U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Docket/Report No. 50-289/88-07 License: DPR-50

Licensee: GPU Nuclear Corporation
P. O. Box 480
Middletown, Pennsylvania 17057

Facility: Three Mile Island Nuclear Station, Unit 1

Location: Middletown, Pennsylvania

Dates: March 6, 1988 - April 9, 1988

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Approved by: W. Baunack for 5/25/88
C. Cowgill, Chief, Reactor Projects Section No. 1A Date

Inspection Summary: The NRC staff conducted routine safety inspections during normal plant power operation. Plant operational items reviewed were: loss of "B" make-up pump; loss of "D" 125-volt a.c. vital bus; and, Safety Issues Management System (SIMS) Item No. B-75/85 for Generic Letter 83-28, "Post Trip Review Process." Other items reviewed in other functional areas included: reactor d.c. trip breaker No. 4 failure; diesel generator exhaust manifold fires, SIMS Item Nos. III.D.3.4.3 and M64800 on control room habitability; physical security; Independent On-site Review Group (IOSRG); and, licensee action on previous inspection findings.

Inspection Results: Operations activities continued to be accomplished in a safe manner, operator attention and response to the three operational events was good in that no major plant transient resulted from these initiating events.

The IOSRG activities were improved, although the procedure was not being followed exactly. A procedure change is in progress to correct this situation.

Licensee action in the areas of radiological controls and engineering support for previous inspection findings was adequate.

No violations of regulatory requirements were identified. Three unresolved issues were identified: one involved licensee action to evaluate 125-volt a.c. breaker trip sequences; the second concerned licensee action to resolve the problems associated with the reactor trip breaker failure; and, the third item involved licensee action to modify the IOSRG procedures to properly reflect the actions being accomplished by the IOSRG personnel.

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DETAILS

1.0 Introduct _ ' Overview

1.1 Licensee , ies

During th ort period the plant operated at full power. As of 8:00 a.m. on April 9, 1988, TMI-1 was operating at full power with the reactor coolant system (RCS) at normal operating temperature (579 F average) and pressure (2155 psig).

1.2 NRC Staff Activities

The purpose of this inspection was to assess licensee activities during the power operations mode as they related to reactor safety, safeguards, and radiation protection. Within each area, the inspectors documented the specific purpose of the area under review, acceptance criteria and sco of inspection, along with appropriate findings/conclusions. The inspectors made this assessment by observation of licensee activities, interviews with licensee personnel, measurement of radiation levels, or independent calculation and selective review of listed applicable documents. NRC staff inspections are generally conducted in accordance with NRC Inspection Procedures (NIP's). These NIP's are noted under the appropriate section in the Table of Contents to this report.

Also, the inspector verified proper implementation, on a sampling basis, of licensee actions related to the below-listed NRC Safety Issue Management system (SIMS) item. The inspection approach for the SIMS item was:

-- research various licensee and NRC correspondence, including Safety Evaluation Reports (SER's) to identify key assumptions, commitments, or other licensee actions to be taken to resolve the safety issues;

-- identify any additional items which need to be verified as delineated in the related NRC Temporary Instruction or other inspection procedures;

-- verify proper implementation of the items planned above; and,

-- assess licensee performance related to that implementation and related to dissemination of the issue and its resolution to licensee personnel who need to know, such as by procedural upgrading and training.

1.3 Persons Contacted

During this inspection, the following key licensee personnel provided substantial information in the development of the inspectors' findings.

-- D. Atherholt, Plant Operations Engineer
-- S. Babzcak, Administrator, Sr., Human Resources
-- H. Behling, Manager, Radiological Health, TMI-1
-- R. Barth, Fire Protection Engineer
-- J. Bowman, Electrical Maintenance
-- G. Brandt, Plant Security
-- G. Broughton, Operations/Maintenance Director
-- J. Colitz, Manager, Plant Engineering
-- *J. Curry, IOSRG Chairman
-- J. Dullinger, Plant Engineering
-- L. Edwards, Operations Quality Assurance Monitor
-- K. Garthwaite, Plant Engineering
-- R. Germann, Nuclear Safety Assessment Director
-- D. Hassler, Licensing Engineer
-- H. Hukill, Vice President and Director, TMI-1
-- C. Incorvati, Audit Manager
-- *R. Knight, Licensing Engineer
-- P. Levine, Electrical Engineer
-- T. O'Connor, Lead Fire Protection Engineer
-- A. Palmer, Manager, Radiological Controls Field Operations
-- J. Pearce, Plant Materiel
-- *M. Ross, Director, Plant Operations
-- J. Schmidt, Radiological Engineer
-- R. Shaw, Manager, Radiological Engineer, TMI-1
-- H. Shipman, Plant Operations Engineer
-- D. Shovlin, Plant Materiel Director
-- C. Smyth, Manager, Licensing
-- *F. Snyder, Materiel Assessment Manager
-- J. Stevens, Corporate Engineer
-- R. Warren, IOSRG
-- S. Williams, Radiological Engineer

* Denotes attendance at final exit meeting (see also Section 9).

2.0 Plant Operations

2.1 Criteria/Scope of Review

The resident inspectors periodically inspected the facility to determine the licensee's compliance with the general operating requirements of Section 6 of the Technical Specifications (TS) in the following areas:

-- review of selected plant parameters for abnormal trends;

-- plant status from a maintenance/modification viewpoint, including plant housekeeping and fire protection measures;

-- control of ongoing and special evolutions, including control room personnel awareness of these evolutions;

-- control of documents, including logkeeping practices;

-- implementation of radiological controls; and,

-- implementation of the security plan, including access control, boundary integrity, and badging practices.

The inspectors focused on the areas listed in Attachment 1. Findings and conclusions in this functional area are addressed below and, in other functional areas, in other sections of this report.

2.2 Events

2.2.1 Temporary Loss of "B" Make-Up Pump

On March 29, 1988, electricians were performing preventive maintenance on the "S" 480-volt a.c. bus tie breaker to the "P" bus (Breaker 1S-12). Main annunciator alarms C-2-7 "4KV Engineered Safeguards (ES) motor trip" and C-3-7 "480 V ES motor trip" were received. Operators identified MU-P-1B as being tripped and auxiliary/fuel handling buildings and control tower ventilation as being shut down.

The control room operators promptly restored make-up and seal injection using the "A" make-up pump. At essentially the same time, the electrician working in the "S" bus room reported accidentally bumping and tripping the supply breaker to 1C ES valves Motor Control Center (MCC), which resulted in loss of the make-up pump lube oil pumps. Letdown was re-established at 2.5 gpm and the "B" make-up pump was returned to service following hand rotating the pump.

The licensee prepared Plant Incident Report (PIR) No. 1-88-01 to document this occurrence and prescribe corrective actions. The inspector reviewed the report and concluded that the cause was attributable to worker activities while performing maintenance activities. Corrective actions consisted of worker and crew briefings which re-emphasized the need to use care when working with energized equipment that affects plant operations. The inspector concurred that this event was an isolated occurrence and not indicative of an overall problem with worker actions having a negative affect on plant operations. Licensee corrective actions were acceptable.

2.2.2 Loss of "D" 125-Volt a.c. Vital Bus

On March 31, 1988, the plant experienced the loss of the "D" 125-volt a.c. vital bus. This resulted in the control room receiving multiple plant alarms on the main annunciator board. Electricians were in the process of performing maintenance on the "D" battery charger; and, during the accomplishment of the maintenance, the d.c. and a.c. input breakers for the "D" inverter opened which resulted in the de-energization of the "D" 125-volt a.c. bus. The breakers tripped as a result of high voltage testing of the "D" battery charger. Although the charger was to be isolated during the test, it was not.

The licensee issued a Plant Incident Report (PIR) No. 1-88-02 to document the problem and specify corrective actions. The cause was a misinterpretation of procedure PM-E-18, which called for the "D" battery charger to be re-energized per Operations Procedure (OP) 1107-2. This resulted in the "D" battery charger being connected to the "D" inverter, which was not the intent of the PM procedure. The result was that the high test voltage applied to the battery charger tripped the inverter input breakers.

Communication between maintenance and operations personnel has been re-emphasized. Additionally, an engineering evaluation was requested to determine if the breaker trip/coordination sequence was proper. At the end of the inspection period, the engineering evaluation was not completed. The licensee will clarify procedure PM-E-18 to more correctly specify the required electrical alignment. This will remain an unresolved item (289/88-07-01) pending completion of the engineering review. The inspector concluded that licensee corrective actions for this event was acceptable.

2.3 SIMS Item No. B-75/B-85 - Post-Trip Review and Data

The inspector conducted a review to verify that a post-trip review process was implemented and that post-trip data collection capability was available as specified in the licensee response to Items 1.1 and 1.2 of Generic Letter 83-28 (Salem ATWS).

The licensee response to this item was contained in letters dated November 8, 1983 and February 1, 1984. These responses were reviewed by NRR and considered acceptable as documented in Safety Evaluation Reports (SER's) dated May 31, 1985 and June 12, 1986.

During previous inspections, the licensee exercised the post-trip review process for eight reactor trips since restart in October 1985. The licensee utilized Administrative Procedure (AP) 1063 as the primary post-trip review process guideline. The inspectors monitored these post-trip/reviews and verified that the licensee properly implemented the process in accordance with the procedures. These reviews were documented in past inspection reports. The inspector discussed various portions of the procedure and the personnel responsibilities involved with various licensee operations personnel. The procedure was well understood and was carried out in the past with few problems.

The data collection capabilities via the transient monitor were reviewed. All parameters required by the generic letter or as exempted in the NRR SER have the capability of being recorded. This capability was enhanced by the sequence of events printout and the alarm printout data, which was also available. Strip chart records were available if the computer was not available at the time of the trip.

The inspector concluded that the requirements of Generic Letter 83-28 for post-trip review were properly implemented at TMI-1.

An unresolved item presently exists (289/86-06-09) concerning the temperature lag for instrumentation for the T-SAT monitor. This is a separate issue that does not affect the required capability of the post-trip review process.

2.4 Operations Summary

Plant operations continued to be conducted in a safe manner. Operator response during the "B" MU pump and "D" 125-volt a.c. vital bus incidents was good and licensee corrective actions were adequate. The problem with poor communications between operations and maintenance personnel was viewed as having the potential to cause other problems with future evolutions if not properly resolved. Licensee review of procedures and proper briefing of personnel prior to the conduct of these evolutions was viewed by the inspector to be vital to safe plant operations. Licensee corrective action in this area will be monitored periodically in future inspections.

3.0 Radiological Controls

3.1 Organization and Qualifications

The inspector reviewed the organization of the Unit-1 radiological controls staff. The qualifications of all members of the staff were also reviewed to ensure that they met the minimum requirements of the Technical Specifications and applicable standards. Nearly all positions identified in the organization were staffed. The staff members were found in all cases to have qualifications at least up to the required levels and, in many cases, had much more formal and/or experience than the minimum required for their positions within the organization.

Additional review in the radiological controls area focused on licensee action on past findings.

3.2 Licensee Actions on Previous Findings

3.2.1 (Closed) Inspector Follow-Up Item (289/83-26-03): Temperature Effects on the Output of the Turbine Building Sump Monitor

This item was opened in connection with the observed changes in the output of the sump monitor with changes in the water temperature in the sump. Investigations by the licensee showed that these temperature-dependent changes were caused by changes in the gain of the photomultiplier tube (PM) in the detector assembly. The detector is a scintillation detector with a sodium iodide (NaI) crystal detector. The gain changes were caused by changes in the resistances of the resistors in the PM tube voltage divider. The detector was sent to the manufacturer (Harshaw) to fix the problem. The resistors were changed to thermistors with negative temperature coefficients. The licensee performed experiments with the modified detector in place in the sump in June 1987. These experiments showed that the temperature effects had been effectively corrected.

However, the data also showed that the output of the detector changed with changes in sump water level. These changes were caused by changes in the amount of shielding provided by the water in the sump. As the water level dropped, the shielding effect decreased and the radiation fields in the turbine building above the sump caused an increase in detector reading. Discussions with the licensee also showed that the method used to calibrate the detector was not representative. The detector was calibrated by immersion in a 55-gallon drum containing radioactive water. The sensitivity of the detector determined in that manner will be less than that with the detector immersed in the sump water because the source size in the sump is larger than that in the drum. In other words, the detector in the sump should give a higher count rate for a given activity concentration than it would for the same concentration in the barrel.

A review of the above considerations show that, although the effects of calibration and water level dependence will cause the detector's output to be different from predicted, both effects are on the conservative side; that is, both effects will cause the detector to register a higher than predicted reading for a given concentration of activity in the sump. The trigger setpoint placed on the output of the detector is used to trip the sump pump and, thus, prevent it from pumping water from the sump to the Industrial Waste Treatment System, which, in turn, discharges into the Susquehanna River. The calculated setpoint was 7600 counts per second (cps), but the setpoint used is 195 cps. The licensee stated that the main reason for choosing this low setpoint was that it falls in the output range of the detector for which calibration data is available. Use of a higher setpoint would place the setpoint in a different output range, which, in turn, would require additional calibration data. Based on the above considerations, the current uncertainties and setpoint are regarded as being conservative and acceptable. This item is therefore considered closed.

3.2.2 (Closed) Inspector Follow-Up Item (289/85-30-03): REM Audit Tracking System

The licensee needed to revise procedure 9100-ADM-1201. The audits were performed periodically by Radiological Engineering and the subject of the audits was the radiological controls program. At the time the item was identified, there was no mechanism to ensure that all elements of the program were audited within an audit cycle.

The licensee has modified the audit procedure and incorporated an audit matrix in procedure 9100-ADM-1201.09, "Internal Assessments Procedure." The program to be audited is divided into ten elements and the procedure requires that an element be audited at least every six months by a minimum of two radiological engineers. The complete audit cycle would take five years. The inspector stated that an audit of a program element once per five years appears to be too infrequent. The licensee stated that the six-month period between element audits specified in the procedure allows for a relaxation of audit efforts during exceptionally busy periods, such as outages. The licensee stated that an element is normally audited every calendar quarter, giving an audit cycle of less than three years. This item is closed.

3.2.3 (Closed) Unresolved Item (289/86-12-16): Procedure Adequacy and Implementation for Shielding Installation

This item was opened in connection with the procedure for installation and removal of temporary shielding. A procedure was developed for installation of temporary shielding (9100-ADM-3282.01, "Installation of Temporary Shielding"). A review of this procedure indicated that the weaknesses identified in connection with this item had been corrected.

3.2.4 (Closed) Inspector Follow-Up Item (289/86-13-04): Radiological Control Department Organization for TMI-1

At the time this item was opened, the position of Deputy Field Operations Manager was included in the actual organization, but it did not appear in the organization plan. Also, at that time, certain functions, such as dosimetry, respiratory protection, and in-plant radiological training, were not part of the Unit-1 organization. These functions had been transferred to Unit 1.

The position of Deputy Manager Field Operations is currently listed in procedure 9100-ADM-1010.01, "Department Organization Plan," but it is not currently staffed and does not appear on the department's organization chart. The licensee indicated that this position will be filled when the Unit-1 and Unit-2 radiological organizations are merged in the near future. The omission of the position from the organization chart will be corrected.

3.2.5 (Closed) Violation (289/86-17-10): Failure to Provide Design Basis for Radiation Monitor Settings

This item is related to the selection of setpoints for monitors RM-G16 through RM-G21 and RM-L1. RM-G16 through RM-G21 are ionization chamber area monitors. Each detector is placed in a location to monitor the radiation field from a pipe that penetrates containment. RM-G21 monitors the activity in the reactor building sump. The function of the detectors is to isolate the lines (or sump pump) if the activity within them exceeds predetermined levels. This is intended to prevent transfer of radioactivity outside of containment. The isolation setpoints were chosen on the basis of activities inside the lines, expressed in uCi/cc. However, the actual detector settings were in mR/hr. At the time the violation was issued, there was no data to show the relationship between the pipe activities in uCi/cc and the detector setpoints in mR/hr. The licensee has since performed a series of calculations of exposure rates at each detector location for specified activities in the respective pipes. The setpoints were selected for activities expected to exist in the pipes for 1 percent failed fuel conditions. The calculated exposure rates were then used to determine the appropriate setpoints. These setpoints have been incorporated into OP 1101-2.1, "Radiation Monitoring System Setpoints." This item is therefore considered closed.

3.2.6 (Closed) Violation (289/87-09-12): Failure to Survey for Letdown Prefilter Cubicle Work

This violation was issued in connection with an incident that occurred in the letdown prefilter room on March 7, 1987. As a result of the events connected with that incident, two workers were found to have internal contamination. A preliminary critique of the incident was held by the licensee on March 7, 1987, and a formal critique was held on March 10, 1987. Radiological Incident Report (RIR) was issued by the licensee on March 25, 1987 (RIR 87-0192). The critiques and the RIR were reviewed by the inspector. The corrective actions were acceptable and the item is closed.

3.2.7 (Closed) Violation (289/87-09-13): Failure to Follow Control Procedures for When Standing Radiation Work Permit is Not to be Used

The violation was issued in connection with an incident that occurred on March 12, 1987. As a result of the incident, two workers showed external and internal contamination. Contamination occurred when the workers removed a yellow plastic bag from a splash ring used on a high integrity container used for spent filters. The plastic bag did not have a radioactive material label. A critique was held by the licensee on March 12, 1987, and an RIR was issued on March 12, 1987. The critique and RIR were reviewed by the inspector. The corrective actions were found to be adequate, and this item is therefore considered to be closed.

3.2.8 (Closed) Unresolved Item (289/87-09-14): Effectiveness of Licensee Measures to Assure High Radiation Areas Remain Properly Posted/Barricaded

High radiation areas are required by Technical Specifications to be barricaded and posted. On an inspection tour on April 20, 1987, the NRC inspector found the door to the waste evaporator cubicle to be open with no barricade. The cubicle was posted as a high radiation area (HRA), but surveys of the area at that time showed the radiation fields to be less (40 mR/hr) than those that would require establishment of a high radiation area (100 mR/hr). The licensee stated that this situation has been corrected by moving the posting for the cubicle outside the door area. This allows the door to be left open to facilitate work in the area and still maintain proper posting and barricading. The inspector reviewed procedure 9100-ADM-4110.01, "Establishing and Posting Areas." The procedure only defines a HRA but does not explain what a barricade is and how to establish such barricades. The licensee stated that the procedure will be changed to address this weakness. This item is therefore considered closed.

3.3 RIR Review

The RIRs generated in connection with closeout items 87-09-12 and 87-09-13 discussed above were reviewed during this inspection. In the case of item 87-09-12, although RIR identified most of the problems that occurred during the incident, it did not clearly identify and isolate the root causes of the incident. A review of the events by the inspector shows that two factors were responsible for the incident: the radiological controls technician who covered the job did not attend the pre-job briefing, and the technician and his supervisor failed to observe the requirements of the RWP for the job. The RWP clearly indicated that respiratory protection was required for any activity other than visual inspection. The activities involved in the incident included movement of equipment inside the filter room, but respiratory protection was not used. The corrective actions specified in the RIR were limited to memos to various supervisors to observe certain requirements and precautions. The RIR did not clearly identify the reasons for not attending pre-job briefings and for violating RWP requirements. It did not, therefore, propose changes in procedure that would address these deficiencies, nor did it clearly identify the persons and organization responsible for the incident. The inspector expressed these concerns to the licensee. The licensee stated that the RIR was weak and that efforts will be made in the future to correct this weakness.

As in the case of the above incident, the RIR produced in connection with item 87-09-13 also did not clearly isolate the root causes of the incident. Corrective actions were again limited to memos to various supervisors alerting them to precautions to take in similar situations. However, the persons directly responsible for the incident, and the procedural violations involved, were not clearly identified. A review of the incident by the inspector indicated that the root cause of the incident was the fact that the plastic bag was not labeled. The licensee stated that the bag was yellow in color, indicating radioactivity, and that the workers involved should have known that fact. However, there was no discussion in the RIR of why the workers did not respond appropriately to the color of the bag, if indeed that statement is valid. There was no clear indication in the RIR of why the bag was not labeled, and who was responsible for this omission. The licensee stated that contaminated items in radiologically controlled areas do not need to be labeled (Procedure 3000-IMP-4400 01), "Radioactive Material Identification and Handling." However, the same procedure specifies that the labeling exemption is for "...radioactive material being worked or otherwise handled by a radiation worker." Otherwise, the material must be labeled to "...provide sufficient information to permit individuals handling or using the material/containers or working in the vicinity thereof, to take precautions to avoid or minimize exposure." The RIR did not discuss these considerations to determine how this procedural requirement applied in the case in question, and if it applied, why there was no label; or, if it did not apply, how might the procedure be modified to prevent recurrence of similar incidents involving unlabeled contaminated items. The inspector expressed concern about regarding RIR serving the function for which it was intended, namely, identifying and correcting root causes. The licensee acknowledged the inspector's concern and stated that they planned improvements in preparing RIRs. This area will be reviewed during future inspections.

3.4 Radiological Controls Summary

Licensee actions on various RIR's were generally weak. The RIR's were not effective in identifying root causes of the problems. The licensee committed to review the process to ensure that adequate reviews of radiological problems are conducted in the future. Licensee action on the remaining open issues was satisfactory.

4.0 Equipment Operability Review - Maintenance/Surveillance

4.1 Criteria/Scope of Review

The inspectors reviewed selected activities to verify proper implementation of the applicable portions of the maintenance and surveillance programs. The inspector used the general criteria listed under the plant operations section of the report. Specific areas of review are listed in Attachment 1. A more detailed review of equipment operability is addressed below.

4.2 Reactor Trip Breaker No. 4 Failure

On March 16, 1988, the licensee reported that a reactor trip breaker had failed a portion of the monthly surveillance test. The licensee was performing Surveillance Procedure (SP) 1303-4.1 on Channel "D" of the Reactor Protection System (RPS).

This surveillance is accomplished on each of four RPS channels on a rotating monthly basis. One channel is checked each week; hence, the entire RPS surveillance is completed monthly. A part of the surveillance for Channel "D" is to check the Nos. 3 and 4 d.c. reactor trip breakers to verify that the shunt trip and undervoltage (UV) trip coil each function. The surveillance is accomplished with a test switch which can be positioned to trip each coil independently. On a normal reactor trip signal, both coils actuate.

During the portion of the surveillance that checked the UV coil, it was observed that when the test switch was positioned to de-energize the coil for the No. 4 reactor trip breaker, the breaker did not trip. The shunt trip function was checked; and, it was verified that the shunt trip coil was operable and, if an actual RPS trip signal was generated, the breaker would have tripped.

The licensee removed the breaker and installed a previously tested spare. The surveillance test for Channel "D" was completed satisfactorily. The technical specifications (TS) allow a 48-hour period to repair a faulty reactor trip breaker, if only one of the diverse trip features was inoperable (TS 3.5.1.7). As the failure did not result in loss of redundancy, no other action by the licensee was required. An evaluation for reportability was made and the licensee determined that the event was not reportable. The inspector concurred in this evaluation based on a review of 10 CFR 50.72/73.

The licensee disassembled the failed breaker to determine the cause of the failure. Initial observations showed that the trip paddle for the UV device had become mispositioned with respect to the armature of the UV trip coil. This prevented the UV armature from moving to actuate the trip paddle to trip the breaker. The operation of the trip shaft was not affected as the shunt trip paddle was able to complete a breaker trip. This was verified on three separate occasions.

Subsequent licensee investigation revealed that the clearances between the end of the UV coil armature and trip paddle prevented the armature from moving when the UV device was de-energized. This was possibly due to manufacturing anomalies with the UV device armature and the trip paddle. The licensee was investigating changes in the preventive maintenance (PM) process to ensure that the clearance between the trip paddle and UV armature was proper. Other reactor trip breakers at the facility had not experienced this problem and the licensee had initially concluded that this problem was not applicable to other breakers.

The inspector concluded that there was reasonable assurance that the reactor trip system can function as designed. This problem appeared to be unique to the one particular breaker and the surveillance test sequence and PM program used by the licensee should identify any other breakers with this problem. The inspectors will continue to follow licensee actions to determine what additional PM effort or testing is required to enhance the reactor trip breaker operability.

The licensee has been in contact with the Babcock & Wilcox Owners Group (BWOG) and General Electric (GE) to determine if any other corrective action is needed. The licensee expects to receive guidance from B&W concerning any additional preventive maintenance that can be accomplished to more adequately verify that the same condition that existed with the No. 4 d.c. reactor trip breaker does not exist with other breakers. This guidance will be factored into site preventive maintenance procedures after evaluation. This item remains unresolved (289/88-07-02) pending licensee changes to the preventive maintenance program. Additionally, the licensee committed to provide a special report to the NRC staff on this problem, as a Licensee Event Report (LER) was not mandatory.

4.3 Operational Test of the Emergency Diesel EG-Y-1B

On March 6, 1988 at 4:13 a.m., during the shutdown following a surveillance test, the diesel exhaust manifold caught fire. The emergency diesel room was manned during the test and the fire was put out immediately. The local and remote speed indication was lost due to the temperature which caused a disconnect of the internal tachometer wires. The diesel was declared inoperable and diesel 6-Y-1A was tested as required by Technical Specifications Section 3.7.2. The diesel was repaired and back in service at 8:15 p.m. the same day. Continued reactor operation would have been allowed for 7 days.

The cause of the fire was determined to be a small leak of engine coolant on the hot exhaust manifold. There have been small fires in the past caused by engine oil leakage through an exhaust manifold joint.

The licensee developed a detailed corrective action plan that included: (1) removal of the exhaust manifold, inspection, cleaning, and reinstallation with new gaskets; (2) replacement of all twelve thermocouples; (3) repair of the small coolant line; and, (4) repair of the tachometer. The inspection of the exhaust system and the mating surfaces did not indicate any significant defects.

Following the above-mentioned repairs, the diesel was tested satisfactorily. The inspector witnessed these activities, including job planning, and reviewed the associated work packages for adequacy and completeness. The inspector made the following observations.

-- The licensee initially planned on replacing two thermocouples (Nos. 4 and 12). Further examination identified additional thermocouple problems and the licensee decided to replace all thermocouples.

-- The inspector also noted two different styles of the replacement thermocouples. Some were of original construction and some had smaller diameter metal sheaths. Both styles have the same part number and were accepted by licensee Quality Control (QC) inspectors; however, the old style did not have a shelf life limit, while the new style had a six years shelf life. The licensee prepared an engineering evaluation supporting the installation and also informed the vendor. It was the vendor's position that the shelf life on the new style was not applicable and both styles were acceptable for the application. However, the vendor did not advise the licensee about the apparent difference in construction, as well as the shelf life issue. Also, it appears that the licensee's receipt inspection system did not detect the apparent discrepancy. In response to previous findings (NRC Inspection Report No. 50-289/88-01), the licensee already has initiated efforts to correct such problems. The residents office will review the effectiveness of the corrective actions once implemented.

-- The inspectors discussed the diesel fire issue with licensee's management on March 21, 1988, to assess long-term actions. The licensee has developed a long term plan using Kepner Tregoe techniques. The technique is a management tool utilized to scientifically analyze the generic issues with safety significance and then implement an action plan. The licensee plans to assess the adequacy of the corrective actions already taken using this system.

The repair was well planned and the licensee did an acceptable job in implementing the short-term actions. The inspector reviewed a total of seven job tickets. The job tickets were well prepared and all the planned work was accomplished and the diesel was declared operable on the same day.

The inspector reviewed SP 1303-4.16 for both emergency diesels. The surveillance data was recorded as required. On both diesels, the inspector noted that the temperature readings for several cylinders were outside the recommended range. However, they were still within the allowable limits of maximum cylinder temperature, as well as the maximum differential temperature between any two cylinders. The operability of the diesels was not compromised by this temperature anomaly: however, the licensee was in contact with the vendor to establish appropriate normal operating limits.

The inspector also reviewed the annual surveillance performed per SP 1301-8.2 on both emergency diesels. The inspector noted that on an older surveillance (June 1987), some of the data corrections were not initialed. This situation was corrected for the current annual surveillance.

The inspectors noted substantial efforts of senior licensee management in looking at new ways to more efficiently conduct troubleshooting and in developing a long-term solution for correcting generic issues. The inspector had no further questions regarding this issue.

4.4 Licensee Actions on Previous Inspection Findings

4.4.1 (Open) Inspector Follow Item (289/86-10-02): Significant Damage to the Diesel-Driven Fire Pump Building

This item remained open pending Borated Water Storage Tank (BWST) pipe tunnel plugging and evaluation of a fire pump discharge check valve preventive maintenance program.

To prevent flooding of the auxiliary building through the BWST pipe tunnel, the conduit duct banks in the BWST tunnel were resealed. The inspector reviewed Job Ticket (JT) No. 130 on which this work was completed. The inspector had no further questions.

The licensee has completed inspections of existing Walworth check valves in the plant. The results of these inspections indicate that there are no problems with other check valves of this design.

The licensee is currently utilizing a non-destructive examination system (checkmate) that allows check valve performance/operability determination without disassembly. The results of the checkmate examinations are to be verified by comparison with the results of other check valve examination techniques. After verification, the licensee will determine the appropriate preventive maintenance frequency for the Walworth check valves.

This item remains open pending determination of the preventive maintenance frequency of Walworth check valves. The licensee plans to determine the frequency of PM's by the end of this year.

4.4.2 (Open) Unresolved Item (289/87-06-05): Review of Differential/ Pressure (D/P) Instrument Performance

This item remained open pending completion of licensee evaluative actions.

The licensee had increased the frequency of calibration of the main feed pump differential/pressure (D/P) switches from a refueling basis to quarterly. The data continued to be unacceptable; i.e., the setpoint continued to drift. Licensee personnel are evaluating possible corrective actions; one of which is replacement of the D/P switches, which appears to be the best option. No plans have been made, as yet, to accomplish this task. This item remains open pending completion of licensee action to correct this situation.

4.5 Equipment Operability Summary

Maintenance and testing activities continue to be accomplished in a safe manner. No forced outages resulted from poor or incorrect maintenance activities. Licensee corrective action for the problems associated with the reactor trip breaker are inconclusive, as yet, and any changes in the maintenance practices for the breakers will be examined in future inspections. The longstanding issues associated with diesel generator fires, fire service check valve, and feedwater D/P instrument appears open for an excessive amount of time. This may be due in part to an inappropriate prioritization of engineering actions.

5.0 Engineering Support

5.1 SIMS Items

5.1.1 (Closed) SIMS No. III.D.3.4.2: Control Room Habitability

The 10 CFR Appendix A, General Design Criteria 19, "Control Room," as well as NUREG 0737, Item III.D.3.4, defines the specific criteria necessary to assure that the control room is maintained in a safe habitable condition to assure that the control room operators are adequately protected against the accidental release of toxic and radioactive gases and to assure the plant can be safely operated or shut down under design basis accident conditions.

The licensee's design was reviewed by the inspector and was found to be acceptable. The inspector had previously identified a few exceptions from NUREG 0737 requirements as documented in NRC Inspection Report No. 50-289/87-02. During this inspection period, the inspector reviewed these exceptions. The details are as follows.

-- System Design Description (SDD): TI-670F on the chlorine detection system stated the location of the two chlorine probes, CE-776-2 and CE-777-2, being below the grade level in the air intake structure. The actual location, however, is above grade at the 320-foot evaluation. The necessary change notice is in place and the SDD will be revised accordingly.

-- SDD TI 670F, Section 1.6.6.2.2 stated the location of a reset button was on Section A of the heating and ventilation (H&V) panel. The actual location, however, was on the Section B of the H&V panel. This was the only exception and it remained uncorrected. The licensee intends to revise the SDD to incorporate this exception.

-- Operating Procedure (OP) 1104-19, as well as the Emergency Procedure (EP) 1203-34 have now been revised to reflect the current design of the Chlorine Detection System (CDS).

The chlorine detection system (CDS) is now fully operational. The required testing and surveillance are being performed per established procedures. The inspector reviewed the relevant data and found it to be satisfactory. The CDS requires continuous maintenance involving frequent replacement of the chlorine detectors. The licensee, however, maintains its operability status by depending upon the routine surveillance and testing, as well as the built-in, self-diagnostic features. The inspector had no other comments on the installation and operation of the CDS.

5.1.2 <u>(Closed) SIMS M64800: Technical Specification for Chlorine Detection and (Closed) Unresolved Item (289/87-11-03)</u>

The safety-grade Chlorine Detection System (CDS) was installed for Cycle 6 startup. The CDS involved installation of four chlorine detectors. Two detectors, CE 766-1 and CE 777-1, were installed at the river water screenhouse and the second set of detectors, CE 776-2 and CE 777-2, were installed at the air intake tunnel. The system is designed so that any chlorine release in excess of 5 parts per million (ppm), the system will automatically be actuated and the Control Room Ventilation System (CRVS) placed into a recirculation mode to prevent outside chlorine from entering the control room environment and, thus, maintain the required control room habitability.

NRC Inspection Report No. 50-289/87-11 addressed the unplanned periodic actuation of the CRVS caused by spurious high chlorine detector response. All the items of concern have been resolved as follows.

-- The inspection report incorrectly noted that the sensitivity of the chlorine detectors was having a negative impact on the system. According to plant engineering, the electrolyte being used is chlorine-specific and does not have any effect on the detectors sensitivity. The spurious actuation was caused by the direct exposure of the detectors to the harsh environmental conditions. Through the Change Modification Request (CMR) No. 0820M, the licensee has corrected this problem by installing a protective umbrella over the detectors. Since then, the CDS is operating satisfactorily without any spurious actuations.

-- In NRC Inspection Report No. 50-289/87-11, the inspector also had questioned the effectiveness of the weekly preventive maintenance procedure IC-145. The review of this procedure during the current inspection period does not indicate any weaknesses. The root cause of the problem was corrected by the above-mentioned CMR.

All the open items on control room habitability, as previously identified, have been resolved and verified by the inspector and this item is closed.

5.2 Licensee Actions on Previous Inspection Findings

5.2.1 (Closed) Unresolved Item (289/86-12-14): Minimum Motor Starting Voltages

NRC Inspection 50-289/86-03 identified concerns regarding the adequacy of analysis performed to assure that sufficient voltage was available to start and operate certain safety-related motor-operated valves (MOV's). An earlier analysis, which was performed in 1979, resulted in the modifications of some of the MOV units to ensure proper operation. However, this analysis did not cover MOV's in the EFW and main steam (MS) systems, since at that time they were not considered safety related. Further, the analysis assumed that the unit MCC bus voltage and the voltage at the motor terminals were the same.

The following documents which reflect licensee analysis/studies and actions taken to ensure adequate voltage were reviewed.

-- GPUN TDR No. 114, Revision 1, "Adequacy of Station Electric Distribution System Voltages"

-- GPUN TDR No. 836, Revision 0, "Evaluation of Loading for the Emergency Diesel Generators and Engineering Safeguards Buses"

-- GPUN Memorandum, R. J. Hrabak/M. A. Materjorich to G. S. Saduska, "1986 TMI 230 KV Grid Voltage Study"

The licensee analyses were performed, using their "DAPPER" computer program with appropriate verification measurements of voltage at selected locations, to provide confidence in the accuracy of the program. Based upon the analyses which show reinforcements in the grid transmission system, since the original analysis, the licensee has increased the minimum switchyard voltage considered for degraded grid operation from 225 KV to 227 KV. The minimum voltages at the MOV terminals were measured for both motor starting and full load currents. The resultant voltages were found to be acceptable in accordance with the criteria previously established in TDR No. 114. This item is closed.

5.2.2 (Closed) Unresolved Item (289/86-12-12): Design Input Associated with Emergency Feedwater Pump (EFW) Overcurrent Protection

During NRC Inspection 50-289/86-03, concerns were identified regarding the overcurrent relay protection provided for large safety-related motors. Of particular concern were the EFW pumps and motors which originally were considered non-safety-related nuclear components. Design analysis support for the EFW pump motor overcurrent protection were considered weak due to incorrect relay settings and the apparent lack of consideration for long-term thermal degradation of the motors.

In response, the relay protection was evaluated for the EFW pump motors and other large safety-related motors including:

-- Reactor Building (RB) Spray Pump Motors (BS-P-1A, BS-P-1B)

-- Decay Heat Removal Pump Motors (DH-P-1A, DH-P-1B)

-- EFW Pump Motors (EF-P-2A, EF-P-2B)

-- Make-Up Pump Motors (MU-P-1A, MU-P-1B, MU-P-1C)

-- RB Emergency Cooling Pump Motors (RR-P-1A, RR-P-1B)

These evaluations identified protective relay setting changes for the spray pumps, decay heat removal pumps, and the EFW pumps. The inspector confirmed licensee implementation of the required changes.

5.2.3 (Closed) Unresolved Items (289/86-12-15 and 289/87-10-01). Instrumentation Grounding and Shield Standards

During NRC Inspection 50-289/86-03, concerns were identified regarding the lack of established formal standard procedures to cover proper grounding and shielding practices for instrumentation and control signal circuits. NRC Inspection 50-289/87-10 identified a specific area of questionable shield grounding in the Heat Sink Protection System (HSPS) instrumentation.

This inspection confirmed that the licensee has established and implemented Engineering Standard (ES)-028, Revision 0, September 25, 1987. This standard endorses Division of Reactor Implement and Technology, USAEC, RDT Standard C1-1T, "Instrumentation and Control Equipment Grounding and Shielding Practices."

Field inspection and review confirmed that the licensee has also investigated and corrected/resolved questionable grounding/shielding in the HSPS instrumentation under Field Change Notice (FCR) No. C038886 and 056084.

These items are closed.

5.2.4 (Closed) Violation (289/87-01-15): Improper Mounting of Foxboro D/P Transmitters

NRC Inspection Report No. 50-289/87-01, examined selected safety-related components including Limitorque MOV's, Foxboro transmitters, Rosemount transmitters, Target Rock solenoid valves, level switches, radiation detectors, temperature detectors, and electrical splices. This inspection revealed two Foxboro transmitters mounting using U-bolts on vertical pipe sections. The U-bolts were loose on both units. This mounting is contrary to the qualified seismic mounting specified in the vendors manual.

The inspector confirmed that the licensee has evaluated the questionable mounting in accordance with NRC Generic Letter (GEL) 87-02, "Verification of Seismic Adequacy of Mechanical and Electrical Equipment (USI) A-46." In addition, the licensee is addressing the seismic adequacy of all safety-related equipment in order to provide the response required by GEL 87-02.

This item is closed.

5.2.5 (Closed) Unresolved Item (289/86-03-22): Procurement Deficiencies for Back-Up Instrument Air

The inspector reviewed a Quality Deficiency Report (QDR), which was issued because Purchase Order No. TP-035330 was issued with a safety classification of non-important to safety (NITS) and incorrect dewpoint and filtration requirements.

The inspector verified that a Certificate of Conformance was issued by the vendor (Air Products, Inc.). The inspector also determined that the quality of air received from the vendor exceeded the required design dewpoint and filtration requirements. The purchase order has been revised to ensure adequate controls on future procurement by classifying the purchase order as important to safety (ITS).

The inspector also reviewed the installation documentation for the modification which installed an air compressor to provide a permanent source of charging air for the two-hour back-up instrument air storage bottles. The inspector verified that dewpoints and filtration requirements are being met by this modification.

This item is closed.

5.2.6 (Closed) Unresolved Item (289/86-12-10): Evaluations of EFW Pump Recirculation Line Design Change

Corrective Maintenance Modification No. CM0515M removed the instrument air tubing from the instrument air line downstream of IA-V-1125 to EF-V-8A. The justification for removal of the instrument air line was that it was a potential safety hazard. Also, the instrument air supply to EF-V-8A is not credited as a back-up supply since the instrument air compressors which feed it are not important to safety (NITS). The work was performed under JT CH-269 per CM0515M.

This item was opened as a PAT inspection finding in NRC Inspection Report No. 289/86-12 because the proper safety evaluation could not be located. An adequate safety evaluation was performed and work was completed as ITS. The inspector determined that removal of this line was previously evaluated by NRC and approved.

This item is closed.

5.3 Engineering Support Summary

Licensee action on previously identified areas in the engineering support area was completed in an acceptable manner.

6.0 Physical Security Plan Implementation

On March 11, 1988, the inspector reviewed licensee's Physical Security Plan and inspected several areas as mentioned below to assess plan implementation.

The installed search equipment, used by the licensee was found to be operable. Some redundant equipment was not operable, was covered by the required compensatory measures. The inspection also reviewed equipment test procedures, test data, and their completeness. No unacceptable conditions were identified.

The inspector toured the protected area with a security department representative. The protective fence, gates, locks, etc. were well maintained and the isolation zones on both sides of the protected area was clean and clear of any obstacles. No weakness was observed.

The inspector witnessed the shift change at the Processing Center. The security guard officers were found to be very attentive.

The inspector also witnessed an inspection of a vehicle, which was performed by the security guard. It was done thoroughly.

The inspector inspected the CAS and Secondary Alarm Station (SAS), reviewed the relevant documentation, and monitored the operation of various equipment. The entire operation was accomplished satisfactorily and both facilities are well maintained. The assessment system had adequate clarity. The manning of the security guards was in compliance with the security plan requirements.

The inspector joined the routine patrol with the "Scout" security guard. This patrol involves monitoring several equipment areas, fencing, gates, building roofs, isolation zones, emergency power supply rooms, lighting, etc. The patrol activities were documented by the security guard, as required.

The entire security crew was found to be professional, well trained, and experienced. The overall security functions reviewed were found to be adequate.

7.0 Safety Assessment - (Closed) Violation (289/85-27-09): Independent On-Site Safety Review Group Performance

An inspection was conducted to evaluate the performance of the Independent On-Site Safety Review Group (IOSRG) and to verify the corrective and preventive actions taken by the licensee as described in a letter, H. Hukill to T. Murley, dated February 10, 1986, in response to a violation related to IOSRG activities identified during NRC Inspection 50-289/85-27.

During Inspection 50-289/85-27, certain requirements associated with the performance of the IOSRG were identified as not having been performed. Also, it was determined the overall effectiveness of the group was difficult to assess. During this inspection, the licensee's corrective action which had been taken, the effectiveness of the corrective action, and overall performance of the group was evaluated.

An important factor in arriving at any conclusion associated with the performance of the group is that, since Inspection 50-289/85-27, all IOSRG members, the Manager of Nuclear Safety and the NSAD Director to whom the IOSRG reports have all been replaced with new personnel. These personnel changes appear to have had a significant impact on the implementation of the corrective action committed to for the prevention of recurrence of previous procedure adherence problems. As discussed later, however, a few of the previous problems still exist.

In addition to discussions with personnel, the following documentation was reviewed to determine adherence to Technical Specifications (TS) and administrative requirements.

-- Independent On-Site Safety Review Group Procedure - TMI-1, 6310-ADM-1010.01, Revision 5

-- Qualification forms for each member of the group

-- Personnel training records for each member with the exception of the consultant currently part of the group

-- Various IOSRG monthly reports

-- Various IOSRG bi-monthly reports

-- TMI IOSRG work projections for 1987

-- Various IOSRG record of review/investigation forms

-- Records of TS Change Request reviews

Also, the following documentation associated with evaluations and assessments were reviewed.

-- Human Performance Evaluation System Report - Replacement of Expansion Joint for RR-P-1B with Wrong Model

-- Human Performance Evaluation System Report - Both Emergency Diesels Removed from ES Standby LCO Violation

-- Containment Integrity, dated October 16, 1987

-- Effectiveness Evaluation of GPUN Operating Experience Review, dated June 1987

-- Evaluation of Shift Scheduling at TMI-1

-- Differences Between TMI-1 Administrative Procedure (AP) 1043 and Corporate Procedure 1504-ADM-3040.01

-- Potential for Hydrogen Combustion in the RCS

-- Failure Rate of RPS System

-- Heated Posts

-- TMI Saturation Monitor - Time Response

As a result of the above reviews, many positive findings were identified. However, some negative findings were also made. In general, the IOSRG requirements of the TS appeared to be met. Some implementing procedure nonadherences were again noted and the corrective action committed as a result of a previous violation was marginally implemented.

As required by TS, the group is comprised of a Manager - Nuclear Safety and a staff of three qualified members. In addition, another engineer skilled in human performance evaluation has recently been assigned to the group.

The documentation considered to be formal evaluations performed by the group are comprehensive, detailed, and well documented. These evaluations appear to satisfy the overview review functions required by the TS. The evaluations appeared to be effective in that it was noted certain reviews were brought to the attention of the president of GPUN. A TS change was being made and procedure revisions undertaken as a result of IOSRG evaluations. Site personnel appear interested in the human performance evaluations being performed, recommendations was being considered by operations, training had interfaced with IOSRG, and top level corporate management had requested group evaluations. A recommendation follow-up system should make the assessment of the group's effectiveness even easier.

Monthly and bi-monthly reports are also prepared. These reports generally summarize the significant activities of the IOSRG. The monthly reports generally provide slightly more information than the bi-monthly reports. These reports although identified as providing a summary of IOSRG activities do quite frequently also contain some assessments.

The IOSRG procedure requires only bi-monthly summary reports and formal reports of evaluations and assessments. Inspection findings show the monthly and bi-monthly reports do frequently include assessments and that reports considered to be formal reports are not generally so identified. For the most part, documentation which serves as a formal report is usually distributed as a memorandum. Also, the report distribution is not always as required by TS or the procedure.

Other areas where the practice is not in accordance with IOSRG procedure is in the u of "review records" and the annual trending of these records. The use of "review records" was judged to be inappropriate and has been completely discontinued. Also, the IOSRG procedure describes a method by which group findings are resolved with responsible management and that only items which are not resolved become recommendations. The IOSRG in its documentation of assessments and evaluations does not adhere to this procedural requirement. This is discussed later in this section. Although not part of the IOSRG procedure, weaknesses were noted in that IOSRG recommendations are not always clearly identified. That is, they are sometimes part of a conclusion while at other times they are clearly noted as recommendations. Also, the results of recommendations are not maintained, nor is any open item list maintained of internal commitments made in monthly and bi-monthly reports.

These issues were discussed in detail with the licensee, particularly since some of the findings were similar to those identified in NRC Inspection Report No. 50-289/85-27.

The licensee was aware of the fact that the IOSRG procedure was not being fully adhered to. A complete rewrite of the procedure in draft form had been prepared and was still in the review process prior to being issued. The draft procedure, among other things, addresses IOSRG project selection, schedules, assessment reporting, records, and responsibilities. Along with the requirement for procedural compliance, the weaknesses primarily in the areas of identification of what is an IOSRG assessment, assessment distribution in order to meet requirements and to be most effective, and the identification and follow-up to recommendations was discussed in detail with the licensee. The licensee indicated these matters would be clearly addressed in the review of the IOSRG procedure. The licensee further committed to have the revised procedure issued by August 5, 1988. This item remains unresolved pending the issuance of the revised procedure (289/88-07-03).

During the follow-up to the corrective action specified by the licensee, it was noted that certain of the IOSRG procedure changes which were committed to in order to avoid further violations were marginally implemented or ineffective. For example: (1) The corrective action stated procedural clarification would be made so that the use of the word "schedule" would be unambiguous. This was accomplished by completely eliminating the word "schedule" in the revised procedure. (2) Procedure clarification was specified which would identify which reports of evaluations and assessments satisfy the TS requirements. The revised procedure specifies bi-monthly reports are to provide a summary of reports of evaluations and assessments and formal reports of evaluations and assessments. Currently, monthly reports and bi-monthly reports are prepared which summarize major IOSRG activities and frequently contain some assessments. Few formal reports are issued; however, formal evaluations are frequently issued, not as formal reports but as memoranda.

(3) procedural clarification was committed to, ensure uniformity and consistency in the documentation and handling of IOSRG recommendations. The revised procedure describes a discussion of assessment findings with responsible management and the preparation of a memorandum to document agreement reached in the development of corrective or problem solving action. The procedure specifies only those items which are not resolved may become recommendations. This method of resolution of IOSRG assessments is not generally used. Many recommendations are specified in assessments, both clearly identified as recommendations or frequently not clearly identified in a conclusion section of an assessment.

This poor follow-up to committed corrective action and the need for accurate communication with the NRC was discussed in detail with the licensee. The licensee indicated that there was no intent to be anything but fully responsive to their implementation of these corrective actions. However, with the significant changes in personnel that have taken place during the implementation and follow-up of the corrective action, the desired improvements had not been fully achieved. In order to address this situation, the licensee prepared a draft procedure, which will correct this poor implementation of corrective action. The quality of the revised procedure and its implementation following its issuance will be closely reviewed by the NRC to fully resolve this matter.

This section closes outstanding item 289/85-27-09.

8.0 Emergency Preparedness - Information Flow During Emergency Exercise

During the past emergency exercises, some communication problems surfaced between the licensee and the NRC Operations Center. The licensee's Emergency Notification System (ENS) and Health Physics Network (HPN) communicators could not readily provide the requested information by the NRC, as required per 10 CFR 50.72(c)(3). The problem was the large amount of information, as well as the type of information. In order to correct this problem, the licensee was provided additional guidance by NRC Region I. Subsequently, the licensee has revised two of their emergency procedures. The inspector reviewed these procedures which reflect the changes consistent with the NRC guidelines. The guidelines were provided in a letter dated August 31, 1987, from Thomas T. Martin, Director, Division of Radiation Safety and Safeguards to Mr. H. D. Hukill, Director and Vice President of TMI-1.

The communication difficulties were related to the emergency exercises only. The normal operations are not affected. The communication during normal operations is conducted per approved procedures and no inadequacies have been observed. No further follow-up is necessary.

9.0 Exit Interview

The inspectors discussed the inspection scope and finding with licensee management at a final exit meeting on April 8, 1988. Interim exit meetings were conducted on March 25, 1988, concerning radiological controls; March 31, 1988, concerning several unresolved items; and, on April 5, 1988, concerning IOSRG. In addition to those marked by an asterisk in paragraph 1.3, senior licensee personnel at the final exit meeting included:

-- J. Colitz, Manager, Plant Engineering
-- R. Hukill, Director, TMI-1

The inspection results as discussed at the meeting are summarized in the cover page of the inspection report. Licensee representatives did not indicate that any of the subjects discussed contained proprietary or safeguards information.

Unresolved Items are matters about which more information is required in order to ascertain whether they are acceptable, violations, or deviations. Unresolved items discussed during the exit meeting are addressed in paragraphs 3.2, 4.3, and 5.2.

Inspector Follow Items

Inspector follow items are matters that necessitate further review and evaluation by the inspectors. These items are used to document, track, and ensure adequate follow-up on matters of concern to the inspector. Inspector follow items are addressed in paragraphs 3.2 and 4.4.

ATTACHMENT 1

NRC INSPECTION REPORT NO. 50-289/88-07

ACTIVITIES REVIEWED

Plant Operations

-- Control room operations during regular and back shift hours, including frequent observation of activities in progress and periodic reviews of selected sections of the shift foreman's log and control room operator's log and selected sections of other control room daily logs

-- Areas outside the control room

-- Selected licensee planning meetings

During this inspection period, the inspectors conducted direct inspections during the following back shift hours.

Day/Date	Time
3/11/88	3:30 - 7:00 a.m.

Maintenance/Surveillance

-- Job Ticket (JT) CR-771/772 - Diesel generator thermocouple repair

-- JT CR-744 - Diesel generator oil leak repair

-- JT CP-504 - Diesel generator cooling system leak repair

-- JT CP-505 - Diesel generator exhaust manifold flatness check

-- Surveillance Procedure (SP) 1301-4.1, Revision 42, effective April 13, 1988, "Weekly Surveillance Checks"

-- SP 1302-3.10, Revision 1, effective March 15, 1986, Chlorine Detection System Instrumentation Channel Calibration"

-- SP 1303-5.16, Revision 3, effective November 17, 1987, "Chlorine Detection System Instrumentation Channel Test"

Reactor Coolant System (RCS) Leak Rate

The inspector selectively reviewed RCS leak rate data for the past inspection period. The inspector independently calculated certain RCS leak rate data reviewed using licensee input data and a generic NRC "BASIC" computer program "RCSLK9" as specified in NUREG 1107. Licensee (L) and NRC (N) data are tabulated below.

TABLE

RCS LEAK RATE DATA
All Values GPM

DATE/TIME DURATION	L_G	N_G	(NUREG 1107) N_U	CORRECTED N_U	L_U
3/14/88 1:03 a.m 2 Hours	0.4260	0.43	-0.03	0.07	0.0720
3/15/88 7:58 a.m. 2 Hours	0.6760	0.68	-0.02	0.08	0.0843
3/28/88 3:23 p.m. 2 Hours	0.2902	0.29	-0.05	0.05	0.0568
3/30/88 4:11 p.m. 2 Hours	0.3161	0.32	0.05	0.15	0.1562

G = Identified gross leakage
L - Licensee calculated
U = Unidentified leakage
N = NRC calculated

*Declared invalid by licensee due to water addition to make-up tank.

Columns 2 and 3, 5 and 6 correlate $\pm$ 0.2 gpm in accordance with NUREG 1107. N_u is corrected by adding 0.1044 gpm to the NUREG 1107 N_u due to total purge flow through the No. 3 seal from RCP's.