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March 5, 1987
 5211-87-2045

Dr. Thomas E. Murley
 Region I, Regional Administrator
 U.S. Nuclear Regulatory Commission
 631 Park Avenue
 King of Prussia, PA 19406

Dear Dr. Murley:

Three Mile Island Nuclear Station Unit 1 (TMI-1)
 Operating License No. DPR-50
 Docket No. 50-289
 Notice of Violation Response for
 Inspection Report 86-17

This is in response to Inspection Report No. 50-289/86-17 dated December 31, 1987. Extension of the original 30 day response time was granted by Senior Resident Inspector, F. Young because of the management meeting to discuss Inspection Report 86-17 which took place on February 9, 1987.

Attachment A to this letter is GPUN's response to Appendix A of Inspection Report No. 50-289/86-17 "Notice of Violation." Attachment B provides GPUN comments in response to additional items discussed in Inspection Report 86-17.

Inspection Report 86-17 also requested a written description concerning TMI-1's independent verification program. This information will be provided by separate correspondence when complete.

Sincerely,

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 PDR ADDOCK 05000289
 Q PDR

J. J. Colitz for H. D. Hukill
 H. D. Hukill
 Vice President & Director, TMI-1

HDH/MRK/spb:0803A

Attachments

cc: J. Thoma, USNRC
 TMI-1 Senior Resident Inspector
 Document Control Desk

Sworn and subscribed to before
 me this 5th day of March, 1987.

Sharon P. Brown
 Notary Public
 SHARON P. BROWN, NOTARY PUBLIC
 MIDDLETOWN BORO, DAUPHIN COUNTY
 MY COMMISSION EXPIRES JUNE 12, 1989
 Member, Pennsylvania Association of Notaries

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FINDING:

- A. Technical Specification 6.8.1 states, "Written procedures important to safety shall be implemented . . . covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978" Appendix A of Regulatory Guide 1.33, Revision 4, recommends procedures for the operation of service water cooling systems.

Contrary to the above and as described below, on September 23, 1986, plant operations procedures associated with Engineering Safeguards Actuation System Testing (ESAS) were not properly implemented.

- (1) Surveillance Procedure (SP) 1303-5.2, June 22, 1986, "Loading Sequence and Component Test and High Pressure Injection Logic Channel Test," Appendix 1, and Operating Procedure (OP) 1104-2, Revision 60, September 19, 1986, paragraph 3.9.2.B.7 require, in part, that cooling water supply valve DC-V-41A be open when shifting the "1A" makeup pump to "ES" standby.

Contrary to the above, DC-V-41A was not opened when shifting the "1A" makeup pump to ES standby lineup. As a result, this pump had no cooling water available for about eighteen hours.

- (2) SP 1303-5.2, Appendix 1, and OP 1104-2, paragraph 3.9.2.B.7 require, in part, that cooling water supply valves for the "1A" makeup pump be independently verified in their correct position, upon shifting the "1A" makeup pump to ES standby.

Contrary to the above, during the "1A" makeup pump shift to ES standby, cooling water supply valves were not independently verified to be in their correct position.

- (3) Administrative Procedure (AP) 1001G, "Procedure Utilization," paragraph 3.3.5a, states, in part, "surveillance procedures require rigorous attention in carrying the procedure steps in detail." In addition, AP 1001J, "Technical Specification Surveillance Testing Program," paragraph 3.2.4, states, in part, that "unless specifically excluded by the surveillance procedure, test steps shall be performed in the order specified." SP 1303-5.2, Revision 22, dated June 11, 1986, "Loading Sequence and Component Test and High Pressure Injection Logic Channel Test," paragraph 5.9, states, in part, "during the performance of this procedure, the individual performing the evaluation shall sign off each step of the procedure as it is accomplished."

Contrary to the above, the performance of the initial steps of Surveillance Procedure (SP) 1303-5.2 were accomplished by the instructions stated in the Plant Operations Director Night Order Book; and, as a consequence, the steps of SP 1303-5.2 were not performed and signed off in the order prescribed in the surveillance procedure.

This represents a Severity Level IV Violation (Supplement I).

RESPONSE TO VIOLATION A:

GPUN agrees with the first two elements of the violation. Plant Incident Report (PIR) No. 1-86-09 concludes that the crew involved failed to adequately implement the long standing independent verification program as required by the procedures. We believe that the corrective actions which were taken as documented in the PIR will prevent this type of occurrence in the future.

We believe that the third element of the violation is based on the misconception that the operators were or should have been accomplishing the procedure steps in SP 1303-5.2 but instead were accomplishing instructions stated in the Plant Operations Director's Night Order Book. This presumption is clearly incorrect in that the Night Order Book is used by the Plant Operations Director as a communications device to establish and direct Operations Department sequences and is not used in lieu of an approved procedure. The Shift Supervisor selects the most appropriate procedure to implement the sequence established in the Night Order Book.

In this case, the 11-7 Shift Supervisor correctly chose and correctly implemented OP 1104-2 when MU-PIA was aligned to the NSCCW systems. This shift would not and should not initiate SP 1303-5.2 to accomplish their tasks. SP 1303-5.2 is a long and complex task requiring direct and continuous supervision from start to finish. As directed by the Night Order Book, an extra crew with additional supervision was being provided on the 7-3 shift to perform and execute SP 1303-5.2. Therefore, the 11-7 shift performed their task in accordance with OP 1104-2. Their independence from SP 1303-5.2 was intentional and consistent with the Director's sequence in order to focus the objectives of the extra crew on the 7-3 shift.

During the 7-3 shift, when SP 1303-5.2 was postponed, the normal 7-3 shift was tasked with restoring the MU-PIA alignment. Since the extra 7-3 crew had not begun SP 1303-5.2, the normal 7-3 crew also intentionally isolated their task from SP 1303-5.2 as the previous shift had done and attempted to restore MU-PIA in accordance with OP 1104-2.

Both OP 1104-2 and SP 1303-5.2 require independent verification of the correct alignment of MU-PIA. This incident was not a result of procedural inadequacy. The error which occurred was a failure to properly implement plant procedures in that procedural requirements were violated. For the reasons stated above, we believe that the particular procedure that was used was the correct procedure for the task that was being accomplished.

(1) Corrective Steps Which Have Been Taken and Results Achieved:

Each Shift Supervisor was requested to provide assurance and has responded in writing that each of his crew members thoroughly understands the minimum requirements for independent verification. Also, the Plant Operations Director has counselled the affected crew members and a letter has been placed in department files for their failure to recognize the need for independent verification and failure to adequately document the status of ESAS equipment.

RESPONSE TO VIOLATION A (CONT'D.):

(2) Corrective Steps Which Will Be Taken to Avoid Further Violations:

GPUN believes that the corrective action which has been implemented will prevent recurrence of this violation.

(3) Date When Full Compliance Will Be Achieved:

GPUN believes that full compliance in response to this violation has been achieved.

FINDING:

B. The 10 CFR 50 Appendix B Criterion 3 and the licensee's (NRC approved) Quality Assurance Plan (QAP), Section 4.1 require, in part, that measures shall be established to assure that applicable design basis for those structures, systems, and components to which the appendix applies are correctly translated into specifications, drawings, procedures, and instructions.

- (1) The 10 CFR 50 Appendix A Criterion 4 requires, in part, that structures important to safety be designed to accommodate the effects of and be compatible with the environmental conditions associated with postulated accident conditions and that these structures shall be appropriately protected against dynamic effects such as missiles that may result from events and conditions outside the nuclear power unit. The updated Final Safety Analysis Report (July 1982), Section 5.1.3 and Figure 5.1-1, provides as a design basis that the reactor building (RB) is a structure designed to aircraft impact criteria and it indicates that the RB equipment hatch is to be protected by a missile barrier.

Contrary to the above, between April 23-28, 1986, the reactor building equipment hatch was not protected by a missile barrier in that the associated protection door was open; i.e., not positioned in front of the hatch. Further, as of October 3, 1986, no measures existed to assure that the design basis aircraft protection (RB equipment missile door) is shut during reactor startup and power operations.

- (2) The QAP Appendix C commits to the implementation of Regulatory Guide 1.64, Revision 2, June 1976, and ANSI N45.2.11, 1974, on "Quality Assurance Requirements for the Design of Nuclear Power Plants." ANSI N45.2.11, paragraph 4.2, requires, in part that applicable design inputs and basis be identified in sufficient detail and documented.

Contrary to the above, as of October 3, 1986, the design basis was not documented in sufficient detail for radiation monitor setpoints for RM-G16 through RM-G21 and RM-L1, in which the function is to isolate certain reactor building penetrations. No correlation was documented between pipe radioactivity concentration and radiation area readings detected by the monitors.

This is a Severity IV Level Violation (Supplement I).

RESPONSE TO VIOLATION B.1:

Based on a 1985 safety assessment of aircraft missile shields in preparation for TMI-2 defueling, it was documented in SER 15737-2-G07-111, which was reviewed by the NRC, that the probability of heavy airplane impact onto the TMI-1 site is about 10^{-8} per year. Because of this low probability it was concluded by TMI-1 at that time that it would be acceptable for the missile doors to be open for brief periods of time while at power. As a result of its

RESPONSE TO VIOLATION B.1 (CONT'D.):

apparent low safety significance, FSAR commitments that would require additional administrative control over missile doors to meet the aircraft impact criteria for TMI-1 were overlooked.

As stated in Inspection Report 86-17, a member of the Independent Onsite Safety Review Group (IOSRG) informed the Shift Supervisor that the missile door was open and operations personnel closed the door. However, through a lack of communication, Operations Department management was not made aware of the need for administrative control over the missile shield door until the NRC exit on September 30, 1986. At that time corrective action was initiated to include a prerequisite into OP 1102-2 "Plant Startup" to close the door. This change was issued, following the required procedure review and approvals as Revision 74 on October 9, 1986.

(1) Corrective Steps Which Have Been Taken and Results Achieved:

OP 1102-2 "Plant Startup" has been revised to incorporate administrative control over the Reactor Building equipment hatch missile door.

(2) Corrective Steps Which Will Be Taken to Avoid Further Violations:

Administrative controls for other missile shield components will be reviewed and verified for adequacy.

(3) Date When Full Compliance Will Be Achieved:

GPUN believes that full compliance in response to this violation has been achieved.

RESPONSE TO VIOLATION B.2:

Radiation monitors RM-G16 through RM-G21 and RM-L1 provide high radiation signals for isolation of certain containment penetrations. GPUN initiated the effort to install these monitors in order to augment the containment isolation function. Isolation of these lines is provided to limit the transfer of radioactive material from the containment under conditions not severe enough to initiate a general containment isolation signal.

The limiting conditions for containment isolation by monitors RM-G16 through RM-G21 were chosen during the long period that TMI-1 was shut down following the accident at TMI-2. The setpoints which were chosen at that time were in terms of μ Ci/cc at levels that were believed to be conservative. However, the amount of data available on the activity levels that would be expected in these monitored lines during operating conditions was limited.

In 1982, it was recognized that there was little basis for these setpoints and new setpoints were chosen based on radiation levels in mR/hr that were estimated from general surveys that had been made during past operational time periods. These new setpoints were selected to be indicative of a high radiation level above the level expected for that area during plant operation and still low enough to be conservative. Since the surveys that were used to determine background radiation did not include measurements at the particular locations of the new detectors, it was planned that new surveys would be made once the plant was operating at full power. The System Design Description (SDD) was not revised to reflect the current setpoints.

Following the restart in October, 1985 surveys were made. This data, which included monitor readings, background measurements, and analyses of the water in the monitored lines, became available in September, 1986. The collection of data and evaluation of the data to provide a substantial basis for the setpoints of these monitors was not given a high priority because it was believed that the setpoints were conservative. GPUN agrees with this violation and we agree that a higher priority would have been appropriate for completion of this activity.

(1) Corrective Steps Which Have Been Taken and Results Achieved:

The input data needed to redefine the setpoints for RM-G16 through RM-G21 and RM-L1 has been collected.

(2) Corrective Steps Which Will Be Taken To Avoid Further Violations:

GPUN is evaluating the data which has been collected in order to redefine the setpoints and sensitivities of these monitors. Setpoints will be established so as to provide a reasonable level of protection against the transfer of radioactive material from the containment and minimize the potential for actuations resulting from the activity levels and background radiation expected during normal plant operation. Redefinition of setpoints and sensitivities for RM-G16 through RM-G21 and RM-L1 along with any necessary procedure changes will be implemented by June, 1987. These bases will be documented and records maintained in accordance with applicable standards.

(3) Date When Full Compliance Will Be Achieved:

Full compliance will be achieved by June, 1987.

FINDING:

- C. The 10 CFR 50.59(b) states, in part, that ". . . Licensee . . . records [of changes in the facility or procedures as described in the safety analysis report] shall include a written safety evaluation which provides the basis for the determination that the change . . . does not involve an unreviewed safety question . . ."

AP 1021, Revision 1, dated November 27, 1985, "Plant Engineering Modifications," paragraph 3.2.2, defines requirements for documented records, in part, as evaluations required in support of design documents including safety analysis described in EP-016. Technical Functions (TF) Procedures EP-016, Revision 1-00, dated January 18, 1985, "Nuclear Safety/Environmental Impact Evaluation," Exhibit 3, paragraph 3.3, requires, in part, the written safety evaluations for facility changes describe how the proposed change will or will not affect the safety functions by addressing concerns such as system performance (3.3.1).

Contrary to the above, between April 21 and April 22, 1986, prior to and during the reactor coolant system (RCS) deboration to criticality activity, one of two channels of source range instrumentation (NI-1) was made inoperable by changing the high voltage power supply cable connection at reactor building penetration No. 202E without a proper evaluation on system performance.

This is a Severity Level IV Violation (Supplement I).

RESPONSE TO VIOLATION C:

This violation occurred when an I&C Technician changed a high voltage power supply cable connection to agree with the plant drawing. This was done without obtaining the supervisor's permission, without following the required procedures, and without an evaluation being performed. The drawing which was used to make this change was found to be incorrect.

GPUN agrees that an inappropriate change took place without following procedures and without a safety evaluation being performed. However, the work that was to be accomplished was that of a maintenance job ticket and not a plant modification. The individual involved did not perceive the change as a modification. Therefore we view this event as a performance issue and not a programmatic deficiency.

(1) Corrective Steps Which Have Been Taken and Results Achieved:

The individual involved in removing the cable was instructed not to make changes to correct an apparent discrepancy without first receiving proper authorization, i.e., lifted leads sheets, temporary mechanical mod or jumper log and with the supervisor's permission. All individuals involved in the incident have been instructed in the proper use of Enclosure 5 of AP 1013 when removing cables or wires, and the proper methods of altering plant systems. Those individuals were instructed to notify their supervision of changes in system configuration. Supervisors were made aware of the necessity for notification of system changes.

RESPONSE TO VIOLATION C (CONT'D):

An FCN was written and issued to the field to correct the existing prints to agree with the actual plant wiring and the drawings involved have now been updated.

All I&C technicians have been instructed in:

- a) the requirements for and the proper use of Enclosure 5 of AP 1013,
- b) the requirements for and the proper use of lifted leads, temporary mechanical modifications, or jumper log from AP 1013, and
- c) the need for seeking guidance from their immediate supervisor before changing any system configuration.

(2) Corrective Steps Which Will Be Taken to Avoid Further Violations:

GPUN believes that the measures that have been taken are sufficient to avoid further violations.

(3) Date When Full Compliance Will Be Achieved:

GPUN believes that full compliance in response to this violation has been achieved.

GPUN COMMENT AND RESPONSE TO ITEMS DISCUSSED
IN INSPECTION REPORT 86-171. Testing Frequency and IST Program Exemptions
(Section 3.3 on page 19)

The Inspection Report states that Makeup System check valves were never exempted from testing at the cold shutdown frequency because of previous NRC denials of the licensee's exemption requests, and that these valves should have been tested during the eddy current outage of March, 1986. It should be noted however that the relief requested from testing these Makeup System valves at the cold shutdown frequency was in fact granted by the NRC in a Supplement Safety Evaluation Report by letter dated October 23, 1984. This fact was acknowledged in the NRC's letter of October 3, 1986 which requested additional information. This additional information was provided in a transmittal dated December 24, 1986. In a conference call with the NRC staff on January 15, 1987, GPUN learned that this relief will be granted for the second ten year IST interval prior to startup for Cycle 6 operation.

2. Post-Accident Sampling Capability - NUREG-0737:II.B.3
(Section 7.3 on page 34)

Inspection Report 86-17 requested information regarding TMI-1's analytical procedures for post accident boron analysis at low concentrations and a schedule for implementation. We are currently evaluating different methods to determine which method will be most appropriate and give us the desired range and accuracy. By May 1, 1987 GPUN commits to implement the necessary procedures and train the technicians with the method of choice.

3. Violation (289/86-06-01): Failure to Properly Implement Facility Procedures (Section 10.6 on page 50)

Inspection Report 86-17 states that the procedural guidance in AP 1001G concerning alarm response procedure utilization is consistent with NRC regulation. However, because the release permit expected a count rate less than the alert setpoint, the inspector concluded that the alert alarm was unexpected and the alarm response procedure should have been followed, the release terminated pending further evaluation, and that the problem (the first alarm setting was too low) corrected prior to resumption of the procedure.

GPUN continues to support the Shift Supervisor's evaluation of the alert alarm at the time of the occurrence. The problem which was ultimately corrected was that of poor wording in the alarm response procedure. Through his trained and experienced judgement, the licensed operator recognized the alert alarm significance relative to the overall safe operation of the unit and we believe that he conducted himself and his shift properly.

It is our belief that the Shift Supervisor did implement station procedures properly. The expected count rate did not significantly differ from the count rate obtained. As we have previously stated, our administrative procedures clearly support the course of action that was taken during this event.