January 28, 2003

Mr. John Skolds
Chairman and CEO
AmerGen Energy Company, LLC
4300 Winfield Road
5th Floor
Warrenville, IL 60555

SUBJECT: THREE MILE ISLAND STATION, UNIT 1 - NRC INTEGRATED INSPECTION REPORT 50-289/02-07

Dear Mr. Skolds:

On December 27, 2002, the NRC completed an inspection at your Three Mile Island Unit 1 facility. The enclosed report documents the inspection findings that were discussed January 17, 2003, with Mr. Bruce Williams and other members of your staff.

This inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations, and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

The report documents one finding of very low safety significance (Green), which was determined to involve a violation of NRC requirements. However, because of the very low safety significance, and because the issue has been entered into your corrective action program, the NRC is treating this issue as a non-cited violation, in accordance with Section VI.A of the NRC's Enforcement Policy. Additionally, a licensee identified violation is listed in Section 4OA7 of this report. If you deny this non-cited violation, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington DC 20555-001; and the NRC resident inspector at Three Mile Island.

Since the terrorist attacks on September 11, 2001, the NRC has issued two Orders (dated February 25, 2002, and January 7, 2003) and several threat advisories to licensees of commercial power reactors to strengthen licensee capabilities, improve security force readiness, and enhance access authorization. The NRC also issued Temporary Instruction 2515/148 on August 28, 2002, that provided guidance to inspectors to audit and inspect licensee implementation of the interim compensatory measures (ICMs) required by the Order dated February 25, 2002. Phase 1 of TI 2515/148 was completed at all commercial nuclear power plants during calendar year (CY) 2002, and the remaining inspections are scheduled for completion in CY 2003. Additionally, table-top security drills were conducted at several licensee

facilities to evaluate the impact of expanded adversary characteristics and the ICMs on licensee protection and mitigative strategies. Information gained and discrepancies identified during the audits and drills were reviewed and dispositioned by the Office of Nuclear Security and Incident Response. For CY 2003, the NRC will continue to monitor overall safeguards and security controls, conduct inspections, and resume force-on-force exercises at selected power plants. Should threat conditions change, the NRC may issue additional Orders, advisories, and temporary instructions to ensure adequate safety is being maintained at all commercial power reactors.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARs) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

We appreciate your cooperation. Please contact me at 610-337-5146 if you have any questions regarding this letter.

Sincerely,

/RA/

John F. Rogge, Chief
Projects Branch 7
Division of Reactor Projects

Docket No: 50-289
License No: DPR-50

Enclosure: NRC Inspection Report 50-289/02-07

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U.S. NUCLEAR REGULATORY COMMISSION

REGION 1

Docket No:	50-289
License No:	DPR-50
Report No:	50-289/02-07
Licensee:	AmerGen Energy Company, LLC (AmerGen)
Facility:	Three Mile Island Station, Unit 1
Location:	PO Box 480 Middletown, PA 17057
Dates:	September 29 - December 28, 2002
Inspectors:	J. Daniel Orr, Senior Resident Inspector Craig W. Smith, Resident Inspector Gregory V. Cranston, Reactor Inspector, DRS Jason C. Jang, Senior Health Physicist, DRS Nancy T. McNamara, EP Inspector, DRS Ronald L. Nimitz, Senior Health Physicist, DRS Daniel L. Schroeder, Reactor Inspector, DRS
Approved by:	John F. Rogge, Chief Projects Branch 7 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000289/02-07; AmerGen Energy Company, LLC; on 9/29-12/28/2002; Three Mile Island Unit 1; Event Followup.

The report covered a thirteen-week period of inspection by resident and specialist inspectors. The inspection identified one Green finding, which was classified as a non-cited violation. The significance of most findings is indicated by their color (green, white, yellow, red) using IMC 0609 "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be "green" or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspector Identified Findings

Cornerstone: Mitigating Systems

- **Green.** A human performance related procedure error resulted in an unexpected start of the 'B' emergency diesel generator (EDG) during emergency safeguards actuation system (ESAS) surveillance testing. The procedure error occurred when an auxiliary operator manipulated keyed test switches on the 'A' EDG instead of the desired 'B' EDG. The inadvertent diesel start resulted in unplanned unavailability to the 'B' EDG, a mitigating system important to safety.

  The safety significance of this finding was evaluated as very low (Green), because the redundant 'A' EDG was not affected, and the increased 'B' EDG unavailability was less than the technical specification allowed outage time for a single EDG. Technical specification 6.8.1.a. requires that written procedures shall be established, implemented and maintained covering applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, Revision 2, February 1978. Regulatory Guide 1.33, Appendix A, Item 8.b, requires procedures be implemented for the conduct of surveillance tests. Contrary to this requirement, on November 22, 2002, an auxiliary operator failed to implement the approved ESAS surveillance test procedure as written. (Section 4OA3)

B. Licensee Identified Findings

A violation of very low safety significance which was identified by the licensee has been reviewed by the inspector. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action process. The violation and corrective action tracking number are listed in Section 4OA7 of this report.

Report Details

Summary of Plant Status

AmerGen Energy Company, LLC (AmerGen), operated Three Mile Island, Unit 1 (TMI) at or near 100 percent power throughout the inspection period, with one exception. Operators reduced power to 50 percent for several hours on October 26, 2002, to support emergent repairs to a leaking condenser manway.

1. REACTOR SAFETY

Initiating Events/Mitigating Systems/Barrier Integrity [REACTOR - R]

1R01 Adverse Weather Protection

a. Inspection Scope

The inspectors reviewed AmerGen's cold weather preparation for risk significant systems affected by freezing temperatures as outlined in AmerGen administrative procedure OP-AA-108-109, "Seasonal Readiness." The inspectors observed control room operator implementation of operating procedure 1104-30, "Nuclear River Water," the first week of December 2002, in response to ice formation at the river water intake structure. The inspectors reviewed the corrective action program data base to determine if AmerGen was identifying and resolving weather-related equipment problems.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignments

.1 Decay Heat River Water System Full System Walkdown

a. Inspection Scope

The inspectors conducted a complete system walkdown of the decay heat river water system (DHRW) in December 2002. The DHRW system was chosen because of its risk importance for supplying the ultimate heat sink for decay heat removal and closed cooling water to emergency core cooling system pumps. The DHRW system is a risk significant system at TMI for its contribution to core damage frequency based on an independent failure. References and aspects of the DHRW system reviewed to verify the system was properly aligned and operable included the DHRW system design basis document, operating procedure 1104-32, "Decay Heat River Water Procedure," the DHRW system maintenance backlogs, proposed design modifications, maintenance rule database, updated final safety analysis report, system engineer interviews, previously completed DHRW system inservice testing surveillances, a physical walkdown of all DHRW system areas, and design calculation C-1101-533-E410-013, "TMI-1 DR Hydraulic Performance Using Field Test Data," Revision 2.

b. Findings

No findings of significance were identified.

.2 Partial System Walkdowns

a. Inspection Scope

The inspectors conducted partial system walkdowns on the following systems and components:

- 'A' emergency diesel generator on November 22, 2002, while the 'B' emergency diesel generator was emergently disabled following an inadvertent start
- Single cell charge on the 'A' station vital battery on November 19, 2002
- 'A' emergency diesel generator the week of October 7, 2002, with the 'B' emergency diesel generator out of service for biennial maintenance
- 'B' train of emergency safeguards equipment on November 21, 2002, during scheduled surveillance of the 'A' train

The systems were chosen based on their risk significance. The partial system walkdowns were conducted on the redundant equipment to ensure that trains relied upon to remain operable for accident mitigation were properly aligned and protected. In the case of the 'A' station vital battery, the affected battery was also walked down to verify that the temporary cell charging equipment was properly installed in accordance with maintenance procedure 1420-DC-3, "Station Battery Cell Replacement and Charging." The inspectors verified the systems were aligned in accordance with operating procedures 1107-3, "Diesel Generator;" 1107-2C, "Vital DC Electrical System;" and 1107-2B, "120 Volt Vital Electrical System." The inspectors verified system parameters were within the required band for current plant conditions as determined by TMI operating logs.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Fire Protection Walkdowns

a. Inspection Scope

The inspectors conducted fire protection inspections for the following plant zones:

- 'D' and 'E' 4kV vital electrical bus rooms
- Engineered safeguards actuation system relay room
- Cable spreading and relay room
- Fuel handling building basement
- Fuel handling building 305' elevation
- Control building chiller room

- Intake structure river water pump house

The rooms and areas were selected based on enclosing equipment important to safety. The inspectors conducted plant walkdowns and verified the areas were as described in the TMI fire hazard analysis report. The plant walkdowns were conducted throughout the inspection period and included observations of combustible material control, fire detection and suppression equipment operability, and compensatory measures established for degraded fire protection equipment.

b. Findings

No findings of significance were identified.

.2 Fire Drill Observation

a. Inspection Scope

The inspectors observed the crew performance of unannounced plant fire drills on November 10 and 24, 2002. The inspectors evaluated the fire brigade's readiness to fight fires in plant areas important to safety. The inspectors observed fire fighters donning protective clothing and self-contained breathing apparatus and observed the fire fighting techniques employed against the simulated fire. The inspectors evaluated the brigade leader's performance on the use of pre-planned strategies and communications with the fire team members and the main control room. The inspectors attended the post-drill critiques.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors reviewed AmerGen's internal flooding mitigation strategy for the heat exchanger vault and the auxiliary steam header in the auxiliary building. The heat exchanger vault contains all the river water system piping and heat exchangers used within the reactor plant. The auxiliary steam is supplied by auxiliary boilers or extraction steam outside the auxiliary building and, if ruptured, could impact the performance of electrical equipment. The inspectors visually walked down the heat exchanger vault and auxiliary steam header for evidence of leaks on November 13 and 14, 2002. The inspectors reviewed the operability of motor operated valves that would be used to isolate any pipe ruptures from the river water systems or the auxiliary steam header.

b. Findings

No findings of significance were identified.

1R7 Heat Sink Performance

a. Inspection Scope

The inspectors observed AmerGen's inspection of the 'B' nuclear service river water heat exchanger the week of October 21, 2002. The inspectors assessed the heat removal capability of the inspected heat exchanger. As part of the inspection, the inspectors reviewed NRC Generic Letter 89-13, "Service Water System Performance Problems Affecting Safety-Related Systems," and AmerGen's responses. The inspectors reviewed the corrective system data base for past problems with nuclear service water system heat exchanger performance to see that the current inspections addressed past performance issues.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed a simulator requalification training session on November 8, 2002. The inspectors reviewed the lesson plans, assessed operator performance during the training sessions, and observed the evaluator's critique of the training scenario. The inspectors referenced the operating procedures used by the licensed operators in response to the scenario.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

.1 Biennial Evaluation Inspection

a. Inspection Scope

The inspectors reviewed the periodic evaluation required by 10 CFR 50.65 (a)(3) for the Three Mile Island Unit 1 facility to verify that structures, systems and components (SSCs) within the scope of the maintenance rule were included in the evaluation and that the balancing of reliability and unavailability was given adequate consideration. The inspectors reviewed AmerGen's most recent periodic evaluation report that covered the interval September 1999 to September 2001.

The inspectors selected the following (a)(1) systems for detailed review:

- Nuclear services closed cooling water
- Auxiliary and fuel handling buildings ventilation
- Emergency feedwater
- Main condenser

The inspectors verified: (1) goals and performance criteria were appropriate, (2) industry operating experience was considered, (3) problem identification and resolution of maintenance rule-related issues were addressed, (4) corrective action plans were effective, and (5) performance was being effectively monitored. The inspectors verified that adjustments were made in action plans for SSCs in (a)(1) status as a result of the licensee's review of system performance against established goals. The inspectors reviewed documentation for a sample of high safety significant SSCs to verify that AmerGen balanced reliability and availability/unavailability and adjusted (a)(1) goals as necessary. The inspectors reviewed availability/unavailability tracking and trending data for nuclear services closed cooling water, auxiliary and fuel handling buildings ventilation, and emergency feedwater and determined that the trends were in the acceptable range and performance criteria had not been exceeded.

The inspectors selected a sample of high safety significant SSCs [Decay Heat Removal, Low Pressure Injection, Instrument Air, Reactor Building Isolation, and Reactor Building Emergency Cooling] that were in (a)(2) status to verify that AmerGen had established appropriate performance criteria (PC). Also, the inspectors evaluated whether AmerGen examined any SSCs that failed to meet their PC and reviewed those SSCs that exhibited repeated maintenance preventable functional failures for consideration of movement to (a)(1) status.

The inspectors reviewed documentation for a sample of systems that AmerGen had changed from (a)(1) status to (a)(2) status during the periodic assessment period. The inspectors selected decay heat river water, decay heat closed cooling water, emergency diesel generators, and high pressure injection/makeup and purification to verify that (a)(1) goals had been met to return the systems to (a)(2) status.

In addition, the inspectors verified that AmerGen had established and implemented a preventive maintenance program to manage preventive maintenance activities for systems in both (a)(1) and (a)(2) status. A sample of risk significant systems in (a)(1) and (a)(2) status was reviewed to verify the performance of condition monitoring and scheduled maintenance.

Also, the inspectors reviewed a sample of corrective action reports shown in Attachment 1 which identified problems related to maintenance rule issues. The inspectors verified that problems with SSCs in the maintenance rule scope were being identified, evaluated, appropriately dispositioned and entered into the corrective action program.

b. Findings

No findings of significance were identified.

.2 Routine Maintenance Effectiveness Inspection

a. Inspection Scope

The inspectors verified AmerGen's implementation of the maintenance rule for the high pressure injection and makeup system (HPI/MU) and the 120V vital ac electrical system. Both systems are risk significant. The inspectors referenced 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Plants," and AmerGen administrative procedure ER-AA-310-1000 series, "Maintenance Rule." The inspectors reviewed the maintenance rule database for both systems, reviewed action requests initiated on the systems for year 2002, and reviewed system health reports.

b. Findings

No findings of significance were identified.

.3 Maintenance Rule Implementation

a. Inspection Scope

The inspectors verified AmerGen's implementation of the maintenance rule for 120V vital ac and HPI/MU performance monitoring. The inspectors selected the 120V vital ac because of its importance to safety and several recent failures of the 120V vital ac inverters. The HPI/MU is a high safety-significant standby system and was selected accordingly.

The inspectors referenced 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Plants," and AmerGen administrative procedure ER-AA-310-1000 series, "Maintenance Rule."

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors reviewed AmerGen's planning and risk assessments for the following risk significant activities:

- Planned station blackout diesel generator outage on October 28, 2002
- Emergent inoperability for the 'B' and 'C' nuclear services closed cooling water pumps on November 15, 2002, during inservice surveillance testing
- Emergent repairs on November 27, 2002, to the nuclear service closed cooling water relief valve supplying the 'C' reactor coolant pump motor
- Planned backwash on December 12, 2002, of the intermediate closed cooling water heat exchangers
- Planned troubleshooting and repairs on December 26, 2002, on the 'C' reactor coolant pump power monitor

The inspectors reviewed the risk assessment of these planned and emergent maintenance activities with respect to 10 CFR 50.65(a)(4). The inspectors referenced AmerGen administrative procedure 1082.1, "TMI Risk Management Program," and NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." In addition to the documents reviewed, the inspectors walked down the protected equipment and maintenance locations to verify that risk was managed in accordance with AmerGen's risk evaluation documents.

b. Findings

No findings of significance were identified.

1R14 Nonroutine Plant Evolutions

a. Inspection Scope

The inspectors reviewed control room operator response to an unexpected start of the 'B' emergency diesel generator (EDG) during engineered safeguards actuation system (ESAS) testing on November 22, 2002. The inspectors verified operator actions to shut down the diesel generator were consistent with operating procedure 1107-3, "Diesel Generator."

b. Findings

No findings of significance were identified with the operator actions in response to the inadvertent start of the 'B' EDG. Section 4OA3 of this report documents a finding concerning the circumstances that led to the inadvertent diesel start.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed operability evaluations for the following degraded equipment issues:

- Instrument anomaly on the 'A' main steam line pressure transmitter that was identified on March 4, 2002
- Erratic behavior of a source range instrument, NI-12, on September 27, 2002
- Inservice testing failure of a reactor building emergency cooling backpressure regulating valve, RR-V-6, on November 7, 2002
- Intake structure traveling screen control problems on November 14, 2002
- Inadvertent isolation of the reactor coolant pump motors nuclear service closed cooling water supply during surveillance testing on November 27, 2002

The inspectors verified the degraded conditions were properly characterized, the operability of the affected systems was properly justified, and no unrecognized increase in plant risk resulted from the equipment issues. The inspectors referenced Inspection Manual Part 9900, "Operable/Operability - Ensuring the Functional Capability of a System Component," to determine acceptability of AmerGen's operability evaluations.

b. Findings

No findings of significance were identified.

1R16 Operator Work-Arounds

a. Inspection Scope

The inspectors reviewed AmerGen's identified operator concerns and work-arounds. The inspectors also reviewed plant operating logs, turnover checklists, and out-of-service equipment lists for potential unidentified operator work-arounds. The inspectors reviewed all plant emergency operating procedures for proceduralized work-arounds. The inspectors walked down several risk significant areas of the plant throughout the inspection period for evidence of degraded conditions requiring unusual operator attention. The reviews were performed to determine significant equipment deficiencies or the cumulative effect of equipment deficiencies on system performance, operator response, or increased likelihood for an initiating event.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors reviewed post-maintenance tests performed by AmerGen in conjunction with the following maintenance activities:

- Planned motor actuator maintenance on nuclear services river water valves 4A and 4B on December 10, 2002. These valves provide an isolation function to non-safety related portions of the nuclear services river water system.
- 'B' reactor river pump packing replacement and motor preventative maintenance on December 10, 2002. The reactor river pumps provide emergency containment cooling to the reactor building during emergency conditions.
- Emergent replacement of the 'B' Reactor coolant loop flow transmitter for the 'B' channel of the reactor protective system on December 18, 2002
- 'B' emergency diesel generator engineered safeguards voltage rheostat replacement on October 11, 2002
- Turbine driven emergency feedwater pump steam trap replacement on November 5, 2002
- 'C' reactor coolant pump power monitor watt meter replacement on December 26, 2002

The inspectors verified that the post-maintenance test procedures, activities, and results were adequate to verify operability and functional capability as described in NRC Inspection Procedure 71111.19, "Post-Maintenance Testing," prior to the affected systems being returned to service. The inspectors also walked down the maintenance locations and verified that maintenance was properly authorized by senior reactor operators and conducted in accordance with procedures.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors observed portions and reviewed results of the following surveillance tests:

- Secondary system heat balance on November 12, 2002. The heat balance is a calculation of several secondary system parameters to verify that the nuclear power range instruments, used in the reactor protective system, are accurate and within technical specification requirements.
- Nuclear services closed cooling water system inservice surveillance testing on November 15, 2002
- 'D' reactor protective system reactor coolant loop flow transmitter calibrations on November 20, 2002
- Reactor coolant system leak rate measurements on December 20, 2002

- Makeup tank level transmitter calibration on October 29, 2002
- 'B' emergency diesel generator monthly run on November 14, 2002

The inspectors verified that test results were within procedure requirements, technical specification requirements, and in-service testing program requirements as applicable.

b. Findings

No findings of significance were identified.

EMERGENCY PREPAREDNESS [EP]

1EP2 Alert and Notification System (ANS) Testing

a. Inspection Scope

An onsite review of AmerGen's ANS was conducted to ensure prompt notification of the public to take protective actions. The inspector reviewed: (1) TEP-SUR-1310.09, "TMI Sirens Testing & Maintenance Instructions"; (2) EP-MA-121-00Y, "EP ANS Control of Equipment & Outages"; (3) Federal Signal Corporation Operating Instructions; and (4) siren testing data and records for correcting siren failures. In addition, the inspector interviewed the siren maintenance and testing contractor and the individual responsible for activating the sirens at the Dauphin County 911 Center. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 02, and the applicable planning standard, 10 CFR 50.47(b)(5) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

Condition Report 134343 was written during the inspection and reviewed by the inspector regarding consistently documenting the maintenance associated with siren failures and yearly maintenance inspections.

b. Findings

No findings of significance were identified.

1EP3 Emergency Response Organization (ERO) Augmentation Testing

a. Inspection Scope

An onsite review of AmerGen's ERO augmentation staffing requirements and the process for notifying the ERO was conducted to ensure the readiness of key staff for responding to an event and timely facility activation. The inspector reviewed the licensee's Emergency Plan qualification records for key ERO positions, 2002 communication pager test records, and associated condition reports regarding on-call ERO not responding to pager tests. In addition, the inspector reviewed TEP-SUR-1310.01, "Emergency Communication Test Procedure," and observed an unannounced, off-hours pager test. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 03, and the applicable planning standard, 10 CFR

50.47(b)(2) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level (EAL) Revision Review

a. Inspection Scope

A regional in-office review of revisions to the Emergency Plan, implementing procedures and EAL changes was performed to determine that changes had not reduced the effectiveness of the Emergency Plan. The revisions covered the period from March through September 2002. Onsite, the inspector reviewed the associated 10 CFR 50.54(q) reviews. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 04, and the applicable requirements in 10 CFR 50.54(q) were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies

a. Inspection Scope

The inspector reviewed corrective actions identified by AmerGen pertaining to findings from drill/exercise reports for 2001 and 2002, a 2002 self-assessment report, and from problems resulting from surveillances and actual events. Condition reports assigned to the EP Department were also reviewed to determine the significance of the issues and to determine if repeat problems were occurring. In addition, the inspector reviewed the Nuclear Oversight Continuous Assessment Quarterly Audit Reports for 2001 and 2002 and the associated audit checklists to determine if the licensee had met the 10 CFR 50.54(t) requirements and if any repeat issues were identified. This inspection was conducted according to NRC Inspection Procedure 71114, Attachment 05, and the applicable planning standard, 10 CFR 50.47(b)(14) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Occupational Radiation Safety [OS]

2OS1 Access Control to Radiologically Significant Areas

a. Inspection Scope

The inspector conducted the following activities and reviewed the following documents based on radiological risk significance to determine the effectiveness of access controls to radiologically significant areas:

- The inspector toured TMI and selectively challenged locked High Radiation Area (HRA) access points to determine if access controls were sufficient to preclude unauthorized entry. The adequacy of posting and barricading of HRAs was also evaluated. The inspector made radiological survey measurements at entry points to posted HRAs to evaluate ambient radiological conditions. Radiological hot spots were surveyed to identify potential un-posted HRAs.

- The inspector reviewed radiological controls, provided on November 11, 2002, for access to the TMI reactor containment at 100 percent reactor power. The inspector reviewed radiation work permits, electronic dosimeter setting, personnel monitoring including neutron doses, airborne radioactivity monitoring, and occupational dose assessment, as appropriate. Also reviewed was HRA Access Controls.

- The inspector reviewed the effectiveness of radioactive material controls for purposes of worker health and safety. In particular, the inspector reviewed instances of identification of radioactive contamination outside the radiological controlled areas and its potential dose consequences to workers and/or members of the public. The inspector reviewed AmerGen's radioactive material clean sweep data files as part of the review.

- The inspector selectively reviewed personnel dose assessments for years 2001 and 2002 associated with personnel contaminations and intakes of radioactive materials. The inspector reviewed the dose assessments for adequacy, causes, and corrective actions, as appropriate. In particular, the inspector reviewed apparent repetitive personnel contamination events of a worker on October 14 and 15, 2001. Also reviewed was Common Cause Analysis, "Three Mile Island Contamination Reports Generated During 2001," dated January 31, 2002.

- The inspector reviewed a selection of self-assessments and licensee-identified findings to determine if issues were properly entered into the corrective action program, the issues were evaluated, and corrective actions were initiated, as appropriate (CR 98995, CR, 100303, CR105712, CR 108800, CR 111018, CR 90044, AR 115523, AR 117054, AR 120182, AR121763, AR 126367, AR 126523, AR 127417, AR 128385, AR 128864), (Self Assessment: SA-2002-1065, Radiological Controls Program, April 26, 2002), (ANI Inspection Report - L011702.220).The review in the above areas was against applicable licensee procedures, 10 CFR 20, and applicable technical specifications.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls

a. Inspection Scope

The inspector selectively reviewed the adequacy and the effectiveness of the program to reduce occupational radiation exposure to as low as is reasonably achievable (ALARA). The following matters were reviewed:

- TMI's plant collective exposure history, current exposure trends, and two and three-year rolling average collective exposures were reviewed to assess current performance and exposure challenges for years 2001 and 2002.

- AmerGen's dose goals for TMI for year 2003 were reviewed. The review included planning, preparation, and dose goals for the upcoming 2003 refueling outage (1R15) including preliminary collective radiation dose estimates for replacement of the TMI reactor vessel head.

- AmerGen's understanding of plant radiation source terms, its source term control strategy, and prioritization and implementation of source term reduction initiatives were reviewed. The review included plans for contaminated area reduction and leak repair to minimize contaminated areas. Also reviewed was Document 51-5016880-00, "Chemical Degassing and Forced Oxidation of the Reactor Coolant System (RCS) During Refueling Outage 1R14 at Three Mile Island Nuclear Station, Unit 1."

- The inspector reviewed exposure controls for year 2002 for declared pregnant workers, as appropriate.

- The inspector reviewed self-assessment SA-2002-1226, Radiological ALARA, September 30, 2002, and Station ALARA Committee meeting minutes (Meetings 02-03, 02-04, 02-05, 02-06, 02-07).

The evaluation of licensee performance in this area was against criteria contained in applicable procedures, 10 CFR 20, and applicable technical specifications.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

.1 Mitigating Systems, Safety System Functional Failures, and Barrier Integrity

a. Inspection Scope

The inspectors referenced NEI 99-02, Revision 2, "Regulatory Assessment Performance Indicator Summary," and verified data submitted by AmerGen for the emergency feedwater unavailability, safety system functional failures, reactor coolant system leakage, and reactor coolant system activity. The inspectors reviewed operating logs, maintenance rule records, chemistry data, licensee event reports, and the corrective action process database to verify the accuracy and completeness of the reported data. For the reactor coolant system leakage PI, the inspectors observed control room operators establish plant conditions for a computer mass balance calculation. Records were reviewed for reported performance indicator data covering the last quarter of 2001 and the first three quarters of 2002.

b. Findings

No findings of significance were identified.

.2 Emergency Preparedness Cornerstone

a. Inspection Scope

The inspector reviewed AmerGen's procedure for developing the data for the EP PIs which are: (1) Drill and Exercise Performance; (2) ERO Drill Participation; and (3) ANS Reliability. The inspector also reviewed the licensee's drill/exercise reports, training records and ANS testing data since the last NRC PI inspection, conducted in May 2001, to verify the accuracy of the reported data. The review was conducted in accordance with NRC Inspection Procedure 71151. The acceptance criteria used for the review are in accordance with 10 CFR 50.9 and NEI 99-02, Revision 1, Regulation Assessment Performance Indicator Guideline.

Condition Report 134395 was generated during the inspection and reviewed by the inspector with respect to providing clear supporting documentation for verifying the accuracy of the ERO participation PI data.

b. Findings

No findings of significance were identified.

.3 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspector reviewed implementation of the AmerGen's Occupational Exposure Control Effectiveness PI Program. The inspector reviewed corrective action program records for occurrences involving high radiation areas, very high radiation areas, and unplanned personnel exposures for the past four quarters against the applicable criteria specified in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 2, to verify that occurrences meeting the NEI criteria were recognized and identified as occurrences by the licensee. The inspector also reviewed AmerGen developed PI program data, in the area of occupational radiation exposure control, for the past four quarters.

b. Findings

No findings of significance were identified.

.4 RETS/ODCM Radiological Effluent Occurrences

a. Inspection Scope

The inspector reviewed the following documents to ensure that AmerGen met all requirements of the performance indicator from the fourth quarter 2001 to the third quarter 2002 (four quarters):

- Monthly projected dose assessment results due to radioactive liquid and gaseous effluent releases
- Quarterly projected dose assessment results due to radioactive liquid and gaseous effluent releases
- Year 2002 condition reports and corrective actions

The inspector also performed an independent verification of AmerGen's capability for calculating projected doses to the public resulting from discharges of radioactive liquid, gases, and particulate using the licensee's meteorological monitoring data. AmerGen used its computer code for radioactive gas releases. The NRC used the NRC PC-DOSE computer code. The comparison results were evaluated.

.5 Physical Protection Cornerstone

a. Inspection Scope

The inspectors referenced NEI 99-02, Revision 2, "Regulatory Assessment Performance Indicator Summary," and verified data submitted by AmerGen for the physical security cornerstone performance indicators: protected area equipment, personnel screening program, and Fitness-for-Duty (FFD)/Personnel reliability program, and semi-annual FFD reports for all of year 2001, and January to June 2002. The inspectors also reviewed numerous site security information reports from July 2001 to September 2002 for performance indicator inputs.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

The inspectors devoted 10 to 15 percent of their inspection time in each baseline inspection procedure assessing AmerGen's problem identification and resolution (PI&R) appropriate to each inspection area.

.1 Human Performance Corrective Actions Follow-up

a. Inspection Scope

The inspector reviewed AmerGen's apparent cause evaluation and corrective actions in response to procedural problems that were identified in October 2001 that adversely affected reactor coolant system (RCS) temperature control, RCS decay heat removal, and pressurizer cooldown rate during mid-loop operation. The problems were documented in NRC Inspection Report 50-289/2001-007, dated December 12, 2001, and were determined to be of very low safety significance. AmerGen's apparent cause and corrective actions are documented in its corrective action process (reference numbers CR 00078654, CR 00078657 and CR 00078494). AmerGen determined the cause for the problems to be human performance errors due to failure to follow procedures and lack of proper communications for the decay heat removal problem and inadequate procedures for the pressurizer cooldown rate problem. The inspector reviewed AmerGen's corrective actions for each of the identified causes and a subsequent common cause analysis conducted by the licensee regarding procedure compliance trends by the operations staff (CR 00101585 and CR 00114487).

b. Findings

No findings of significance were identified.

.2 Equipment Performance Monitoring Supplemental Inspection Follow-up

a. Inspection Scope

The inspectors reviewed AmerGen's resolution of two inspection findings documented in NRC supplemental Inspection Report 50-289/2001-014, dated March 1, 2002. The supplemental inspection findings involved two instances of poor equipment performance monitoring that resulted in risk significant equipment degraded conditions. One involved an unmonitored oil leak on the 'B' decay heat closed cooling water pump, and the other involved unmonitored high vibrations on the 'A' decay heat removal pump that resulted from an improperly installed pump bearing support plate. The inspectors reviewed AmerGen's evaluation and corrective actions for these two equipment performance monitoring issues. AmerGen's analysis identified weakness in the implementation of its oil addition trending data base and in the process for evaluating inservice testing program reference values following component maintenance. AmerGen instituted corrective actions to improve tracking and trending of oil additions to safety-related components and to improve inservice testing program data evaluation.

b. Findings

No findings of significance were identified.

4OA3 Event Followup

.1 Inadvertent Emergency Diesel Generator Start During Testing

a. Inspection Scope

The inspectors observed operator response to an inadvertent start of the 'B' EDG on November 22, 2002. The inspectors observed followup actions by control room operators to identify the cause of the inadvertent start and actions taken to verify operability of the unaffected EDG. As part of the followup to this event, the inspectors reviewed AmerGen's prompt investigation and immediate corrective action to this event and as well as the formal root cause analysis report.

b. Findings

Introduction. A Green self-revealing NCV was identified for an auxiliary operator failing to implement an approved procedure for ESAS testing as required by technical specification 6.8, "Procedures and Programs." The procedure error resulted in an inadvertent start of the 'B' EDG during testing and an unplanned increase in 'B' EDG unavailability.

Description. On November 22, 2002, a self-revealing finding was identified when the 'B' EDG unexpectedly started during performance of surveillance procedure 1303-5.2, "Emergency Loading Sequence and HPI [high pressure injection] Logic Channel/Component Testing." The starting of the 'B' EDG was an unexpected response to the insertion of an ESAS test signal. Control room operators referenced operating procedure 1107-3, "Diesel Generator," and shut down the 'B' EDG. The diesel generator was declared inoperable immediately following the shutdown because the automatic air start system was isolated as required by the operating procedure. The inadvertent start, and subsequent recovery efforts, resulted in 6.9 hours of unplanned 'B' EDG unavailability.

AmerGen's investigation of this event determined the root cause to be human performance. The approved surveillance test procedure includes steps to prevent an inadvertent, fast start of the EDG during this test. The start signal to the EDG on the ESAS train being tested by this procedure is blocked through the manipulation of keyed test switches. On November 22, 2002, the auxiliary operator mistakenly operated the test switches on the 'A' EDG instead of the desired 'B' EDG. When the 'B' ESAS test signal was inserted, the 'B' EDG unexpectedly started, because the test signal to the automatic start circuit had not been blocked, as required by the test procedure.

Analysis. The deficiency associated with this event was a human performance-related procedure error, which led to the unexpected starting of the 'B' EDG during ESAS testing. The finding was more than minor because it resulted in 6.9 hours of unplanned unavailability to a system important to safety. This finding, under the mitigating systems cornerstone, was evaluated as very low safety significance (Green) using the significance determination process Phase I, because the redundant 'A' EDG was not affected and the increased 'B' EDG unavailability was less than the technical specification allowed outage time for a single EDG.

Enforcement. Technical specification 6.8.1.a requires written procedures be established, implemented, and maintained covering the applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, Revision 2, dated February 1978. Regulatory Guide 1.33, Appendix A, Item 8.b, requires procedures be implemented for the conduct of surveillance tests. Contrary to the above, on November 22, 2002, the auxiliary operator failed to implement an approved ESAS surveillance test procedure as written, resulting in the inadvertent start of the 'B' EDG and increased safety system unavailability. Because this procedure error is of very low safety significance and has been entered into the corrective action system (CR 00132810), this violation is being treated as a non-cited violation, consistent with Section VI.A of the NRC Enforcement Policy: NCV 50-289, 02-07-01, Failure to Follow Test Procedure Results in Inadvertent Emergency Diesel Generator Start and Increased Unavailability.

4OA5 Other Activities

a. Inspection Scope

An audit of AmerGen's performance of the interim compensatory measures imposed by the NRC's Order Modifying License, issued February 25, 2002, was completed in accordance with the specifications of NRC Inspection Manual Temporary Instruction 2515/148, Revision 1, Appendix A, dated September 13, 2002.

b. Findings

No findings of significance were identified.

4OA6 Management Meetings

Exit Meeting Summary

On January 17, 2003, the resident inspectors presented the inspection results to members of AmerGen management led by Mr. Bruce Williams. Inspection results in maintenance rule implementation, emergency preparedness, and radiation safety were previously presented to members of AmerGen management by Region I inspectors. AmerGen acknowledged the findings presented. AmerGen did not indicate that any of the information presented at the exit meetings was proprietary.

4OA7 Licensee-Identified Violations

The following finding of very low safety significance was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a Non-Cited Violation (NCV).

- 10 CFR 20.1501 requires that reasonable surveys be made, as necessary, to comply with the requirements of 10 CFR 20. Contrary to this requirement, reasonable and necessary surveys were not adequate to ensure control of radioactive materials in conformance with 10 CFR 20, Subpart I, "Storage and Control of Licensed Materials." On August 20, 2002, via a pre-excavation survey program, radioactive material was detected imbedded in asphalt in a former radioactive materials storage area, outside the radiological controlled area, but within the protected area. The radiological surveys, conducted in January 2002 to release the area as a non-radioactive materials area, were not adequate to identify and control the radioactive material. Subsequent surveys of other locations, conducted in response to this finding or as part of a "Clean Sweep" radiological survey program initiated by AmerGen over the last year, identified additional examples of low level fixed contamination in non-radioactive materials areas. Applying the applicable Significance Determination Process (NRC Manual Chapter 609, Appendix D), this finding, associated with conduct of radiological surveys to identify and control radioactive material control, is considered to be of very low significance (green) because: (1) the finding was not associated with transportation, (2) no member of the public received or was likely to receive a dose in excess of 5 millirem, and (3) this matter was not considered to represent more than five radioactive material occurrences. The materials were identified via AmerGen survey programs (i.e., Clean Sweep and pre-survey for excavation) and their follow-up. These matters were addressed by various corrective actions, including removal of the material, and entered into the corrective action process (CRs 119884 and 112987).

ATTACHMENT 1

SUPPLEMENTAL INFORMATION

a. Key Points of Contact

K. Bartes, Plant Operations Director
R. Brady, Emergency Preparedness Manager
M. Bruecks, Site Security Manager
G. Gellrich, Plant Manager
L. Clewett, Director, Site Engineering
D. McDermott, Director, Maintenance
D. Merchant, Radiation Protection Manager
G. Rombold, Manager, Regulatory Assurance
B. Williams, Vice President, TMI Unit I

b. Items Opened, Closed

50-289/02-07-01	NCV	Failure to Follow Test Procedure Results in Inadvertent Emergency Diesel Generator Start and Increased Unavailability

c. List of Documents Reviewed

Condition Reports and CAPs

075911	115824	T2001-0207	T2001-0571
078494	116961	T2001-0208	T2001-0605
078654	120847	T2001-0251	T2001-0640
078657	122892	T2001-0297	T2001-0719
087379	123786	T2001-0304	T2001-0720
093014	124798	T2001-0326	T2001-0725
094729	126786	T2001-0332	T2001-0754
095410	132810	T2001-0333	T2001-0839
095418	136324	T2001-0336	T2001-0863
095779	T2001-0009	T2001-0366	T2002-0002
096905	T2001-0034	T2001-0401	T2002-0023
100277	T2001-0060	T2001-0405	T2002-0032
100552	T2001-0061	T2001-0431	T2002-0036
100920	T2001-0068	T2001-0439	T2002-0037
101585	T2001-0083	T2001-0467	T2002-0042
112636	T2001-0112	T2001-0468	T2002-0045
113148	T2001-0114	T2001-0470	T2002-0056
113152	T2001-0121	T2001-0471	T2002-0071
114487	T2001-0128	T2001-0529	T2002-0072
115573	T2001-0204	T2001-0531	
115614			

Plant Information Management System (PIMS) Action Requests

A2014323-07
A2014323-08
A2014323-09
A2014323-10
A2014323-11
A2014323-12

Corrective Maintenance Action Requests

A1802481	A2016649	A2020980	A2017710
A1802524	A2018646	A2034207	A1801351
A2000864	A2018647	A2034458	A1801520
A2005188	A2018952	A2042315	A1801728
A2007363	A2018955	A2042704	A2024870
A2007364	A2020085	A2043940	A2026978
A2011664	A2020190	A2043945	A2027513
A2013768	A2020733	A2044940	A2034700
A2016341	A2020917	A2017711	A2035794

Procedures

ER-AA-310	Implementation of the Maintenance Rule, Rev. 1, March 1, 2002
ER-AA-310-1001	Maintenance Rule System Scoping, Rev. 0, March 1, 2002
ER-AA-310-1002	Maintenance Rule Risk Significant Determination, Rev. 0, March 1, 2002
ER-AA-310-1003	Maintenance Rule Performance Criteria Selection, Rev. 0, March 1, 2002
ER-AA-310-1004	Maintenance Rule Performance Monitoring, Rev. 0, March 1, 2002
ER-AA-310-1005	Maintenance Rule (a)(1) Determination Process, Rev. 0, March 1, 2002
ER-AA-310-1006	Maintenance Rule Expert Panel Activities, Rev. 0, March 1, 2002
ER-AA-310-1007	Maintenance Rule (a)(3) Periodic Reports, Rev. 0, March 1, 2002
OP-1103-11	RCS Water Level Control, Revision 56

Self Assessments

- Maintenance Rule Nuclear Oversight Continuous Assessment Report, NOA-TM-02-2Q
- Maintenance Rule 14R Readiness Assessment, June 15, 2001
- Maintenance Rule Focus Area Self-Assessment, July 19, 2001
- Maintenance Rule Focused Area Self Assessment, November 5 and 6, 2002

NOA-TM-01-1Q Maintenance Rule Nuclear Oversight Assessment Report for January 12 through March 31, 2001, June 1, 2001

NOA-TM-01-2Q Maintenance Rule Nuclear Oversight Assessment Report for April 1 through June 30, 2001, July 31, 2001

NOA-TM-01-3Q Maintenance Rule Nuclear Oversight Assessment Report for July 1 through September 30, 2001, October 14, 2001

- Self-Assessment Plan & Report, SA-2002-1197

System Health Improvement Program (SHIP) Reports

SHIP 211 HPI/Makeup & Purification, October 2002

SHIP 212	LPI/Decay Heat Removal, October 2002
SHIP 244	Reactor Building Isolation, October 2002
SHIP 533	Decay Heat River Water, October 2002
SHIP 534	Reactor Building Emergency Cooling, October 2002
SHIP 543	Decay Heat Closed Cooling Water, October 2002
SHIP 829, 845	Aux/Fuel Handling Building HVAC, October 2002
SHIP 852	Instrument Air, October 2002
SHIP 861, 863, 741	Emergency Diesel Generator, October 2002
SHIP 661, 908	Radiation Monitors

System Health Reports

- Aux/Fuel Handling Buildings & Other Vital Buildings Ventilation Systems, September 20, 2002
- Containment Isolation, July 10, 2002
- Decay Heat Closed Cooling Water, November 11, 2002
- Decay Heat River Water, July 17, 2002
- Emergency Diesel Generators, July 12, 2002
- Condenser/Vacuum, July 19, 2002
- Emergency Feedwater, October 8, 2002
- Flood Equipment and Dikes, January 1, 2001
- Instrument Air, August 9, 2002
- Low Pressure Injection & Decay Heat Removal, July 10, 2002
- Nuclear Services Closed Cooling Water, June 19, 2002
- Reactor Building Emergency Cooling, July 17, 2002

Miscellaneous Documents

- Maintenance Rule Performance Criteria, Radiation Monitoring and Sampling System, December 2, 1999
- Maintenance Rule Performance Criteria, Fuel Handling Area ESF Ventilation System, December 6, 1999
- N. O. Field Observation, NOA-TMI-01-4Q, 01-4-070
- NOS Field Observation, NQA-TMI-02-2Q, 02-3-122
- NOS Field Observation, NQA-TMI-02-3Q, 02-3-022 & 02-4-016

TR-137	Maintenance Rule Periodic Assessment, Per 10CFR50.65(a)(3), E220-PA-99-001, Rev 0, February 29, 2000
TR-153	Maintenance Rule Periodic Assessment, Per 10CFR50.65(a)(3), 9/1999 to 9/2001, Rev. 0, April 30, 2002

d. Acronyms

ADAMS	Agencywide Documents and Management System
ALARA	As Low As is Reasonably Achievable
AmerGen	AmerGen Energy Company, LLC
ANS	Alert and Notification System
AR	Action Request
CAP	Corrective Action Process
CFR	Code of Federal Regulations
CR	Condition Report
CY	Calendar Year
DHRW	Decay Heat River Water
DRS	Division of Reactor Safety
EAL	Emergency Action Level
EDG	Emergency Diesel Generator
EP	Emergency Preparedness
ERO	Emergency Response Organization
ESAS	Emergency Safeguards Actuation System
FFD	Fitness-for-Duty
HPI	High Pressure Injection
HPI/MU	High Pressure Injection Makeup System
HRA	High Radiation Area
HSAS	Homeland Security Advisory System
HVAC	Heating, Ventilation and Air Conditioning
ICM	Interim Compensatory Measures
IR	Inspection Report
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OHS	Office of Homeland Security
OP	Operating Procedure
PARs	Publicly Available Records
PC	Performance Criteria
PI	Performance Indicator
PIMS	Plant Information Management System
PI&R	Problem Identification and Resolution
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RETS	Radiological Effluent Technical Specification
SDP	Significance Determination Process
SSC	Structures, Systems and Components
TMI	Three Mile Island, Unit 1
TS	Technical Specifications