The allocation of a sufficient number of experienced technical and support personnel resulted in sound designs, good planning, timely procurement, and quality installations.

An aggressive and comprehensive surveillance program was developed to monitor the performance of new systems and equipment in their initial period of use. The program was carried out by a team composed of personnel with expertise in security, engineering, I&C, and computers. The team approach was highly effective in accomplishing this activity and was continued during the development of routine surveillance testing and maintenance procedures.

As experience with systems, equipment and facilities was gained, plans were developed and modifications were initiated for upgrading existing systems, equipment and facilities. This demonstrated the licensee's continuing attention to establishing and maintaining a high quality and effective security program.

Staffing for the expanded security organization involved hiring about 150 new personnel. Due to the shortage of qualified candidates in the local area, extensive recruitment efforts were required. These efforts were successful and the necessary manning, training, and qualification were achieved on schedule. These efforts further demonstrate the licensee's intent to implement a quality program.

The training and qualification program was well developed with quality lesson plans and instructional aids. It was administered by three full-time and experienced instructors provided by the security contractor. The training program is effective and of high quality, as indicated by the relatively small number of identified personnel errors. Training is continually upgraded as a result of feedback from operational experience and on-the-job performance observations. Oversight of the training program is provided by a senior licensee security supervisor and this is considered by the NRC to be a major strength of the program.

The licensee developed and implemented a comprehensive records management system. It included such things as manufacturers' specifications, acceptance criteria and testing data for the new systems and equipment, design and construction information for new systems and facilities, as well as the routine security program records. The system provided for clear identification, ease of retrievability and mandatory retention periods, and demonstrated the licensee's commitment to quality.

Necessary revisions to the licensee's corporate security audit program, to reflect the integration of Unit 3 with the site security program, were accomplished during the pre-operational phase as the new systems and equipment were accepted for operation by the licensee. In this manner, the licensee was able to ensure that all new program elements were included. The audit plan is comprehensive and is maintained up-to-date in order to provide quality information concerning the implementation of the program.

Fourteen Unit 3 related event reports, which required reporting in accordance with 10 CFR 73.71, occurred during this assessment period. Seven of these events were minor problems with new equipment/systems; of those, three concerned a deficiency in the new intrusion detection system which, when located, was promptly corrected by an engineering modification. Two events involved personnel errors by members of the security force. One of these was a security officer leaving his post early; this individual was re-trained. The other was a security officer found asleep on duty; this individual was fired. Licensee response to these two events showed their strong insistence upon proper performance of duty. Four events resulted from poor interface/coordination between various plant functional groups and security. Another event resulted from a contractor employee who surrendered a weapon prior to entering the plant protected area. The remaining event involved a bomb threat. Each of the above events was appropriately handled and compensatory measures were promptly initiated when required. The event reports were clear, concise and promptly submitted to NRC. The cumulative downtime for the equipment/systems related events was less than 10 hours, indicating prompt attention to and detection and correction of the problems. This timely support by I&C and

Computer Services to the maintenance of the security systems and equipment demonstrates the licensee's commitment to a high quality maintenance program.

During the assessment period, the licensee submitted seven changes to the Training/Qualification, Contingency, and Security Plans under the provisions of 10 CFR 50.54(p) and provided its response to the August 4, 1986 Miscellaneous Amendments to 10 CFR 73.55, codified by the NRC. The changes were described in a summary transmitted with each revision and referenced to plan pages that were marked to facilitate review by NRC. Revisions were generally of high quality. The licensee's safeguards licensing function is adequately staffed by experienced personnel who are knowledgeable of NRC program objectives. The quality of the submittals is further evidence of the licensee's commitment to a quality security program.

The licensee's program and procedures to control and account for special nuclear material at Unit 3 were found to be adequate, as was the licensee's plan for the protection of new fuel.

In summary, corporate and site management involvement in the program resulted in the efficient and effective integration of Unit 3 into a consolidated site security program. Significant management oversight and direction and the application of a well planned and executed team approach were largely responsible for the ease with which this evolution was accomplished. These factors remained strongly evident throughout the assessment period in monitoring personnel and equipment/systems performance and in customizing the program to meet its expanded needs while conforming to NRC program objectives. The only NRC concern identified was for a possible adverse effect from future retirements of highly experienced and capable individuals, and that does not affect the performance rating for the current SALP period.

2. Conclusion

Category 1.

3. Board Recommendations

Licensee: Place emphasis on maintaining high performance during the transitions when senior personnel retire.

NRC: None.

G. Outage Management (127 Hours, 2%)

1. Analysis

This is the first time that Outage Management has been assessed for Millstone 3. The plant is in its first operating cycle so there was no refueling outage. There were, however, two planned and three unplanned outages and planning activities for the March 1987 outage. Outage planning, mobilization, performance, restoration and restart were observed as part of the routine inspection program.

Outages were planned in detail and very closely managed. As job needs were identified, requisite plant conditions and materials were noted with expected durations delineated by experienced personnel. The data was incorporated, with the aid of critical path management software, into a master outage schedule complete with bar charts, sensitivity analysis for each task that might impact the critical path, and logical ties between tasks. The schedule received senior and supervisory management reviews and modifications prior to outage commencement. Twice daily during an outage, an expanded time base printout of the current three-day window, including all recent updates to the master schedule, was provided to all supervisors during a status meeting. These meetings were characterized by accurate assessments of work in progress and resolution of conflicts. Tight controls over the schedule and plant conditions were maintained and many potential problems were avoided by early addressal. During these meetings, NRC observers noted a strong spirit of cooperation and a very positive attitude toward nuclear safety and high quality performance.

One safety impact of good planning has been that sufficient time was allotted to careful completion of safety-related equipment lineups and surveillance requirements.

Administrative control of maintenance and tagging was for the most part effective. A notable exception was a failure to clear an Automated Work Order and its associated tag during recovery from an outage, leaving a Safety Injection Hot Leg Recirculation manual isolation valve shut until in Mode 3 (hot shutdown). During that same outage, two work orders that resulted in the breach of Control Room and Secondary Leak Collection Recovery System (SLCRS) pressure boundaries were approved by Shift Supervisors without realization that these boundaries were impacted. This was during one of the earlier outages. Corrective actions for these licensee-identified losses of control appear effective, in that there have been no repeat occurrences.

Management at both the unit and department levels was proficient at planning and scheduling, determining contingency strategies, and quickly adapting to changing conditions. An example was the 24-day

outage beginning in July 1986. The licensee had a future three-week outage in the planning stage when performance of an inaccurate surveillance procedure damaged the letdown relief valve (this overpressurization of letdown piping is incorporated in the Surveillance functional area), forcing the plant down to cold shutdown for repairs. As the reactor was being cooled down, planning sessions were called to scope the full work load and determine the critical path for accomplishment of all commitments up to February 1987 (the tentative date for a mid-cycle outage). Many vendor and material arrangements were expedited to meet the new schedule. What started as an unplanned shutdown grew into a successful 24-day outage during which much corrective and preventive maintenance, and major technical specification surveillances, were completed. This effective utilization of forced plant conditions eliminated the need for an additional outage during the SALP period.

In summary, the control of outage activities was a significant management strength, based on the quality evident in the successful completion of numerous complex tasks during five observed outages.

2. Conclusion

Category 1.

3. Board Recommendations

None.

I. Licensing Activities

1. Analysis

The previous SALP rated this area as Category 2. To assure more timely resolution of licensing issues, increased licensee management involvement in the licensing process was recommended.

Licensee management involvement in licensing activities was evident during the current SALP period. An example was their extensive comments on the staff's Station Blackout [10 CFR 50.54(f)] letter and associated discussions with NRC reviewers and management. In addition, licensee management was active in the NUMARC industry group addressing this activity, thereby ensuring a high level of review and decision making on this issue. The licensee, Northeast Nuclear Energy Company (NNECO), also consistently demonstrated evidence of prior planning and assignment of priorities, and had well stated, controlled, and explicit procedures for control of licensing activities. NNECO worked aggressively toward completing license conditions and commitments to the NRC, and maintained a priority list corresponding to the NRC Licensing Action Priority list. The Unit 3 lead licensing engineer's ability to provide schedular and technical information on past and present licensing activities indicated that licensee records were complete, well maintained, and available.

The NNECO licensing staff was evaluated as well qualified, and NNECO assigned the necessary technical people to develop complete, high quality responses to NRC requests. For example, NNECO technical staff and managers attended four NRC staff meetings to support the NRC review of a request for approval to operate with N-1 loops. Requests for information were responded to in meetings, conference calls, and correspondence. Licensee responses were usually technically sound, had appropriate management review and approval, and were submitted on or ahead of schedule.

One expedited Technical Specification change was requested, for extending the 18-month diesel generator surveillance schedule. The licensee notified the NRC of the schedule well in advance, and plant management promptly responded to a request for more information.

NNECO was generally responsive to the staff's concerns. They took the initiative to resolve issues through conference calls and meetings, and promptly followed-up with response submittals. For the proposed installation of one feedwater venturi inspection port instead of two, the licensee provided a drawing showing the proposed venturi meter installation which showed the inspection port and the effect of the inspection port opening on the accuracy of the reading. The licensee also provided ASME paper 83-JPGC-PTC-3 which described a similar installation at Calvert Cliffs. NNECO was also excep-

tionally responsive during the NRC staff's review of reactor coolant system flow anomalies at the Callaway and Wolf Creek plants. When asked to repeat the RCS flow measurements taken at Callaway and Wolf Creek, the licensee took the data and promptly provided the results in a meeting with the NRC staff, even though flow anomalies had not been observed at Millstone 3.

Infrequent lack of responsiveness to NRC concerns was noted. One example was responses and submittals concerning open items on reactor coolant loop stop valve interlocks in the staff's Safety Evaluation Report (SER) on N-1 loop operation. Some drawing submittals were not the latest revision available. After a staff visit to the site to obtain the latest drawings, review indicated that further revision was needed to eliminate additional errors.

For the eight Technical Specification change requests submitted, the licensee advised the NRC of the need for the changes and the submittal schedule well in advance. Seven of the eight requests were thorough and technically sound. The eighth was an exception which would have allowed the Nuclear Review Board (NRB) quorum to consist of less than a majority of the NRB members. This was found unacceptable by the NRC. Submittal of this request represented an apparent lack of understanding of the intent of the Westinghouse standard technical specifications.

Initially, licensee submittals lacked details on criteria for reaching a "no significant hazards" determination. Improvement was shown during the SALP period. A recent submittal related to ESF response times contained detailed information from the associated safety analysis, providing a strong basis for the "no significant hazards" determination.

Overall, the licensee provided effective licensing liaison with NRR and showed a clear understanding of the issues. There was effective centralization, with one point of contact with NRC. Timely and acceptable resolution was thereby facilitated.

2. Conclusion

Category 1.

3. Board Recommendations

Licensee: Assure accuracy of submittals to the NRC.

NRC: None.

I. Engineering Support (262 Hours, 4%)

1. Analysis

This is a new functional area. It 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 onsite engineering presence in both the operating company (NNECO) and the support company (NUSCO). The NNECO engineering department is currently staffed to 28 full time employees and includes reactor, mechanical and electrical engineering functions as well as in-service inspection (ISI). The NUSCO onsite engineering group includes mechanical, electrical, I&C, and civil/structural/stress engineering. Each of these four groups has a NUSCO engineer as supervisor, with the large majority of working level engineers being contracted from the Unit 3 architect/engineer. The onsite groups report directly to central management at the utility headquarters. Additional technical support is provided by the Production Test Group. These electrical and electronic technicians and engineers, mainly concerned with generation and distribution equipment, are used for complex troubleshooting and repair problems.

The above groups above were composed of technically knowledgeable personnel with skillful, seasoned supervision. They exhibited perseverance and dedication to perform tasks correctly the first time. Examples included timely and thorough assessments of the effects of failed snubbers on the systems they restrained and the active and timely resolution of pipe vibration problems.

The NNECO Reactor Engineering and ISI sections effectively anticipated plant conditions and scheduled related surveillances. Reactor physics and core surveillances were accurate, well controlled and timely. Numerous NRC observations of inservice pump testing found skilled and knowledgeable technicians performing well-controlled tests and questioning the results for possible trends. Technique and measurement accuracy for Local Leak Rate Tests (LLRTs) have never come into question. Mechanical and electrical NNECO engineering sections performed well in supporting evolutions affecting plant operation. An example was identifying Volume Control Tank temperature reduction as a temporary means of decreasing reactor coolant pump seal leakage. This group also did an excellent job of originating and managing special inservice tests (ISTs) when required. An example was the special IST of the motor-driven auxiliary feed-water pumps, identifying the cause of low suction pressure trips as a pressure oscillation.

Support from NUSCO engineering was essential and well utilized. Numerous design deficiencies were effectively addressed. Containment Recirculation System (RSS) heat exchanger service water connections and chemical addition tank seismic supports were both upgraded prior to full power licensing. The Condensate Storage Tank was redesigned by NUSCO with improved overpressure relief protection. Main Steam Valve Building (MSVB) Heating, Ventilation and Air Conditioning (HVAC) design problems were addressed with interim changes. (Permanent modifications are planned.) The Main Steam low pressure trip sensing lines froze (rendering 3 of 4 channels inoperative); alternately, the Environmental Qualification high temperature limits were routinely exceeded. Both site engineering groups coordinated effectively to correct such deficiencies.

Engineering and design considerations contributed to several events during this SALP period. The reactor scrams and feedwater isolations due to steam generator level transients were in part due to the equipment design, the difficulty of manual control of steam generator level, the need for extensive system grooming, and improper equipment setpoints. Corrective actions were generally good and performance improved, but there appears to be considerable room for further engineering improvement of steam generator level control.

Two errors in the Reactor Protective System (RPS) Overtemperature Differential Temperature (OTdT) setpoint calibration procedure led to incorrect entries into the RPS for calculation of OTdT. One was an incorrect constant for the setpoint calculation, the other was a setpoint reduction for excessive Axial Flux Difference (AFD). Both errors were caused by failure to recognize changes in NSSS vendor setpoint documents. The result was a slight (<1%) non-conservative shift in the trip setpoint. In a similar instance, due to a change between procedure setpoints and the Technical Specifications, three loop protective interlock P-8 reset at a thermal power higher than was allowed by Technical Specifications. These items were discovered by licensee reactor engineers, thoroughly analyzed, and subjected to timely and sound corrective actions (procedure changes and re-review of all RPS setpoints).

In one case, immediate corrective actions were evaluated as not conservative enough. During Startup Report review, the NSSS vendor discovered that the reactor coolant system resistance temperature detector (RTD) response time interpretation and acceptance criteria were in error. The error involved late provision of information by the vendor and licensee failure to retrofit that information into the Startup Manual. When correctly evaluated, loop 2 RTDs exceeded the acceptance criteria and required a review for impact on the Final Safety Analysis. Between the time the vendor raised the issue and the time a Justification of Interim Operation (JIO) was provided, five accident analyses were in question. The licensee did not then trip the loop 2 bistables that provide protection for these acci-

dents. Those three bistables, as well as two interlock and one permissive bistables, were tripped about eight hours later when the vendor-supplied JIO did not satisfactorily address all five accident analyses. Subsequently, following reallocation of some design margin and additional JIO, the licensee reset these 6 bistables.

Several engineering issues which adversely affected performance were being acted upon. Continued licensee attention to resolution of the following of these is needed:

- Steam Generator Feedwater Flow oscillations.
- Elimination of illuminated control board annunciators.
- Power Operated Relief Valve internal leakage.
- Control Building ventilation radiation monitor causing spurious ventilation isolations.
- Main Steam Valve Building Heating and Cooling.

In summary, engineering support has been satisfactory. There was a high workload and much competent work. Some design changes were not carried through to modification of the technical specifications and procedures. Further, some procedures were not changed to reflect technical specification changes in reactor protection set-points. Performance would have been better if steam generator level control difficulties had been resolved early during initial operation, and if unnecessary control room annunciations had been significantly lower. However, the problems were not unusual for early operation, and the licensee response was sound.

2. Conclusion

Category 2.

3. Board Recommendations

Licensee: Resolve issues requiring engineering attention.

NRC: None.

J. Training and Qualification Effectiveness

1. Analysis

Training and Qualification Effectiveness is an evaluation criterion for each functional area. During this SALP, it also is being considered as a separate area (for the first time). This area is a synopsis of the assessments in the other areas. Training effectiveness has been measured primarily by the observed performance of licensee personnel and, to a lesser degree, through program review.

A strong training commitment was evident in the investment in staff and facilities. The plant specific simulator was a significant benefit in training operators and was used to train managers as well. The licensee has built the training staff to over twenty instructors, three-quarters of whom hold operating licenses. There is a strong supervisory organization to manage the training staff.

Four reactor scrams were assessed as having training implications. These were the 1/16/86 scram due to too quick opening of a steam dump valve with the main steam isolation valves shut, the 1/18/86 scram due to welding cables being near nuclear instrumentation cables, the 3/19/86 scram caused by failure to shift to feedwater regulating bypass valve control, and the 4/10/86 scram due to low steam generator level during manual control. While better training should have reduced such events, the associated training effectiveness is considered representative of a sound program during its initial application to actual operation. The licensee's training organization separately reviewed licensee event reports (LERs) and plant information reports (PIRs) for training aspects, and the on-site safety committee (PORC) actively probed training considerations during its regular reviews. These feedback loops represented management involvement and provided good corrective action inputs.

As noted in the plant operations area, operator performance on NRC license examinations was good. While consistency has not yet been shown in that performance, NRC concern about there being too much of a cookbook approach to accident response and too little individual case assessment no longer exists. Also, operator performance on shift was excellent, with quick response to changing conditions evident in spite of the high number of lighted annunciators.

The licensee is actively pursuing accreditation by the Institute of Nuclear Power Operations (INPO). Operator training is based on Northeast Utility programs which are INPO accredited.

Non-licensed staff training was inspected and found acceptable. Plant equipment operators, maintenance, production test, and I&C technicians have been observed performing normal and infrequent

operations, maintenance activities and surveillances. These individuals have been found to be knowledgeable and to perform their assigned tasks safely and competently.

The maintenance and I&C technician training program was actively pursued. Training commitments were scheduled and strictly followed. Senior department personnel actively assured that their juniors had the knowledge for performing assigned tasks. NRC questioning of in-service inspection technicians revealed excellent knowledge of equipment, procedures, and applications.

A significant weakness in Shift Supervisor Staff Assistant (SSSA) training was identified by the licensee. Use of the marginally trained SSSAs for a task in excess of their training contributed to isolation of an emergency core cooling subsystem without the knowledge of shift supervision. This isolated incident was an exception to the generally excellent non-licensed personnel performance.

General Employee Training (GET) is common to the three Millstone units. The program adequately addresses orientation, radiation protection, security, emergency planning, safety, and assurance of quality. Program content is directed by a steering committee made up of the Unit Superintendents and other managers who determine the emphasis of GET based on station performance goals.

In summary, the licensee's commitment to training was evident in enhanced training staffing with a high percentage of experienced licensed operators and expenditure of considerable resources for training. The operators were assessed as becoming excellent performers early in the initial operating period. Also, a high level of operator and support personnel knowledge was consistently demonstrated. Performance on NRC exams was good. Notwithstanding the large number of reactor scrams, training was generally effective in providing well qualified personnel who contributed positively to safe operation.

2. Conclusion

Category 2.

3. Board Recommendations

Licensee: Continue training development to achieve accredited training and assure consistently good operator examination results.

NRC: None.

K. Assurance of Quality (424 Hours, 6%)

1. Analysis

Management involvement in assuring quality is an evaluation criterion in each functional area. Quality assurance (QA) is an integral part of each functional area and the respective QA inspection hours are included in each one. This area is a synopsis of the assessments of the assurance of quality in other areas. During the current SALP period, there were three QA inspections, inspections by the resident inspectors, and a readiness for operations team inspection.

The related area of quality assurance was not rated during the previous SALP. Strengths were, however, noted in management's strong commitment to assure quality throughout the design, procurement, construction and preoperational test phases. No breakdowns in quality programs or serious individual quality problems were noted.

During the current SALP period, daily observations found Millstone 3 personnel to have a standard of completing assigned work correctly on the first attempt. This positive attitude was repeatedly displayed. Shoddy workmanship or lack of attention to detail were typically not tolerated by peers or supervisors. Department Heads were very knowledgeable of the status of work. Plant personnel exhibited a good attitude towards QA and adherence to procedures. The individuals closest to the work (operators, technicians, mechanics, electricians, engineers, etc.) exhibited high personal performance standards and detailed knowledge of equipment and procedures.

QA/QC personnel were found knowledgeable of the tests they were monitoring. QC inspectors were found to be trained, qualified and certified to the level of their responsibilities. Site staffing levels were found adequate to support the startup test program and normal operations, with headquarters and contractor personnel available as needed. Questionable trends were investigated to determine their root cause.

First line supervisors provided close oversight of work activities. Maintenance, I&C, and Production Test supervisors were generally knowledgeable of the plant design and station administrative requirements. They were often observed to be providing technical guidance and oversight to workers at the work site. Further, Shift Supervisors repeatedly demonstrated that they were knowledgeable of plant activities and that they were effectively managing activities and shift personnel.

Department supervisors were also frequently observed in the plant conducting personal inspections. NRC inspectors found them to be knowledgeable of specific problems and active participants in problem resolution. These individuals were members of the onsite safety committee, the Plant Operations Review Committee (PORC), and their sound safety perspective extended into PORC activities. NRC observers continually witnessed frank, open, and knowledgeable PORC discussions of issues. PORC members clearly demonstrated sound safety and facility knowledge, and their contribution to safety was a notable licensee strength. The many related examples of thorough problem resolution include the licensee reviews upon discovery that a reactor coolant loop hot leg injection valve, tagged shut for maintenance while the plant was in cold shutdown, remained shut while the plant was taken to hot shutdown. The basic operator error was addressed. There also were two days of intensive PORC review of operating procedures, tagout control, work activity control, work activity control, and retest and training requirements. Procedure improvements resulted. A design change to annunciate main steam isolation was initiated as a side effect.

Senior plant staff were assigned as Duty Officers to act for licensee management on a weekly basis during operations and outages. Management Representatives were assigned on eight-hour shifts round the clock on site for coverage of outages. Daily staff meetings were used to discuss plant conditions and each department was required to present the status of its work items. Issues were discussed and tracked in detailed reports which were updated and distributed daily. These controls provided excellent management of ongoing activities.

Plant management attention was rapidly focused on problem areas by the Plant Incident Report (PIR) system. This system has a very low threshold for PIR origination and mandates unit superintendent review as well as assignment of follow-up activity. Four hundred PIRs were written during 1986. NRC inspectors found the PIRs to be an excellent tool for keeping senior licensee managers informed, and senior managers did pay significant attention to root cause assessment and corrective actions. This was routinely observed to occur during daily management and PORC meetings.

The plant superintendent was observed making frequent control room tours. Weekly plant walkdowns by operations, maintenance, and health physics supervisors resulted in improved housekeeping, in diminished size of contaminated areas, and in enhanced correction of packing leakage and other lesser maintenance items.

Nuclear Safety Engineering (NSE), the independent safety engineering group which is part of the corporate staff, was active in its coverage of Unit 3. This on-site group had ready access to the plant staff, equipment and records. NSE assessed plant safety programs

and evaluated plant operating experiences through reviews of procedures and data including independent reviews of the resolution of Licensee Event Reports (LERs) and PIRs. NSE made a significant effort to participate in the Institute of Nuclear Power Operations (INPO) sponsored Human Performance Evaluation Study Program (HPES). Recommendations for corrective actions were provided from evaluations of incidents or "near misses" reported to the HPES coordinator. In addition to site specific corrective action, the licensee provided information to the INPO-HPES data base. Although no measured improvement in plant performance resulted, the fact that detailed evaluations on human performance were performed is assessed as contributing positively to root cause identification.

The Millstone Unit 3 Nuclear Review Board (NRB) was thorough in its reviews. Its meeting agendas were extensive, the board discussions were probing, and open issues were conscientiously tracked.

Plant management losses have included the station superintendent, the station services superintendent, and the unit superintendent. The fact that no notable drop in performance resulted indicates depth in management expertise and careful management of the transition periods involved.

The licensee's audit program was well planned. Audits were found to be in depth and conclusive. Audit checklists were well organized and comprehensive. Some audit findings, however, were left unresolved for as long as three years. Although no significant individual concerns were involved, the three-year delay in resolving findings indicates an audit response system inadequacy.

In summary, there was excellent regard for assurance of quality in all aspects of plant operation. Management expended significant effort to ensure that processes were controlled, that problems were discovered, communicated and corrected, and that process controls were modified to prevent problem recurrence.

2. Conclusion

Category 1.

3. Board Recommendations

None.

V. SUPPORTING DATA AND SUMMARIES

A. Investigation and Allegation Review

None.

B. Escalated Enforcement Actions

1. Civil Penalties

None.

2. Orders

None.

3. Confirmatory Action Letters

None.

C. Management Conferences

- 11/5/85 Management Meeting onsite to discuss completion status for construction, testing, and procedure development.
- 1/9/86 Enforcement Conference - failure to report a construction deficiency in accordance with 10 CFR 50.55(e) when an error was detected in the load path for a reactor coolant pump snubber support. A Level III violation was ultimately issued.
- 3/13/86 Management Meeting to discuss operating experience, plant incidents, and reportable events occurring during the startup test program.
- 3/27/87 Enforcement Conference to discuss the events affecting the operability of the "B" high pressure safety injection pump during 11/26-30/86. A Level IV violation was ultimately issued.

D. Licensee Event Reports

A tabulation of Licensee Event Reports (LERs) by functional area, and an LER synopsis, is attached as Table 4.

1. Licensee Event Reports Reviewed

LER Nos. 85-001 through 85-003, 86-001 through 86-059, 87-001 through 87-007, and fourteen security-related event reports.

2. Causal Analysisa. Tabulation by Common Cause FactorsCauses:

C - Communications Inadequate
 Cn - Construction
 D - Design Inadequacy
 E - Equipment Failure
 K - Lack of Knowledge (possible training inadequacy)
 M - Management Planning or Control Error
 Pe - Personnel Error
 Pf - Procedure Not Followed
 Pr - Procedure Inadequacy

CAUSES	NUMBER OF LERs	LER NUMBERS
Pe & Pr	13	85-02, 86-07, 86-15, 86-19, 86-20, 86-21, 86-28, 86-30, 86-56, 86-58, 87-05, 86-06, Security 86-13
Pe & K	10	86-01, 86-02, 86-19, 86-21, 86-26, 86-28 86-30, 86-56, Security 85-32, Security 86-30
Pe	6	85-03, 86-04, 86-08, 86-10, 86-33, 86-44
Pe & E	5	86-13, 86-32, 86-41, 86-48, 86-49
Pe & D	5	86-03, 86-12, 86-14, 86-26, 87-02
Pe & Cn	5	86-02, 86-06, 86-36, 86-38, 86-59
Pe & M	3	86-35, 86-52, 86-56
Pe & C	1	87-01
Pe & Pf	1	86-33

Note: The causes in this table are not mutually exclusive. For example, LER 86-21 was evaluated as having personnel error, procedure, and training causes, and was listed under both "Pe & Pr" and "Pe & K."

b. Tabulation By Common Event Description

Failure of Safeguards Channel due to instrument line freezing: 86-05 and 86-22.

Missed Surveillance: 86-07, 86-26, 86-33, 86-34, 87-06, and 87-07.

Safety Injection System Actuation: 86-01, 86-03, 86-19, and 86-21.

Steam General Level Transients: 86-10, 86-14, 86-15, 86-30, 86-32, and 86-48.

Supplementary Leak Collection System Boundary Problems: 86-06, 86-38, and 86-59.

High Temperatures in EEQ Monitored Areas: 86-29 and 86-50.

Security-Related Equipment Problems: 50-245/86-01, 86-02, 86-03, 86-04, 86-20, 86-21, and 86-31.

E. Licensing Activities

1. NRR/Licensee Meetings

a. NRC Headquarters

- 1/8/86 Meeting to discuss status of licensing issues in preparation for issuing full power operating license.
- 1/23/86 Meeting to discuss Millstone 3 Station Blackout.
- 2/19/86 Meeting to discuss NU response to NRC's 50.54(f) letter of December 18, 1985 on Station Blackout.
- 7/15/86 Meeting to discuss status of licensing activities.
- 7/28/86 Meeting to discuss staff concerns related to 3 loop operation.

b. Site Visits

- 5/12/86 Meeting to discuss status of licensing activities.
- 11/14/86 Meeting to review drawings of solid state protection system for 3 loop operation.
- 12/23-24/86 Site visit to review Plant Design change request files.
- 2/25/87 Site visit to simulator and control room in support of 3 loop operation.

2. Commission Briefings

- 1/29/86 Vote on Full Power License Issuance for Millstone 3.

3. Schedule Extensions Granted

None.

4. Reliefs Granted

None.

5. Exemptions Granted

None.

6. License Amendments Issued

1/22/86 Low Power License (NPF-44) Amendment 1 - Remote Shutdown
Instrumentation

9/9/86 Full Power License (NPF-49) Amendment 1 - Fire Protection
Audits

7. Emergency Technical Specifications Issued

None.

8. Orders Issued

None.

9. NRR/Licensee Management Conferences

None.

TABLE 1
INSPECTION REPORT ACTIVITIES

<u>REPORT/DATES</u>	<u>INSPECTOR</u>	<u>HOURS</u>	<u>AREAS INSPECTED</u>
423/85-54 9/9-20/85	SPECIALIST TEAM INSPECTION	375	AS-BUILT INSPECTION OF PIPING, DUCTING, SUPPORTS, ELECTRICAL POWER, INSTRUMENTATION AND CONTROL OF SELECTED SAFETY-RELATED SYSTEMS
423/85-55 9/16-23/85	SPECIALIST	176	OPERATING PROCEDURES, EMERGENCY PROCEDURES, AND REVIEW OF LICENSEE ACTIONS ON PREVIOUS FINDINGS
423/85-56 9/30-10/4/85	SPECIALIST	74	REVIEW STATUS OF PREVIOUSLY IDENTIFIED ITEMS, PREOP STATUS OF SOLID RADWASTE SYSTEM AND TASK ITEMS IDENTIFIED IN NUREG 0737
423/85-57 11/12-27/85	SPECIALIST	205	SURVEILLANCE, CALIBRATION CONTROL, MAIN- TENANCE PROCEDURES, EMERGENCY PROCEDURES, OPERATING PROCEDURES, INITIAL FUEL LOAD PROCEDURES REVIEW, PRECRITICAL TEST PRO- CEDURES REVIEW, STARTUP TEST PROGRAM
423/85-58 9/30-10/4/85	SPECIALIST	32	SITE PHYSICAL SECURITY PROGRAM
423/85-59 9/30-10/4/85	SPECIALIST	131	OPERATIONAL STAFFING, OPERATIONAL STAFF TRAINING, MAINTENANCE PROCEDURES
423/85-60 8/26/85-9/19/85	IE TEAM	N/A	ENGINEERING ASSURANCE TECHNICAL AUDIT
423/85-61 9/30-11/1/85	SPECIALIST	454	PREOPERATIONAL TEST PROGRAM
423/85-62 9/24-11/18/85	RESIDENT	594	REVIEW OF PREVIOUS FINDINGS, REVIEW OF NUREG 0737 ACTION ITEMS, OBSERVATION AND WITNESSING OF HOT FUNCTIONAL TESTING AND RETESTING
423/85-63 10/21-25/85	SPECIALIST	31	PHYSICAL SECURITY PROGRAM
423/85-64 11/4-11/8/85	SPECIALIST	68	REV 0 PHYSICAL SECURITY PLAN, SAFEGUARDS CONTINGENCY PLAN, TRAINING AND QUALIFICA- TION PLAN, AND IMPLEMENTING PROCEDURES

<u>REPORT/DATES</u>	<u>INSPECTOR</u>	<u>HOURS</u>	<u>AREAS INSPECTED</u>
423/85-65 10/21-25/85	SPECIALIST	100	CHEMISTRY AND RADIOACTIVE EFFLUENT CONTROL PROGRAMS
423/85-66 10/21-11/8/85	SPECIALIST	27	EMERGENCY PLAN IMPLEMENTATION APPRAISAL
423/85-67	SPECIAL REPORT	N/A	INITIAL OPERATING LICENSE REVIEW REPORT
423/85-68 11/4-6/85	SPECIALIST	24	FIRE PROTECTION/PREVENTION PROGRAM
423/85-69 11/12-27/85	SPECIALIST	326	PREOPERATIONAL TEST PROGRAM
423/85-70 11/12-15/85	SPECIALIST	10	NUCLEAR MATERIAL CONTROL AND ACCOUNTING
423/85-71 11/11-22/85	SPECIALIST	216	SURVEILLANCE PROCEDURES
423/85-72 12/16-19/85	SPECIALIST	18	PHYSICAL SECURITY INCLUDING: PHYSICAL BARRIERS, COMPENSATORY MEASURES, ASSESSMENT AIDS, ACCESS CONTROL, DETECTION AIDS, ALARM STATIONS, COMMUNICATIONS, PERSONNEL TRNG
423/85-73 11/5/85	SPECIALIST	N/A	MANAGEMENT MEETING - COMPLETION STATUS FOR CONSTRUCTION, TESTING, AND PROCEDURES
423/85-74 11/19/85- 1/6/86	RESIDENT	417	NUREG 0737, WITNESSING OF SYSTEM AND COMPONENT TESTING, OBSERVATION OF CORE LOAD, SURVEILLANCE, MAINTENANCE, AND PHYSICAL PROTECTION
423/85-75 12/9-13/85	SPECIALIST	69	PREOP TESTING
423/85-76 12/12-20/85	SPECIALIST	130	PREOP TESTING
423/86-01 1/6-17/86	SPECIALIST	181	STARTUP PROGRAM REVIEW, POST CORE HOT FUNCTIONAL TESTING PROC. REV., SURVEILLANCE TEST REVIEW AND WITNESSING
423/86-02 1/7-2/24/86	RESIDENT	470	PLANT EVENTS AND NON ROUTINE REPORTS, NUREG 0737 ITEMS, POST CORE HOT FUNCTIONAL TESTING, APPROACH TO CRITICALITY, LOW POWER PHYSICS TEST

<u>REPORT/DATES</u>	<u>INSPECTOR</u>	<u>HOURS</u>	<u>AREAS INSPECTED</u>
423/86-03 3/24-27/86	SPECIALIST	36	SITE SECURITY PROGRAM
423/86-04 1/6-10/86	SPECIALIST	68	REVIEW OF PREVIOUSLY IDENTIFIED SIGNIFICANT DEFICIENCIES
423/86-05 3/13/86	MEETING REPORT	N/A	MEETING REPORT: DISCUSSION OF PLANT EVENTS
423/86-06 1/27-31/86	SPECIALIST	37	CHEMISTRY AND RADIOACTIVE EFFLUENT CONTROL PROGRAMS
423/86-07 1/19-2/14/86	SPECIALIST	225	STARTUP PROGRAM REVIEW, POST CORE HOT FUNCTIONAL TEST WITNESSING AND TEST RESULTS REVIEW, INITIAL CRITICALITY AND LOW POWER PHYSICS TESTS, POWER ASCENSION PROGRAM
423/86-08 2/25-4/14/86	RESIDENT	300	PLANT EVENTS, NON-ROUTINE REPORTS AND OBSERVATION OF POWER ASCENSION TESTING, VERIFICATION OF COMPLETION OF NUREG 0737 ITEMS
423/86-09 2/18-3/14/86	SPECIALIST	121	STARTUP PROGRAM REVIEW, POWER ASCENSION TEST PROCEDURES REVIEW, TEST RESULTS REVIEW, TEST WITNESSING
423/86-10 3/31/-4/4/86	OPERATOR LICENSING	N/A	OPERATOR LICENSING EXAMINATION
423/86-11 3/15-4/3/86	SPECIALIST	90	STARTUP PROGRAM REVIEW, POWER ASCENSION TEST WITNESSING AND TEST RESULTS REVIEW, PREOP TEST PROGRAM FINAL REVIEW
423/86-12 4/14-18/86	SPECIALIST	145	OPERATIONAL TEAM INSPECTION, INCLUDING SURVEILLANCE, MAINTENANCE, QUALITY ASSURANCE, AND FIRE PROTECTION ACTIVITIES
423/86-13 4/7-11/86	SPECIALIST	67	NONRADIOLOGICAL CHEMISTRY PROGRAM, LABORATORY ORGANIZATION, TRAINING MEASUREMENT CONTROL AND ANALYTICAL PROCEDURE EVALUATIONS
423/86-14 4/14-24/86	SPECIALIST	71	STARTUP TEST RESULTS REVIEW AND STARTUP TEST WITNESSING
423/86-15 4/15-5/19/86	RESIDENT	167	PLANT OPERATIONS, RADIATION PROTECTION, SURVEILLANCE AND MAINTENANCE

<u>REPORT/DATES</u>	<u>INSPECTOR</u>	<u>HOURS</u>	<u>AREAS INSPECTED</u>
423/86-16 5/5-9/86	SPECIALIST	32	WATER CHEMISTRY CONTROL PROGRAM
423/86-17 6/2-6/86	SPECIALIST	43	STARTUP TESTING RADIATION SURVEY PROGRAM
423/86-18 5/20-6/23/86	RESIDENT	153	PLANT OPERATIONS, RADIATION PROTECTION, PHYSICAL SECURITY, FIRE PROTECTION, IE BULLETINS, SURVEILLANCE AND MAINTENANCE
423/86-19 6/2-6/86	SPECIALIST	16	RADIOCHEMICAL MEASUREMENTS USING THE NRC REGION I MOBILE LABORATORY
423/86-20 6/16-19/86	SPECIALIST	31	STARTUP TEST RESULTS REVIEW
423/86-21 6/24-8/11/86	RESIDENT	115	SHUTDOWN PLANNING, PLANT OPERATIONS, RADIATION PROTECTION, SECURITY, FIRE PROTECTION, SURVEILLANCE AND MAINTENANCE
423/86-22 7/7-10/86	SPECIALIST	18	NOTIFICATION AND COMMUNICATION EQUIPMENT AND PROCEDURES, OPEN EMERGENCY PREPAREDNESS ITEMS
423/86-23 7/7-11/86	SPECIALIST	12	REVIEW OF RADIATION PROTECTION PROGRAM-TRAINING, EXPOSURE CONTROL, SURVEYS, AUDITS ALARA
423/86-24 7/14-18/86	SPECIALIST	26	SITE SECURITY PROGRAM
423/86-25 7/21-25/86	SPECIALIST	36	MAINTENANCE PROGRAM PROCEDURES, CALIBRATION CONTROL, AND QUALITY ASSURANCE INTERFACE
423/86-26 7/21-8/8/86	SPECIALIST	43	QUALITY ASSURANCE PROGRAMS FOR AUDITS
423/86-27 8/18-22/86	SPECIALIST	142	LICENSEE'S IMPLEMENTATION AND STATUS OF TASK ACTIONS IDENTIFIED IN NUREG 0737
423/86-28 8/12-10/6/86	RESIDENT	203	SHUTDOWN PLANNING, PLANT OPERATIONS, RADIATION PROTECTION, SECURITY, FIRE PROTECTION, SURVEILLANCE AND MAINTENANCE
423/86-29 8/18-22/86	SPECIALIST	36	PROBLEM AREAS ASSOCIATED WITH SNUBBERS, PORVS AND MAIN STEAM SAFETY VALVES

<u>REPORT/DATES</u>	<u>INSPECTOR</u>	<u>HOURS</u>	<u>AREAS INSPECTED</u>
423/86-30 9/8-12/86	SPECIALIST	35	SURVEILLANCE TESTING AND CALIBRATION CONTROL PROGRAM FOR I&C, PRODUCTION TEST, OPERATIONS DEPARTMENT
423/86-31 12/15-19/86	OPERATOR LICENSING	N/A	OPERATOR LICENSING EXAMINATION REPORT
423/86-32 9/15-19/86	SPECIALIST	34	QUALITY ASSURANCE AUDIT PROGRAM
423/86-33 10/7-11/17/86	RESIDENT	132	PLANT OPERATIONS, RADIATION PROTECTION, PHYSICAL SECURITY, FIRE PROTECTION, SURVEILLANCE AND MAINTENANCE
423/86-34 11/17-20/86	SPECIALIST	13	NON-LICENSED STAFF TRAINING
423/86-35 11/18/86- 1/05/87	RESIDENT	154	OPERATIONAL SAFETY, MAINTENANCE, SURVEILLANCE, LER REVIEW
423/86-36 11/19-20/86	SPECIALIST	40	EMERGENCY PREPAREDNESS INSPECTION AND OBSERVATION OF THE ANNUAL EMERGENCY EXERCISE
423/86-37 12/1-5/86	SPECIALIST	10	OFFSITE REVIEW COMMITTEE ACTIVITIES
423/86-38 12/11-12/86	SPECIALIST	16	DEGRADED PROTECTED AREA BARRIER AND CORRECTIVE ACTIONS
423/86-39 12/29/86- 01/07/87	RESIDENT	44	OPERATIONS AND ENGINEERED SAFETY FEATURES
423/87-01 1/5-9/87	SPECIALIST	45	ALARA, RADIATION SURVEYS, EXPOSURES, TRAINING
423/87-02 1/6-2/17/87	RESIDENT	229	MAINTENANCE, SURVEILLANCE, OPERATIONS, RADIATION PROTECTION, RADCON, OUTAGE TRAINING, QA, SECURITY
423/87-03 1/27-29/87	SPECIALIST	5	PHYSICAL SECURITY PROGRAM
423/87-04 2/23-27/87	SPECIALIST	12	PHYSICAL SECURITY PROGRAM

TABLE 2
INSPECTION HOUR SUMMARY

<u>FUNCTIONAL AREA</u>	<u>HOURS</u>	<u>% OF TIME</u>	<u>NORMALIZED ANNUAL HOURS</u>
PLANT OPERATIONS	1365	19.1	910
RADIOLOGICAL CONTROLS	845	11.9	560
MAINTENANCE	359	5.0	240
SURVEILLANCE	554	7.8	370
EMERGENCY PREP.	173	2.4	115
SECURITY AND SAFEGUARDS	409	5.7	270
OUTAGE MANAGEMENT	127	1.8	130
LICENSING	N/A	N/A	N/A
ENGINEERING SUPPORT	262	3.7	175
TRAINING	N/A	N/A	N/A
ASSURANCE OF QUALITY	424	6.0	280
OTHER*	<u>2612</u>	<u>36.6</u>	<u>1740</u>
TOTAL	7130	100.0	4790

*Includes: construction inspections, the followup of previously identified construction issues, as-built inspection of piping and supports, electrical and instrument and controls, preoperational test program implementation, test witnessing and review and startup test programs, its implementation and test review.

TABLE 3
ENFORCEMENT SUMMARY

<u>FUNCTIONAL AREA</u>	<u>SEVERITY LEVEL</u>					<u>TOTAL</u>
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	
OPERATIONS				2	1	3
RADIOLOGICAL CONTROLS						
MAINTENANCE						
SURVEILLANCE						
EMERGENCY PREP.						
SECURITY AND SAFEGUARDS				3	1	4
OUTAGES						
LICENSING						
TRAINING						
ASSURANCE OF QUALITY						
OTHER	-	-	<u>1</u>	<u>1</u>	-	<u>2</u>
TOTAL	0	0	1	6	2	9

<u>INSPECTION</u>	<u>REQUIREMENT</u>	<u>SEVERITY</u>	<u>AREA</u>	<u>DESCRIPTION</u>
423/85-74 11/19/85- 1/6/86	ANSI N45.2.2-73 HOUSEKEEPING	IV	CONSTRUCTION MAINTENANCE	EDG CRANKCASE OPENED WITHOUT MATERIAL CONTROLS
	10 CFR 50, APP. B.V	IV	OPERATIONS	FAILURE TO FOLLOW EDG FUEL OIL TRANSFER PROCEDURES
	SECURITY PLAN	V	SECURITY	FAILURE TO LOCK A VEHICLE
	SECURITY PLAN	IV	SECURITY	FAILURE TO ESCORT VISITORS
	10 CFR 50.55(e)	III	CONSTRUCTION	NOT REPORTING A REACTOR COOLANT PUMP SNUBBER SUPPORT DEFICIENCY
423/86-09 2/18-3/14/86	10 CFR 50 APP B, CRI 2	V	OPERATIONS	INDOCTRINATION AND TRAINING OF PERSONNEL
423/86-38 12/11-12/86	SECURITY PLAN	IV	SECURITY	FAILURE TO MAINTAIN PRO- TECTED AREA BARRIER
423/86-39 12/29/86- 1/6/87	TS 3.5.2	IV	OPERATIONS	SERVICE WATER TO "B" HPSI PUMP ISOLATED
423/87-03 1/27-29/87	10 CFR 75.21	IV	SECURITY	FAILURE TO LOCK SAFEGUARDS INFORMATION REPOSITORY

TABLE 4
LICENSEE EVENT REPORTS

A. LISTING OF LERs BY FUNCTIONAL AREA

<u>FUNCTIONAL AREA</u>	<u>CAUSE CODES</u>						<u>TOTAL</u>
	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>X</u>	
OPERATIONS	12	6		3	3		24
RADIOLOGICAL CONTROLS	3			1			4
MAINTENANCE	3				1		4
SURVEILLANCE	6	2		6	2		16
EMERGENCY PREP.					0		0
SECURITY AND SAFEGUARDS	5		2		7		14
OUTAGE MANAGEMENT							0
TRAINING							0
LICENSING							0
ASSURANCE OF QUALITY							0
ENGINEERING SUPPORT	<u>2</u>	<u>17</u>	<u>—</u>	<u>—</u>	<u>2</u>	<u>—</u>	<u>21</u>
TOTAL	31	25	2	10	15	0	83

Cause Codes

A - Personnel Error
 B - Design/Manufacturing/Construction/Installation
 C - External Cause
 D - Defective Procedure
 E - Component Failure
 X - Other

B. LER SYNOPSIS

<u>LER NUMBER</u>	<u>EVENT DATE</u>	<u>CAUSE CODE</u>	<u>DESCRIPTION</u>
85-001-00	12/09/85	B	EMERGENCY DIESEL GENERATOR "A" FUEL OIL HEADER LEAK - PERFORATION IN THE RETURN LINE TUBING
85-002-00	12/15/85	A	REACTOR TRIP SIGNAL - TWO LOW-LOW LEVEL BISTABLES ON STEAM GENERATOR "C" WHEN LEVEL INCREASED ABOVE SETPOINT - CAUSED BY IN- STALLED JUMPER
85-003-00	12/14/85	A	480 VOLT AC EMERGENCY BUS, REQUIRED TO BE OPERABLE PER TS, TAGGED OUT OF SERVICE TO PERFORM MAINTENANCE
86-001-00	01/16/86	A	REACTOR TRIP WITH SI DUE TO LOW STEAM LINE PRESSURE
86-002-00	01/18/86	B	SOURCE RANGE CHANNEL A REACTOR TRIP
86-003-00	01/19/86	B	REACTOR TRIP WITH SI DUE TO LOW STEAM LINE PRESSURE
86-004-00	01/23/86	A	PLANT WENT FROM HOT STANDBY MODE TO STARTUP MODE WITH TS ACTIONS STMT IN EFFECT WHICH DID NOT PERMIT THIS CHANGE
86-005-00	01/25/86	B	TWO CHANNELS OF STEAM GEN A STEAM LINE PRESSURE WERE FOUND TO BE FAILED HIGH DUE TO SENSING LINES ON PRESSURE TRANSMITTERS BEING FROZEN
86-006-00	01/25/86	B	VIOLATION OF SLCRS BOUNDARY PENETRATIONS
86-007-00	02/02/86	A	PLANT IN MODE 2 WITH LCO ACTION STATMT FOR TS 3.8.4.1 NOT MET FOR VERIFICATION OF CONTAINMENT ELECTRICAL PENETRATION ISOLA- TION BREAKER POSITION
86-008-00	02/02/86	A	12 HOUR GRAB SAMPLES REQUIRED BY TS 3.3.3.10 WERE NOT BEING TAKEN WITH PLANT AT 3% POWER
86-009-00	02/04/86	E	FWI OCCURRED DUE TO HIGH LEVELS IN STEAM GEN. 1 AND 4

<u>LER NUMBER</u>	<u>EVENT DATE</u>	<u>CAUSE CODE</u>	<u>DESCRIPTION</u>
86-010-00	02/04/86	A	REACTOR TRIP AT 15% POWER DUE TO LEVEL DEVIATION IN STEAM GENERATOR 2
86-011-00	02/05/86	B	CBI SIGNAL GENERATED DUE TO NOISE SPIKE IN ONE OF THE INSTRUMENT LOOPS
86-012-00	02/06/86	B	FWI SIGNAL FROM HIGH-HIGH WATER LEVEL IN STEAM GENERATOR "C"
86-013-00	02/07/86	B	FEEDWATER ISOLATION WITH REACTOR TRIP DUE TO STEAM GENERATOR WATER LEVEL TRANSIENT
86-014-00	02/10/86	B	REACTOR TRIP DUE TO STEAM GENERATOR WATER LEVEL TRANSIENT-IMPROPERLY DESIGNED LEAD BEING USED
86-015-00	02/12/86	D	REACTOR TRIP DUE TO LOW STEAM GENERATOR LEVEL-ERROR IN PROCEDURE COVERING OPERATION OF MAIN FEEDWATER PUMPS
86-016-01	02/08/86	B	PRESSURIZER CUBICLE REACHED A TEMPERATURE OF 121.2 DEGREES FAHRENHEIT AND PLANT ENTERED ACTION STATEMENT
86-017-00	02/13/86	E	REACTOR TRIP DUE TO SSPS GENERAL WARNING
86-018-00	02/14/86	D	FWI ON OPENING THE "A" MAIN STEAM ISOLATION VALVE
86-019-00	02/28/86	A	SAFETY INJECTION DUE TO LOW STEAM LINE PRESSURE
86-020-00	03/01/86	A	WITH PLANT IN MODE 3, THE RCS LOOP 2 HGT LEG INJECTION VALVE WAS FOUND TO BE DANGER TAGGED SHUT INSTEAD OF LOCKED OPEN AS REQ. BY MODE
86-021-00	03/01/86	A	SI DUE TO LOW STEAM LINE PRESSURE
86-022-00	03/08/86	B	FAILURE OF SAFEGUARDS CHANNEL DUE TO FREEZING
86-023-00	03/11/86	D	DEFECTIVE PROCEDURE FOR MIS-CALIBRATION OF AREA RADIATION MONITORS IN CONTAINMENT BUILDING

<u>LER NUMBER</u>	<u>EVENT DATE</u>	<u>CAUSE CODE</u>	<u>DESCRIPTION</u>
86-024-00	03/15/86	D	P-8 PROTECTIVE INTERLOCK SETPOINT HIGH
86-025-00	03/15/86	B	CONTROL BUILDING INLET VENTILATION RADI- ATION MONITOR INOPERABILITY
86-026-00	03/01/86	A	FAILURE TO MONITOR AFD
86-027-00	03/19/86	B	TRAIN "A" EMERGENCY GENERATOR LOAD SEQUENCER SAFETY INJECTION SIGNAL
86-028-00	03/19/86	D	FEEDWATER ISOLATION AND REACTOR TRIP DUE TO STEAM GENERATOR WATER LEVEL TRANSIENT
86-029-00	03/29/86	B	AREA ES-07 REACHED A HIGH TEMPERATURE OF 121.2 DEGREES FAHRENHEIT
86-030-00	04/10/86	A	REACTOR TRIP DUE TO LEVEL DEVIATION IN STEAM GENERATOR C
86-031-00	04/19/86	B	CBI SIGNAL DUE TO CHLORINE DETECTOR FAILURE
86-032-00	04/23/86	A	REACTOR TRIP ON LOW STEAM GENERATOR WATER LEVEL
86-033-00	04/29/86	A	DISCHARGE OF THE LOW LEVEL WASTE DRAIN TANK WAS PERFORMED WITH THE RADIATION MONITOR SAMPLE PUMP DE-ENERGIZED
86-034-00	05/07/86	D	SURVEILLANCE OF ESF BUILDING VENTILATION RADIATION MONITOR SAMPLER FLOW RATE MONITOR WAS NOT INCLUDED IN MONITOR SURVEILLANCE PROCEDURES
86-035-00	05/09/86	A	REACTOR TRIP RESULTANT FROM TURBINE TRIP DUE TO LOW CONDENSER VACUUM SCREEN WASH REMOVED FOR MAINTENANCE
86-036-00	05/19/86	A	PLANT OPERATING IN ACTION STATEMENT IN THAT BATTERY BANK 301A-2 WAS NOT OPERABLE DUE TO AN UNPERFORMED MODIFICATION TO CHARGER 301A-2
86-037-00	05/10/86	B	CBI SIGNAL DUE TO CHLORINE DETECTOR FAILURE

<u>LER NUMBER</u>	<u>EVENT DATE</u>	<u>CAUSE CODE</u>	<u>DESCRIPTION</u>
86-038-00	06/05/86	B	PRESSURE BOUNDARY VIOLATION WITHOUT PROPER NOTIFICATION
86-039-00	06/25/86	B	CBI SIGNAL DUE TO CHLORINE DETECTOR FAILURE
86-040-00	07/21/86	B	CBI SIGNAL DUE TO CHLORINE DETECTOR FAILURE
86-041-00	07/24/86	E	RX TRIP CAUSED BY LOW LOW STEAM GENERATOR LEVEL DUE TO HIGH LEVEL FEEDWATER ISOLATION
86-042-00	07/25/86	B	SAFETY INJECTION ACTUATION CAUSED BY INTERMITTENT RESETTING OF PRESSURIZER LOW PRESSURE SI BLOCK
86-043-00	07/29/86	B	INCORRECT MAIN STEAM SAFETY RELIEF VALVE BLOWDOWN RING SETTINGS
86-044-00	07/31/86	A	BYPASSED LIQUID DISCHARGE VALVE WITHOUT DOUBLE VALVE LINEUP VERIFICATION
86-045-00	07/31/86	E	CONTAINMENT LOCAL LEAK RATES EXCEEDED
86-046-00	08/01/86	E	FAILURE OF B TRAIN EMERGENCY DIESEL GENERATOR DUE TO UNKNOWN CAUSES
86-047-00	08/15/86	D	OVERTEMPERATURE DELTA T SETPOINT HIGH DUE TO ADMINISTRATIVE ERROR
86-048-00	08/17/86	A	REACTOR TRIP DUE TO STEAM GENERATOR WATER LEVEL TRANSIENT CAUSED BY OPERATOR ERROR
86-049-00	08/17/86	A	FEEDWATER ISOLATION AND REACTOR TRIP DUE TO STEAM GENERATOR WATER LEVEL TRANSIENT CAUSED BY OPERATOR ERROR
86-050-01	09/02/86	B	AREA TEMPERATURE MONITORING MS-01
86-051-00	09/06/86	E	REACTOR TRIP DUE TO LOW STEAM GENERATOR LEVEL CAUSED BY FAILED FEEDWATER ISOLATION VALVE
86-052-00	09/18/86	A	MISSED FIRE PROTECTION SURVEILLANCE

<u>LER NUMBER</u>	<u>EVENT DATE</u>	<u>CAUSE CODE</u>	<u>DESCRIPTION</u>
86-053-00	10/15/86	D	INCORRECT INTERMEDIATE RANGE DETECTOR SETPOINTS
86-054-00	10/30/86	B	FIRE WATCH NOT ESTABLISHED IN REACTOR CONTAINMENT WITHIN ALLOTTED TIME
86-055-00	11/06/86	E	FAILURE OF B EMERGENCY DIESEL GENERATOR TO START IN LESS THAN 10 SECONDS
86-056-00	11/30/86	A	INOPERABILITY OF "B" TRAIN SAFETY INJECTION PUMP COOLER
86-057-00	12/16/86	D	INCORRECT REACTOR COOLANT SYSTEM FLOW SETPOINTS DUE TO ADMINISTRATIVE ERROR
86-058-00	12/17/86	A	INADEQUATE RAD MONITOR SURVEILLANCES DUE TO INADEQUATE TS REVIEW
86-059-00	12/27/86	B	UNSEALED SLCRS PRESSURE BOUNDARY
87-001-00	01/13/87	A	REACTOR TRIP AS A RESULT OF CIRCULATING WATER PUMP DUE TO PERSONNEL ERROR
87-002-00	01/14/87	A	REACTOR TRIP DUE TO ACCIDENTAL RESET OF SOURCE RANGE CHANNEL BLOCK
87-003-00	01/14/87	E	FAILURE OF "B" EMERGENCY DIESEL GENERATOR TO START IN LESS THAN 10 SECONDS
87-004-00	01/29/87	B	MOTOR DRIVEN AUXILIARY FEEDWATER PUMP TRIPS DUE TO LOW SUCTION PRESSURE TRIPS
87-005-00	02/01/87	D	CONTROL ROOM PRESSURIZATION SURVEILLANCE FAILURE CAUSED BY MISPOSITIONED THROTTLE VALVE.
87-006-00	02/01/87	A	MISSED AREA TEMPERATURE MONITORING SURVEILLANCE DUE TO PERSONNEL ERROR AND PROCEDURE INADEQUACY
87-007-00	02/11/87	A	MISSED TECHNICAL SPECIFICATION ON CONTAINMENT DRAIN SUMP INVENTORY DUE TO OPERATOR ERROR

SECURITY RELATED LERs:

<u>LER NUMBER</u>	<u>EVENT DATE</u>	<u>CAUSE CODE</u>	<u>DESCRIPTION</u>
50-245/85-32	12/28/85	A	SECURITY OFFICER LEFT POST PREMATURELY
50-245/86-01	1/5/86	E	INTELLIGENT DOOR CONTROLLER FAILURE
50-245/86-02	1/18/86	E	INTELLIGENT DOOR CONTROLLER FAILURE
50-245/86-03	1/25/86	E	INTELLIGENT DOOR CONTROLLER FAILURE
50-245/86-04	2/4/86	E	INTELLIGENT DOOR CONTROLLER FAILURE
50-245/86-12	4/12/86	A	BREACH OF PROTECTED AREA BARRIER
50-245/86-13	4/14/86	A	VITAL AREA DOOR DISARMED DURING A SURVEILLANCE
50-245/86-14	4/21/86	C	BOMB THREAT HOAX
50-245/86-16	5/1/86	A	SECURITY OFFICER ASLEEP ON DUTY
50-245/86-20	8/12/86	E	LOSS OF POWER TO SECURITY SYSTEM
50-245/86-21	9/11/86	E	INTELLIGENT DOOR CONTROLLER FAILURE
50-245/86-24	11/14/86	C	CONTRACTOR VIOLATES SITE FIREARMS RESTRICTION (FIREARM DID NOT ENTER THE PROTECTED AREA).
50-245/86-30	12/11/86	A	BREACH OF PROTECTED AREA BARRIER
50-245/86-31	12/23/86	E	LOSS OF POWER TO SECURITY SYSTEM

NORTHEAST UTILITIES

THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

General Offices • Selden Street, Berlin, Connecticut

P.O. BOX 270
HARTFORD, CONNECTICUT 06141-0270
(203) 665-5000

February 18, 1987

Docket No. 50-423
B12186

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

- References:
- (1) T. E. Murley letter to J. F. Opeka, Systematic Assessment of Licensee Performance (SALP) Report No. 50-423/85-99, dated December 27, 1985.
 - (2) J. F. Opeka letter to T. E. Murley, Response to SALP Report 50-423/85-99, dated February 11, 1986.
 - (3) T. E. Murley letter to J. F. Opeka, Systematic Assessment of Licensee Performance (SALP) Report No. 50-423/85-99, dated March 21, 1986.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 3
Systematic Assessment of Licensee Performance (SALP)

The purpose of this letter is to inform you of the status of corrective actions taken as a result of the SALP Board's recommendations that were provided to us in the last SALP review period. In addition to providing you with the status of corrective actions, we would also like to take this opportunity to provide some information concerning our performance over the past year which we believe will be useful to the SALP board in their next assessment of Millstone Unit 3. In Reference (1), the NRC issued the Millstone Unit 3 SALP report for the twelve month period ending August 31, 1985. In Reference (2), Northeast Nuclear Energy Company (NNECO) provided its responses and comments on SALP Report No. 50-423/85-99. In Reference (3), the NRC provided its comments on NNECO's Reference (2) submittal.

At the time of our last submittal (Reference 2), a number of corrective actions had been completed and they were addressed in that letter. This submittal will provide information, which is contained in Attachment 1, on the additional corrective actions taken since then.

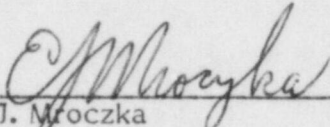
Additionally, Attachment 2 provides a summary of some of the key accomplishments on Millstone Unit 3 over the past year as well as some examples of Northeast Utilities (NU) productive participation in industry activities and positive involvement in the regulatory process.

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We believe that you will find the actions outlined herein that address the Board's recommendations satisfactory and that you may find the additional information on our positive involvement in the regulatory process to be of value in your next SALP assessment of Millstone Unit 3. Please feel free to contact us if you require any additional information.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY



E. J. Mroczka
Senior Vice President

cc: Dr. Thomas E. Murley, Regional Administrator, Region 1
E. L. Doolittle, Licensing Project Manager, NRR
J. T. Shedlosky, Senior Resident Inspector, Millstone Unit No. 3

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Attachment 1

Northeast Nuclear Energy Company
Millstone Unit No. 3
Update to SALP Report 50-423/85-99 Recommendations

February, 1987

Functional Area: OPERATIONS SUPPORT

Board Recommendation:

Review control of and training for jumpers and lifted leads, tagging, log keeping, and shift turnover requirements to assure controls are adequate for power operation.

Status:

NNECO has implemented Millstone Station Administrative Control Procedures ACP-QA-2.06.A, B & C, which cover control of bypass jumpers, lifted leads, and tagging; ACP 6.12, shift turnover; and ACP 10.05, log keeping requirements for all plants at the Millstone Station. The controls delineated in these procedures were initially implemented at Millstone Units 1 and 2 and have proven to be very effective. In order to assure these controls were appropriate for power operation and to familiarize Millstone Unit 3 operating personnel with these procedural requirements prior to power operation, these procedures were instituted during startup testing, far in advance of power operation.

In April, 1986, the NRC conducted an operations audit on Millstone Unit 3 (Audit No. 8612). No weaknesses in the area of bypass jumper and lifted lead control were identified.

Functional Area: RADIATION CONTROL

Board Recommendation:

Assure the FSAR accurately describes the solid radwaste system.

Status:

At the present time, the FSAR reflects the as built configuration of the solid radwaste system. The FSAR will be updated in accordance with 10CFR50.71 to reflect any modifications made to the system in the future.

We would also like to provide some information concerning our performance over the past year in the area of radiological controls at Millstone Unit 3. As noted in the Millstone Unit 3 SALP report (Reference (2)), the radiological controls implemented at Millstone Unit 3 are identical to those which have been used at Millstone Units 1 and 2. As a result of SALP Board recommendations on Millstone Units 1 and 2, NNECO has strengthened radiological controls in several areas, namely radiation worker training, radiation exposure reduction, and radwaste handling and shipping.

Radiation Exposure Reduction

With regard to radiation exposure, the cumulative exposures at Millstone Unit 3 have been extremely low. The 1986 total was about 27 person rem. Corporately, NU has recently undertaken a program to lower collective exposures for all of our plants to meet INPO goals. The program is investigating methods of reducing dose rates and work scope in high radiation areas, and improving worker efficiency at all plants.

Radwaste

Several changes have occurred during the past year which are expected to yield significant improvements in the implementation of the Millstone Station radwaste management program. Examples of these are:

- o The Millstone radwaste handling group has been expanded in size and reorganized under a separate supervisor who is responsible solely for implementation of the radwaste management program.
- o Increased training is being given to radwaste handling and quality control personnel to expand their knowledge of radwaste manifest preparation, shipping, and burial regulations.
- o Nuclear Engineering and Operations Procedure 6.07 "Quality Assurance and Quality Control in Station Radioactive Material Processing, Classification, Packaging, and Transportation" was issued which defines the quality related aspects of the radwaste shipping process.
- o A NU corporate radwaste engineering group has been approved for implementation in 1987. Staffing for this group, which will provide engineering expertise in all areas of radwaste processing, is currently underway.

Radiation Worker Training

Radiation worker training is administered as part of our General Employee Training Program and is updated annually to include lessons learned from the previous year, as well as NRC, INPO and NU significant findings from the previous year.

Additionally, supervisors have been reminded of their responsibilities in assuring worker radiation protection. This includes providing all the equipment, training and controls necessary to ensure that their workers perform their jobs both safely and efficiently.

In summary, we believe that the above actions illustrate NU's commitment to maintaining proper radiological controls at Millstone Station.

Functional Area: MAINTENANCE

Board Recommendation:

Establish a schedule for the completion and implementation of maintenance related procedures and training programs.

Status:

All maintenance procedures necessary to support operation of the unit have been approved and implemented.

Please refer to the TRAINING AND QUALIFICATION EFFECTIVENESS functional area for a discussion of the training programs related to maintenance.

Functional Area: SURVEILLANCE

Board Recommendation:

Assure surveillance procedures support future planned testing and operations. Particular emphasis should be placed on orderly development and review of procedures.

Status:

All surveillance procedures have been developed, reviewed and implemented to meet the requirements of the Technical Specifications.

Beginning in early 1985, a significant effort was expended in the development of the surveillance testing program. Many of the tests were incorporated into the startup test program which eliminated duplicate testing and permitted operational experience to be gained and factored into the surveillance test procedures.

A number of procedures for tests which are conducted during refueling outages or less frequently are still under development. These procedures are being developed on a schedule which will permit adequate review and training prior to conduct of the tests.

Functional Area: TRAINING AND QUALIFICATION EFFECTIVENESS

This functional area was not evaluated during the previous Millstone 3 SALP. However, we feel it is important to inform you of our progress in the areas of training programs.

Technical Training

On October 1, 1986, NU submitted the Millstone Unit 3 technical training program to INPO for accreditation (approximately 1 1/2 years ahead of schedule). The decision to expedite the implementation of the accreditation process was based on NU's continued commitment to excellence. In addition, the Nuclear Training Department has commenced development of training programs in the Radioactive Waste Worker and Quality Assurance/Quality Control disciplines to the same accreditation standards. This decision was predicated on the belief that even though the latter two programs are not part of the INPO accreditation effort, the critical nature of these job functions in the day-to-day operation of the unit dictate no less a quality commitment.

The Technical Training Branch is presently staffed with nine full-time technical instructors who are exclusively committed to supporting the technical training requirements of Millstone Unit 3. In addition, recognizing the invaluable benefits of practical hands-on training, NU has established a fully equipped laboratory for each journeyman discipline. During 1986, 20% of the entire training program was presented to approximately 20% of the student population. Our 1987 plans call for each mechanic, electrician, and technician to participate in approximately five weeks of technical training. The curriculum chosen for the 1987 schedule was guided by the plant supervisory staff of Millstone Unit 3 based upon their operational requirements.

In a continuing effort to establish a lead position in the industry through innovative training techniques, NU is in the process of piloting programs in the fields of team training, diagnostic training, and such practical hands-on courses as Reactor Coolant Pump Seal Overhaul. In the case of the latter, the RCP Seal course is being presented six times prior to the Millstone 3 March, 1987 mid-cycle outage. This course incorporates the use of a full scale mockup of the seal assembly mounted in a bell housing. The team training process involves Mechanics, Quality Control Engineers, Reliability Engineers, Safety Engineers, Health Physics Technicians and ALARA Engineers all simultaneously attending these courses, each offering their expertise to the training process. As a result of this multi-discipline approach, several modifications to the existing maintenance procedures have been incorporated that should reduce radiation exposure and radwaste production, while at the same time improving the overall human safety aspects of conducting the job.

Operator Training

Many significant improvements have been made in the area of Operator Training.

The organization and staffing of this branch has been strengthened to provide one supervisor for each nuclear unit with (2) assistant supervisors reporting to him. The authorized staffing level has been increased to fourteen (14) instructors per nuclear unit.

To ensure that the Operator Training Branch can attract the talented personnel necessary to perform this critical function, position grade levels have been upgraded such that many experienced plant operating personnel have been attracted to a career in the Nuclear Training Department. It is noteworthy that this action received corporate and station support, thus illustrating the recognition of the importance of the training functions.

During the past year, the Millstone Unit 3 operator training programs completed cold license training, with 42 of 45 candidates receiving NRC operator licenses. The Licensed Operator Requalification Training program was successfully completed by all licensed personnel, and the first training program for replacement operators was completed with 12 of 12 candidates receiving NRC operator licenses.

The training program for the Millstone Unit 3 Operations Shift Advisors was successfully completed in February, 1986.

The Millstone Unit 3 plant specific simulator had an availability of greater than 98% for 1986 bringing the capability for training nuclear plant operators to the highest possible level.

A job and task analysis has been completed for all operator job positions in preparation for INPO accreditation. Formal learning objectives are being developed to support operator training programs, and are being incorporated into all on-going programs as the development activity proceeds. INPO accreditation activities are firmly on track, and the Accreditation Self Evaluation Report will be submitted to INPO by November 1, 1987.

General Nuclear Training

In October, 1986 a new organization was announced for the General Nuclear Training Branch. The changes primarily affected the personnel that are supporting general training activities at the nuclear stations and should result in improved efficiency in training station engineering personnel, emergency response training, radiation worker, fire brigade, production maintenance management and medic first-aid safety training.

The Branch now consists of three sections, two of which are located at the Millstone Training Center, and one at the NU corporate office. The Millstone-based staff supports the training discussed above at both the Millstone and Haddam Neck sites and the corporate section provides corporate nuclear training for offsite engineering personnel. The corporate staff is also

responsible for managing the Shift Technical Advisor college program at Thames Valley State Technical College.

The General Nuclear Training Branch's priority goal at the present time is to achieve INPO accreditation of the Haddam Neck and Millstone Technical Staff and Manager (TSM) Training program, a goal that we feel confident about meeting. The TSM Accreditation Self Evaluation Report (ASER) was submitted to INPO on October 1, 1986 and course work refinements and teaching the approximately fifty new courses to plant engineering personnel has begun. We are hopeful that the INPO Accreditation Team will visit in the latter part of 1987 and ultimately grant NU this important certification.

Functional Area: LICENSING ACTIVITIESBoard Recommendations:

Increase management involvement in the licensing review process in order to assure more timely resolution of licensing issues.

Status:

Senior NU management is routinely and actively involved in the management of licensing issues. This is acknowledged and documented by the NRC in recent SALP reports issued on our other Millstone plants as well as Millstone Unit 3.⁽¹⁾⁽²⁾ NU has in the past and will continue to utilize all of the experience gained from its other nuclear plants to develop consistent and technically sound resolutions to safety issues. A high level of management review and approval of all correspondence with the NRC is procedurally required at NU to ensure a consistently clear licensee understanding and responsiveness to NRC initiatives. Additionally, we have undertaken several initiatives to ensure that management remains fully cognizant and involved in unresolved licensing issues. Examples of these are discussed below.

- o We have designated a Millstone Unit 3 lead licensing engineer to facilitate communications with the NRC Project Manager.
- o Our lead licensing engineer has worked closely with the NRC Project Manager to establish a prioritization system containing all key outstanding licensing items. This information is updated frequently and assures appropriate priority focus and timely resolution.
- o Periodic meetings have been held between NU management and NRC project management to assess the status of outstanding items and thus assure that adequate resources are committed to achieve timely resolution.
- o High levels of NU management have been extensively involved in industry groups that support NRC initiatives. NUMARC, AIF, INPO and EEI are representative examples.

We believe that the above actions have contributed to maintaining clear communications between the NRC and NU on outstanding information requests and other licensing actions thereby allowing timely decisions to be made to resolve outstanding issues.

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- (1) T. E. Murley letter to J. F. Opeka, "SALP Report Nos. 50-245/85-98 (Pg. 32 and 33) and 50-336/85-98 (Pg. 31)," dated August 29, 1986.
 - (2) T. E. Murley letter to J. F. Opeka, "SALP Report No. 50-423/85-99" (Pg. 28), dated December 27, 1985.

During the past year NU has continued to be very responsive to NRC staff requests for information. NU has provided information required to satisfy the following 8 of 11 license conditions requiring submittal of additional information.

- 2.C.4 - 3 Loop Operation (July 1, 1986)
- 2.C.5 - Inservice Inspection Program (May 22, 1986)
- 2.C.6 - Instrumentation for Monitoring Post Accident Conditions R.G. 1.97 Revision 2 Requirements (December 9, 1985)
- 2.C.9 - Operating Staff Experience Requirements (July 3, 1986)
- 2.C.10 - Changes to Initial Test Program (February 12, February 20, March 12, March 24, May 2, May 6, May 19, and July 18, 1986)
- 2.C.11 - Revised Small Break LOCA Methods to Show Compliance with 10 CFR 50.46, TMI Stem II.K.3.31 (June 9, 1986)
- 2.C.13 - Detailed Control Room Design Review (May 20, 1986)
- 2.C.14 - Salem ATWS Events Generic Letter 83-28 (May 13, 1986)

We have continually strived to provide comprehensive, thorough, and technically sound submittals. In cases where the NRC staff has required additional information, we have been quick to respond to the request with follow up telephone conference calls, meetings or additional written submittals.

We believe a prime example of this has been our pursuit of NRC approval for 3 loop operation. NU is unique in the nuclear industry in its request for approval to operate Millstone Unit 3 with one reactor coolant loop isolated. We have expended substantial resources to ensure that our request was founded on a firm technical base. We have consistently demonstrated diligence in our follow-up of NRC staff questions and concerns by providing additional information in meetings, telephone conference calls and written correspondence. In each case, NU was able to provide the NRC with the necessary information "on-the-spot" or was able to obtain a clear understanding of what was required to resolve the concern in a timely manner. It is our understanding that we have provided all of the information necessary for the NRC to complete its review of this issue and we are awaiting the staff's final safety evaluation and approval. We have had a very cooperative working relationship with the NRC on this unique licensing application.

Another area which we feel exemplifies our responsiveness to the NRC is updating the Millstone Unit 3 FSAR. Three FSAR updates were submitted within the first year following license issuance whereas 10CFR50.71 does not require submittal of the first update until two years. NU has committed substantial resources to enable us to exceed regulatory requirements in this regard.

We continue to maintain a knowledgeable and highly motivated licensing staff. Millstone Unit 3 licensing personnel have received training both in-house and outside in areas such as:

- Quality Assurance
- The Nuclear Safety Ethic
- Nuclear Engineering and Operations procedures affecting licensing (technical specification changes, license amendments, safety evaluations, FSAR updates)
- Millstone Unit 3 Systems
- NRC Unresolved Safety Issues

Additionally, Millstone Unit 3 licensing personnel are participating on various subcommittees of the Westinghouse Owners Group.

In summary, we feel that the licensing activities associated with Millstone Unit 3 continue to demonstrate that NU management is firmly committed to providing the proper resources and direction necessary to effectively resolve all issues which have the potential to affect the safety of the plant.

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Attachment 2

Northeast Nuclear Energy Company
Millstone Unit No. 3
Examples of NU Performance During Current SALP Period

February, 1987

The following is a summary of various meetings, letters, or other activities that occurred during the period January 1, 1986 to January 31, 1987 which we feel are relevant to the Millstone Unit 3 SALP evaluation.

- o The following plant startup milestones were achieved:
 - January 23, 1986 - Initial criticality.
 - January 31, 1986 - Issuance of Millstone Unit 3 operating license NPF-49 authorizing full power operation.
 - April 21, 1986 - Completion of the startup test program.
 - April 23, 1986 - Start of commercial operation.
- o January 8, 1986 - A meeting was held between NU management and NRC/NRR to discuss the status of remaining licensing issues prior to issuance of the full power operating license.
- o January 9, 1986 - A meeting was held between NU management and NRC Region 1 to discuss the status of remaining licensing issues prior to issuance of the full power operating license.
- o January 23, 1986 and February 19, 1986 - Meetings were held between representatives of NU and the NRC to discuss the issue of station blackout with respect to Millstone Unit 3.
- o March 18, 1986 - NU submitted a letter providing additional information on station blackout for Millstone Unit 3.
- o May 12, 1986 - A meeting was held between representatives of NU and the NRC Licensing Project Manager at the Millstone Station to discuss the status of licensing activities.
- o June 18, 1986 - NU provided comments on the proposed station blackout rule. NU has been an active member of the industry effort to resolve the USI-A-44, Station Blackout issue. In this regard, the industry, via the Nuclear Utility Management and Resource Committee (NUMARC) and the Nuclear Utility Group on Station Blackout, has been working with the Staff towards a mutually agreeable resolution to this issue. NU personnel have lead roles in these committee initiatives.
- o June 18, 1986 - NU submitted a letter proposing to extend the use of Integrated Safety Assessment Program methodology to Millstone Units 2 and 3.
- o June 25, 1986 - NU submitted Revision 1 to the Millstone Unit 3 Inservice Test Program for pumps and valves.

- o July 3, 1986 - NU submitted a letter providing information regarding actions taken by NU in response to IE Information Notice 86-47, Erratic Behavior of Static "0" Ring Differential Pressure Switches. Although a response to this Information Notice was not required, NU felt it was appropriate to inform the NRC of our followup on this issue because Millstone was specifically mentioned in the Information Notice as having received the subject switches.
- o July 15, 1986 - A meeting was held between representatives of NU and NRC project management to discuss the status of licensing activities.
- o July 22, 1986 - NU submitted the Millstone Unit 3 startup report.
- o July 28, 1986 - A meeting was held between representatives of NU and the NRC to discuss NRC staff concerns related to 3-loop operation of Millstone Unit 3.
- o On September 17 and 18, 1986, NU hosted a Region I Fire Protection Organization seminar. The seminar was attended by NRC representatives from NRR and Region I as well as numerous utility representatives. The seminar was well received by all in attendance with recommendations that similar seminars be held in the future.
- o In September, 1986, NU implemented an emergency preparedness surveillance tracking system at the Millstone Station to ensure that facilities and equipment are maintained operational.
- o On October 1, 1986, NU provided comments on a draft report written by Brookhaven National Laboratory entitled "Evaluation of Reliability Technology Applicable to LWR Operational Safety." NU has undertaken numerous initiatives aimed at maintaining high safety system availability, such as development and use of living PRAs and implementation of a Safety System Unavailability Monitoring Program.
- o On November 19, 1986, a full participation emergency exercise was successfully conducted at the Millstone Station. The exercise, which involved Connecticut, Rhode Island, and local Emergency Planning Zone communities, was evaluated by both FEMA and the NRC. No major findings of deficiencies were identified.
- o On January 13, 1987, Millstone Unit 3 completed 128 days of continuous operation and established a plant record for continuous service.
- o In an effort to improve the timeliness of providing site access to NRC inspectors, NU developed and implemented a "Read and Sign" training program. On October 10, 1986, NU transmitted a letter to the NRC Region I describing the program and our plans for implementing it.

- o Noteworthy changes which have occurred in the implementation of the NU QA/QC programs include the following:
 - The Operations QA staff has been relocated from the corporate offices to the Millstone site. This action is expected to increase the effectiveness of the quality organization by maintaining a full-time presence on site. This will allow improved communication between the plant operating staff and QA staff and will expand the QA department's knowledge and evaluation of plant problems by allowing increased observation of on-going plant activities.
 - A standardized corporate QC manual has been issued which will result in the Haddam Neck, Millstone, and Betterment Construction QC organizations working to the same set of procedures. This will assure consistent application of all QC activities and will allow better utilization of personnel because all inspectors will be trained and qualified to the same program.