ENCLOSURE 1

FINAL SALP REPORT

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

50-289/87-99

GENERAL PUBLIC UTILITIES NUCLEAR CORPORATION

THREE MILE ISLAND NUCLEAR GENERATING STATION

ASSESSMENT PERIOD: November 1, 1987 - January 15, 1989

MANAGEMENT MEETING DATE: April 10, 1989

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I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) program is an integrated NRC staff effort to collect the available observations and data on a periodic basis and to evaluate licensee performance based upon this information. The SALP is supplemental to normal regulatory processes used to ensure compliance with NRC rules and regulations. The SALP is intended to be sufficiently diagnostic to provide meaningful guidance to the licensee's management to promote quality and safety of plant construction and operation.

An NRC SALP Board, composed of the staff members listed below, met on March 2, 1989, to review the collection of performance observations and data to assess the licensee performance in accordance with the guidance in NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." A summary of the guidance and evaluation criteria is provided in Section III of this report.

This report is the SALP Board's assessment of the licensee's safety performance at the Three Mile Island Nuclear Generating Station, Unit 1 (TMI-1) from November 1, 1987 through January 15, 1989. The summary findings reflect a 15-month assessment period.

SALP Board

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

Members:

M. Knapp, Director, Division of Radiation Safety and Safeguards (DRSS)
T. Martin, Director, Division of Reactor Safety (DRS)
L. Bettenhausen, Chief, Projects Branch No. 1, DRP
*J. Durr, Chief, Engineering Branch, DRS
*R. Bellamy, Chief, Facilities Radiological Safety and Safeguards Branch, DRSS
R. Gallo, Chief, Operations Branch, DRS
C. Cowgill, Chief, Reactor Projects Section 1A, DRP
R. Conte, Senior Resident Inspector (TMI) DRP
J. Stolz, Director, Project Directorate I-4, Office of Nuclear Reactor Regulation (NRR)
R. Heiman, Operating Reactors Project Manager, NRR

Other Attendees:

*C. Amato, Emergency Preparedness Specialist, DRSS
*W. Pasciak, Chief, Effluents Radiation Protection Section, DRSS
*M. Shanbaky, Chief, Facilities Radiation Protection Section, DRSS
*S. Sherbini, Senior Radiation Specialist, DRSS
*C. Smith, Safeguards Specialist, DRSS
D. Johnson, Resident Inspector (TMI), DRP
T. Moslak, Resident Inspector (TMI), DRP
F. Young, Senior Resident Inspector (Susquehanna), DRP

*Part-Time Attendees

I.A Licensee Activities

During this period, the licensee operated TMI-1 essentially at full power, except for a refueling outage and as noted in Section II.C and II.D (Forced Outages and Plant Transients). This reflected ten transition periods between power operations and hot (or cold) shutdown in addition to the two transition periods for their refueling outage. The one trip during this SALP period occurred on October 30, 1988 (the last one being on September 16, 1987). A scheduled sixty-four day refueling outage started June 17, 1988, and the licensee completed it about five days early.

Major safety-related work completed during the refueling outage was: "B" make-up pump overhaul; seal replacement for four reactor coolant pumps; steam generator mechanical cleaning and eddy current testing; installation of Regulatory Guide (RG) 1.97, Instrumentation; fuel handling bridge modification; upgrade power supply for the Integrated Control System/Non-Nuclear Instrumentation System (ICS/NNI).

At the beginning of this period, the licensee's maintenance department at TMI-1 was in the process of reorganizing into a Materiel Department. Four major groups in this department were to perform the following functions: plant materiel (corrective and preventive maintenance implementation), planning and scheduling, materiel assessment and administration.

Also, during this period, the licensee implemented a corporate reorganization, establishing a new division with Vice President for Quality and Training.

Self-assessments were completed in the maintenance and technical support functional areas.

I.B Direct Inspection and Review Activities

Four NRC resident inspectors were assigned to the site (TMI-1 and 2) throughout most of the assessment period. Total NRC inspection effort was 4693 hours (4107 hours per year). See Table I for functional area expenditures.

Special team inspections were: Outage Team Inspection (88-17) and Emergency Preparedness Exercise (88-28).

Also, the Office of Nuclear Reactor Regulation (NRR) sent a team to review the design of electrical power distribution.

Six violations (five Severity 4, one Severity 5) were issued. These are listed in Table 2.

II. SUMMARY OF RESULTS

II.A Overview

The licensee operated TMI-1 in a safe manner throughout the rating period. In all functional areas, programs are well established. These programs are carried out by knowledgeable personnel who are appropriately trained.

During the period, the operating record at the facility was excellent. Overall plant material condition remained good. One reactor trip occurred as a result of equipment failure. Operators responded alertly to other conditions such as equipment malfunctions to prevent plant transients. The excellent operating record is a reflection of a high level of performance in plant equipment material condition, operator performance, and overall management oversight of the facility.

In general, management involvement in maintenance and surveillance was effective and outage management was excellent. Several important initiatives have been taken including a restructuring of the maintenance department. The principal weaknesses observed were in specific job planning, increased personnel errors, and nonradiological chemistry laboratory operations. This led to the decline in performance in the maintenance area noted during the period.

Strong programs continue in the radiological controls, emergency preparedness, and security areas. Improvements in the emergency preparedness area in response to NRC concerns and communication problems in the last SALP were positive and returned that program to its previous strong level of performance.

Engineering and technical support performance improved; this was most notable in engineering support to the 7R refueling outage. A technical support self-assessment was completed and corrective actions were begun.

Licensee programs to identify and correct problems are thorough and the various review groups are active in assessing plant performance. Root cause determination and corrective action implementation although effective, sometimes result in a lengthy process. A recent noteworthy improvement in this process is the high quality of the human performance evaluations of selected incidents. Although overall improvements have been made in procedure adherence, progress in these achievements has been slow, particularly in administrative controls.

Overall, licensee performance during this period continued to be very good. The refueling outage was a noteworthy example of this performance. Completion of corrective action programs underway and management attention to problems existing or identified in the future should continue this progress.

SEE AMENDED PAGE

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II.B Facility Performance Tabulation

This SALP report incorporates the recent NRC redefinition of the assessment functional areas. Changes include combining the previously separate maintenance and surveillance areas and addition of the safety assessment/quality verification area. The safety assessment/quality verification section is largely a synopsis of observations in other functional areas. Additionally, the fire protection, licensing, refueling/outage, training, and assurance of quality areas have been incorporated into the remaining functional areas as appropriate.

Functional Area	Rating Last Period*	Rating This Period**	Trend
A. Plant Operations	2	1	
B. Radiological Controls	1	1	
C. Maintenance/Surveillance***	1/1	2	
D. Emergency Preparedness	1	1	
E. Security/Safeguards	1	1	
F. Engineering/Technical Support	2	2	Improving
G. Safety Assessment/Quality Verification	#	2	
H. Fire Protection	2	#	
I. Licensing Activities	2	#	
J. Refueling/Outages	2	#	
K. Training and Qualification Effectiveness	1	#	
L. Assurance of Quality	2	#	

*November 1, 1986, to October 30, 1987
**November 1, 1987, to January 15, 1989
***Previously addressed as separate areas of Maintenance and Surveillance
#Not addressed as a separate area

II.C Unplanned Shutdowns, Plant Trips/Transients, Forced Outages

Date	Level	Functional Area	Root Cause	Description
11/17/87	100%	Maintenance/ Surveillance	Procedure Inadequacy	Turbine runback from 100 percent to 70 percent power due to the loss of one main feedwater (MFW) pump. The loss of one MFW pump was due to poor maintenance procedure for restoring a condensate booster pump breaker to service which resulted in inadvertent loss of the second feedwater booster sump such that only one booster pump remained running. This condition tripped one MFW pump.
2/16/88	100%	N/A	Unknown	A three-day forced outage due to heat transfer surface fouling of the main generator stator cooling system, apparently due to excessive levels of oxygen in the cooling system.
9/17/88	100%	N/A	Unknown (Repetitive - See 12/15/88)	A nine-day forced outage to repair the No. 1 seal for the "D" reactor coolant pump (RCP) that was apparently improperly installed during the Cycle 7 refueling outage.
10/17/88	100%	Maintenance/ Surveillance	Material Failure	A two-day forced outage to repair an oil leak in the lubricating system for "C" RCP. The oil leak was at pipe-to-oil cooler weld. The licensee conducted a reactor startup prior to completion of a proper post-maintenance test. This required a reactor shutdown and second startup to completely repair the leak.

Date	Level	Functional Area	Root Cause	Description
10/30/88	100%	N/A	Unknown	A reactor trip occurred on high Reactor Coolant System (RCS) pressure because the main turbine generator control valve went shut. The root cause could not be specifically identified, but certain electro-hydraulic control system components were found to be malfunctioning and were replaced without a repetitive event.
12/15/88	100%	N/A	Unknown (Repetitive - See 9/17/88)	A fourteen-day forced outage to repair the No. 1 seal of the "D" RCP. This was the second failure of the No. 1 seal runner O-ring since start-up from the 7R outage. A shaft alignment problem was suspected.

II.D Other Minor Plant Transients and Reduced Power Periods

This listing is representative of the types of events that resulted in situations which challenged operators to respond.

-- On January 18, 1988, at 4:46 a.m., there was a transient from 100 to 101 percent power, due to a malfunction in the Integrated Control System (ICS). The operators manually stopped the transient.

-- On January 22, 1988, between 5:19 p.m. and 5:33 p.m., there was a transient between 101 and 90 percent power which was operator induced while switching between manual and automatic ICS control during maintenance work on the ICS.

-- On January 28, 1988, between 1:10 p.m. and 1:20 p.m., there was a transient from 100 to 97 percent power, apparently due to ICS malfunction in feedwater demand signal processing circuits.

-- Between 3:57 p.m., January 31, 1988, and 2:10 a.m., February 1, 1988, the licensee operated at reduced power (approximately 77 percent) in order to make repairs to a feedwater pump (FW-P-1A). Coupling grease had leaked out of the feedwater pump coupling causing excessive vibrations on the pump.

-- On October 11, 1988, a momentary plant runback (100 percent to 96 percent) occurred when a component in the ICS unit load demand circuit malfunctioned.

-- On October 13, 1988, a minor plant transient occurred when an instrument and control (I&C) technician inadvertently removed an electronic component from service in the ICS.

Control room operators responded to all the above transients to prevent a plant trip/runback and to restore the plant to normal steady-state conditions.

III. CRITERIA

Licensee performance was assessed in selected functional areas significant to nuclear safety and/or the environment. The following were evaluated, as applicable, to assess each area.

1. Assurance of quality, including management involvement and control.
2. Approach to the resolution of technical issues from a safety standpoint.
3. Responsiveness to NRC initiatives.
4. Enforcement history.
5. Operational events (including response to. analyses of, reporting of, and corrective actions for).
6. Staffing (including management).
7. Effectiveness of training and qualification.

Each functional area was rated as being one of the following.

1. Category 1. Licensee management attention and involvement are readily evident and place emphasis on superior performance of nuclear safety or safeguards activities, with the resulting performance substantially exceeding regulatory requirements. Licensee resources are ample and effectively used so that a high level of plant and personnel performance is being achieved. Reduced NRC attention may be appropriate.

2. Category 2. Licensee management attention to and involvement in the performance of nuclear safety or safeguards activities is good. The licensee has attained a level of performance above that needed to meet regulatory requirements. Licensee resources are adequate and reasonably allocated so that good plant and personnel performance is being achieved. NRC attention may be maintained at normal levels.

3. Category 3. Licensee management attention to and involvement in the performance of nuclear safety or safeguards activities are not sufficient. The licensee's performance does not significantly exceed minimum regulatory requirements. Licensee resources appear to be strained or not effectively used. NRC attention should be increased above normal levels.

The SALP Board also considered assigned performance trends for the last quarter of the SALP period. A trend is assigned if definitely discernible, if the SALP Board concludes that its continuation might change the performance level, and if considered necessary to either focus attention on declining performance of acknowledge improving performance. The SALP trend definitions 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 and the licensee had not taken meaningful steps to address this pattern.

A trend is assigned only when, in the opinion of the SALP Board, the trend is significant enough to be considered indicative of a likely change in the performance category in the near future. For example, a classification of "Category 2, Improving" indicates the clear potential for "Category 1" performance in the next SALP period.

It should be noted that Category 3 performance, the lowest category, represents acceptable, although minimally adequate, safety performance. If at any time the NRC concluded that a licensee was not achieving an adequate level of safety performance, it would then be incumbent upon NRC to take prompt appropriate action in the interest of public health and safety. Such matters would be dealt with independently from, and on a more urgent schedule than, the SALP process.

It should also be noted that the industry continues to be subject to rising performance expectations. NRC expects licensees to use industry-wide and plant-specific operating experience actively in order to effect performance improvement. Thus, a licensee's safety performance would be expected to show improvement over the years in order to maintain consistent SALP ratings.

Further, in this assessment, training programs are evaluated within the engineering/technical support functional area.

IV. PERFORMANCE ANALYSIS

IV.A Plant Operations

IV.A.1 Analysis

The previous SALP report rated this area as Category 2 with a need to further improve procedural compliance, develop documentation and evaluation for minor operational events, enhance interfaces between operations and engineering/test personnel under schedular pressure. Positive aspects identified in this functional area included a strong post-trip review process, improvements in management's involvement in day-to-day operations, a high quality of operator training, and a high degree of professionalism by control room personnel.

This section of the SALP report now includes refueling and outage management (previously Category 2), which was previously rated as a separate functional area. This SALP was based on monthly resident inspections and one team inspection covering the maintenance/modification activities conducted during the 7R refueling outage. It also was based on augmented NRC coverage during Cycle 7 start-up and during other outage transition periods.

During routine power operations, the licensee maintained a professional environment in the control room and assured that distractions to the operating crews would be kept to a minimum. Operators rigorously controlled access to the control room proper to restrict the number of non-essential personnel in this area. Shift supervisors consistently maintained authority over activities and provided detailed turnover briefings to the relief crews. Operating crews consistently demonstrated a detailed knowledge of plant design and procedural requirements associated with equipment operation. The approach to full-power operation following the 7R refueling outage was deemed to be deliberate, conservative, and professional. Management decisions to address a number of typical minor equipment problems were based upon safety considerations even if it meant slipping the schedule. Although frequent involvement by the Operations Manager; Director, Operations and Maintenance; and TMI Director were apparent, the operators did not appear to be rushed to get the plant back on line. Response to alarms and off-normal conditions was prompt and appropriate to the situation.

Operator vigilance during steady-state and transient conditions was excellent. A number of minor transients (Section II.D) resulted from equipment malfunctions and maintenance personnel errors. Licensee middle management appropriately sensitized operators to the potential impact on the plant when the Integrated Control System (ICS) manipulations or work was on-going. For all transients, control room operators responded alertly to prevent a plant trip/runback and quickly restored the plant to normal, steady-state operations. The event that resulted in exceeding the RCS technical specification limit for plant heat-up rate and some other minor events were due to poor communications, not poor vigilance. Overall, operators acted in a conservative manner with respect to nuclear safety.

There were some misunderstandings during power operation and during the outage regarding operator knowledge of plant status. One significant miscommunication occurred during simultaneous maintenance and operational use of Reactor Coolant System (RCS) drain piping. The event resulted in a spill of radioactive water onto the reactor building (containment) floor. One LER on inoperable chlorine detectors resulted from a miscommunication on the status of the detectors. The licensee's self-review identified a problem in maintaining a knowledge of plant status during outages. Operating personnel had to coordinate and control a large number of diversified maintenance jobs and modification activities being performed in various plant areas. There was not an effective method of keeping track of all of these activities early in the outage.

Two senior reactor operator and five reactor operator candidates were administered written and operational examinations and licenses were issued to all including one RO candidate who required a retest. All candidates exhibited weaknesses during the operating test portion of the examinations on the simulator in that they were unable to identify the cause of various instrument failures in the Integrated Control System (ICS). While overall operator training is satisfactory, training management needs to pay closer attention to simulator transient response training. However, as stated above, operator response to actual transients was good.

Overall, operators were well trained for all plant modifications installed during the refueling outage. In addition to classroom training on major changes, the operations department issued substantial training handouts which also were beneficial to the support and management personnel who needed knowledge of facility changes.

Upper and middle management attention to and involvement in plant operations were evident. They continued to implement a number of positive measures described in past SALP reports. Such involvement resulted in an enhancement to identify plant problem areas. The most notable example of their conservative approach to safe operation included shutting down the plant to investigate the cause of the reactor coolant pump problem before they exceeded any Technical Specification (TS) limits. As further evidence of their involvement in this area, middle management instituted a number of initiatives as described below. Plant housekeeping was good throughout this SALP period as a rule. Following the refueling outage, the quality of housekeeping trended downward in areas where system modification work was in progress. Housekeeping in the radiologically controlled areas as noted in the Radiological Controls section of this report is good.

Middle management took a number of initiatives to further improve overall operational performance. Included in these initiatives was a program to cross-assign extra shift supervisors (SS) among shifts in order to free up the most experienced SS's for other support duties, such as simulator training. They also instituted a plant component labeling system along with enhanced shift turnover notes in the interest of efficiency. Further, upper management detailed operating personnel to participate in INPO evaluations at other sites. Also, the licensee implemented several administrative control initiatives to adequately log and further evaluate incidents having relatively minor significance. However, these actions were not completely effective. Preliminary review by inspectors identified that related guidance on such incidents was incomplete. The licensee implemented revised guidance at the end of the SALP period. The effectiveness of all of these measures remained to be determined.

The overall planning of all the outage activities was effective due to good performance in the areas of inter-departmental and contractor interfaces, routine status meetings, radiological controls, as well as management attention and involvement. The plant had four forced outages (Table II.C); two of these were for maintenance to repair the No. 1 seal on the "D" reactor coolant pump (RCP). Each unplanned outage required significant "impromptu" replanning of manpower resources, vendor interfaces, training, as well as special testing, especially during weekends.

The results were that the licensee's overall planning and implementation of maintenance activities were well coordinated and effective. Management's involvement in assuring successful completion of each outage was noteworthy. Considerable resources were expended on determining the cause of the "D" RCP seal problem but no definitive root cause was determined.

Inspections noted improved performance in the area of adhering to operational procedures. This is in contrast to administrative control procedure adherence. The licensee's Quality Assurance Department similarly noted these results, but they also identified a continuing problem in the area of adherence to administrative controls (see Section IV.G). Inspectors noted proper alignment of systems in accordance with operational procedures. Despite weaknesses stated in the last SALP report, the licensee's independent verification program continued to be effectively implemented to assure proper safety system alignments. However, as noted below, some discrepancies in the area of procedure adequacy continued to challenge operators to comply with procedures.

In general, inspections confirmed the adequacy of procedures, especially with respect to safety system alignments. The licensee made improvements in the quality of emergency operating procedures (EOP's). However, inspectors continued to note individual step inadequacies in some of the relatively frequently used procedures. One problem occurred in that two valves had been inadvertently omitted from a valve lineup checklist for the emergency diesel generators. Other minor procedural deficiencies caused operator confusion in some instances and had the potential to cause procedural non-adherence. None of these examples within this functional area resulted in an event of major safety significance. However, such discrepancies indicated that the biennial procedure review process, was not completely effective in preventing procedure problems.

In summary, operator professionalism, competence, and vigilance were significant operational strengths and operator training was conducive to this strong overall performance. There was improved performance in adhering to the operational procedures, but the quality of certain administrative control procedures needs to be improved. Middle management control of plant operations and outage activities was very good. All levels of management were involved in the conduct of daily operations. Middle and upper management acknowledged areas where improvements were needed. In some cases, however, management response was slow in implementing corrective actions to improve performance in these areas. Operator performance continued to significantly contribute to the overall excellent operating record of TMI-1.

IV.A.2 Performance Rating: Category 1.

IV.A.3 Recommendations: None.

IV.B Radiological Controls

IV.B.1 Analysis

The last SALP report rated this area as Category 1. Concerns during that period were limited to occasional improper posting of high radiation areas as well as several deficiencies in performing surveys in connection with some radwaste operations.

Two specialist inspections were conducted in this area during the current SALP period. In addition, there were routine reviews by the resident inspectors.

Performance in the areas of concern identified during the last period has improved. Performance in radiological controls, in general, has maintained the same level of high quality as that observed during the last SALP period. Management at all levels remains involved in the daily activities on site and is also constantly apprised of the details of on-going and future radiologically significant activities. The responsibilities of the managers and supervisors are clearly defined and are well understood by the staff. Management at all levels also remains responsive to concerns expressed by the staff or by the NRC. As an example, a review of the issues raised in incident reports and concerns raised by workers shows that the radiological engineers consistently study these issues, make recommendations, and initiate corrective action, if appropriate. Audits of the site radiological controls program, both internal and corporate, are performed periodically and the findings are evaluated and acted upon. One concern in this area was the inadequate planning of scaffolding erection during the last outage. The result was unnecessary radiation exposure. Management's responsiveness is exemplified by the fact that this deficiency was recognized and plans were made to improve performance in the next outage.

Radiation exposure and access control by radiation work permit remains effective and the job descriptions and access requirements in the permits are generally good. Surveys are usually of high quality and are timely as is the air sampling program. Personnel contamination control is effective and well documented. Although surveys are routinely performed on schedule, a minor concern in this area is that new surveys are sometimes not posted in place of the expired surveys in all the areas. Surveys and measuring instruments are routinely calibrated on schedule. Support programs, such as the respirator maintenance facility, personnel dosimetry, and instrument service and calibration facility, are effective and well run by competent professionals.

The training programs for radiation workers and for the health physics technicians are good. The staff in charge of these programs are competent and experienced in plant operations. Based upon the staff's limited observations, we consider the health physics staff to be well qualified and well trained.

Performance in the area of ALARA continues to be good. Outage planning is still being performed in a satisfactory manner and ALARA oversight during major jobs is being provided by competent radiological engineers. Jobs are being reviewed routinely for incorporation of ALARA measures and long-term source reduction efforts

are on-going. These efforts include system and area decontamination, a cobalt reduction program, mock-up training, and improved procedures, such as those for eddy current inspections, based on lessons learned from previous outages. Despite these efforts, however, the dose goal (120 man-rem) was exceeded during the last outage (157 man-rem). The reasons appear to be a combination of planning problems associated with scaffolding erection, hot transient working conditions, and unexpectedly high minor maintenance work. Licensee's responsiveness to identified problems is exemplified by a demonstrated awareness of the problem (scaffolding erection planning) and its causes and the formulation of solutions to prevent recurrence. Solutions include the use of permanent or semi-permanent scaffolding and a more detailed mapping of the locations of items such as valves and welds that may require maintenance and inspection in the future. Locating such items, many of which are in relatively high dose rate areas, has contributed significantly to the cumulative exposure for the last outage. The cumulative exposure, though higher than the estimate, is indicative of good performance.

Three inspections of the licensee's solid radioactive waste (radwaste) and transportation program were performed, including processing, preparation, packaging, shipping, quality controls, and audits. Two problems occurred with radwaste shipment manifests associated with TMI-2 decontamination. Licensee corrective actions to correct the problem were prompt and appeared to be of sufficient depth to prevent recurrence. Additionally, the training program for personnel in this area was found to be strong. Despite the problems, the licensee is maintaining an effective program in this area.

Three inspections of the licensee's effluent controls were performed during the assessment period. Effluent control procedures were very detailed and accurate. The licensee properly implemented its Off-Site Dose Calculation Manual (ODCM). The dose calculation methods were found to be comprehensive and adequate to accomplish their purpose. The licensee's dose calculations were performed in accordance with the procedures that implement the methodology described in the ODCM. Release permits were properly completed and accurate with respect to dose calculations. Good agreement was obtained between expected and actual responses of selected effluent monitors, as confirmed by the inspector's calculations. Operability checks and calibrations were performed as required. The licensee maintains good control over deficiencies identified during calibrations and tests. The licensee is maintaining an excellent program in this area.

Two inspections of the licensee's radiological environmental monitoring program were conducted including Quality Assurance/Quality Control (QA/QC) of the analytical laboratory, comparison of the collocated thermoluminescent (TLD) monitoring results and meteorological monitoring program. QA/AC of the analytical laboratory is well maintained. The monitoring results of the licensee's TLD's collocated with NRC's are generally in agreement. Calibration and preventive maintenance of the meteorological instrumentation was found to be adequate. The annual environmental monitoring report was reviewed and found the licensee performed all aspects (sampling, analytical sensitivities, reporting schedules, and inter-laboratory comparison) as required. The licensee is maintaining an effective program in this area.

An inspection was conducted using the NRC's mobile laboratory during the last quarter of the assessment period. The licensee's performance with respect to actual samples during the inspection was good with the exception of detecting radioactivity in a charcoal cartridge used to sample iodine effluent from the main condenser exhaust. Because of an erroneous assumption regarding distribution of iodine within the cartridge, the licensee's analysis indicated an activity of 30% lower than that measured by NRC. This problem was initially identified in 1986. During the NRC mobile laboratory analysis in 1988, the staff determined that the iodine was deposited uniformly throughout the cartridge resulting in the analysis error, and also indicating excessive moisture in the sample stream. The licensee has now committed to resolve the moisture problem and correct past effluent reports. Management response to this issue was very slow indicating that the original issue had not been elevated to the proper level of management attention. The public health consequences of this error was very small. However, the length of time taken to resolve the issue indicates occasional lack of attention to NRC inspection findings.

Summary

In summary, the radiological controls program remains effective in controlling access to radiologically controlled spaces, controlled areas are posted in accordance with applicable requirements, and good housekeeping is generally maintained in the controlled areas. Planning and control of jobs in radiological areas is also good, and efforts to minimize individual and cumulative exposure appears to be effective. Training of radiation workers and of health physics technicians is good. Support programs such as dosimetry and respiratory protection are well managed and technically current. The overall assessment is that the radiological control program onsite is a high quality program.

IV.B.2 Performance Rating: Category 1.

IV.B.3 Recommendations: None.

IV.C Maintenance/Surveillance

IV.C.1 Analysis

During the last SALP period, no major maintenance programmatic problems were evident and the licensee's performance was judged to be a positive influence on operations. The surveillance program was well managed. The implementation of the inservice inspection (ISI), as well as inservice testing (IST) of equipment, ensuring operability of safety-related equipment, was adequate and effective. A Category 1 rating was assigned to both the maintenance and surveillance areas.

During this assessment, the NRC staff combined the maintenance and surveillance areas into an equipment operability perspective. The overall assessment included routine inspections by the resident inspectors, specialist inspections by region-based inspectors, as well as a special team inspection, covering major 7R maintenance/refueling outage activities.

Maintenance Organization and Planning

The licensee conducted a self-assessment and changed the maintenance organization structure, emphasizing three areas: materiel assessment, corrective/preventive maintenance, and planning and scheduling. The new organization had qualified and experienced people in these areas and there were indications that this change would be instrumental in improving performance. Examples of the effectiveness of these changes included successful completion of the 7R outage ahead of schedule, computerizing work packages, strengthening of motor-operated valve actuator testing programs, implementation of scientific event review process, development of a maintenance plan to further improve materiel conditions of the plant. Most notable, the maintenance organization initiated a new reliability centered maintenance (RCM) program, which involved systematic assessment of systems, emphasizing functional reliability, current preventive maintenance measures, and then upgrades as necessary to enhance equipment reliability.

Despite the overall good planning and outage management efforts, several shortcomings in specific job planning and implementation for routine and outage work existed. The licensee had a total of seven violations during this assessment, with five violations attributed to this functional area. The problems were generally reflective of poor specific job planning, inadequacies in maintenance/surveillance procedures, and failure to follow administrative procedures. With respect to specific job planning, a significant example was the installation of a wrong expansion joint in the reactor building emergency cooling water system. In addition to this, there were other examples of inadequate maintenance program implementation as addressed below.

Maintenance Implementation

With respect to maintenance procedure adequacy, the inspectors noted that a substantial number of preventive and corrective maintenance procedures were established. Overall, these procedures were adequate. However, pump work was performed using a generic maintenance procedure and a substantial rework effort on one of the pumps resulted from the failure to incorporate appropriate vendor guidance into the procedure.

With respect to properly following administrative controls, there was overall satisfactory performance considering the number of measures that need to be implemented for substantial maintenance/modification work packages. However, the examples of nonadherence were significant. For example, two problems involved licensee failures to properly incorporate vendor-supplied information into specific work instructions. There were also examples of incomplete job tickets and excessive delays in making return to service signoffs, some up to three months. The licensee recognized the administrative controls problem and they were to address it by their administrative compliance task force (see Section IV.G). However, these examples were also generally reflective of a lack of awareness by licensee and contractor personnel on the numerous administrative measures that existed in this functional area.

Overall, the materiel condition of the plant based upon routine plant tours by the inspectors remained generally good. Despite a licensee program in this functional area, the inspectors noted some materiel deficiencies, such as loose conduits, connections, supports, bolts, and missing clamps. This reflects a lack of attention to detail by licensee personnel in identifying minor material deficiencies during routine and special plant tours. The licensee was responsive by developing a new procedure to further improve their current program. However, its effectiveness remained to be determined at the end of the SALP period.

Maintenance Activity Interface

During several maintenance activities, the inspectors noted substantial interfacing among the Quality Assurance/Quality Control (QA/QC), Plant Maintenance, Engineering and Operations groups. However, inspectors noted some weaknesses. Maintenance personnel caused a number of transients which challenged operators. In addition to personnel error, the root causes were similar to the causes of the examples noted above. In the area of receipt inspection, two different kinds of injectors and thermocouples as well as the jacket cooling water pump motor having the same part numbers, were received, accepted, and installed on the emergency diesels without adequate review by the responsible work groups. In one case, a diesel generator inoperability resulted. A receipt inspection error contributed to the installation. The licensee planned to re-evaluate their receipt inspection program, as well as other interface deficiencies, to prevent recurrence.

The major plant modifications were installed by Maintenance, Construction and Facilities. During the 7R outage, some of the major modifications, such as mechanical cleaning and tube plugging of main steam generators, were well managed and completed in a safe manner on or ahead of schedule with successful post-modification testing. In general, surveillance/special testing complemented maintenance/modification work.

Surveillance

Overall, the licensee continued to implement a well-established surveillance program. The surveillances were performed on schedule and adequately documented. Even though various groups were involved, they were, in general, well coordinated and the interfaces properly defined. A notable example was the licensee's reactor building local leak rate testing. In general, the surveillance procedures adequately addressed the acceptance criteria, as well as follow-up actions, on failed surveillances. The test methods and procedures were technically sound and consistent with accepted industry practice. The procedures were clear, detailed, and provided good administrative control. The personnel performing the tests were well trained and qualified. During surveillance activities, the inspectors noted that the communication among various groups was clear and each procedure step was followed and signed off by designated personnel.

There was one Licensee Event Report (LER) in this area. During a low pressure injection flow test, the licensee exceeded the technical specifications (TS) level and cooldown rate limits for the pressurizer due to procedural inadequacy. The applicable surveillance procedure had several biennial reviews (see Section IV.3) which had not identified the problem. No reactor trips were caused by surveillance activities and the personnel in various groups were knowledgeable of surveillance requirements and plant equipment.

Special Tests

The inservice testing (IST) implementation was well organized and conducted by a knowledgeable, dedicated staff. Extensive and detailed test records were readily available, an example being the setting of the main steam safety valve ring. The coordination between operations, who performed the testing, engineering, who reviewed the results, and Plant Materiel, who was responsible for overall scheduling (computerized) was excellent. An extensive audit by the Quality Assurance Department (QAD) of IST implementation in 1987 was evidence of QA's continued involvement in plant activities. The accomplishment of erosion/corrosion inspection on secondary plant piping was ahead of schedule as evidenced by the completion of approximately 75 percent of the required inspections by the end of the 7R outage.

Secondary water chemistry data were reviewed as part of the steam generators maintenance program. Eddy current testing of the steam generators clearly indicated having adequate water chemistry parameters. During the last two months of operation before the 7R refueling outage, the licensee experimented with morpholine for pH and oxygen control and the results were positive, justifying a shift to that type of chemistry control. The licensee also upgraded the chemistry laboratory by installing additional equipment. The licensee effectively controlled secondary water chemistry and provided initiatives to improve performance.

SEE AMENDED PAGE

Relative to the last SALP assessment, the nonradiological chemistry control program has declined. During an inspection of the licensee's nonradiological chemistry control program, standard solutions prepared by Brookhaven National Laboratory for the NRC were submitted to the licensee to analyze using the licensee's normal methods and equipment. Evaluation of the results indicated about 31 percent (11 measurements out of 36) of the results were in disagreement with the criteria used for comparison. These disagreements were attributable to equipment calibration technique, sampling error, determination of the minimum detectable concentrations, and training. The licensee's inter-comparison program was ineffective in identifying these concerns. The laboratory operation lacked substantial management attention.

Summary

In summary, the maintenance and surveillance activities continued to be accomplished in a safe manner. The completion of 7R outage ahead of schedule with sustained successful Cycle 6 operating run clearly demonstrated a substantial maintenance/surveillance program. Licensee management involvement at all levels was

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Relative to the last SALP assessment, the nonradiological chemistry control program remained constant. During an inspection of the licensee's nonradiological chemistry control program, standard solutions prepared by Brookhaven National Laboratory for the NRC were submitted to the licensee for analysis using the licensee's routine methods and equipment. Licensee performance on the standards was acceptable. Some minor problems were identified in the areas of instrument calibration. A recent inspection determined that this problem has been resolved.

Summary

In summary, the maintenance and surveillance activities continued to be accomplished in a safe manner. The completion of 7R outage ahead of schedule with sustained successful Cycle 6 operating run clearly demonstrated a substantial maintenance/surveillance program. Licensee management involvement at all levels was

noteworthy in development and implementation of corrective actions required in response to problems, establishment of licensee initiatives, department reorganization, and in conducting a self-assessment. The newly structured maintenance organization was fully staffed and functional, but its effectiveness remained to be realized in certain cases. The primary weaknesses observed were instances of poor specific job planning, failure to follow administrative controls, increased personnel errors, and deficiencies in nonradiological chemistry laboratory operations.

IV.C.2 Performance Rating: Category 2.

IV.C.3 Recommendations: None.

IV.D Emergency Preparedness

IV.D.1 Analysis

During the previous assessment period, licensee performance in this area was rated category 1. This rating was based upon satisfactory response capability in the full participation exercise and results of a routine safety inspection

During the current assessment period, a partial participation exercise was observed. A routine safety inspection was conducted within a week of the close of the SALP period. This analysis is based on the results of these inspections. The licensee issued a new Corporate Emergency Plan for both GPU Nuclear sites. Because of the significance of the changes, the revised Plan was submitted for NRC review prior to implementation. During the review it was identified that the Plan did not reflect the NRC guidance concerning protective actions for a General Emergency. Acceptable changes were made to the Plan and it was subsequently implemented and distributed.

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The partial participation exercise was conducted on November 16, 1988. The licensee's response was satisfactory. The scenario specified a potential station blackout, primary to secondary leakage, loss of main condenser vacuum and atmospheric steam dump. Barrier breech analysis as given in NRC guidance was applied correctly avoiding declaration of a General Emergency, the correct source term was used to calculate projected doses and Technical Support Center engineers performance was markedly improved over that for the 1987 exercise.

During the routine safety inspection, thirty items encompassing facilities, equipment, plans, procedures, communication capabilities, ongoing and improvement activities were reviewed. The Emergency Plan and Implementing Procedures are being followed and an effective emergency preparedness program and associated training program are in place. The emergency preparedness-security interface is well maintained including frequent interface meetings between the two programs. There are no apparent off site problems. The TMI off-site Radiological Emergency Response Plans have been incorporated into the single, all hazard State-wide emergency plan.

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IV.C.2 Performance Rating: Category 2.

IV.C.3 Recommendations: None.

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In addition to maintaining emergency preparedness effectiveness, the licensee has undertaken a number of improvement activities in response to NRC and GPU initiatives. In response to an NRC concern, the Technical Support Center (TSC) engineering staff number has been increased and training is being upgraded. Five engineers and a senior reactor operator have been added to the staff. In addition, a TSC Engineer's Handbook has been developed. TSC engineers have received problem solving training using this handbook plus training in Abnormal Transient Operating Guides. In order to significantly reduce the probability of a recurrence of the May 1987 communication system failure (noted in the 1987 SALP report), GPU and the Pennsylvania Emergency Management Agency (PEMA) have installed additional communication systems including an additional land line and radios for PEMA.

Senior management attention to emergency preparedness activities is evident by the interfaces with outside organizations and response to issues. The Director of GPU's Division of Environmental and Radiological Controls devotes much of his time to emergency preparedness activities and regularly updates the GPU Nuclear President on emergency preparedness matters or responds to his requests in this area.

In summary, the licensee has committed sufficient resources to emergency preparedness and has demonstrated response to GPU and NRC identified concerns. Technical issues have been resolved. Upper management has become routinely involved in emergency preparedness activities. There are no off-site problems. Exercise performance was satisfactory.

IV.D.2 Performance Rating: Category 1.

IV.D.3 Recommendations: None.

IV.E Security

IV.E.1 Analysis

During the previous assessment period, the licensee's performance was rated as a Category 1, based on a very effective security program. No major regulatory issues were identified by either region-based or resident inspectors.

During this assessment period, there were two routine unannounced security inspections performed by region-based inspectors. Routine inspections by the resident inspectors continued through the period. There was one licensee-identified violation during this assessment period for which the licensee took timely and effective action to correct the problem, identify the root cause and strengthen procedures to prevent recurrence. The self-identification of that violation and the lack of any NRC-identified violations during this and the previous assessment period are indicative of the licensee's commitment to implement an effective security program.

The licensee consolidated implementation of the Unit 1 and Unit 2 security program during this assessment period. Due to some unique circumstances at TMI, implementation of certain aspects of the physical security program were different between

Unit 1 and Unit 2. The NRC completed its review of the licensee's request to unify the program, as well as the licensee's submittals in response to the Miscellaneous Amendments and Search Requirements rulemaking and the staff's Regulatory Effectiveness Review. This review was complex and required a number of meetings, site visits and conference calls. The NRC received good cooperation from licensee personnel and was able to issue a favorable Safety Evaluation Report (SER) in September 1988. Within a month, all procedures that implement the revised Plan were also revised by the licensee. These modifications were accomplished without any adverse impact on the effectiveness of the program and is evidence of effective planning and management, as well as a sound program.

Corporate security management continued to be actively involved in all site security program matters. This involvement included site visits by the corporate staff to provide assistance, program appraisals, and direct support in the budgeting and planning processes affecting program modifications and upgrades. Site and corporate senior security management personnel also remained active in the Region I Nuclear Security Association and other organizations engaged in nuclear plant security matters. This demonstrates program support from upper level management.

The NRC-required annual audit of the security program, performed by the licensee's quality assurance group, was comprehensive in scope and depth. Contributing to the effectiveness of audits were a thorough understanding and appreciation for nuclear plant security objectives by the audit team members. In addition to the NRC-required audit, the licensee also continued to conduct self-assessments of the program utilizing experienced security management personnel from corporate headquarters and the licensee's Oyster Creek plant.

Corrective actions on findings and recommendations identified during audits and self-assessments were prompt and effective with adequate follow-up to ensure their proper implementation. The NRC believes that the comprehensive quality assurance audits and the self-assessments are major contributing factors in the licensee's excellent enforcement history and are indicative of the licensee's desire to implement an effective security program. Further evidence of this is the licensee's continued effective implementation of program enhancements that were initiated during the previous assessment period.

The programmatic problem with source training documents, which was addressed in the previous SALP period, was subsequently determined by the NRC to be inconsequential once the transition from hard copy documents to microfiche files was completed. During this assessment period, records retrieval was adequate.

The licensee submitted one security event report in accordance with 10 CFR 73.71 during this assessment period. That event involved the control of Safeguards Information that was subsequently determined to be a licensee-identified violation. The event was properly reported to the NRC and the documentation was sufficiently comprehensive to permit NRC analysis without the need for additional information. Recordable events were also found to be consistent with NRC guidance. Review of the licensee's event reporting procedures found them to be consistent with regulatory requirements and implemented by knowledgeable personnel. This is further evidence of the implementation of an effective security program.

Staffing of the security force is consistent with program needs, as evidenced by the minimal use of overtime. Members of the security force exhibited a professional appearance, good morale and demeanor. The turnover rate remains very low.

The training and requalification program is administered by two full-time instructors with assistance, as necessary, for specialized training. The effectiveness of the training program is reflected by the small number of personnel errors that occurred during the assessment period.

The licensee continued to implement a well-disseminated, strong and effective fitness-for-duty program during this assessment period. Only one instance, following an allegation, resulted in the identification of drug use by contractor employees (non-licensee personnel). The licensee took appropriate disciplinary action.

In summary, the licensee continues to maintain a very effective and performance-oriented security program. Management attention to and support of the program are clearly evident in all aspects of program implementation. The efforts expended to maintain an effective program are commendable and demonstrate the licensee's continued emphasis on a high quality security program.

IV.E.2 Performance Rating: Category 1.

IV.E.3 Recommendations: None.

IV.F Engineering/Technical Support

IV.F.1 Analysis

SEE AMENDED PAGE

This area was rated Category 2 in the previous SALP report. This area now includes Fire Protection, which was previously rated at Category 2. Inconsistent performance was noted in the areas of design and drawing control, fire protection, environmental qualification, and safety review. It was noted in the previous SALP report that in some cases site operational feedback was not effective due to schedule pressures. Discussion of licensee actions in response to these observations is included in the assessment below.

Management Involvement and Initiatives

Management has established a formal system to assign work priorities in the Technical Functions Division. This system provides a proper safety perspective in establishing priorities. Also, licensee management has established a good program to trend and analyze generic technical information and plant parameters.

The licensee has initiated an extensive, formalized training program to improve safety reviews and control over plant modifications and procedure changes performed under 10 CFR 50.59. This program has effectively improved plant modifications; however, the area of procedure changes still requires improvement. Also, in one case, a minor revision to the TMI-1 50.59 review procedure was made at the site without the concurrence of the lead corporate safety review coordinator (SRC).

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IV.E.2 Performance Rating: Category 1.

IV.E.3 Recommendations: None.

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The licensee has documented the process for engineering configuration management and has established programs for improving design basis documents, conducting safety system functional inspections, and improving as-built drawings to reflect plant conditions. These are good initiatives; their effectiveness has yet to be assessed by the NRC.

The Computer Assisted Record and Information Retrieval System provides accurate tracking and documentation of plant configuration; however, NRC inspectors found that using the system to construct the current configuration of a system is very time consuming.

The licensee is effectively using architect engineers (AE) to supplement the staff. A prime AE has been selected for each of the plants and a wide spectrum of engineering expertise is available on short notice to work with the licensee's staff. The licensee also took the initiative to make a number of significant capital improvements not required by NRC; namely, the reactor building closed circuit television and the plant communications tie switch for simulator use during emergency drills.

The licensee submitted a Level I PRA in December 1987 for the staff's information. The PRA is a state-of-the-art document and includes external events and human performance considerations. The staff is performing an abbreviated review of the PRA to assess the level of confidence that might be placed on it should it be referenced in the future licensing action decisions. The licensee has initiated an internal program to assess, on a cost-benefit basis, possible design, procedure and policy changes to address various risk contributors disclosed by the PRA. Some modifications, including those to the instrument air system, have already been initiated due, in part, to the PRA results.

Licensee upper management strongly supports participation in industry, owners groups, and professional societies. This was evident by individual participation and financial support to INPO and the number of people representing GPUN on the owners and other industry groups.

Support of Operations

During this assessment period, the licensee was effective in resolving emerging technical problems. Self-identification and resolution of the pressurizer vent valve environmental qualifications issue were noteworthy. The review of the valve function and the justification for continued operation with the valve not environmentally qualified was thorough and complete. Also, the identification of the Borated Water Storage Tank (BWST) vortexing issue was resolved in a timely and adequate manner. Resolution of a potential problem with the net positive suction head (NPSH) available to the high pressure injection (HPI) pumps in the recirculation mode was also thorough. These actions reflected good corporate engineering support. However, some other activities indicated that improvement can still be made in engineering support. For example, the load calculation for assuring the adequacy of the diesel generator was not well supported. Also, the emergency feedwater (EFW) system upgrade was not sufficiently followed through in the non-safety-related area.

Engineering support for low power physics testing was well coordinated and resulted in a trouble free start-up after the 7R refueling. The nuclear engineering staff provided good support to the operations staff during these activities.

The licensee's shift technical advisors report to the systems engineering department of Technical Functions Division. This system appears effective in providing an independent technical overview of the plant operations by the Technical Functions Division staff knowing the plant status on a day-to-day basis and being ready to provide assistance at short notice. This was evidenced by the division staff's readiness to provide assistance for the problem of biofouling in the heat exchangers at TMI before the operating staff made a request for evaluation.

Previous fire protection issues were resolved during this period. The licensee's engineering analysis was thorough. It included in-plant testing to validate the air flow/temperature models and demonstrated a significant reduction in the core melt frequency estimated in the TMI-1 PRA.

Outage Activities

Improvement in engineering support of outage activities was evidenced by successful and early completion of cycle 7R outage. Outage activities were well controlled and few problems occurred in plant restart, demonstrating the quality of the work performed. The licensee's new policy of completing the design, engineering, and supporting technical evaluations for modifications and other associated work before the start of the outage contributed to this success. This is in sharp contrast to the licensee's previous practice of engineering, design and erection of modifications going concurrently throughout the outage. Also, changes in administrative controls to improve the turnover of modifications from construction to operations were made during the assessment period.

Technical support of post modification activities needs greater attention as shown by the following instances. Opportunities to verify functional acceptability of the new post accident monitoring systems were missed. For example, functional checks of the Rector Coolant Inventory Tracking System (RCITS) level indicators during RCS fill were not routinely planned. Also, during power decreases and increases following 7R, operation of the NI-11/12 full range nuclear instrumentation was not functionally verified.

The quality of the information submitted in support of the 7R refueling and the evaluations to support raising the licensed core power level were of high quality and made requests for additional information by the staff unnecessary. The completeness of the submittals allowed issuance of the required amendments several weeks early.

Response to NRC Initiatives

Examples of response to NRC initiatives included the Integrated Control System/Non-Nuclear Instrumentation (ICS/NNI) power supply modifications and ICS upgrades with incorporation of the Smart Automatic Selector Switch (SASS) modifications for ICS

control parameters. Significant progress was made in the closeout of NRC inspection items during this assessment period. The licensee provided good support of an NRC review of several Safety Issues Management System (SIMS) issues during this SALP period.

During this period, the staff completed its review of the Babcock & Wilcox Owners Group (BWOG) generic design to fulfill the Anticipated Transient Without Scram (ATWS) rule requirements in accordance with 10 CFR 50.62. Contrary to guidance provided by the staff, the licensee proposed design failed to address a power supply separation issue and resubmittal will be required. The staff also has concerns regarding the implementation schedule for these design changes.

During the SALP period, the licensee was responsive to the previous SALP Board recommendation by briefing the NRC staff on the status of their technical support self-assessment. They conducted these briefings on two occasions during 1988; the second briefing was more definitive in terms of specifying short-term corrective actions to improve engineering support. Implementation of these corrective actions was in progress at the end of the SALP period. From these briefings, it was unclear which of these corrective actions would be preceduralized or become formal matters of corporate policy. Effectiveness of these measures also remained to be evaluated.

Staffing and Training

The licensee has maintained a stable work force in the engineering organization. The majority of the engineers and other technical personnel have been with the licensee for an extended period of time and are degreed professionals. The licensee has a comprehensive training program for entry level engineers and supports continuing expansion of technical knowledge by thorough post-graduate education and attendance in technical meetings and seminars by the technical staff.

Licensee efforts to ensure that personnel are appropriately trained on new systems, modified systems and other changes to plant systems are effective. NRC staff review of operations training handouts revealed a comprehensive and effective means for informing support personnel and management, as well as operators, of these changes.

Summary

The licensee's performance in the area of engineering and technical support is improving. This is particularly true in the support of outage activities; however, in other areas such as support of operations and management controls, additional time is required to confirm the effectiveness of licensee initiatives.

IV.F.2 Performance Rating: Category 2, Improving.

IV.F.3 Recommendations: None.

IV.G Safety Assessment/Quality Verification

IV.G.1 Analysis

In previous SALP reports, Assurance of Quality and Licensing Activities were evaluated in separate sections of the report. This new section (Safety Assessment/Quality Verification) has been created to consolidate those two sections and to encompass activities such as safety reviews, responses to NRC-generated initiatives and to provide a broad assessment of the licensee's ability to identify and correct problems related to nuclear safety. In assessing this area, the SALP Board considered attributes which are likely to be key contributors in assuring nuclear safety and verification of quality in operation of the plant. Implementation of management goals, planning of both routine and infrequent activities, worker attitudes, management involvement and training effectiveness are examples of these attributes.

In the previous SALP, Assurance of Quality and Licensing Activities both received category 2 ratings. The SALP report identified as strengths a strong modification control program, training effectiveness, a vigorous QA program and substantial upper management involvement in site and licensing activities. Weaknesses included procedure compliance, inconsistencies in the conduct of safety reviews of procedure changes, engineering support and escalation of issues identified by the QA program. Licensee performance in the areas of fire protection and equipment qualification were also identified as areas requiring improvement.

During the assessment period the NRC observed activities directed towards correcting previously noted problem areas and achieving agreement with the NRC to resolve these areas. Engineering support issues have been discussed in Section IV.F of this report. The quality of procedures and improvements in the safety review process are discussed below. The licensee also maintained an effective level of activity in the organizational components involved in identifying problems and verifying quality including Quality Assurance oversight, Independent On-Site Safety Review Group (IOSRG) reviews and the corporate Nuclear Safety and Compliance Committee (NSCC) audits. The licensee took substantial initiatives for self-assessing performance in certain functional areas. Personnel were capable of performing these self-reviews in an objective manner because of their qualifications or special training. Results indicated that these reviews were objective. The most noteworthy methodology was the Human Performance Evaluation System (HPES). Licensee management showed support for this area by committing resources to these efforts including special training. The Safety Issues Assessment Program (SIAP) was further evidence of management commitment to this effort and it represented an attempt to organize and prioritize important safety and/or regulatory issues. This prioritization was important in light of the numerous findings of the various review groups that were site or corporate based. The licensee also submitted a Level I PRA for the staff's information during this period (See Section IV.F).

During the assessment period, 59 formal licensing actions were under review. These actions included license amendments, exemption requests, NUREG-0737 action plan items, relief requests and inspection confirmatory issues. Action had been completed on 34 of these actions and 25 actions remained open as of the end of the

period. Many of these actions involved complex issues such as increasing the enrichment of the uranium fuel, reactor refueling, increasing the authorized reactor power level, accident monitoring instrumentation (Regulatory Guide 1.97), and fire protection. Fifteen amendments were issued to the TMI-1 Facility Operating License during this period. In addition, the NRC issued seven Generic Letters and six Bulletins that required licensee action and response during this period.

During this SALP period, the quality of formal submittals with regard to licensing issues remained excellent and the licensee's cooperation in resolving these issues was exemplary.

Quality Assurance Department (QAD) oversight activities continued to be a valuable asset to the licensee's organization. Audits continued to be highly technical, detailed, thorough, and reflect innovative techniques. Inspections noted that the Quality Assurance Monitoring Reports (QAMR's) reflected an excellent process of QAD documenting and verifying program implementation across all functional areas of plant activities. The QA inspectors provided detailed references, procedure requirements, and verification results. This documentation was sufficient for a knowledgeable reviewer to understand the basis on the QA inspectors' results. Further, QMAR's and Quality Deficiency Reports (QDR's) were sufficient vehicles to trend procedure adherence performance for this facility.

The Operations Quality Assurance (OQA) Quarterly Trend Review identified deficiencies through the use of Quality Assurance Shift Monitors, who look at back shift activities on a six-week cycle. In addition, the trend review appeared to be effective in that QAD conducted an overview and comparison of individual QA findings. They issued additional quality assurance action items for repetitive concerns identified. For example, the October 11, 1988, OQA Quarterly Trend Review documented eight areas where repeated QA findings indicated possible performance trends. This overview function was effective in that a preventive philosophy was implemented.

The NRC reviewed several of the licensee's 10 CFR 50.59 evaluations for plant modifications as well as changes to procedures and a special test for addition of morpholine to the feedwater system. The evaluations for hardware changes were well-done and typically supported by detailed technical reports or Safety Evaluations. The 50.59 review for the morpholine test included a consultant report providing extensive test results for morpholine exposure to various materials and data based on previous use of morpholine in other plants. In general, licensee personnel do a thorough job of evaluating changes or tests as provided by 10 CFR 50.59.

On the other hand, 50.59 reviews for administrative and operating procedure changes were sometimes found to be lacking in thoroughness, depth and documentation. The GPUN procedure for these reviews provides for an initial screening to determine if a more detailed evaluation using the 50.59 criteria is required. In several cases involving procedure changes, the documentation did not clearly document the basis for the reviewers conclusions. The staff believes additional improvements are warranted in the reviews associated with procedure revisions.

The staff notes that the licensee made progress in improving the corporate safety review process during this period. However, the manner in which the licensee is implementing this procedure at the TMI site has one remaining open issue to be resolved with the staff. Implementation of the revised corporate procedures at TMI-1 did not occur until after the end of the period; therefore, an assessment of resultant improvements at the site could not be made. Also, TMI Division Draft Procedure was not in accordance with the corporate policy for the Safety Review Process. The licensee is also participating in a cooperative effort between the NRC and the Nuclear Utility Management and Resources Council (NUMARC) to develop uniform industry guidance relating to the safety review process. In summary, the licensee has improved the quality of safety reviews in most cases and is continuing to pursue improvements in this area.

Although the attitude of management at all levels has remained positive and visible, a number of events occurred during this period (see Section IV.A of this report) that demonstrate implementation problems at the working level. Common causes that emerge are procedural inadequacies and lack of awareness and attention to detail. For example, the decay heat removal flow path was inadvertently interrupted causing core heatup due to an instrument technician performing one step of a surveillance procedure out of order. The licensee's human performance evaluation report on the event concluded that the technician became distracted by an ambiguity in the procedure, stopped to confer with other technicians, then resumed following the procedure but at the wrong step. Other procedural step inadequacies continued to exist. A number of significant problems resulted because of weak or inadequate procedures as described in the other functional areas. The biennial review process was not completely effective in producing a steady improvement in procedures overall, because of high frequency requirements and strained resources. However, inspections noted continued improvement to the Emergency Operating Procedures (EOP's). Licensee management, up to and including the Chairman of the Board, is also aware of these problems via their own self-assessment committees including the NSCC.

SEE AMENDED PAGE

The staff has also noted a few cases where initial assessments of plant event safety significance and reportability of plant events by the licensee have been incorrect and not initially entered in the operator's logs. For example, problems that occurred on June 19, 1988 during Low Pressure Injection surveillance testing were not entered in the operators logs until they were later determined to be reportable. It was determined, after studying the data, that two TS limits had been violated. In the previous SALP report, we stated that the licensee should initiate a program to evaluate less significant problems (i.e., those below the threshold of requiring a Plant Incident Report (PIR) or Licensee Event Report (LER)). The licensee has since initiated a program to highlight and review such events. The staff will continue to monitor the quality of critiques, post-trip evaluations, event investigation and resultant corrective actions. Overall, the staff considers that progress is being made in this area but at a slow pace.

The staff notes that the licensee made progress in improving the corporate safety review process during this period. Implementation of the revised corporate procedures at TMI-1 did not occur until after the end of the period; therefore, an assessment of resultant improvements at the site could not be made. The licensee is also participating in a cooperative effort between the NRC and the Nuclear Utility Management and Resources Council (NUMARC) to develop uniform industry guidance relating to the safety review process. In summary, the licensee has improved the quality of safety reviews in most cases and is continuing to pursue improvements in this area.

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The staff has also noted a few cases where licensee initial assessments of the safety significance of plant events have been incomplete. For example, problems that occurred on June 19, 1988 during Low Pressure Injection surveillance testing were not entered in the operators logs until they were later determined to be reportable. It was determined, after studying the data, that two TS limits had been violated. In the previous SALP report, we stated that the licensee should initiate a program to evaluate less significant problems (i.e., those below the threshold of requiring a Plant Incident Report (PIR) or Licensee Event Report (LER)). The licensee has since initiated a program to highlight and review such events. The staff will continue to monitor the quality of critiques, post-trip evaluations, event investigation and resultant corrective actions. Overall, the staff considers that progress is being made in this area but at a slow pace.

The quality of the licensee's LER's continued to be high during this period due to their detailed, well-written event descriptions and root cause analyses. As noted elsewhere in this report, the number of events requiring LER's dropped from ten last period to six this period and there was only one unplanned reactor trip during this 14½ month period.

In summary, the licensee made progress in enhancing this area but problems persisted. They took substantial initiatives in self-assessing their performance and this included conducting proper training and using skilled personnel on the assessment. The one noted exception was in the maintenance area in light of material condition findings during this SALP period. Established program/review groups continued to do an outstanding job of identifying problems, most notably the Quality Assurance Department efforts. Despite all of these efforts, certain long-standing problem areas continued to be noted in the areas of safety review, procedure adequacy, procedure implementation (primarily in the administrative controls area), and event handling/reporting. Solutions/corrective actions to these identified problems were slow in implementation.

IV.G.2 Performance Rating: Category 2.

IV.G.3 Recommendations: None.

SEE AMENDED PAGE

The quality of the licensee's LER's continued to be high during this period due to their detailed, well-written event descriptions and root cause analyses. As noted elsewhere in this report, the number of events requiring LER's dropped from ten last period to six this period and there was only one unplanned reactor trip during this 14½ month period.

In summary, the licensee has effective programs in place of assessing nuclear safety and verifying quality. A number of initiatives have been taken to enhance performance in this area and the personnel involved are skilled and well-trained. Established review groups, mostly notably the Quality Assurance Department, have continued to do an adequate job of identifying problems. However, implementation of corrective action in some cases has failed to correct the problems. One such example noted in this report is the thoroughness of safety reviews associated with procedure revisions, which ultimately has had a detrimental effect on procedure quality. The quality of some procedures coupled with worker inattentiveness to details have led to a small number of operational errors during this assessment period.

IV.G.2 Performance Rating: Category 2.

IV.G.3 Recommendations: None.

SUPPORTING DATA AND SUMMARIES

A. Inspection History Summary

Table 1 reflected the expenditure of staff hours in the various functional areas for all inspections that occurred during the SALP period. Inspection report numbers that covered this period 87-21 through 87-26 and 88-01 through 88-32.

In addition to the resident (normal monthly) inspections, the following team inspections occurred:

-- Outage Team Inspection (88-17); and,

-- Emergency Preparedness Exercise (88-27).

Major region-based reviews in the following programmatic areas occurred:

-- Solid Radioactive Waste Handling and Shipping (88-21 and 30);

-- Testing and Measuring Equipment (88-22);

-- Document (focus on drawing) Control (88-26);

-- Security Program and Implementation (88-02 and 30);

-- Inservice Test on Pumps and Valves (88-06);

-- Effluents Control Program (88-09, 10, and 30);

-- Radiological Control Program (88-12 and 19);

-- Radiological Environmental Monitoring (88-14);

-- Special Start-Up, Preoperational, Operations Testing (88-20, 21, and 22); and,

-- Corporate/Engineering Support (88-25).

Operator licensing examinations were documented in NRC Examination (Inspection) Report Nos. 87-25 and 88-15.

In addition to the SALP management meeting for the last SALP period, management meetings were documented as follows:

-- Technical and Safety Review Program on April 26, 1988 (88-08);

-- Technical Support Self-Assessment on May 23 and September 21, 1988 (88-05 and 24); and,

-- Refueling Outage Preparation on April 27, 1988 (88-08).

B. Enforcement Summary

Table 2 reflected a summary of the enforcement action taken by the NRC staff for TMI-1. The description of the violations are also provided.

Additionally, two violations issued to Unit 2 in the radwaste area are discussed in the analysis section of the Radiological Controls area.

On August 24, 1988, the NRC staff conducted one enforcement conference (No. 50-289/86-06) during this period, dealing with apparent violations in the area of environmental qualification of safety-related equipment for items found outside this SALP period. As a result of this review, the NRC staff issued a Notice of Violation, dated December 29, 1988, with multiple examples of failure to comply with 10 CFR 50.49. At the end of the SALP period, the licensee was preparing a response.

C. Licensee Event Reports/Analysis

Table 3 reflected a summary of Licensee Event Reports (LER's) submitted during the SALP period.

LER's adequately described events, including contributing component or system failures and significant corrective actions. The reports were thorough, detailed, well-written, and easy to understand. Narrative sections typically included details such as valve identification numbers, model numbers, operable redundant systems, dates of completion of repairs, etc. Root causes were identified.

Many LER's presented information in an organized pattern with separate headings and specific information that led to a clear understanding of the event. Previous similar occurrences were properly referenced.

With so few LER's generated, a common casual link could not be established. These LER's are indicative of performance problems identified in each of the functional areas.

D. Allegations

During this period, two allegations received in previous SALP periods were resolved by the NRC staff: (1) labor relations and technical concerns by a health physics technician (NRC Inspection Report No. 50-289/88-19); and, (2) concerns on health physics technician qualification at TMI (NRC Inspection Report No. 50-289/87-24).

A new allegation received during this period was from a private citizen on drug abuse at TMI. The individual also implicated certain licensee employees to licensee representatives. The licensee completed their review of the matter with results not substantiating the allegation against the named individuals. However, the licensee's review identified other personnel having drug test results with indication of drug abuse. The licensee took disciplinary action.

TABLE 1

INSPECTION HOURS SUMMARY

TMI-1

Area	Actual Hours	Annualized Hours	% Time
Plant Operations	1918	1587	41%
Radiological Controls	418	345	9%
Maintenance/Surveillance	1152	953	24%
Emergency Preparedness	74	61	1%
Security/Safeguards	113	93	2%
Engineering/Technical Support	1018	842	23%
Safety Assessment/Quality Verification	--	--	--
TOTAL	4693	4107	100%

TABLE 2

TMI-1 ENFORCEMENT/SEVERITY LEVELS

A. TMI-1 Enforcement/Severity Levels

AREA	DEV	5	4	3	2	1	TOTAL
Plant Operations			1				1
Radiological Controls							0
Maintenance/Surveillance		1	4				5
Emergency Preparedness							0
Security/Safeguards							0
Engineering/Technical Support			1				1
Safety Assessment/Quality Verification							0
TOTALS	0	1	6	0	0	0	7

B. Violation Summary

REPORT/ DATE	REQUIREMENT	SEVERITY LEVEL	FUNCTIONAL AREA	DESCRIPTION
88-01 1/10-2/6/88	10 CFR 50, App. B, Crit. VI and ANSI 18-7-1976, Para 5.3	IV	Maintenance/ Surveillance	Failure to follow Quality Assurance Plan (QAP) (ANSI) [administrative controls] on completion of various maintenance activities: (1) wrong expansion joint installed (RR); (2) incorrect information in job tickets (JT's); and (3) JT's not at work site.
88-13 6/12-7/15/88	10 CFR 50, App. B, Crit. VI, ANSI 18.7-1976, Para 5.2.15 and AP 1065	IV	Maintenance/ Surveillance	Control room ventilation fan blade modification conducted without controlled vendor manual (improper torquing of blades and fan hub incorrectly described in work package.

REPORT/ DATE	REQUIREMENT	SEVERITY LEVEL	FUNCTIONAL AREA	DESCRIPTION
88-17 8/8-19/88	TS 6.8.2 and 6.8.3.c	IV	Maintenance/ Surveillance	Failure to properly change Maintenance Procedure (MP) (RCP seal work) (conflicting procedure and administrative controls for MP's permit unauthorized temporary changes (TC's).
88-17 8/8-19/88	TS 6.8.1	IV	Maintenance/ Surveillance	Failure to adequately establish procedures. (1) Emergency diesel generator (EDG) jacket coolant valves not in operating procedure (OP) lineup. (2) MP on make-up pump (generic procedure vendor technical instructions not incorporated into MP.
88-18 7/16-9/1/88	TS 6.8.2/ MP 1407-1, Para. 6.2.1.2	V	Maintenance/ Surveillance	Failure to follow maintenance procedures by not getting the same level of review and approval on engineering instruction to torque pressurizer tailpipe bolt as the original job ticket.
88-18 7/16-9/1/88	TS 3.1.12.3/ 3.1.2.3	IV	Operations	Failure to adhere to technical specifications pressurizer cooldown and (material ductility) level limits (same as LER 88-02).
87-01 & 86-07 12/29/88	10 CFR 50.49(f) and (j)	IV	Technical Support	Failure of safety-related equipment to meet environmental qualification standards.

TABLE 3

LICENSEE EVENT REPORTS

FUNCTIONAL AREA/CAUSE CODE

TMI-1

A. LER Functional Area by Cause Code

AREA	A	B	C	D	E	X	TOTAL
Plant Operations	2			1			3
Radiological Controls							
Maintenance/Surveillance					2		2
Emergency Preparedness							
Security/Safeguards	1						1
Engineering/Technical Support				1			1
Safety Assessment/Quality Verification							
TOTALS	3	0	0	2	2	0	7

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

Cause codes in this table are based on inspector evaluation and may differ from those specified in the LER.

B. LER Summary

LER NUMBER	EVENT DATE	CAUSE CODE	FUNCTIONAL AREA	DESCRIPTION
*88-01	3/16/88	E	Maintenance/ Surveillance	Failure of control rod drive breaker to trip on undervoltage during surveillance test due to component malfunction.
88-02	6/19/88	D	Plant Operations	Pressurizer cooldown and ductility (NDT) exceeded due to inadequate low pressure injection surveillance procedure.
88-03	7/28/88	A	Plant Operations	Both channels of screenhouse chlorine detectors taken out of service simultaneously due to operator error.
88-04	3/13/88	D	Technical Support	Reactor Protection System (RPS) actuation due to faulty preoperational test procedure.
88-05	9/25/88	A	Plant Operations	Reactor Coolant System (RCS) heat-up greater than 50 F per hour due to personnel error.
88-06	10/30/88	E	Maintenance/ Surveillance	Reactor trip due to high RCS pressure because control valves went shut on mail turbine electro-hydraulic control (EHC) system malfunction.
88-SP-01	7/21/88	A	Security/ Safeguards	Uncontrolled safeguards information.

*Voluntary Report

ENCLOSURE 2

Nuclear

GPU Nuclear Corporation
One Upper Pond Road
Parsippany, New Jersey 07054
201-316-7000
TELEX 136-482
Writer's Direct Dial Number:

May 10, 1989
C311-89-2048

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

Dear Sir:

Three Mile Island Nuclear Station, Unit 1 (TMI-1)
Operating License No. DPR-50
Docket No. 50-289
Response to SALP 87-99

On April 3, 1989, the NRC issued the Systematic Assessment of Licensee Performance (SALP) Report for Three Mile Island Unit 1. A meeting to discuss this report was held at the Three Mile Island Training Center on April 10, 1989. Attachment I to this letter provides the GPUN written comments on the SALP report.

We appreciate the opportunity to review with you the SALP Report and provide our comments. We continue to believe that this dialogue is the most meaningful portion of the SALP process.

It is our understanding that the NRC plans to conduct mid cycle SALP reviews to assess progress and evaluate effects of licensee performance. We would encourage this mid cycle review for TMI-1 and are willing to participate.

Sincerely,

P. R. Clark

P. R. Clark
President

PRC/DVH/spb:2048

cc: W. Russell
R. Hernan
F. Young

8905230391 3pp

ATTACHMENT I

RESPONSE TO SALP REPORT 87-99

Overview

Several sections of the SALP Report referred to issues on procedures. GPUN has established an Administrative Procedure Task Force which has corporate wide responsibility. This task force has developed a list of recommendations which are currently being implemented. The task force will continue to monitor the implementation of these recommendations.

On the Plant level, a new Procedure Specialist has been added to the staff to help improve the procedure preparation, change and review process. This individual also will assist in the training of the procedure preparers and reviewers. This effort has been largely associated with maintenance procedures. In this area, we have increased monitoring of in field procedure compliance and quality by the QA Department, the Plant Materiel Department and the management offshift tour program. The final approval authority of plant procedures has been changed to the Department Heads in place of the O&M Director. We continue to believe the biennial review frequency is appropriate and that we have adequate resources to produce improvements on that schedule.

Overall our emphasis on procedure improvement is focused on technical, useability and human performance issues. This will strengthen the worker's ability to use the procedure on the job.

Plant Operations

We are pleased the NRC acknowledged our improvement in this area. We believe the good, safe operation during this SALP period is indicative of our conservative approach to safe operations, operator professionalism and knowledgeable personnel. In addition, there is an active program in place to improve crew communications.

Radiological Controls

We are in agreement with the analysis as presented. We have emphasized the importance of current surveys being posted. Also, significant scaffold erection in radiological areas is now an integral part of our outage planning and scheduling where appropriate.

In addition to the reasons stated in the SALP Report which contributed to higher than estimated outage personnel dose, other factors included higher working area dose rates, implementation of a more rigorous program for discrete radioactive particle control and a greater percentage of respirator work.

Maintenance/Surveillance

1. Materiel Organization

During this SALP period the staffing of the Materiel Department was completed. In the planning and scheduling areas of this function we have added additional planners, placed more emphasis on the planning process and formed the outage and non-outage scheduling groups. These steps, along with the implementation of the computerized GMS-2 work management system and integrated scheduling will enable us to better plan, schedule, and document maintenance work.

2. Plant Materiel Condition

As acknowledged in the SALP Report, the plant and its equipment are in good materiel and operating condition. This contributed significantly to the excellent operating record. Increased emphasis has been placed on the identification and correction of minor materiel deficiencies.

3. Water Chemistry Control Program

GPUN has a strong water chemistry control program as discussed at the April 28, 1989 meeting with the NRC. We do not believe the SALP Report accurately characterizes this program and request that you re-review this section of the SALP. We constantly strive for improvement and therefore look forward to a clear assessment with its associated basis from which we can continue to progress.

Emergency Preparedness and Security

We believe these are important areas and will continue our emphasis and management involvement.

Engineering/Technical Support

We are continuing our efforts to improve in this area. The recently completed Technical Support Self Assessment has provided and will continue to provide a mechanism for improvements.

With regard to satisfying the ATWS rule requirements, we feel we are essentially agreement in every area. The implementation schedule of 9R is responsive and appropriate. This schedule has been extensively communicated to and approved by the NRC.

Safety Assessment/Quality Verification

In our safety review process all divisions are now following the corporate procedure requirements. We believe the GPUN safety review process is a good, sound program and will improve the quality of our safety reviews. We will continue to monitor the performance in this area.

ENCLOSURE 3

LIST OF ATTENDEES

TMI-1 SALP MANAGEMENT MEETING

APRIL 10, 1989

GPU Nuclear Corporation

H. D. Hukill, Director, TMI-1
P. R. Clark, President
T. G. Broughton, Director, Operations and Maintenance
M. J. Ross, Plant Operations Director
R. L. Long, Vice President, Planning and Nuclear Safety
D. H. Shovlin, Plant Materiel Director
P. B. Fiedler, Vice President, Quality and Training
W. Popow, MCF Production and Technical Director
J. E. Hildebrand, Director, Radiological and Environmental Controls
R. F. Wilson, Vice President, Technical Functions
R. P. Coe, Training and Education Director
J. L. Sullivan, Jr., Licensing and Regulatory Affairs Director
R. J. McGoey, Manager, PWR Licensing
D. V. Hassler, TMI-1 Licensing Engineer
J. F. Stacey, Site Security Manager
T. M. Hawkins, Manager, TMI-1 Startup and Test
R. P. Shaw, Radiation Controls Director, TMI-1
M. C. Wells, Media Relations Manager
O. J. Shalikashvil, Manager, Plant Training
D. H. Bedell, Manager, Public Information, TMI

U.S. Nuclear Regulatory Commission

W. F. Kane, Director, Division of Reactor Projects (DRP)
J. P. Durr, Acting Chief, Projects Branch No. 1, DRP
C. J. Cowgill, Chief, Reactor Projects Section 1A, DRP
F. I. Young, Senior Resident Inspector, TMI
D. M. Johnson, Resident Inspector, TMI-1

ENCLOSURE 4

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406

Docket No. 50-289

APR 03 1989

GPU Nuclear Corporation
ATTN: Mr. H. D. Hukill
Vice President and Director, TMI-1
P. O. Box 480
Middletown, Pennsylvania 17057

Gentlemen:

Subject: Systematic Assessment of Licensee Performance (SALP) Report No. 50-289/87-99

On March 2, 1989, the NRC Region I SALP Board assessed the performance of Three Mile Island Unit 1 for the 14½-month period from November 1, 1987 to January 15, 1989. That assessment is documented in the enclosed report. We have arranged to meet with your staff onsite on April 10, 1989 to discuss the SALP.

At the meeting, please be prepared to discuss the assessment and any plans you have to improve performance. You may, of course, provide any comments you have regarding the SALP at the meeting. Also, you may provide written comments within thirty days after the meeting.

Thank you for your cooperation.

Sincerely,

James M. Allan

William T. Russell
Regional Administrator

Enclosure: NRC Region I SALP Report No. 289/87-99

~~8904130155~~ /p

APR 0 3 1990

cc w/encl:
T. G. Broughton, Operations and Maintenance Director, TMI-1
C. W. Smyth, TMI-1 Licensing Manager
R. J. McGoey, Manager, PWR Licensing
E. L. Blake, Jr., Esquire
Chairman Zech
Commissioner Roberts
Commissioner Carr
Commissioner Rogers
Commissioner Curtiss
K. Abraham, PAO, RI (14 copies)
TMI Alert
Susquehanna Valley Alliance
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
Commonwealth of Pennsylvania

ENCLOSURE 5

SALP BOARD REPORT ERRATA SHEET

PAGE	LINE	NOW READS	SHOULD READ
3	12-14	The principal weaknesses observed were in specific job planning, increased personnel errors, and non-radiological chemistry operations.	The principal weaknesses observed were in specific job planning and increased personnel errors.

Basis: Additional information provided by the licensee via meetings and subsequent inspections clarified the NRC assessment, and form a basis to conclude that non-radiological chemistry operations and management oversight of this area was adequate.

PAGE	LINE	NOW READS	SHOULD READ
17	27-37	Relative to the last SALP assessment, the non-radiological chemistry control program has declined. During an inspection of the licensee's non-radiological chemistry control program, standard solutions prepared by Brookhaven National Laboratory for the NRC were submitted to the licensee to analyze using the licensee's normal methods and equipment. Evaluation of the results indicated about 31 percent (11 measurements of 36) of the results were in disagreement with the criteria used for comparison. These disagreements were attributable to equipment calibration technique, sampling error, determination of the minimum detectable concentrations, and training. The licensee's inter-comparison program was ineffective in identifying these concerns. The laboratory operation lacked substantial management attention.	Relative to the last SALP assessment, the non-radiological chemisty control program remained constant. During an inspection of the licensee's non-radiological chemistry control program, standard solutions prepared by Brookhaven National Laboratory for the NRC were submitted to the licensee for analysis using the licensee's routine methods and equipment. Licensee performon the standards was acceptable. Some minor problems were identified in the areas of instrument calibration. The recent inspection determined that this problem has been resolved.

Basis: Additional information provided by the licensee via meetings and subsequent inspections clarified the NRC assessment, and form a basis to conclude that non-radiological chemistry operations and management oversight of this area was adequate.

PAGE	LINE	NOW READS	SHOULD READ
18	6-8	...controls, increased personnel errors, and deficiencies in non-radiological chemistry laboratory operations.	...controls and increased personnel errors.

Basis: Additional information provided by the licensee via meetings and subsequent inspections clarified the NRC assessment, and form a basis to conclude that non-radiological chemistry operations and management oversight of this area was adequate.

PAGE	LINE	NOW READS	SHOULD READ
21	36-38	Also, in one case a .....safety review coordinator (SRC).	Delete

Basis: This issue was not a substantial problem and deletion does not affect the staff's conclusion.

PAGE	LINE	NOW READS	SHOULD READ
27	2-4	However, the manner...with the staff.	Delete
	6-8	Also, TMI Division...the Safety Review Process	Delete

Basis: These minor items were resolved shortly after the completion of the SALP period and deletion does not alter the NRC conclusions in this area.

PAGE	LINE	NOW READS	SHOULD READ
27	31-33	The staff has also noted a few cases where initial assessment of plant noted safety significance and reportability of plant events by the licensee have been incorrect and not initially entered in the operators log.	The staff has also noted a few cases where licensee initial assessment of the safety significance of plant events have been incomplete.

Basis: To clarify the sentence and to note that no incorrect entries were made. The entries made were incomplete in some cases.

PAGE	LINE	NOW READS	SHOULD READ
28	6-16	In summary, the licensee made progress in enhancing this area but problems persisted. They took substantial initiatives in self-assessing their performance and this included conducting proper training and using skilled personnel on the assessment. The one noted exception was in the maintenance area in light of material condition findings during this SALP period. Established program/review groups continued to do an outstanding job of identifying problems, most notably the Quality Assurance Department efforts. Despite all of these efforts, certain longstanding problem areas continue to be noted in the areas of safety review, procedure adequacy, procedure implementation (primarily in the administrative controls areas), and event handling/reporting. Solutions/corrective actions to these identifying problems were slow in implementation.	In summary, the licensee has effective programs in place for assessing nuclear safety and verifying quality. A number of initiatives have been taken to enhance performance in this area and the personnel involved are skilled and well-trained. Established review groups, mostly notably the Quality Assurance Department, have continued to do an adequate job of identifying problems. However, implementation of corrective action in some cases has failed to correct the problems. One such example noted in this report is the thoroughness of safety reviews associated with procedure revisions, which ultimately had a detrimental effect on procedure quality. The quality of some procedures coupled with worker inattentiveness to details have led to a small number of operational errors during this assessment period.

Basis: This paragraph was revised to more accurately summarize the licensee safety assessment/quality verification activities.