November 7, 2002

Mr. John Skolds
President and CNO
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
5th Floor
Warrenville, IL 60555

SUBJECT: THREE MILE ISLAND STATION, UNIT 1 - NRC INTEGRATED INSPECTION REPORT 50-289/02-06

Dear Mr. Skolds:

On September 28, 2002, the NRC completed an inspection at your Three Mile Island Unit 1 facility. The enclosed report documents the inspection findings that were discussed October 4, 2002, 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.

Based on the results of this inspection, the inspectors identified two issues of very low safety significance (Green). These issues were determined to involve violations of NRC requirements. However, because of the very low safety significance, and because these issues have been entered into your corrective action program, the NRC is treating these issues as non-cited violations, in accordance with Section VI.A. of the NRC's Enforcement Policy. If you deny these non-cited violations, 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, D.C. 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-001; and the NRC resident inspector at Three Mile Island.

The NRC has increased security requirements at Three Mile Island in response to terrorist acts on September 11, 2001. Although the NRC is not aware of any specific threat against nuclear facilities, the NRC issued an Order and several threat advisories to commercial power reactors to strengthen licensees' capabilities and readiness to respond to a potential attack. The NRC continues to inspect the licensee's security controls and its compliance with the Order and current security regulations.

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.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 50-289/02-06
Attachment: 1) Supplemental Information

cc w/encl.:
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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No:	50-289
License No:	DPR-50
Report No:	50-289/02-06
Licensee:	AmerGen Energy Company, LLC (AmerGen)
Facility:	Three Mile Island Station, Unit 1
Location:	PO Box 480 Middletown, PA 17057
Dates:	June 30 - September 28, 2002
Inspectors:	J. Daniel Orr, Senior Resident Inspector Craig W. Smith, Resident Inspector Jason C. Jang, Senior Health Physicist, DRS Ronald L. Nimitz, Senior Health Physicist, DRS
Approved by:	John F. Rogge, Chief Projects Branch 7 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000289-02-06; AmerGen Energy Company, LLC; on 6/30-9/28/2002; Three Mile Island, Unit 1; Maintenance Rule Implementation; Surveillance Testing.

The report covered a thirteen-week period of inspection by resident and specialist inspectors. The inspection identified two Green findings, both of which were classified as non-cited violations. 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.** Operators failed to promptly evaluate an oil leak on the 'A' emergency diesel generator (EDG) mechanical governor that was of sufficient magnitude to render the diesel inoperable. The delay in assessing the significance of the degraded condition resulted in the diesel being inoperable for more than five hours with no compensatory actions in place.

  The safety significance of AmerGen's failure to promptly evaluate and correct an oil leak on the 'A' EDG that rendered the diesel inoperable was very low (Green), because the time period the diesel was inoperable was less than the technical specification allowed outage time for a single EDG and the redundant 'B' EDG was not affected. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," requires in part that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to this requirement, plant operators failed to assure that an oil leak that affected the operability of the 'A' EDG was promptly identified and repaired. (Section 1R22)

Cornerstone: Barrier Integrity

- **Green.** Control room operators secured an inoperable reactor coolant drain tank (RCDT) vent radiation monitor and placed its associated interlock defeat switch in defeat for several weeks without adequate compensatory actions. The defeat position disabled a high radiation isolation signal for two normally open reactor building isolation valves on the RCDT vent line in the auxiliary building.

  The operators' oversight caused by inadequate procedure guidance was determined to be of very low safety significance (Green). Only the radiological barrier function of the reactor building containment to the auxiliary building was degraded. Engineered safeguards isolation capability was maintained operable to the isolation valves for the duration. Technical specification 6.8.1.a. requires in part that written procedures shall be established, implemented and maintained covering the applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, Revision 2, February 1978.

Regulatory Guide 1.33, Revision 2, February 1978 recommends written procedures for process radiation monitoring system operation. Contrary to this requirement, on May 1, 2002, to August 4, 2002, control room operators secured the RCDT vent line radiation monitor and disabled associated high radiation signals without adequate procedural instruction. (Section 1R12)

B. Licensee-identified Violations

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 program. 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 (TMI), Unit 1 at or near 100 percent power throughout the inspection period.

1. REACTOR SAFETY

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

1R04 Equipment Alignment

a. Inspection Scope

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

- 'B' decay heat removal system train with the 'A' train out of service for scheduled maintenance on August 6, 2002
- 'A' high pressure injection/makeup system train with the 'B' train out of service for scheduled maintenance on September 10, 2002
- 'B' emergency diesel generator with the 'A' emergency diesel generator out of service for scheduled maintenance on July 10, 2002
- emergency feedwater system during scheduled surveillance testing of the motor driven emergency feedwater pumps on August 15, 2002

The systems were chosen based on their risk significance. The partial system walkdowns were conducted on the operable system trains with the redundant trains out of service for scheduled maintenance. The inspectors verified the operable trains were aligned in accordance with operating procedures "Decay Heat Removal System, 1104-4," "Makeup and Purification System, 1104-2," "Diesel Generator, 1107-3," and "Emergency Feedwater System, 1106-6." 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

a. Inspection Scope

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

- station blackout diesel generator room
- station blackout diesel generator fuel oil storage tank room
- control building chill water room
- river water heat exchanger vault room

- turbine building areas important to maintaining offsite power
- diesel driven river water fire pump room during surveillance testing
- auxiliary building makeup system valve gallery
- engineered safeguards ventilation system fan rooms

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.

1R06 Flood Protection Measures

a. Inspection Scope

During the week of July 22, 2002, the inspectors reviewed internal flooding protective measures for the intermediate building. This area is risk significant because feedwater line breaks within the intermediate building have the potential to impact emergency feedwater system components and secondary heat removal capabilities. The inspectors reviewed AmerGen calculation C-1101-424-E540-064, “Flooding due to a postulated pipe break in the intermediate building,” and walked down risk significant design features credited in the analysis. The inspectors reviewed preventive maintenance records for design components including sump pumps and level alarms and verified operator actions credited in the analysis were reasonable.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed a simulator requalification training session on September 11, 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 Rule Implementation

a. Inspection Scope

The inspectors verified AmerGen's implementation of the maintenance rule for radiation monitoring system (RMS) performance monitoring and an 'A' emergency diesel generator (EDG) governor oil leak functional failure determination. Although the RMS is not a risk-significant system, it provides several important functions for radiological dose assessment and control. The inspectors selected the RMS because several radiation monitors have had recent failures. The EDG is a high safety-significant standby system and was selected accordingly. The governor oil leak occurred on July 5, 2002.

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

Introduction

The inspectors identified a non-cited violation (NCV) for failure to establish, implement and maintain written procedures for operating the radiation monitoring system. Specifically, control room operators secured an inoperable reactor coolant drain tank (RCDT) vent radiation monitor (RM-G-20) and placed its associated interlock defeat switch in defeat for several weeks. The defeat position disabled a high radiation isolation signal for two normally open reactor building isolation valves on the RCDT vent line in the auxiliary building. The inspectors determined the finding was of very low safety significance (Green) because only a radiological barrier function of the reactor building containment to the auxiliary building was degraded. Engineered safeguards isolation capability was maintained operable to the isolation valves for the duration.

Description

To assess the aggregate RMS equipment problems, the inspectors walked down the radiation monitor panels in the main control room on August 23, 2002. The inspectors identified that several degraded radiation monitors had interlock defeat switches in defeat. The defeat position disables a high radiation signal that would isolate an associated pathway when high radiation conditions are detected locally. The inspectors observed for the time being that each defeated interlock was maintained in an isolated condition. However, the inspectors recalled that the RCDT vent radiation monitor had recently been returned to service after an extended out of service period. The inspectors discovered that control room operators had maintained the associated RCDT vent line isolation valves open with the high radiation signal defeated from May 1, 2002, to August 4, 2002.

The inspectors discussed the operation of the radiation monitor interlock defeat switches with the operations manager on August 26, 2002. AmerGen initiated condition report (CR) 121152 on August 28, 2002, to correct deficient use of the radiation monitor interlock defeat switches. AmerGen also initiated CR 125538 on October 2, 2002, to

address other intended corrective actions. Procedural guidance did not exist for securing radiation monitors and for operation of the interlock defeat switches.

Analysis

The inspectors determined the safety significance of this finding was very low (Green) using phase one of the significance determination process (SDP). Procedure quality under the barrier integrity cornerstone was affected. The issue was more than minor because two reactor coolant drain tank vent valves were maintained open from May 1, 2002, to August 4, 2002, with a high radiation isolation signal defeated and without any compensatory action. With RM-G-20 secured and the high radiation signal defeated, an increase in RCDT radioactivity could have initially gone unnoticed, raising auxiliary building radiation levels in the vicinity of the RCDT vent line. The issue screened to Green in phase one because only a radiological barrier function of the reactor building containment to the auxiliary building was degraded. The engineered safeguards isolation signals provided to the affected valves were maintained.

Enforcement

Technical specification 6.8.1.a. requires in part that written procedures shall be established, implemented and maintained covering the applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, Revision 2, February 1978. Regulatory Guide 1.33, Revision 2, February 1978 recommends written procedures for process radiation monitoring system operation. Contrary to this requirement, on May 1, 2002, to August 4, 2002, control room operators secured the RCDT vent line radiation monitor and disabled associated high radiation signals without adequate procedure instruction. This violation is being treated as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy **(NCV 50-289/02-06-01)**. AmerGen entered this problem into the corrective action program as CR 121152 and CR 125538 and intended to improve the radiation monitoring system procedure quality.

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:

- 'B' decay heat removal train scheduled system outage the week of July 24, 2002;
- turbine driven emergency feedwater pump scheduled surveillance testing with the station blackout diesel inoperable on August 1, 2002;
- heat sink protection system scheduled maintenance on September 13, 2002;
- 'D' safety-related inverter scheduled maintenance on August 22, 2002; and
- 'B' safety-related inverter scheduled maintenance on September 17, 2002.

The inspectors reviewed the risk assessment of these planned 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 Evolutions

a. Inspection Scope

The inspectors observed main control room operators down power the 'A' vital bus on July 25, 2002. The 'A' vital bus outage was scheduled to support maintenance on the 'A' inverter. The 'A' vital bus supplies power to the 'A' reactor protective system channel, the 'A' heat sink protection system channel, the 'A' engineered safeguards actuation system channel and several control room indicators. The inspectors verified that the activity was conducted in accordance with TMI operating procedure "120 Volt Vital Electrical System, 1107-2B."

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed operability evaluations for the following degraded equipment issues affecting risk significant systems or components:

- 'C' nuclear service closed cooling water system pump discharge check valve abnormal noise on July 29, 2002;
- Decay heat closed cooling water system flow switch anomalies on July 23, 2002;
- Backup emergency boration system supply valve, MU-V-51, inservice testing failure on September 11, 2002;
- Main steam safety valve, MS-V-21A, seat leakage on August 13, 2002; and
- Pressurizer cycling heater failures on September 16, 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 the acceptability of AmerGen's operability evaluations.

b. Findings

There were no findings of significance identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors reviewed post-maintenance tests performed by AmerGen in conjunction with the following maintenance activities on risk significant systems or components:

- 'B' decay heat removal system outage on July 24, 2002
- 'B' high pressure injection/makeup system outage on September 10, 2002
- 'A' decay heat removal system outage on August 6, 2002
- 'B' emergency diesel generator air start check valve inspections on July 10, 2002
- heat sink protection system logic module replacement on September 13, 2002
- 'B' Safety-Related inverter outage on September 19, 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

.1 'A' Emergency Diesel Generator

a. Inspection Scope

The inspectors reviewed the monthly surveillance test of the 'A' emergency diesel generator (EDG) conducted on July 5, 2002, in accordance with AmerGen surveillance procedure "Emergency Power System, 1303-4.16." The inspectors observed portions of the surveillance and compared the final test results against the procedure acceptance criteria.

b. Findings

Introduction

The inspectors identified a non-cited violation (NCV) for failure to promptly identify and correct a condition adverse to quality involving an oil leak on the 'A' EDG mechanical governor. The leak was of sufficient magnitude to render the 'A' EDG inoperable. The control room was not made aware of the degraded condition for more than five hours. The delay in reporting the leak and subsequent repairs resulted in 16 hours of EDG

unplanned unavailability. The inspectors determined the finding was of very low safety significance (Green) because the time period the 'A' EDG was inoperable was less than the technical specification seven day allowed outage time for a single EDG, and the redundant 'B' EDG remained operable.

Description

The inspectors observed performance of the 'A' EDG monthly surveillance on July 5, 2002. After the equipment operator and in-plant supervisor completed their inspections, the inspectors performed an independent inspection of the running EDG. In preparing for this inspection, the inspectors identified a log entry for oil addition to the 'A' EDG governor oil reservoir the previous month. The inspectors were particularly sensitive to possible governor oil leaks. The inspectors observed a 30 drop per minute oil leak coming from a copper tube fitting on the governor oil pressure booster, which the operators had not identified during their inspections. The inspectors discussed the oil leak with the in-plant supervisor while the 'A' EDG was still running. However, the in-plant supervisor did not immediately notify the control room of the abnormal condition. After the EDG was secured, the in-plant supervisor initiated actions to enter the governor oil leak into the work control system for repair, but did not fully consider potential operability concerns or immediately discuss the condition with senior shift management or the system engineer. It was not until shift turnover, five hours after the leak was first identified by the inspectors, that operability of the 'A' EDG was questioned by the on-coming shift manager. The licensee initiated immediate compensatory actions to require an operator is dispatched to the EDG in the event of a demand fast start, and to closely monitor governor oil level. The leak was repaired later that shift by tightening the loose fitting.

Analysis

AmerGen initiated condition reports to evaluate the less than timely operability evaluation (CR 00114940) and to evaluate past operability of the 'A' EDG (CR 00114597). The licensee determined, through a review of the as-found condition of the tubing fitting and interviews with plant operators that the governor oil leak was not present prior to the July 5, 2002, surveillance. Therefore, past operability of the 'A' EDG was not in question. The oil addition the previous month was made to bring the level indication within the normal operating band.

The inspectors determined the safety significance of this finding was very low (Green) using phase one of the significance determination process (SDP). The issue is more than minor because the in-plant supervisor's failure to properly recognize, evaluate, and take prompt corrective actions in response to a degraded condition on the 'A' EDG resulted in an extended period of unplanned unavailability for equipment important to safety. The human performance attribute under the mitigating system cornerstone was affected. The EDG governor reservoir holds 1.5 quarts of oil and the leak rate was estimated at 0.2 quarts per hour. The leak was not present with the EDG in a standby condition. AmerGen determined that because of the volume of the leak and the size of the reservoir, operator action should not be credited to prevent the governor oil reservoir from emptying following an EDG automatic start. The repairs to the fitting and

subsequent post-maintenance testing resulted in 15.97 hours of EDG unavailability, from the time the leak was first identified by the inspectors.

Enforcement

10 CFR 50, Appendix B, Criterion XVI, “Corrective Actions,” requires in part that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to this requirement, on July 5, 2002, the in-plant supervisor failed to assure that a leaking governor oil fitting on the ‘A’ EDG was promptly evaluated and repaired. The leak was of sufficient magnitude to render the ‘A’ EDG inoperable. This violation is being treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy **(NCV 50-289/02-06-02)**. This issue was entered into the licensee’s corrective action program as CR 00114940.

.2 Additional Surveillance Testing

a. Inspection Scope

The inspectors observed portions of and reviewed the results of the following surveillance tests on risk significant systems and components:

- Nuclear services river water system inservice testing conducted in accordance with “IST of NSRW Pumps and Valves, 1300-3I” on August 25, 2002;
- Quarterly ‘A’ and ‘B’ safety-related station battery test conducted in accordance with “Station Battery Quarterly, 1301-5.8" on September 19, 2002;
- High pressure injection and low pressure injection functional engineered safeguards actuation system testing conducted in accordance with “HPI/LPI Analog Channel Test, 1303-4.19" on September 19, 2002;
- Decay heat removal river water inservice testing conducted in accordance with “IST of DR Pumps and Valves, 1300-3D” on July 1, 2002; and
- Borated water storage tank level instrument calibration conducted in accordance with “Borated Water Storage Tank Level Indicator, 1302-5.19" on September 4, 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.

1R23 Temporary Plant Modifications

a. Inspection Scope

During the week of September 16, 2002, the inspectors reviewed AmerGen’s ongoing actions for a temporary modification installed on the steam trap for the steam admission line to the turbine driven emergency feedwater pump. The temporary modification was

installed on April 20, 2002, to provide a means to measure condensate buildup in the steam admission line to the emergency feedpump turbine. Auxiliary operators measure the condensate level each shift as part of their normal rounds. The inspectors verified that the temporary modification was consistent with the modification document. Controlled drawings and procedures were also verified to accurately reflect the temporary modification. NRC Inspection Procedure 71111.17, "Permanent Plant Modifications," was referenced by the inspectors and provided several attributes for acceptability. The inspectors reviewed guidance provided to auxiliary operators for operation of the temporary modification.

b. Findings

No findings of significance were identified.

Emergency Preparedness [EP]

1EP6 Drill Evaluation

a. Inspection Scope

On August 20, 2002, the inspectors observed an emergency preparedness drill from the main control room that AmerGen credited toward the Drill/Exercise Performance NRC performance indicator. The drill also included manning the emergency facilities during off normal working hours by the emergency preparedness duty team. The inspectors evaluated the opportunities for classification and notification of the emergency action levels presented in the drill. The inspectors verified that AmerGen correctly evaluated the participants' classifications and notifications in accordance with TMI's emergency plan implementing documents.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Occupational Radiation Safety [OS]

2OS3 Radiation Monitoring Instrumentation

a. Inspection Scope

The inspector reviewed performance in the area of radiation monitoring and instrumentation and protective equipment. The inspector reviewed the following matters:

- The status and surveillance records for self-contained breathing apparatus (SCBA) staged and ready for use in the station (SCBA Unit Nos. 3, 6, 41, 42);
- AmerGen's capability for refilling and transporting SCBA bottles to/from the control room and the operations support center in emergency conditions;
- The training and qualifications of personnel assigned to refill SCBA bottles;
- Personnel respiratory protection equipment fit testing process including verification of fit factors prior to respiratory protective equipment wear authorization;
- The training and qualification of control room operators, chemistry personnel, radiation protection personnel and other selected emergency response personnel in the use of SCBA, including bottle change-out;
- Personnel qualification documentation for onsite personnel designated to perform maintenance including inspection, testing, repair, and overhaul of vendor designated vital components of SCBA. (The qualifications were verified for personnel who performed inspections of two ready-for-use SCBAs from the Control Room and two ready-for-use SCBAs from the operations support center (SCBA Unit Nos. 3, 6, 41, 42)).
- The periodic air cylinder hydrostatic testing data to verify testing was completed, documented and up-to-date, including the status of DOT required retest air cylinder markings. (Records covering the past five years were reviewed.)
- Onsite SCBA maintenance procedures were reviewed to verify consistency between AmerGen's procedures and the SCBA manufacturer's recommended practices including the low-pressure alarm and air regulator procedure;
- Corrective action reports in this area to determine if problems were reviewed for reportability, risk ranking, and prioritization and whether potential repetitive problems were identified, including contributing causes. A selection of corrective action documents was reviewed (CAP Nos. 0189, 0262, 0542) (CR Nos. 106650, 95979, 092294, 9169, 82761, 80067, 104732, 73831, 85811, 115523). (Included in this review was the availability of appropriate radiation survey instrumentation during

TMI's October 2001 refueling outage and the proper use by personnel of personnel and equipment contamination monitoring systems.);

- The types of airborne radioactivity sample counting equipment used to measure airborne radioactivity including calibration, adequacy of sources used, and conduct of operability checks (continuous air monitor #328/251, alpha counter #711462, and beta gamma counter #102761);

- AmerGen's shallow dose equivalent radiation measurements and dose assessments techniques.

The reviews in this area were against regulatory requirements and industry guidance contained in the following documents:

- 10 CFR 20, Sub Part H, "Respiratory Protection and Controls to Restrict Internal Exposure in Restricted Areas";

- Regulatory Guide 8.15, Rev. 1, "Acceptable Programs for Respiratory Protection";

- NUREG 0041, Rev. 1, "Manual of Respiratory Protection Against Airborne Radioactive Material";

- TMI Updated Final Safety Analysis Report, Technical Specifications, Emergency Operating Procedures, and licensee respiratory protection procedures.

b. Findings

No findings of significance were identified.

Public Radiation Safety [PS]

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

a. Inspection Scope

The inspector reviewed the following documents to evaluate the effectiveness of AmerGen's radioactive gaseous and liquid effluent control programs. The requirements of the radioactive effluent controls are specified in the Technical Specifications/Offsite Dose Calculation Manual (TS/ODCM):

- 2000/2001 Radiological Annual Effluent Release Reports, including Public Radiation Dose Assessment results;

- Most recent ODCM, (Revision 21, January 19, 2001; Revision 22, May 4, 2001; and Revision 23, March 19, 2002) and technical justifications for ODCM changes made;

- Implementation of the compensatory sampling and analysis program when the effluent radiation monitoring system (RMS) is out of service;

- Selected 2002 radioactive gaseous and liquid release permits;

- Implementation of IE Bulletin 80-10 (e.g., main steam to auxiliary steam for domestic side use);

- Calibration records for laboratory measurements equipment (gamma spectroscopy and liquid scintillation counter);

- Implementation of the laboratory quality control programs and the validation of the measurements, including inter-laboratory comparisons;

- Selected 2002 analytical results for charcoal cartridge, particulate filter, and noble gas samples;

- 2002 CRs for Radiation Monitoring System (955449, 109459, 112364, 112909, 114789, 116126, and 116184);

- 2002 CRs for Air Cleaning Systems required by Technical Specification (TS) Sections 3/4.15.1: 3/4.15.2: 3/4.15.3: and 3/4.15.4 (76314, 78475, 78621, 84779, 89032, 97787, 106435, 108567, and 108475); and

- CRs for effluent control programs (76021, 94762, CAP No. T2001-0381, and CAP No. T2001-0771)

- 2001 Quality Assurance Audit (No. NQA-TM-01-1Q) for the radiological effluent control and ODCM implementations;

- 2002 self-assessment for the radioactive gaseous and liquid effluent controls;

- Associated radioactive effluent control procedures, including the vendor's analytical procedures;

- Most recent effluent RMS channel calibration and flow monitor calibration results listed in Table 3.1-1 and 3.1-2 of the ODCM and accident RMS;

<u>Radiation Monitoring System (RMS)</u>

- Liquid Radwaste Effluent Line RMS (RM-L-6);
- ISTS/IWFS Discharge Line RMS (RM-L-12);
- Waste Gas Holdup System, Noble Gas Activity Monitor (RM-A7);
- Containment Purge Vent System, Noble Gas Activity Monitor (RM-A9)
- Condenser Vent System: Noble Gas Activity Monitor (RM-A5);
- Auxiliary and Fuel Handling Building Ventilation System, Noble Gas Activity Monitors (RM-A4, RM-A6, and RM-A8);
- Fuel Handling Building ESF Air Treatment System, Noble Gas Activity Monitor (RM-A14);
- Chemical Cleaning Building Ventilation System, Noble Gas Activity Monitor (ALC RM-1-18);

- Auxiliary and Fuel Handling Building High Range Noble Gas Monitor (RM-A-8GH);
- Condenser Vent System High Range Noble Gas Monitor (RM-A5Hi); and,
- Containment Purge Vent High Range Noble Gas Activity Monitor (RM-A9Hi).

Flow Monitoring Devices

- Liquid Radwaste Effluent Line Flow Rate Measuring Device (FT-84);
- Station Effluent Discharge Flow Rate Measuring Device (FT-146);
- Waste Gas Holdup System, Effluent System Flow Rate Measuring Device (FT-123);
- Containment Purge Vent System, Effluent Flow Rate Measuring Device (FT-148 A and B);
- Auxiliary and Fuel Handling Building Ventilation System, System Effluent Flow Rate Measuring Devices (FT-149 and FT-150); and,
- Fuel Handling Building ESF Air Treatment System, System Effluent Flow Rate (UR-1104 A/B).

- Most recent surveillance testing results [(1) visual inspection, (2) delta P, (3) in-place testing for HEPA, (4) in-place testing for charcoal filters, (5) air capacity test (flow rate), and (6) laboratory test for iodine collection efficiency] for the following air treatment systems:

  - TS 3.15.1, Emergency Control Room Air Treatment System
  - TS 3.15.2, Reactor Building Purge Air Treatment System
  - TS 3.15.3, Auxiliary and Fuel Handling Building Air Treatment System
  - TS 3.15.4, Fuel Handling Building ESF Air Treatment System

The inspector toured and observed the following areas and activities to evaluate the effectiveness of the licensee's radioactive effluent control programs.

- Availability of selected radioactive liquid and gaseous effluent RMS;
- Sampling techniques for effluent samples (air tritium, noble gas, charcoal, filter, and entrained noble gases in the reactor coolant);
- Sample preparation for measurements, and gamma spectroscopy and liquid scintillation counter measurement techniques; and,
- Emergency control room air treatment system integrity.

b. Findings

No findings of significance were identified.

3. SAFEGUARDS

Physical Protection [PP]

3PP3 Response to Contingency Events

The Office of Homeland Security (OHS) developed a Homeland Security Advisory System (HSAS) to disseminate information regarding the risk of terrorist attacks. The

HSAS implements five color-coded threat conditions with a description of corresponding actions at each level. NRC Regulatory Information Summary (RIS) 2002-12a, dated August 19, 2002, "NRC Threat Advisory and Protective Measures System," discusses the HSAS and provides additional information on protective measures to licensees.

a. Inspection Scope

On September 10, 2002, the NRC issued a Safeguards Advisory to reactor licensees to implement the protective measures described in RIS 2002-12a in response to the Federal government declaration of threat level "orange." Subsequently, on September 24, 2002, the OHS downgraded the national security threat condition to "yellow" and a corresponding reduction in the risk of a terrorist threat.

The inspectors interviewed licensee personnel and security staff, observed the conduct of security operations, and assessed licensee implementation of the threat level "orange" protective measures. Inspection results were communicated to the region and headquarters security staff for further evaluation.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

4OA1 Performance Indicator Verification

a. Inspection Scope

The inspectors referenced NEI 99-02, Revision 2, "Regulatory Assessment Performance Indicator Guideline" and verified data submitted by AmerGen for the emergency AC power and decay heat removal system unavailability performance indicators in the mitigating systems cornerstone. The inspectors reviewed operating logs, maintenance rule records, and the corrective action process database to verify the accuracy and completeness of the reported unavailability data. Records were reviewed for reported performance indicator data covering the last two quarters of 2001 and the first two quarters of 2002.

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 Increased Unidentified Reactor Coolant System Leakage

a. Inspection Scope

As part of the routine PI&R effectiveness assessment, the inspectors reviewed AmerGen's corrective actions for an increase in reactor coolant system unidentified leakage that began in early June 2002. This review was selected for a potential impact on the barrier integrity cornerstone.

b. Findings

The inspectors identified some weaknesses with AmerGen's disposition of an increase in reactor coolant system unidentified leakage. AmerGen identified the increase in unidentified leakage, but did not include all problems in the initial identification within the corrective action program.

The inspectors reviewed condition reports 112219 and 112255 that reported a slight but discernible increase in unidentified reactor coolant system leakage that began in early June 2002. TMI operated with a steady Reactor Coolant System (RCS) unidentified leakage at about 0.01 gallons per minute (gpm). In early June 2002, control room operators and system engineers identified that the new leak rate was about 0.02 gpm. Condition report 112219 was initiated on June 17, 2002, by control room operators and condition report 112255 was initiated on June 18, 2002, by system engineers. The inspectors reviewed the condition reports to verify that AmerGen identified the increased leakage in a timely manner and also to gauge AmerGen's corrective actions to locate and administratively trend and control any future increased leak rate.

The inspectors determined through review of condition report 112219 that control room operators first noticed indications of increased leakage on June 9, 2002. The control room operators specifically noticed the reactor building atmosphere particulate monitor (RM-A-2P) had increased from about 400 counts per minute (cpm) to about 2500 cpm. The control room operators also initially noticed other supporting indications such as makeup tank level usage and RCS mass balance computer calculations. The inspectors interviewed control room operators and learned that the indications were also reported to some operations management staff. Followup mass balance calculations were performed and did not immediately support an increased leak rate. The increase in leak rate by a mass balance calculation at these values is discernible only through averaging, the data scatter is about 0.1 gpm. The control room operators also

questioned the RM-A-2P performance. Instrument and control (I&C) technicians reported that the filter paper may not be advancing, indicating a false increase in counts. The operators declared the RM-A-2P inoperable and initiated a work request to repair the suspected filter paper advance problems.

On June 12, 2002, I&C technicians completed maintenance on the RM-A-2P monitor. The technicians found the paper supply roll jammed but this contradicted an initial diagnosis that the paper would advance manually. On June 14, 2002, the operators declared the RM-A-2P monitor operable and it indicated about 3000 cpm. On June 17, 2002, the same control room operators from June 9, 2002, noticed that the RM-A-2P monitor was now continuously reading over 4000 cpm. The control room operators initiated condition report 112219 for the increased unidentified RCS leakage.

The inspectors identified that no corrective actions were developed for the untimely initiation of a condition report. Control room operators almost immediately recognized the increase in unidentified RCS leakage, yet questioned some indications and waited about eight days to initiate a condition report. Operators and management did maintain an increased awareness to the RCS unidentified leakage. The inspectors identified that AmerGen was not properly managing the most sensitive indicator for very small RCS unidentified leak rates, the RM-A-2P monitor. When indications of a slightly increased RCS unidentified leakage occurred on June 9, 2002, prompted by the RM-A-2P monitor, the indications were questioned and another five days expired before the monitor was returned to an operable status. After another three days with the RM-A-2P monitor reading a ten fold increase from the levels on June 9, the condition report for an increase in unidentified leakage was initiated. The inspectors did not notice in either condition report any corrective actions to increase operator awareness to the RM-A-2P capabilities.

The corrective action problems identified were not violations of NRC requirements. Unidentified RCS leakrates were monitored and maintained within technical specification limits. AmerGen was sensitive to the slight increase in RCS unidentified leakrate, but did not administratively enter the issue into the corrective action program in a prompt manner and did not maximize the operability of RM-A-2P.

4OA3 Event Followup

(Closed) Licensee Event Report 50-289/2002-002-00: Pressurizer Code Safety Valve Setpoint Outside Tolerance During Plant Operation Due to Mechanical Setpoint Drift.

This licensee event report described one of two pressurizer code safety valves (PCSV) removed during the cycle 14 refueling outage and setpoint tested out of tolerance high; a contractor reported the test results to AmerGen on May 29, 2002. The subject PCSV lifted at 3.8 percent high and the technical specification 3.1.1 bases required a maximum 3 percent setpoint drift in accordance with ASME Section XI. The inspectors reviewed the LER and determined that the barrier integrity cornerstone, specifically functionality of the reactor coolant system and procedure quality, was impacted. AmerGen's root cause investigation identified an inadequate contact area between the PCSV upper spring washer and spring. The inspectors determined the safety

significance of this finding was very low (Green) using phase two of the significance determination process (SDP). All RCS barrier findings immediately go to phase two, and this issue was Green because operability of the PCSVs was ultimately not affected. The LER described an analysis that demonstrated that the RCS pressure would not have exceeded the safety limit if the most limiting pressure transient had occurred with the actual setpoint tested. 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires in part that procedures shall include appropriate quantitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Contrary to this requirement, AmerGen failed to establish an acceptance criteria for the PCSV upper spring washer and spring contact area. However, because of the very low safety significance of this finding, and because AmerGen entered this issue into its corrective action process (CR110747), this violation is being treated as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy.

4OA6 Management Meetings

.1 Exit Meeting Summary

On October 4, 2002, the resident inspectors presented the inspection results to members of AmerGen management led by Mr. Bruce Williams. The occupational and public radiation safety inspection results were previously presented to members of AmerGen management. 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

Section 4OA3 of this inspection report describes a violation of very low safety significance (Green) which 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.

ATTACHMENT 1

SUPPLEMENTAL INFORMATION

a. Key Points of Contact

M. Bruecks, Site Security Manager
G. Gellrich, Plant Manager
L. Clewett, Director, Site Engineering
D. McDermott, Director, Maintenance
G. Rumbold, Manager, Regulatory Assurance
S. Queen, Senior Manager, Plant Engineering
J. Robertson, Plant Operations Director
B. Williams, Vice President, TMI Unit I

b. Items Opened and Closed

50-289/02-06-01	NCV	Failure to Implement Adequate Procedures for Process Radiation Monitoring System Operation
50-289/02-06-02	NCV	Failure to Assure a Leaking EDG Governor Oil Fitting was Promptly Evaluated and Repaired
50-289/02-02-00	LER	Pressurizer Code Safety Valve Setpoint Outside Tolerance During Plant Operation Due to Mechanical Setpoint Drift

c. Acronyms

ADAMS	Agencywide Documents and Management System
AmerGen	AmerGen Energy Company, LLC
CAP	Corrective Action Process
CFR	Code of Federal Regulations
CR	Condition Report
DOT	Department of Transportation
DRS	Division of Reactor Safety
EDG	Emergency Diesel Generator
gpm	Gallons per minute
HSAS	Homeland Security Advisory System
HEPA	High-Efficiency Particulate Air (Filter)
IR	Inspection Report
LER	Licensee Event Report
NCV	Non-cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OHS	Office of Homeland Security
PARs	Publicly Available Records
PCSV	Pressurizer Code Safety Valve
RCS	Reactor Coolant System

RCDT	Reactor Coolant Drain Tank
RIS	Regulatory Information Summary
RMS	Radiation Monitoring System
SCBA	Self-Contained Breathing Apparatus
SDP	Significance Determination Process
TMI	Three Mile Island, Unit 1
TS	Technical Specifications