U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.	50-289
License No.	DPR-50
Report No.	97-08
Licensee:	GPU Nuclear Corporation
Facility:	Three Mile Island Station, Unit 1
Location:	P.O. Box 480 Middletown, PA 17057
Dates:	July 28, 1997 - September 6, 1997
Inspectors:	Wayne L. Schmidt, Senior Resident Inspector Samuel L. Hansell, Resident Inspector Lois M. James, Reactor Engineer William A. Maier, Emergency Preparedness Specialist Edward B. King, Physical Security Inspector
Approved by:	Peter W. Eselgroth, Chief Reactor Projects Branch No. 7

EXECUTIVE SUMMARY

Three Mile Island Nuclear Power Station
Report No. 50-289/97-08

This integrated inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a six week period of resident inspection; in addition, it includes the results of one announced Regional inspection in the area of emergency preparedness.

Overall

GPU Nuclear (GPU) operated Three Mile Island Unit 1 (TMI-1) safely over the period.

Plant Operations

Operators responded well to two equipment failures that caused minor plant power/pressure transients including: a failed integrated control system (ICS) module which, caused a feedwater transient; and a partial closure of makeup (MU) valve MU-V-3, which caused a reactor pressure increase (Section O1.1).

Operators effectively implemented approved written procedures for infrequently performed fuel reactivity control, control rod movement, and Tave reductions, at end of core life. (Section O1.2)

The inspectors noted strengths in control room operator equipment manipulations and supervisor command and control and management oversight, during the unit shutdown for the 12th refueling outage (12R) (Section O1.2).

Maintenance

GPU conducted the observed maintenance and surveillance task well. Post-shutdown surveillance testing was properly scheduled for the appropriate plant conditions.

The shift supervisor provided excellent self-checking feedback to the instrument and control technicians during a reactor protection system surveillance (Section M1.1).

The GPU staff demonstrated excellent performance during the core flood (CF) system check valve testing, including excellent coordination between the control room and the reactor building (RB) personnel.

GPU conducted on-line main steam relief valve testing, in accordance with ASME Code requirements. Personnel demonstrated proficiency in resetting lift setpoints. The procedure clearly addressed, verified, and documented proper valve release nut installation and associated cotter pin material which had caused stuck open relief valves at other Babcock and Wilcox (B&W) sites. (Section M3.1).

Engineering

Overall, the engineering department provided good support for the safe operation of TMI-1.

The engineering department provided operations with clear procedures for reactivity control management during end of core life operations. (Section O1.2).

The system engineer provided excellent coordination of the main steam safety valve lift test in the plant. In addition, the Engineering Director provided senior management oversight for part of the test (Section M3.1).

The system engineer and inservice test engineer provided good direction and oversight when needed during CF testing. (Section M1.1).

GPU Nuclear responded promptly and very effectively in their review, analysis, and corrective actions for the ESAS power supply logic design deficiency. Engineering performed well in developing and analyzing a change to the emergency operating procedures to ensure the ability to throttle DHR and BS pump flows, after a DBA LOCA, to maintain adequate NPSH. The Operations department properly followed the TS and reported the condition to the NRC. The LER described the issue in detail and appropriately addressed the root cause and associated corrective actions. NRC enforcement discretion was exercised, and no violation issued, in recognition of licensee self-identification and correction through voluntary initiatives of an old design issue. (Section E8.1).

Plant Support

Radiation Protection:

The radiological control monitoring and oversight of the fuel transfer system cable drive modification was very good. GPU implemented good controls over a diver performing modification activities in the spent fuel pool (SFP). Lessons learned from previous industry problems with such activities were properly factored into the work. (Section R1.1)

Emergency Preparedness:

GPU effectively implemented the emergency preparedness (EP) program, including maintenance of an operational technical support center and emergency operation facility that were maintained operationally ready. The inspector noted improvement in management support of activities and programs. Emergency plan and procedure changes met NRC requirements. The EP training program administration and qualification maintenance were also improved. External audits of the EP program implementation were well defined, but the EP Department has not yet implemented a self-assessment program (Sections P5,6,7 and 8.2).

The inspector closed one previously identified violation. Another violation was documented as withdrawn by NRC letter dated September 26, 1997, based on review of licensee information. (Sections P8.4 and P8.5). (CLOSED VIO 97-04-03; WITHDRAWN VIO 97-04-04)

TABLE OF CONTENTS

Report Details

Summary of Plant Status

GPU Nuclear operated the unit safely throughout the period, maintaining essentially 100% power. Prior to the shutdown on September 5, 1997, for the 12R refuel outage, the plant reactor power dropped to 98% due to fuel burn up, at the end of the operating cycle.

I. Operations

O1 Conduct of Operations (71707)[1]

O1.1 General Comments

Using Inspection Procedure 71707, "Plant Operations," the inspectors conducted frequent reviews of ongoing plant operations. Operators performed in a professional and safety-conscious manner, responding well to two equipment failures that caused minor plant power/pressure transients including: a failed integrated control system (ICS) module, which caused a feedwater transient, on August 19; and a partial closure of makeup (MU) valve MU-V-3, which caused a reactor pressure increase due to reduced normal primary letdown flow, on August 21. Following the ICS module failure operators stabilized plant power and directed that the instrument and controls department (I&C) troubleshoot and conduct repairs as needed. When operators noticed that MU-V-3 was closing they properly directed that the valve be manually positioned open to restore the normal letdown flowpath. The manual positioning of the valve made it inoperable as an automatically closing containment isolation valve and the operators properly entered the required Technical Specification (TS) limiting condition of operation (LCO).

O1.2 Plant Shutdown for the 12R Refueling Outage

The inspectors found that plant operators conducted and management supported an orderly unit shutdown for the 12 refueling outage (12R) on September 5. Plant management augmented the normal control room staff to include additional reactor operators (ROs) at the feed, turbine, and ICS stations, to allow efficient monitoring of parameters during the reduction in power. The inspector observed that the operators performed very well in reporting trends and controlling their specific parameters. Plant operators used good communications techniques and senior reactor operators (SROs) (shift management) conducted good briefings as the unit entered different phases of the shutdown and prior to surveillance testing. Plant management conducted a very good pre-shutdown meeting and control room briefing. Further, the presence of plant management in the control room during the shutdown provided excellent support and coaching to the operators.

---

[1]Topical headings such as 01, M8, etc., are used in accordance with the NRC standardized reactor inspection report outline. Individual reports are not expected to address all outline topics.

In addition, prior to the 12R shutdown the engineering department properly evaluated and provided instructions for reactivity controls. Approved written procedures provided detailed direction to the plant operators for the infrequent reactivity control manipulations. The plant operators properly executed these procedures. In particular, the operator cautiously adjusted the reactor coolant system average temperature (Tave) reductions and axial power shaping control rod (APSR) withdrawal without any impact on plant operation. The shift and plant management provided focus on these infrequent manipulations at the daily management meetings to ensure plant personnel awareness.

II. Maintenance

M1 Conduct of Maintenance (62707, 61726)

M1.1 General Comments

a. Inspection Scope

The inspectors observed all or portions of the following maintenance and surveillance work activities:

- Job Order No. 137103, "'B' Decay Heat Removal Pump Cyclone Separator Clean and Inspect."
- Job Order No. 139804, "Install Open and Close Torque Switch Bypass Modification."
- Job Order No. 133745, "Fuel Transfer System Cable Drive Modification."
- Surveillance Procedure 1303-11.3, "Main Steam Safety Valves."
- Surveillance Procedure 1300-3I, "IST of Nuclear Service River Water Pumps and Valves."
- Surveillance Procedure 1300-3T, "Pressure Isolation Test of Core Flood Valves CF-V4A/B, CF-V5A/B and DH-V22A/B."
- Refueling Procedure 1505-1, "Fuel and Control Component Shuffle."
- Surveillance Procedure 1303-4.1A, "RPS Channel 'A' Test."

b. Observations and Findings

Technicians and operators performed surveillance tests properly and the tests demonstrated the ability of the associated systems to perform their design safety functions. The initial refuel interval surveillances were scheduled and planned to be performed at the proper plant conditions.

The shift supervisor (SS) provided excellent self-checking feedback to the instrument and control (I&C) technicians during the 'A' reactor protection system (RPS) test. The I&C technicians used proper communications and repeat backs for each action step. On a few occasions the SS noticed that the I&C technicians did not always apply the "touch the tag" self-checking principal. The SS appropriately coached the technicians on management's expectations and the technicians applied the "touch the tag" check throughout the remainder of the RPS test.

Operators performed and engineering supported Surveillance Procedure 1300-3T, "Pressure Isolation Test of Core Flood Valves CF-V4A/B, CF-V5A/B and DH-V22A/B." The Inspectors observed:

- Excellent test coordination between the control room and the reactor building,
- The establishment of proper plant conditions during the plant cooldown,
- A clearly written test procedure that contained critical tasks in the correct sequence,
- Good system engineer and inservice test (IST) engineer oversight and direction in the RB, and
- A shift supervisor (SS) providing excellent self-checking feedback (touch the tag) to the instrument and control technicians during testing.

c. Conclusions

The TMI staff performed surveillance testing and maintenance activities well. Testing demonstrated the ability of systems to function properly. The initial refueling surveillance was properly scheduled and conducted as plant conditions warranted.

M3 Maintenance Procedures and Documentation

M3.1 Maintenance Surveillance Test Procedures

a. Inspection Scope

The inspectors observed portions of surveillance procedure 1303-11.3, "Main Steam Safety Valves," from the Intermediate Building.

b. Observations and Findings

The licensee properly conducted the safety valve testing and lift settings using appropriate ASME code devices. The inspectors observed:

- The main steam system engineer coordinated the safety valve test locally at the safety valves. In addition, the Engineering Director observed part of the test in the plant.

- The test procedure included the acceptable and required lift tolerances, allowed set pressure adjustments, time between valve openings, number of test required per valve, and ambient temperature criteria.

- Engineering properly performed a temporary change notice to update the procedure with the new inservice test (IST) requirements contained in the 1987 edition of the ASME Code. The maintenance personnel were experienced and had performed the test numerous times in the past. An example was noted for the safety valves that required adjustment to meet the 1% lift set point. The technicians were experienced and were able to adjust the lift setpoint to within 1% accuracy for the three valves found set outside the procedure criteria.

c. Conclusions

GPU effectively conducted on-line main steam relief valve testing. Engineering was involved and the test procedure was well written to meet ASME code requirements.

Personnel well demonstrated proficiency in resetting lift set points.

The procedure clearly addressed, verified, and documented proper valve release nut installation and associated cotter pin material which had caused stuck open relief valves at other Babcock and Wilcox (B&W) sites.

III. Engineering

E1 Conduct of Engineering (37551)

E8 Miscellaneous Engineering Issues

E8.1 (Closed) LER 50-289/97-009-00: Engineering Analysis of the Loss of 'A' Train DC Power with a Loss of Offsite Power and a Loss of Coolant Accident.

a. Inspection Scope

Background

The inspectors reviewed GPU actions to address a report from Parsons Power group (formerly Gilbert Commonwealth) and Framatome concerning the potential loss of 'A' Train DC electrical power Engineered Safeguards Actuation Systems (ESAS) design deficiency at Crystal River-3 nuclear power plant. Parsons Power designed the ESAS for both Crystal River-3 and TMI-1. The design problem had a potential to prevent the ability to throttle the decay heat removal (DHR) and building spray (BS)

pumps to ensure adequate net positive suction head (NPSH) would be maintained for a postulated loss of coolant accident (LOCA) with a failure of the 'A' DC electrical power supply and a concurrent loss of offsite power (LOOP).

The ESAS is a two train, three channel system with separate bypass switches for all three channels. The 'A' and 'C' channels are powered from the 'A' train electrical power supplies and the 'B' channel is powered from the 'B' electrical power supply. In order to bypass an ESAS actuation signal to permit throttling DHR and BS pumps, two of the three ESAS channels must have power to the bypass logic. For the postulated LOCA coincident with a LOOP and failure of the 'A' DC power supply, the 'B' bypass logic would remain functional but would not allow the ESAS actuation signal to be bypassed in the absence of the minimum required two channels. The ability to bypass ESAS to regain control of ES equipment would be required post LOCA to prevent potential air entrainment in the DHR and BS pumps when taking suction on the Reactor Building sump.

The inspectors reviewed emergency procedure EP-1202-9A, "Loss of 'A' DC Distribution System," temporary change notice (TCN), associated engineering safety evaluation and engineering evaluation request (EER) related to the ability to bypass the engineered safeguards actuation system signal to throttle the DHR and reactor BS pumps. The review included the DHR and BS Technical Specifications (TSs), operations training handout, and NRC reporting requirements.

b. Observations and Findings

Resolution

GPU Nuclear personnel reviewed the Crystal River report immediately and determined that the design deficiency also applied at TMI-1. The engineering department recognized that if the assumed single failure were a loss of 'A' DC power, the ability to bypass the ESAS actuation signal and throttle DHR and BS pumps in response to a large break LOCA may not be accomplished in a manner consistent with the safety analysis and existing plant procedures. Due to the lack of written procedure guidance to bypass the ESAS signal, plant management declared the 'B' DHR and BS systems inoperable.

Plant operators entered the proper Technical Specification limiting condition of operation (LCO) for the inoperable systems. TS sections 3.3.1.1.c., "Injection Systems," and 3.3.1.3.a., "Reactor Building Spray System," required a plant shutdown within 72 hours if the problem was not corrected. Emergency procedure EP-1202-9A, "Loss of 'A' DC Distribution System," was revised to include written guidance for plant operators to cross tie the 'A' ESAS bypass logic power supply from the 'B' channel to provide the ability to throttle the DHR and BS pumps. The EP-1202-9A temporary change notice (TCN) was completed in approximately 5.5 hours and included a detailed engineering safety evaluation and engineering evaluation request (EER) that supported the ability to bypass the engineered safeguards actuation system signal to throttle the low pressure injection and reactor building spray pumps. Engineering properly verified that the 'B' emergency diesel

generator (EDG) loading criteria would not be exceeded due to the additional channel 'A' electrical loads. The installation of a relay and test switch in the ESAS to allow bypassing the B channel without the loss of DC power was planned for implementation during the current refuel cutage. The extended period without operability of the DHR and BS system is a violation of 10 CFR Appendix B, Criteria III, Design Control. The violation was identified by the licensee as a result of a voluntary initiative, corrective actions were prompt and comprehensive, the violation was not likely to be identified by routine licensee efforts such as normal surveillance or quality assurance activities and the violation is not reasonably linked to current performance. As a result, this apparent violation of NRC requirements will not be cited in accordance with Section VII.B.3 of the NRC Enforcement Policy. **(NCV 50-289/97-08-01)**.

The TMI root cause evaluation was thorough and determined that the problem was attributed to the oversight of the plant's designers to recognize the need and ability to bypass the 'B' ESAS logic on a loss of offsite power and a loss of the 'A' DC electrical power supply. Also, engineering analyzed the effect of the loss of offsite power with the redundant 'B' train DC power supply and determined that the A&C channels would retain the ability to bypass an ESAS signal. In addition, the effects of the loss of offsite power and loss of a train of DC electrical power were evaluated for the reactor protection system (RPS), the Heat Sink Protection System (HSPS). No design deficiencies were noted.

Each operations shift crew was given a copy of the revised emergency procedure prior to assuming their duties. The operators were instructed how to restore power to the ESAS bypass logic to regain control of the 'B' train equipment. In addition to the short term corrective actions, the engineering department will review the possibility of a modification to allow the bypass of the ESAS actuation without the need for additional operator actions.

The licensee event report (LER) provided a detailed description and assessment of the event. The root cause analysis and associated corrective actions were comprehensive. The LER is closed.

c. Conclusions

GPU Nuclear responded promptly and effectively in their review, analysis, and corrective actions for the ESAS logic power supply design deficiency. Engineering performed well in developing and analyzing a change to the emergency operating procedures to ensure the ability to throttle DHR and BS pump flows, after a DBA LOCA, to maintain adequate NPSH. The Operations department properly followed the TS and reported the condition to the NRC. The LER described the issue in detail and appropriately addressed the root cause and associated corrective actions. In recognition of licensee self-identification and corrective action initiatives, this violation will not be cited.

IV. Plant Support

R4 Staff Knowledge and Performance in RP&C

The radiological control monitoring and oversight of the fuel transfer system cable drive modification was very good. Radiological Control supervision provided a detailed pre-job brief to the divers, supervisors, rad con techs, and other support personnel prior to the first spent fuel pool (SFP) dive. The pre-job brief included the recent Calvert Cliffs diving problems and highlighted the root cause and related problems. TMI applied the lessons learned and verified that the TMI program controls would prevent the problems noted at Calvert Cliffs. The diving controls and safety were followed throughout the fuel transfer work.

In addition, the foreign material exclusion (FME) controls contained in administrative procedure AP 1030, "Control of Access to System/Component Openings," were followed for the SFP work activities.

P2 Status of EP Facilities, Equipment and Resources

a. Inspection Scope (82701)

The inspectors toured the onsite Technical Support Center (TSC) and the offsite Emergency Operations Facility (EOF), checking the readiness of both facilities. They also reviewed the contents of three sealed emergency equipment lockers, the operability of the telephone circuits and the availability of computer displays in the two facilities. They reviewed selected inventory sheets and communication surveillances for the last twelve months and interviewed licensee EP staff who oversee the maintenance of EP facilities, equipment and resources. They also reviewed two licensee corrective action plan reports that described the late performance of two facility inventories and the results of an inventory audit containing several discrepancies.

b. Observations and Findings

The TSC and EOF contained all the major equipment specified in the facility inventories. Licensee staff demonstrated the availability of the plant process monitor and the primary plant computer in the TSC. The three sealed equipment lockers observed contained the necessary items. Some minor discrepancies were noted in the two facilities including:

An "information only" book of piping and instrumentation drawings was present at the TSC that was five years out of date. There were also current, controlled copies of the drawings in the TSC file cabinets, such that responders would have access to the up-to-date drawings. The out of date drawings were removed from the TSC prior to the end of the inspection.

Two telephones, the operations line and the technical function line, in the EOF had no dial tone and would not function. The EP staff member accompanying the inspectors immediately initiated action to repair the circuits. The licensee EP staff later learned that these circuits were undergoing troubleshooting to investigate a previously reported problem.

There were three operator aids at the EOF that had no approval signatures or control numbers. Two of these gave instructions for certain operation of the primary plant computer and the other gave instructions for manual operation of the EOF emergency diesel generator. The inspectors discussed the presence of these items with the EP Manager, who stated an intention to investigate the implementation of a system of tracking operator aids used in emergency preparedness facilities and activities.

The inventories performed in the past year were performed monthly and after use. The licensee inventoried sealed equipment cabinets quarterly, provided the seal was intact. The EP staff member overseeing the inventory performance knew the status of most of the recently completed inventories. The licensee identified two recent problems associated with sealed emergency equipment lockers. These problems were documented on corrective action program (CAP) forms. One problem involved two sealed equipment lockers that were not inventoried during the second calendar quarter of 1997 and the other involved multiple shortages of items identified during an EP audit of all the lockers the week prior to the inspection. This EP audit also identified extra unused tamper seals located in three lockers. Unauthorized use of these tamper seals could allow a person to remove contents from the locker, apply a tamper seal, and prevent detection of the loss until the next quarterly inventory. Nuclear Safety Assessment personnel later issued a Quality Deficiency Report (QDR) to document these problems for evaluation and resolution.

c. Conclusions

The inspectors considered the TSC and EOF to be operationally ready. They concluded that the deficiencies noted in those facilities did not significantly detract from the readiness of those facilities. They concluded that the EP staff was exercising adequate oversight of the emergency facilities and equipment. The inspectors considered the locker inventory discrepancies to be worthy of attention by the licensee but not so severe as to affect the level of onsite emergency preparedness. They concluded that the licensee was taking adequate action to document and investigate the problem.

P3 EP Procedures and Documentation

a. Inspection Scope (82701)

The inspectors also reviewed, at the NRC Regional office, Temporary Change Number 1-97-0083 which the licensee made to Emergency Plan Implementing Procedure EPIP-TMI-.03, Emergency Notifications and Call Outs. They also reviewed Revision 6 to document 6610-PLN-4200.02, TMI Emergency Dose Calculation Manual (EDCM).

b. Observations and Findings

The temporary change made to procedure EPIP-TMI-.03 and Revision 6 to the EDCM contained the appropriate approval signatures. Neither change decreased the effectiveness of the approved corporate emergency plan.

c. Conclusions

The inspectors concluded that the temporary change made to procedure EPIP-TMI-.03 and Revision 6 to the EDCM were made in accordance with the licensee's document control practices. The inspectors further concluded that these changes met the requirements of 10 CFR 50.54(q) and that prior NRC review and approval of the changes was not required.

P5 Staff Training and Qualification in EP

a. Inspection Scope (82701)

The inspectors reviewed the training records of 25 persons in the on-shift, initial response and emergency support organizations to determine if the licensee was conducting EP training in accordance with the requirements of the emergency plan. They also reviewed selected EP training lesson plans and tests to evaluate the content of the training given to emergency responders and the effectiveness of the testing. Finally, the inspectors interviewed training department personnel responsible for the administration of EP training to determine how emergency responder qualifications are tracked and to discuss the changes made to the EP training program since the March, 1997 exercise.

b. Observations and Findings

All of the individual training records reviewed showed that training for those individuals had been accomplished according to emergency plan requirements. The lesson plans addressed the duties and responsibilities of the specific emergency response positions. Test questions were based on information contained in the lesson plans.

The EP training program had undergone several changes that applied lessons learned from the March, 1997, exercise. For example, training was conducted with emergency decision makers to provide guidelines for validation of conflicting information. Also, additional training conveyed expectations regarding the conduct of emergency activities, including proper communication techniques.

Emergency responder qualifications are maintained by attendance at EP continuing training and they are tracked by several systems. An Emergency Preparedness Tracking System (EPTS) was initiated by the EP Department to track the qualification status of all but on-shift responders. Individual responders can also determine their own qualifications by accessing this system. The EP training coordinator checks this system for upcoming qualification lapses frequently during the period of EP requalification training (January through July). EP staff members also check this system for potential lapses of emergency response organization members.

GPUN has also implemented, since February, 1996, a second system for tracking qualifications. This system is called the Quals Coming Due Notification System (QCDNS). The QCDNS system is an automatic system for notifying work group managers and training qualification administrators of impending lapses of qualifications of personnel in their work groups. The system generates reports at the beginning of each month that flag individuals whose qualifications are coming due in the near future. Individuals are notified by the work group administrators to schedule training for requalification. As a backup, coordinators for the different emergency response organizations check before the end of each month to ensure that individuals flagged for requalification have received the required training. Since the implementation of this system, the licensee has had good success in preventing qualifications of on-duty personnel from lapsing (see Section P8.3).

c. Conclusions

The inspectors concluded that the training administration program had improved and met all emergency plan requirements. They further concluded that the qualification tracking systems in use were being effectively implemented.

P6 EP Organization and Administration

a. Inspection Scope (82701)

The inspectors interviewed eight managers to determine the level of management involvement and support for EP activities. They also interviewed officials of three of the five risk counties surrounding the plant and reviewed records of training given to offsite response personnel to determine the level of support given by the licensee to the offsite organizations. They discussed the structure of the site and corporate EP organizations with the EP manager and the Director of Radiation Health and Safety.

b. Observations and Findings

The licensee had reported inadequate management oversight and attention to EP as the root cause of the unsatisfactory exercise performance in March, 1997. All of the senior managers interviewed recognized this inadequacy and were aware of a need for improvement in this area. The Site Director stated several actions he either had committed to perform or was investigating in order to accomplish this. Other managers stated their expectations for their own and their subordinates' support of EP activities. These intentions on the part of the managers interviewed indicated a desire by the licensee management to increase their support of the EP program.

All of the interviewed officials of the risk counties were pleased with the attention given by the licensee to their needs. They cited the efforts of the offsite emergency planner at GPUN to provide quality training. They also cited the licensee's recent upgrade of the offsite siren notification system by providing diagnostic feedback circuitry. One official noted that the licensee was working with them to improve the timeliness of offsite notification of emergency conditions. All of the officials interviewed felt the licensee was responsive to their county's emergency preparedness needs.

The staffing level of the EP department has recently been reduced by one individual. Currently there are three onsite planners, one offsite planner and one corporate planner to share the department's workload. The inspectors discussed this fact with the EP Manager and the Manager of Radiological Engineering. The EP manager did not see this loss as having an impact on his department's ability to accomplish its work load since the workload of the lost individual has been transferred to the Radiological Engineering Department. The Manager of Radiological Engineering did not see the increased workload for his department as a significant increase since an additional person from another company location is expected to assist in performing the work of the former onsite emergency planner.

The inspectors learned from the corporate Director of Radiation Health and Safety that he had recently been assigned as the Radiation Protection Manager at the Oyster Creek plant. This assignment is in addition to his corporate oversight responsibilities for radiation protection and emergency preparedness at both sites. This additional responsibility has reduced the amount of his time available for corporate oversight. The effects of the burden of this additional responsibility on his corporate oversight effectiveness have not been shown since the additional assignment was made in the month immediately preceding this inspection.

c. Conclusions

The inspectors concluded, based on the interviews with the licensee's management, the managers' knowledge of the causes of the performance problems associated with the March, 1997 exercise and the orally stated expectations for the improvement of EP performance and oversight, that the support for the EP program by the site management has improved noticeably. They further concluded, based on the interviews with the risk county officials and the review of offsite responder

training records, that the licensee was providing good support to the offsite agencies on the county level. They also concluded that the loss of the fourth onsite emergency planner will not adversely impact the effectiveness of the EP department since that individual's workload has also been transferred. Finally, they concluded that the effects of the corporate Director of Radiation Health and Safety's additional duties on his performance as corporate oversight of the EP program at TMI will need to be evaluated further.

P7 Quality Assurance (QA) in EP Activities

P7.1 Independent Reviews by Nuclear Safety Assessment (NSA)

a. Inspection Scope (82701)

The inspectors interviewed the managers and two auditors in the Nuclear Safety Assessment Department. This interview was primarily to inspect corrective actions for previously identified Notices of Violation, but the information presented in the interview provided the inspectors with knowledge of the NSA activities during the past year. They also reviewed GPUN Audit Report S-TMI-96-08, dated September 13, 1996, which detailed the annual review of the EP program for 1996. They also reviewed the audit plan for the recently completed, but not yet documented, audit report S-TMI-97-07 for the 1997 annual review.

b. Observations and Findings

The audit report for the 1996 annual review was written to summarize both the results of the audit team's activities and the NSA findings that were recently identified outside of the audit. The audit team leader was selected because he had no emergency response duties and was completely independent of the EP program. The audit evaluated all of the items required by 10 CFR 50.54(q), including offsite interface, drills, and procedures.

The audit plan for the 1997 review also included all the items required by 10 CFR 50.54(q) and was a very comprehensive plan, evaluating 86 attributes of all aspects of the licensee's EP program. The 1997 review had a different audit team leader than the previous review who was also independent of the emergency response program at the site.

c. Conclusions

The inspectors concluded that the NSA audit activities met all the requirements of 10 CFR Part 50.54(t) and were an effective tool for the licensee's self-evaluation of the EP program. They felt the licensee's effort to select audit team leaders who were not emergency response organization members is a good policy.

P8 Miscellaneous EP Issues

P8.1 (UPDATE) VIO 97-04-01: Lack of Computer Code Documentation and Procedures for Dose Assessment

a. Inspection Scope (92904)

Inspectors issued a Notice of Violation (NOV) to the licensee during the May, 1997 remedial exercise inspection report. The NOV described the inadequate documentation for the online dose assessment and quick calculation computer codes used to assess the offsite dose consequences of releases of radioactive material. The licensee documented their response to the NOV in a letter dated July 24, 1997. The inspectors reviewed the licensee's response to the NOV and interviewed the Manager of Rad Engineering and the RadCon and Safety Director to determine what actions had been completed and what actions remained to be completed.

b. Observations and Findings

This violation was cited in NRC inspection report 97-04, in which it was established that the licensee had exercised inadequate oversight of the computer codes used in the various dose assessment models employed during emergency conditions.

The licensee has established a dose assessment oversight committee with a charter and has initiated actions to relocate the host computer for the continuous on-line assessment (COLA) model to a more secure location with a more reliable power supply. They have arranged to obtain the services of a programmer from another company location for the maintenance of the system.

The licensee has committed to update the Emergency Dose Calculation Manual (EDCM) to reflect the current conditions of the computer codes and to upgrade the manual code to be consistent with the COLA code. The licensee has also committed to provide training to the dose assessment personnel using the codes on the refinements that will be made. This action is scheduled for completion by the end of March, 1998.

c. Conclusions

This item will remain open until the actions described above and in the licensee's response to the NOV are complete.

P8.2 EP Internal Assessments

a. Inspection Scope (82701)

The inspector for the last EP program inspection, conducted in April, 1996, noted that the EP department did not have a clearly defined self-assessment program for identifying potential problems and implementing timely corrective actions to prevent degradation of readiness or problem recurrence. The inspectors from the current inspection interviewed the EP Manager and the corporate Director of Radiation Health and Safety to determine the level of self-assessment currently performed.

b. Observations and Findings

The inspectors noted that the EP department has an action item tracking list that is used to document deficiencies. This list is analyzed periodically to determine if trends exist. There is no formal process in place for the EP department to perform a detailed self-assessment of its performance, apply corrective actions and determine the effectiveness of those actions. The EP Manager discussed this absence of a formal self-assessment program in an interview with the inspectors. He informed the inspectors that he had committed internally within the licensee's organization to develop and implement such a program.

c Conclusions

The inspectors considered a well-developed self-assessment program for the EP department to be a demonstrated need. The NRC will inspect the implementation of this program after its development is completed.

P8.3 (UPDATE) IFI 97-04-02: Additional Guidance Necessary for Steam Generator Leakrate Calculation Tool

a. Inspection Scope (92904)

During the remedial exercise inspection in May, 1997, inspectors noted that the licensee's newly developed methodology for determining primary to secondary leak rate was being used inconsistently between the TSC staff and the Radiological Assessment Coordinator (RAC).

b. Observations and Findings

The inspector interviewed the Managers of Shift Engineering and Radiological Engineering to determine their expectations for the calculation of primary to secondary leak rate. Both managers agreed that the new calculation methodology for determining primary to secondary leak rate could be used by the RAC prior to the activation of the TSC, but that once the TSC was activated, the TSC staff would have the ultimate responsibility for the leak rate determination.

The training on this policy had yet to be performed at the time of the current inspection. Training of RACs and radiological support personnel is currently scheduled for later this year and early next year.

c. Conclusions

The inspectors concluded that the actions to close this item would be complete upon the completion and documentation of the training of the RACs and radiological support personnel. Until the completion of that training, the item will remain open.

P8.4 (CLOSED) VIO 97-04-03: Personnel on ERO Duty Roster Who Were Not Qualified

a. Inspection Scope (92904)

The inspectors for the May, 1997 remedial exercise inspection identified this violation from their review of licensee audits of the EP program. The licensee's audits noted recurring lapses of qualifications for emergency responders who remained on the duty roster. The inspectors for the current inspection reviewed the licensee's response to the Notice of Violation and performed an audit of the qualifications of a sample of 25 emergency response organization members. The inspectors also reviewed the licensee's current qualification tracking system.

b. Observations and Findings

The licensee, in the response to the Notice of Violation, described the adoption, in February, 1996, of the Quals Coming Due Notification System (QCDNS) (see Section P5.b). The QCDNS system was actually implemented prior to the performance of the licensee's 1996 EP review that discussed the qualification tracking problems. The inspectors discussed this point with the licensee's NSA management, who stated that the 1996 review included an historical summary of qualification tracking problems that existed and were documented during the year preceding the 1996 audit.

The licensee reported near perfect success using the QCDNS tracking system to prevent lapses of qualification of persons assigned to the emergency response organizations. Only two persons had exceeded their qualification periods without being removed from the emergency response roster. The total time occurring with unqualified members on the roster was 2.25 person-days in 18 months of implementation of the QCDNS system.

The inspectors' review of the training records of 25 randomly selected persons showed no instances of expired qualifications among assigned members of the emergency response organization. This finding supported the success rate reported with the QCDNS system.

c. Conclusions

Based on the success rate of the QCDNS system and the results of their review of training records, the inspectors concluded that the licensee's tracking system was adequate to ensure the readiness of qualified members of the emergency response organization to respond to an emergency. They closed the violation.

P8.5 (WITHDRAWN) VIO 97-04-04: EP Audit Program Inadequate to Correct Deficiencies

a. Inspection Scope (92904)

The inspectors for the May, 1997 remedial exercise issued a Notice of Violation (NOV), citing the licensee's EP audit program as ineffective in characterizing and correcting the repeat deficiencies identified in those audits, particularly the 1996 annual EP audit. They cited the recurring qualification lapses as evidence of this problem. The inspectors also cited a failure to trend deficiencies and to properly characterize findings of adverse trends.

The inspectors for this inspection reviewed the licensee's response to the Notice of Violation and interviewed the licensee's Nuclear Safety Assessment management to gather any additional information regarding the findings which led to the NOV.

b. Observations and Findings

The licensee's response to the NOV provided additional information that was unavailable to the inspectors during the May, 1997 inspection. The licensee reported that the documentation of lapsed emergency responder qualifications during the 1996 audit was not based on findings discovered during the audit, but rather on audit findings that had been documented months before. The licensee also explained in its reply that it had, in fact, escalated the classification of repeat findings in the area of emergency equipment locker inventory results. The inspectors for the current inspection verified performance of this. The inspectors learned, through discussions with NSA management, that a method exists for escalation of NSA findings that are disputed by the responsible department. Finally, the inspectors verified that the 1997 audit plan provided for re-examination of areas having deficiencies in the 1996 audit, thus ensuring a follow-up of the effectiveness of corrective actions for previous deficiencies.

c. Conclusions

The inspectors concluded, based on their review of the licensee's response to the NOV, their review of the 1996 EP audit report and their discussions with NSA management, that additional information that was not available to the inspector during the May, 1997 inspection demonstrated that the licensee had characterized

the findings of the 1996 EP audit report properly and that the characterization of findings of NSA audits of EP activities were not negotiated with the audited organization. The inspectors concluded that the NOV was based on incomplete information. The NRC retracted this violation by letter dated September 26, 1997.

V. Management Meetings

X1 Exit Meeting Summary

At the conclusion of the reporting period, the resident inspector staff conducted an exit meeting with TMI management on September 11, 1997, summarizing Unit 1 inspection activities and findings for this report period. TMI staff comments concerning the issues in this report were documented in the applicable report section. No proprietary information was identified as being included in the report.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

T. Gary Broughton, President GPUN
D. Etheridge, Acting Radiological Controls/Occupational Safety Director
J. Grisewood, Emergency Preparedness Manager
D. Hosking, NSA Manager
*J. Langenbach, Vice President and Director
R. Maag, Plant Maintenance Director
L. Noll, Plant Operations Director
M. Ross, Director, Operations and Maintenance
J. Schork, Regulatory Affairs
G. Skillman, Technical Functions Site Director
P. Walsh, Engineering Director
J. Wetmore, Manager, Regulatory Affairs

* senior licensee manager present at exit meeting on September 11, 1997.

NRC

B. Buckley, TMI Project Manager, NRR

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 40500:	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 92901:	Followup - Plant Operations
IP 92902:	Followup - Maintenance
IP 92903:	Followup - Engineering
IP 92904:	Followup - Plant Support

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-289/97-08-02 (IFI), The inspectors considered a well-developed self-assessment program for the EP department to be a demonstrated need. The NRC will inspect the implementation of this program after its development is completed.

Closed

50-289/97-04-03 (VIO), Emergency response organization personnel qualifications," will be closed.

97-009 (LER), Engineering Analysis of the Loss of 'A' Train DC Power with a Loss of Offsite Power and a Loss of Coolant Accident.

Opened/Closed

50-289/97-08-01 (NCV), Engineering Analysis of the Loss of 'A' Train DC Power with a Loss of Offsite Power and a Loss of Coolant Accident.

LIST OF ACRONYMS USED

AB	Auxiliary Building
ALARA	As low As Reasonably Achievable
ASME	American Society of Mechanical Engineers
CDF	Core Damage Frequency
CR	Control Room
CFR	Code of Federal Regulations
DBD	Design Basis Documents
ECCS	Emergency Core Cooling System
EPIP	Emergency Plan and Implementing Procedure
ESF	Engineered Safety Feature
HRA	High Radiation Area
IFI	Inspection Followup Item
IPE	Individual Plant Evaluation
IR	Inspection Report
ISI	Inservice Inspection
IST	Inservice Testing Program
JO	Job Order
LCO	Limiting Condition of Operation
LER	Licensee Event Report
MNCR	Material Nonconformance Report
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
NSA	Nuclear Safety Assessment
PCR	Procedure Change Request
PPB	Part per Billion
PPM	Part per Million
PRA	Probabilistic Risk Assessment
PRG	Plant Review Group
QV	Quality Verification
RCA	Radiological Control Area
RCS	Reactor Coolant System
RP	Radiation Protection
RWP	Radiation Work Permits
SALP	Systematic Assessment of Licensee Performance
SF	Shift Foreman
SRO	Senior Reactor Operator
SS	Shift Supervisor
TI	Temporary Instruction
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VIO	Violation