

May 11, 2005

Mr. Christopher M. Crane  
President and CEO  
AmerGen Energy Company, LLC  
200 Exelon Way, KSA 3-E  
Kennett Square, PA 19348

SUBJECT: THREE MILE ISLAND STATION, UNIT 1 - NRC INSPECTION REPORT  
05000289/2005002

Dear Mr. Crane:

On March 31, 2005, the Nuclear Regulatory Commission (NRC) completed an inspection at your Three Mile Island, Unit 1 (TMI) facility. The enclosed report documents the inspection findings that were discussed April 7, 2005, with Mr. Rusty West and other members of your staff.

The 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 two findings of very low safety significance (Green). The findings were determined to involve a violation of NRC requirements. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating them as non-cited violations (NCVs) consistent with Section VI.A of the NRC Enforcement Policy. If you contest the NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis of your denial, 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 20555-0001; and the Resident Inspector at Three Mile Island.

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Mr. Christopher Crane

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We appreciate your cooperation. Please contact me at 610 337-5069 if you have any questions regarding this letter.

Sincerely,

**/RA/**

Arthur Burritt, Acting Chief  
Reactor Projects Branch 7  
Division of Reactor Projects

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

Enclosure: Inspection Report 05000289/2005002  
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION 1

Docket No: 05000289

License No: DPR-50

Report No: 050000289/2005002

Licensee: AmerGen Energy Company, LLC (AmerGen)

Facility: Three Mile Island Station, Unit 1

Location: PO Box 480  
Middletown, PA 17057

Dates: January 1, 2005 - March 31, 2005

Inspectors: David M. Kern, Senior Resident Inspector  
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## SUMMARY OF FINDINGS

IR 05000289/2005002; 1/01/2005 - 3/31/2005; AmerGen Energy Company, LLC; Three Mile Island, Unit 1; Fire Protection and Operability Evaluations.

The report covered a 13-week period of inspection by resident inspectors and announced inspections by five regional inspectors. Two Green non-cited violations (NCVs) were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (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. NRC Identified and Self-Revealing Findings

#### Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of TMI-1, Facility Operating License Condition 2.C(4), "Fire Protection." Station personnel breached fire barrier doors that separated two of three safety related makeup pump rooms from a common hallway and did not implement compensatory measures as required by the TMI Fire Protection Program.

This finding is more than minor because it affects the mitigating systems cornerstone objective of ensuring the availability of systems that respond to initiating events and is associated with the protection against the external factors attribute (fire). This finding is of very low safety significance because the combustible load for the affected areas was small, concrete walls located immediately outside the rooms help minimize potential fire propagation, and there is no credible scenario by which a fire on one side of the barrier could propagate through both degraded fire doors to affect equipment in both fire areas. In addition, the fire detectors on each of the rooms affected were operable.

A contributing cause of this finding is related to the cross-cutting area of human performance, because station personnel did not implement a TMI Fire Protection Program procedure (AP-1038) despite being trained on its requirements to maintain fire barriers. A second contributing cause is related to the cross-cutting area of problem identification and resolution, because station personnel did not implement adequate corrective actions to prevent recurrence of the inoperable fire barriers.

- Green. The inspectors identified a non-cited violation of TS 6.8.1 in that station personnel did not properly implement station procedures to erect and control the construction of seismic scaffolding in the vicinity of safety-related equipment. The required clearance distance between the seismic scaffold and safety-related equipment was not maintained, resulting in damage to and contact with safety-

related building spray (BS) and main steam (MS) system components, respectively.

This issue affected the mitigating systems cornerstone and was more than minor because station personnel did not properly install scaffolding in safety-related areas, and did not perform required engineering evaluations when needed. If left uncorrected it could become a more significant safety concern in that inadequate constructed scaffold could affect the availability and reliability of mitigating systems during plant operations or a seismic event. This finding was determined to be of very low significance because engineers determined the scaffold, as installed, would not prevent the BS and MS systems from performing their safety functions (Section 1R15).

A contributing cause of this finding is a cross-cutting issue in the area of human performance, because craft personnel did not adhere to station scaffold procedures on two occasions. A second contributing cause affected the cross-cutting areas of problem resolution and corrective action, because (1) after the procedure violation was identified, station personnel did not initially enter the issue into the corrective action program for evaluation of actions to preclude recurrence and (2) this finding is repetitive, in that the NRC issued a similar Green finding in May 2004 and previous corrective actions were not effective to preclude recurrence.

B. Licensee Identified Violations

None.

## 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.

#### 1. REACTOR SAFETY

##### **Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity**

#### 1R01 Adverse Weather Protection (71111.01)

##### a. Inspection Scope (2 samples)

The inspectors performed two inspection samples. The inspectors walked down risk significant plant areas for several days in February 2005 and assessed AmerGen's protection for cold weather conditions. Several heavy snow storms and periods of sustained heavy winds were forecast for this period. The inspectors were sensitive to outside instrument line conditions and the potential for unheated ventilation. The walkdown included the emergency feedwater system, the condensate storage tanks and the turbine driven pump steam supply exhaust piping, the borated water and sodium hydroxide storage tanks, and the cooling water intake and screen pump house. The inspectors also reviewed implementation of procedures WC-AA-107, "Seasonal Readiness," Rev. 0 and OP-AA-108-111-1001, "Severe Weather Guidelines," Rev. 0 for cold weather conditions.

In late March 2005, heavy rains resulted in elevated Susquehanna River levels and flooding in the vicinity of TMI. The inspectors reviewed AmerGen's procedures for adverse weather, relative to the protection of safety-related systems, structures, and components from the effect of external flooding. The inspectors reviewed planned work activities and walked down areas within the river intake structure, the intermediate building, the auxiliary building, and the turbine building to verify that flood protection devices were staged and procedures were in place to ensure external flooding would not impact the functionality of the safety-related systems. Particular emphasis was placed on the nuclear services river water, decay heat river water, reactor river water, and intake traveling screen systems. Planned repairs to the intake structure 'B' traveling screen were appropriately deferred to ensure screen availability until after elevated amounts of river debris were no longer a concern. The inspectors verified plant material condition and operator actions were consistent with those specified in procedure 1202-32, "Flood," Rev. 60.

##### b. Findings

No findings of significance were identified.

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## 1R04 Equipment Alignment (71111.04)

### a. Inspection Scope

#### Partial System Walkdowns (4 samples)

The inspectors performed four partial system walkdown samples on the following systems and components:

- On January 3 - 5, 2005, the inspectors walked down the 'A' and 'B' reactor building (RB) emergency cooling trains, including nuclear service water pump and heat exchanger alignment and electrical power supply alignment. These inspections were performed to verify two independent RB cooling trains were maintained in accordance with TS 3.3.1.3 following the failure of RB cooling fan AH-E-1A of December 30, 2004.
- On January 26, 2005, the inspectors walked down the 'A' decay heat removal (DH) system pump train (DH-P-1A), the 'A' emergency diesel generator, and their corresponding switch gear room cabinets while the 'B' DH pump (DH-P-1B) was out of service for planned maintenance. The maintenance included replacement of the existing circuit breaker and replacement of hydraulic snubbers DH-H-197 and SPSE-7.
- On February 15, 2005, the inspectors walked down portions of the two motor-driven emergency feedwater (EFW) pumps (EF-P-2A and 2B) and associated components, while the turbine driven EFW pump (EF-P-1) was out of service for scheduled maintenance activities.
- On March 11, 2005, the inspectors walked down portions of the 'B' emergency diesel generator (EDG) EG-Y-1B and the 'A' and 'B' EDGs switch gear rooms while the 'A' EDG (EG-Y-1A) was out of service for planned maintenance. In addition, the inspectors interviewed plant operators and the EDG system engineer.

The partial system walkdowns were conducted on the redundant and standby equipment to ensure that trains and equipment relied on to remain operable for accident mitigation was properly aligned. Additional documents reviewed during the inspection are listed in the Attachment.

#### Complete System Walkdown (1 sample)

On March 9, 2005, the inspectors performed one complete system walkdown sample of the 'A', 'C' and 'D' 120 volt vital inverters while the 'B' 120 volt vital inverter was out of service for planned maintenance. The inspectors conducted a detailed review of the alignment and condition of the inverters using the applicable one line diagram E-206-051, "250/125 V D.C. system & 120 V A.C. Vital Instrumentation," Rev. 29. In addition, the inspectors reviewed and evaluated the open work orders and corrective action

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program reports for impact on system operation and interviewed the system engineer and maintenance technicians. The inspectors also verified that system parameters were within the required band for existing plant conditions as determined by TMI operating logs and operating procedure 1107-2B, "120 Volt Vital Electrical System," Rev. 11.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope (10 samples)

The inspectors performed ten inspection samples. The inspectors conducted fire protection inspections for several plant fire zones, selected based on the presence of equipment important to safety within their boundaries. The inspectors conducted plant walkdowns and verified the areas were as described in the TMI Fire Hazard Analysis Report (FHAR), and that fire protection features were being properly controlled per surveillance procedure 1038, "Administrative Controls-Fire Protection Program," Rev. 63. The plant walkdowns were conducted throughout the inspection period and included assessment of transient combustible material control, fire detection and suppression equipment operability, and compensatory measures established for degraded fire protection equipment were controlled per procedure OP-MA-201-007, "Fire Protection System Impairment Control," Rev. 2. In addition, the inspectors verified that applicable clearances between fire doors and floor met the specified criteria per Attachment 1, of Engineering Technical Evaluation CC-AA-309-101, "Engineering Technical Evaluations," Rev. 7. Fire zones and areas inspected included:

- Fire Zone AIT-FZ-1, Air Intake Tunnel (North Side)
- Fire Zone AIT-FZ-1a , Air Intake Tunnel (South Side)
- The inspectors reviewed NRC Information Notice (IN) 2005-01, "Halon Fire-Extinguishing System Piping Incorrectly Connected," and TMI's issue report (IR) 291978, regarding an industry operating problem that occurred January 12, 2005, at another nuclear facility, for applicability to TMI. Specifically, the issue involved the incorrect connection of the pilot valves to the manual-pneumatic actuator on halon bottles used for fire suppression, which could have caused the halon bottles not to properly discharge as designed. The inspectors interviewed the TMI fire protection system engineer, and performed walkdowns of the TMI halon systems. The inspectors determined that the TMI halon design for these zones is different in that it does not include a pneumatic actuator nor pilot valves and therefore it is not susceptible to the issues described in the NRC IN 2005-01.
- Fire Area CB-FA-2f, Control Building East Battery Area - 322 foot elevation

- Fire Area CB-FA-2g, Control Building West Battery Area - 322 foot elevation
- Fire Zone AB-FZ-2a, Makeup And Purification Pump 'A', Auxiliary Building -281 foot elevation
- Fire Zone AB-FZ-2b, Makeup And Purification Pump 'B', Auxiliary Building -281 foot elevation
- Fire Zone AB-FZ-2c, Makeup And Purification Pump 'C', Auxiliary Building -281 foot elevation
- IR 295637 documented a licensee identified degraded fire barrier. Specifically, two fire doors (DR-C401 and 402) in the turbine building 355 foot elevation were propped open for painting and left unattended without the required continuous fire watch for approximately 40 minutes. The inspectors interviewed maintenance technicians, their supervisors, fire protection engineers, and operators, and verified that corrective actions were in place to address this issue.
- Fire areas CB-FA-3A thru 3D, Control Building 4160V 1D, 1E Switchgear Rooms-338 foot elevation.

b. Findings

Introduction. The inspectors identified a Green, non-cited violation of TMI-1 Operating License Condition 2.C(4), "Fire Protection." The 1½-hour rated fire doors separating two of the three safety-related trains of makeup pump rooms were not closed and could not have performed their safety function.

Description. While touring the auxiliary building on January 26, 2005, the inspectors noted that the 1½-hour fire door barriers between the 'A' and 'B' safety-related makeup pump rooms and a common hallway were jammed opened against a concrete wall located immediately outside each of the rooms. The inspectors also noted that significant force was required to free the doors from the wall. The doors were properly labeled as fire doors. The inspectors immediately notified operations personnel and closed the fire doors. Operators initiated IR 294515. On January 27, 2005, the inspectors toured the same area to assess the adequacy of corrective actions. Once again, the inspectors identified a similar condition involving the 'B' safety-related makeup pump door. Operators initiated additional IRs (295007 and 295002) to report the repetitive condition.

Analysis. The performance deficiency associated with this finding is that station personnel did not maintain fire barriers operable or establish appropriate compensatory measures as required by procedure AP-1038. This finding is more than minor because it affects the mitigating systems cornerstone objective of ensuring the availability of systems that respond to initiating events and is associated with the Protection Against External Factors attribute regarding fire protection. Specifically, if a fire occurred when the doors were not fully closed, they would not have performed their function to prevent

a fire from spreading from one fire area to another. This finding is of very low safety significance in accordance with Phase 2 of the Fire Protection Significance Determination Process (SDP) because the combustible loads for the affected areas were small, concrete walls located immediately outside the rooms help minimize potential fire propagation, and there is no credible scenario by which a fire on one side of the barrier could propagate through both degraded fire doors to affect equipment in both fire areas. In addition, the fire detectors on each of the rooms affected were operable.

This issue affected the crosscutting area of human performance because station personnel did not perform the procedure requirements of AP-1038. The issue also affected the crosscutting area of problem identification and resolution in that station personnel did not implement adequate corrective actions to prevent recurrence of inoperable fire barriers. IR 295637 documented additional examples of deficient control of turbine building fire door barriers during this inspection period.

Enforcement. Facility Operation License Condition 2.C(4), "Fire Protection," states that AmerGen Energy Company, LLC shall implement and maintain in effect all provisions of the Fire Protection Program as described in the Updated Final Safety Analysis Report (UFSAR) for TMI-1. The FSAR, Section 9.9, "Plant Fire Protection Program," states that the administrative procedure AP-1038 and the Fire Hazard Analysis are considered to be part of the Safety Analysis Report, by reference. Procedure AP-1038, Exhibit 2, Section 7.1, states that fire barriers, including fire doors, shall be intact at all times when the barrier is relied upon to provide separation of safe shutdown functions in the event of a fire. In this case, on January 26 and 27, 2005, fire doors DR-A12 and DR-A13, for the 'A' and 'B' makeup pump rooms were not maintained intact in that they were open and jammed against a concrete wall located immediately outside the doors. Because this issue was of very low safety significance and has been entered into the corrective action program (IRs 294515, 295002, and 295007), this violation is being treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy: **NCV 05000289/2005002-01, Failure To Maintain Fire Barriers For The 'A' and 'B' Makeup Pump Rooms.**

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope (2 samples)

The inspectors performed two inspection samples. The inspectors performed visual inspections of flood barriers, system boundaries, and water line break sources located in portions of the control tower building where internal flooding could adversely affect safety-related systems needed for safe shut down of the plant. The review included (1) the battery and inverter rooms (elevation 322'), and (2) the relay, emergency safety actuation system and the heat sink protection systems on elevation 338'-6". The documents used to support this inspection included:

- UFSAR Section 2.6.4, "Flood Studies"

- TMI Fire Hazard Analysis Report, Section 6.0, "Protection Against Water Spray to Conform with 10 CFR 50, Appendix R"
- Section 10, "Internal Flooding Analysis", from TMI Unit-1 Probabilistic Risk Assessment (Level 1) Update

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

1. Biennial Licensed Operation Requalification (71111.11B)

a. Inspection Scope (1 sample)

The inspectors performed one biennial inspection sample. The following inspection activities were performed using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Rev. 9; Inspection Procedure Attachment 71111.11, "Licensed Operator Requalification Program;" NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP);" and 10 CFR 55.46 Simulator Rule (sampling basis) as acceptance criteria.

The inspectors reviewed documentation of operating history since the last requalification program inspection. The inspectors also discussed facility operating events with the resident staff. Documents reviewed included NRC inspection reports, performance indicators (PIs), licensee event reports, and licensee issue reports (IRs) that involved human performance issues for licensed operators to ensure that operational events were not indicative of possible training deficiencies (see document list attached).

The inspectors reviewed three sets of comprehensive biennial written exams, simulator scenarios, and job performance measures (JPMs) administered during this current exam cycle (i.e., weeks 1, 2, and 3) to ensure the quality of these exams met or exceeded the criteria established in the Examination Standards and 10 CFR 55.59.

The week of the inspection, the inspectors observed the administration of operating examinations to one operating crew (i.e., Echo Shift) and one staff crew (i.e., SC-1). The operating examinations consisted of two simulator scenarios for each crew and one set of five JPMs administered to each individual.

Conformance with Simulator Requirements Specified in 10 CFR 55.46

For the site specific simulator, the inspectors observed simulator performance during the conduct of the examinations, and reviewed discrepancy reports to verify compliance with the requirements of 10 CFR 55.46. The following areas were reviewed:

Priority scheme for all open and recently closed (e.g., in the past one year period) simulator work requests (SWR).

The testing and certification plan for the simulator upgrade to replace the Core model and Reactor Coolant System thermo-hydraulics (TH), including the Steam Generator model. The intention is to eventually use the new core model for Reactivity Management experience for training new licensed operators, probably starting in December 2005. The current plan includes 36 days of factory testing performed by the vendor, which includes the 10 annual ANSI 3.5 tests, and 11 days of core performance testing. Site acceptance testing will begin in June to assure that the software is properly integrated. Site testing will be performed by TMI training personnel with assistance from the vendor, if needed. Core testing will be per Exelon procedure TQ-AA-303, "Controlling Simulator Core Updates and TH Model Updates," Rev. 3, using plant procedures and acceptance criteria whenever possible. Testing will also include identified deficiencies with the existing Core and TH models.

Note: This area, including simulator testing, was reviewed previously during the requalification program inspection conducted in February 2004 (IR 05000289/2005002).

Conformance with operator license conditions was verified by reviewing the following records:

- Seven medical records (5 SRO; 2 RO). The inspectors confirmed all records were complete, that restrictions noted by the doctor were reflected on the individual's license, and that the exams were given within 24 months.
- Proficiency watch-standing and reactivation records. A sample of licensed operator reactivation records were reviewed as well as a random sample of watch-standing documentation for time on shift to verify currency and conformance with the requirements of 10 CFR 55.
- Remediation training records for 15 individual remediations were reviewed for the past two-year training cycle. These records covered both cyclic quiz failures and annual operating exam failures.

Licensee's Feedback System. The inspectors interviewed Instructors, training/operations management personnel, and licensed operators (i.e., Assistant Operation's Manager, one Operation's Supervisor, the Operation's Training Manager, two training supervisors, two instructors, three evaluators, the simulator lead, and licensed operators (3 ROs and 3 SROs)) for feedback regarding implementation of the

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licensed operator requalification program to ensure the requalification program was meeting their needs and responsive to noted deficiencies/recommended changes. The inspectors reviewed overtime records for the initial and requalification program training leads and for several key instructors based on a concern identified during interviews regarding excessive training staff overtime due to staff shortages. The inspectors concluded that overtime use over the past year appeared to be excessive for certain individuals and discussed this concern with the Training Director. The Training Director indicated that recent increases in staff numbers should alleviate this problem, especially after all the new instructors get certified.

#### Operator License Requalification Exam Results

On March 30, 2005, the inspectors conducted an in-office review of licensee requalification exam results. These results included the annual operating tests and the comprehensive written exams administered this year. The inspection assessed whether pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)." The inspectors verified that:

- Crew failure rate on the dynamic simulator was less than 20%. (Failure rate was 0.0%)
- Individual failure rate on the dynamic simulator test was less than or equal to 20%. (Failure rate was 4.8%)
- Individual failure rate on the walkthrough test (JPMs) was less than or equal to 20%. (Failure rate was 0.0%)
- Individual failure rate on the comprehensive biennial written exam was less than or equal to 20%. (Failure rate was 7.0%)
- More than 75% of the individuals passed all portions of the exam (90.7% of the individuals passed all portions of the exam).

#### b. Findings

##### Adequacy of Walkthrough Exam Administered to Control Room Supervisors

Introduction. An issue was identified related to the adequacy of the Job Performance Measures (JPMs) administered this exam cycle to Control Room Supervisors (CRSs) in testing the understanding of the knowledge and abilities being examined.

Description. The inspectors identified that the level of difficulty for the JPM sets for exam weeks 1 and 2 already administered and week 3 not yet administered to junior Senior Reactor Operators (SROs)/ Control Room Supervisors (CRSs) were potentially inadequate in that the JPMs did not require the senior operator to demonstrate an understanding of and ability to perform the task. Specifically, the JPMs being used for

testing EAL determinations for exam weeks 1, 2, 3, 4 and 5 were determined to be overly simplistic and involved only one challenge (e.g., JPM 080-12, Transient RCS Leak Rate calculation for OTSG leak rate of 12.5 gpm; JPM 080-11, ATWS Classification; JPM 080-13, Main Generator Hydrogen Burn/Explosion; JPM 080-14, Evacuation of all unnecessary personnel due to ammonia tank car leak; JPM 080-15, Rad Release).

This is an open reference exam and with the emergency action level (EAL) Matrix in hand, unless the JPM involves multiple plant challenges to the operator, the task becomes a simple reading exercise that someone with little understanding could easily answer (i.e., the equivalent of a direct look-up). Exelon procedure TQ-AA-106-0118, "Exelon Nuclear Licensed Operator Requal Training Exam Bank Question Submittal/Validation/Review Form," Rev. 0, Open Reference Test Item Checklist Item 6 asks, "Is the question a "direct look-up" question?" Although these JPMs were not written exam items, these EAL test items could be viewed as equivalent in scope to a simple open reference written exam question. For exam weeks 1, 2, and 3, there were at least two of the five JPMs designated for testing junior SROs/CRSs for each of those weeks that were either the equivalent of direct look-up exam items (e.g., in the case of JPMs 080-11, 12, and 13 designated to test the SRO function in making EAL calls) or were overly simplistic and did not adequately discriminate as an exam item (e.g., JPM # 11205006, Locally Operate EF-V-52A or EF-V-52D; Trip Turbine Locally Using MS-V-6; and Trip Generator Breaker G1-02). In addition, the JPMs planned for use in exam weeks 4 and 5 to test EAL calls were also determined to be overly simplistic and do not require the operators to demonstrate understanding (JPM 080-14 and 080-15).

Exelon training procedure, TQ-AA-106-0304, "Licensed Operator Requal Training Exam Development Job Aid," Rev. 4, Section 4.7.1.2.C states, "verify that the operating test, to the extent applicable, requires the applicant to demonstrate an understanding of and the ability to perform the actions necessary to accomplish a representative sample from among the 12 items listed on Attachment 11, 10 CFR 55.45 Operating Exam Content." (Note: This procedure requirement is essentially a quote from the requirements found in 10 CFR 55.59 (a)(2)(ii)). The 10 CFR 55.45 includes item (a)(11), "Demonstrate knowledge of the emergency plan for the facility..." and (a)(12), "Demonstrate the knowledge and ability as appropriate to the assigned position to assume the responsibilities associated with safe operation of the facility." These exams must examine depth of knowledge and understanding to ensure that operators continue to maintain adequate knowledge and abilities to safely operate the plant (i.e., discriminating safe from unsafe operators).

Analysis. The inspectors determined that a potential performance deficiency (PD) existed in that AmerGen did not ensure that adequate JPMs were developed and administered to licensed operators during their annual operating requalification examinations. The requirement/standard is that the annual operating test requires operators to demonstrate an understanding of and the ability to perform the actions necessary to accomplish a sample of the items listed in 10 CFR 55.45. The potential PD is more than minor because it affected at least the Mitigating Systems Cornerstone



(and potentially Initiating Events and Barrier Integrity) objective and its related attribute on Human Performance (Human Error (Pre-Event and Post-Event)).

Enforcement. This remains to be determined. This item has been entered into the AmerGen's Corrective Action Program (IR 309418, dated 3/7/05) and is unresolved pending further NRC staff review to determine whether the content of the JPMs were sufficient to demonstrate operators' understanding of and ability to perform elements of the facility emergency plan and to assume the responsibilities associated with safe facility operation. **URI 05000289/2005002-04, Adequacy of Walkthrough Exam Administered to Control Room Supervisors.**

#### Review of Previously Opened Items

Introduction. The inspectors reviewed three URIs, two of which concerned simulator fidelity issues and the third concerned AmerGen's policy that allowed reexamining licensed operators using only one dynamic scenario vice two following a failure. All three of these issues had been documented in a previously issued NRC resident report 05000289/2004002.

#### Closed URI 05000289/2004002-06: Potential Simulator Fidelity Issues Regarding Parameter Discrepancies with 2004 Feed Pump Trip

This issue addressed simulator fidelity discrepancies regarding 2004 feed pump trip data. During the inspection conducted in February 2004, the inspectors requested that AmerGen provide supporting data to prove that the MWe simulator fidelity issue (i.e., the plant could only achieve 880 MWe and the simulator was modeled at 924 MWe) did not result in significant negative training to the operators. Consequently, the licensee compared data from the 2004 feed pump trip against 1990 OE plant data. However, several potential simulator fidelity discrepancies in data points were identified that were not adequately explained. The NRC Region I staff requested at the exit meeting that AmerGen further review the simulator versus plant response differences and provide a more detailed engineering evaluation of these potential simulator fidelity discrepancies so that it could be determined if the data is acceptable.

AmerGen, in response to the inspectors request, initiated IR 203907 and reevaluated simulator response to feed pump trip/plant run back data for 1997, 2000 and 2003. AmerGen's review confirmed that existing simulator modeling adequately matched plant response for OTSG levels, MWe, and feed flows with only minor discrepancies identified. In addition, testing, model correction, and further investigation had addressed all these minor discrepancies with the exception of the control rod position. Core model replacement in 2005 will address discrepancies with this parameter. In April 2004, the licensee corrected the simulator turbine model for ambient conditions, resulting in a more accurate representation of generated megawatts. This resulted in a decrease of about 34 MWe at full power. The licensee increased Steam Generator levels to match current plant conditions in October 2004 by SWR 6570 and are now within 2% of the plant per the steady state accuracy test and compared favorably with Steam Generator

level response with the feed pump failure data of December 7, 2003. Feedwater flows compared favorably with the feed pump failure data of December 7, 2003.

The inspectors concluded that simulator modeling adequately matched plant response in February 2004 with only minor discrepancies. Corrective actions which include core model replacement, scheduled for completion in 2005, will address the minor discrepancies regarding control rod position. This issue was minor, in that it did not cause negative training. Therefore the inspectors determined there was no finding of significance.

Closed URI 05000289/2004002-07: Potential Simulator Fidelity Issues Regarding Natural Circulation Transport Time

This issue addressed a difference in reactor coolant system transport time between the simulator (5 minutes) and the plant (15 minutes). AmerGen agreed to compare station blackout data from the plant to simulator data to determine if this presented a significant potential for negative training. AmerGen's response indicated that, based on engineering analysis, natural circulation should be five to six minutes for both the plant and simulator. The NRC Region I staff requested at the exit meeting that AmerGen determine the transport time based on actual plant data.

AmerGen initiated IR 213541 to investigate these discrepancies and determined that loop transport times will vary with Once-Through Steam Generator (OTSG) level, Emergency Feed Water flow rates and temperatures and decay heat generation (time since reactor trip). AmerGen believes that 18.5 minutes is a best estimate for early post-trip natural circulation. Deficiencies with loop transport time models on the simulator have been identified since the delivery of the simulator. Early efforts were not successful in correcting the issues. During the 1997 reactor trip, operators utilized their knowledge and training to properly determine natural circulation conditions, and control a stable cooldown until offsite power was restored, and transition back to forced circulation was achieved. A planned simulator upgrade is scheduled for completion in the third quarter of 2005. Natural circulation is one of the planned tests to be run following the upgrade. This issue appears to be as a result of an old verification and validation issue.

The inspectors determined the deficiencies with loop transport time models on the simulator had been previously identified (since 1985 TMI Unit 1 restart) and highlighted for the operators. In addition, the operators have been trained to use their knowledge to properly determine natural circulation conditions and a planned simulator upgrade is scheduled for completion the third quarter of 2005. Based on these reasons the inspectors determined the potential for negative training is remote. This issue is minor and does not represent a finding of significance.

Closed URI 05000289/2004002-07: AmerGen's Policy to Re-Examine Using Only One Scenario Vice Two for Retake Exams Following Failures on the Annual Operating Exam May Not be in Compliance with 10 CFR 55.59

This issue addressed the number of scenarios which operators were required to perform to demonstrate sufficient remediation following failure of an Annual Operating test. Procedure, TQ-AA-106-0304, "Licensed Operator Requal Training Exam Development Job Aid," Rev. 2, section 4.5.1.1.D states, "each operating test shall consist of at least two scenarios..." However, AmerGen ran only one scenario instead of two for the retake exams after remediation on the Annual Operating tests for seven candidates that failed in 2003.

AmerGen initiated IR 206911 to document this concern. The NRC Region I staff sought guidance from the Nuclear Reactor Regulation program office regarding this concern due to potential generic industry impact. It was determined after further review that the facility licensee would be expected to administer a retest in accordance with their NRC approved requalification program and AmerGen's current program allowed some flexibility regarding the content of retests, including retesting using only one scenario. However, the SAT based process must be utilized in determining the appropriate method and depth of retest based on analysis of individual and/or crew failures (i.e., a one size fits all approach would not be appropriate). In response to this concern, AmerGen Nuclear Training Program Managers determined that enhancements to the Annual Operating Exam reevaluation process were in order and consequently initiated revision 3 to Exelon procedure TQ-AA-106-0305, "Licensed Operator Requal Examination Administration Job Aid" which added more specific guidance regarding individual and /or crew failures (e.g., section 6.2 states, "If a crew receives a FAIL grade, then all crew members **shall** be evaluated using a simulator scenario set prior to being returned to licensed duties)."

The inspectors determined after further review that the facility licensee would be expected to administer a retest in accordance with their NRC approved requalification program and AmerGen's existing program allowed some flexibility regarding the content of retests, including retesting using only one scenario. However, NRC staff concluded that the System's Approach to Training (SAT) based process must be used in determining the appropriate method and depth of retest based on analysis of individual and/or crew failures (i.e., a one size fits all approach would not be appropriate). In response to this concern, AmerGen Nuclear Training Program Managers determined that enhancements to the Annual Operating Exam reevaluation process were in order and consequently initiated revision 3 to Exelon procedure TQ-AA-106-0305 that added more specific guidance regarding individual and /or crew failures. The inspectors determined that AmerGen's program allowed some flexibility regarding the content of retests, including retesting using only one scenario. In addition, AmerGen further enhanced their procedures to provide more specific guidance regarding individual and/or crew failures. The inspectors concluded no violation of regulatory requirements occurred.

2. Quarterly Licensed Operation Requalification (71111.11Q)

a. Inspection Scope (1 sample)

The inspectors performed one inspection sample. The inspectors observed licensed operator requalification training at the control room simulator. The inspectors reviewed the operators' ability to correctly evaluate the simulator training scenario and implement the emergency plan. The inspectors observed the operators' simulator drill performance and compared it to the criteria listed in simulator scenarios No. 7, Rev. 10 and No. 30, Rev. 6. The inspectors observed supervisory oversight, command and control, communication practices, and crew assignments to ensure they were consistent with normal control room activities. The inspectors observed operator response during the simulator drill transient and verified the fidelity of the simulator to the actual plant. The inspectors evaluated training evaluator effectiveness in recognizing and correcting individual and operating crew errors, including post-training remediation actions. The inspectors attended the post-drill critique in order to evaluate the effectiveness of problem identification. The inspectors verified that emergency plan classification and notification training opportunities were tracked and evaluated for success in accordance with criteria established in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," Rev. 2. Additional documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

1. Biennial Inspection (6 samples)

a. Inspection Scope

The inspectors performed six inspection samples. The inspectors reviewed AmerGen's periodic evaluation of the implementation of the Maintenance Rule (MR) required by 10 CFR 50.65 (a)(3). The evaluation covered a period from September 30, 2001 to June 30, 2003. The purpose of this review was to ensure that AmerGen effectively assessed its (a)(1) goals, (a)(2) performance criteria, system monitoring, and preventive maintenance activities. The inspectors verified that the assessment was completed within the required time period and that industry operating experience was properly utilized. Also, the inspectors verified that AmerGen appropriately balanced equipment reliability with unavailability for planned maintenance activities and that changes to preventive maintenance and Maintenance Rule program scope were appropriate. Further, the inspectors reviewed corrective action documents to verify that recommendations of the AmerGen evaluation had been addressed.

The inspectors selected a sample of six risk-significant systems to verify that: (1) the structures, systems, and components were properly characterized, (2) goals and

performance criteria were appropriate, (3) corrective action plans were adequate, and (4) performance was being effectively monitored in accordance with ER-AA-310, "Implementation of the Maintenance Rule," Rev. 3 and other Maintenance Rule procedures. The following systems were selected for this detailed review:

- Containment isolation system
- Pressurizer
- Emergency feedwater system
- Main feedwater system
- 480 volt AC auxiliary system
- Flood protection system

These systems were either in a(1) status, had been in a(1) status or had experienced degraded performance during the assessment period. The inspectors reviewed corrective action documents for malfunctions and failures of these systems to determine if: (1) they had been correctly categorized as functional failures; (2) they were correctly categorized as maintenance preventable; and (3) their performance was adequately monitored to determine if classifying a system as (a)(1) was appropriate.

Further, the subsequent evaluation period spanned July 2003 through December 2004. As this period was completed but the periodic evaluation had not been issued, the inspectors reviewed some applicable aspects from this period, such as results supporting systems reclassified from (a)(1) status to (a)(2) status and associated action plans, reliability and unavailability results and trends, MR scope and PM changes, and use of industry operating experience.

b. Findings

No findings of significance were identified.

2. Quarterly Inspection

a. Inspection Scope (1 sample)

The inspectors performed one inspection sample. The inspectors evaluated Maintenance Rule (MR) implementation for the issue listed below. Specific attributes reviewed included MR scoping, characterization of failed structures, systems, and components (SSCs), MR risk categorization of SSCs, SSC performance criteria or goals, and appropriateness of corrective actions. The inspectors verified that the issues were addressed as required by 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 Power Plants," Rev. 2, and AmerGen procedure ER-AA-310, "Implementation of the Maintenance Rule," Rev. 3.

- IR 261059 described a November 5, 2004, failure of the 'B' emergency diesel generator ventilation dampers AH-D-25 and AH-D-26 to open to their required

position during routine testing. The inspectors evaluated AmerGen's response to this failure from a maintenance rule perspective and verified that the engineering evaluation properly categorized this issue as a maintenance rule functional failure. In addition, the inspectors reviewed IR 279083, which documented a minor deficiency identified by the inspectors regarding the lack of a past operability evaluation and an extent of condition review for the initial damper failure documented in IR 261059. The inspectors performed field walkdowns, interviewed the system engineer and his supervisor, and verified that corrective actions were implemented to address the deficiency identified.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope (8 samples)

The inspectors selected eight samples for review. The inspectors reviewed the scheduling and control of maintenance activities in order to evaluate the effect on plant risk. This review was against criteria contained in AmerGen Administrative Procedure 1082.1, "TMI Risk Management Program," Rev. 4 and WC-AA-101, "On-Line Work Control Process," Rev. 10. The inspectors reviewed the routine planned maintenance, restoration actions, and/or emergent work for the following equipment removed from service:

- On January 3-9, 2005, risk assessment during emergent maintenance activities to replace the AH-E-1A Reactor Building Emergency Cooling System fan motor (on-line risk evaluation # 1119).
- On January 3, 2005, risk assessment of scheduled maintenance/cleaning on the 'B' Nuclear Services Closed Cooling Water (NSCCW) heat exchanger while also performing motor operated valve preventive maintenance and circuit breaker checks on the river water inlet and outlet valves to the 'C' NSCCW heat exchanger (on-line risk evaluation 964). This work was reduced in scope following the emergent work on the AH-E-1A fan motor and then suspended due to experiencing elevated heat exchanger tube vibration when the 'B' NSCCW heat exchanger was isolated.
- On January 6, 2005, risk assessment of scheduled replacement of 'A' steam generator pressure transmitter MS-PT-1181 (on-line risk evaluation # 572).
- On January 26, 2005, orange risk assessment of a scheduled maintenance outage to replace the 'B' decay heat removal pump (DH-P-1B) vacuum breaker and two hydraulic snubbers. The inspectors also performed system walkdowns, interviewed operators, the work week manager, and the DH and snubber system engineers (on-line risk evaluation #1120).

Enclosure

- On February 3, 2005, snubber SPSE-2 which supports piping common to the 'A' low pressure injection (LPI) header and the 'A' building spray (BS) header was replaced. Prior to the maintenance, the inspectors noted that no risk assessment document had been prepared for this activity. The inspectors discussed the function of the snubber and the related impact on BS and LPI operability with station personnel before the work activity to verify risk had been properly assessed (IRs 297584, 297935, and 302213).
- On February 15, 2005, yellow risk assessment of scheduled maintenance outage on the turbine driven emergency feedwater pump (EF-P-1). The inspectors also performed system walkdowns, interviewed operators, the work week manager, and electrical and mechanical maintenance technicians (on-line risk evaluation #599).
- On March 1, 2005, station personnel temporarily pinned main feedwater regulation valve FW-V-17B in the open position while installing temporary test monitoring equipment to evaluate degraded valve actuator controller air pressure signals. During a portion of this activity, the heat sink protection system (HSPS) actuation signal to FW-V-17B was unavailable (on-line risk evaluation #1131).
- On March 9, 2005, yellow risk assessment of scheduled maintenance outage on the 'B' 120 volt AC inverter, to perform preventive maintenance and fuse and timing relay replacements. The inspectors also performed system walkdowns, interviewed operators, the work week manager, and electrical maintenance technicians (on-line risk evaluation #881).

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-routine Plant Evolutions (71111.14)

a. Inspection Scope (1 sample)

The inspectors performed one inspection sample. The inspectors reviewed human performance during the following non-routine plant evolution, to determine whether personnel performance caused unnecessary plant risk or challenges to reactor safety. The inspectors evaluated whether the evolution was properly implemented according to the applicable procedures and Technical Specification (TS) limiting condition for operations (LCOs).

- On February 22, 2005, operators observed degraded actuator controller air pressure to main feedwater regulating valve FW-V-17B. Control air pressure was cycling and remained slightly above the minimum pressure required for valve operation. In addition to controlling feedwater flow for power operation, FW-V-17B has a risk mitigation function to isolate feedwater from the steam generator on an HSPS signal. On March 1, 2005, operators placed the

integrated control system (ICS) in manual control in accordance with OP-TM-621-471, "ICS Manual Control," Rev. 0; established local manual control of FW-V-17B in accordance with OP-TM-421-455, "Local Manual Control of FW-16s or FW-17s," Rev. 1; and connected temporary instrumentation to more closely monitor and record the air controller's performance (work order A2109128). FW-V-17B was briefly pinned open during the evolution, which made the HSPS function inoperable. Pre-evolution briefings were held to emphasize proper communications and procedural compliance to reduce the likelihood of human error. On March 6, technicians determined that the air controller had further degraded and performed corrective repairs using work order C2009043. The repair plan required FW-V-17B to again be temporarily pinned in the open position. Air controller repairs were promptly completed and FW-V-17B and the ICS were returned to their normal automatic modes of operation.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope (5 samples)

The inspectors selected five samples for review. The inspectors reviewed operability evaluations for the following degraded equipment issues. The inspectors verified that degraded conditions in question were properly characterized, operability of the affected systems was properly justified, that applicable extend of condition reviews were performed, and no unrecognized increase in plant risk resulted from the equipment issues. The inspectors performed several field walkdowns, interviewed plant operators, engineers and technicians, and consulted with regional NRC specialists. The inspectors also referenced IMC Part 9900, "Operable/Operability-Ensuring the Functional Capability of a System Component" and AmerGen procedure LS-AA-105, "Operability Determinations," Rev. 1, to determine acceptability of AmerGen's operability evaluations. Additional documents reviewed during the inspection are listed in the attachment.

- IR 261059 evaluated a November 5, 2004, failure of the 'B' emergency diesel generator (EDG) ventilation dampers AH-D-25 and AH-D-26 to open to their required position during routine testing. The engineers determined that a small hole in the air diaphragm of the operators caused the damper failures. These dampers support proper EDG room cooling via the 'B' EDG fan AH-E-29B. The inspectors reviewed 'A' and 'B' EDG room ambient temperature test data taken in the last 12 months prior to the damper failures, data collected while the EDGs were running during prior monthly testing, and data collected while the EDGs were in standby. The inspectors confirmed that the degraded condition did not affect 'B' EDG operability, and that procedures addressed operator actions to open required doors to provide EDG cooling.



In addition, the inspectors reviewed IR 279083, which documented a minor deficiency identified by the inspectors regarding the lack of a past operability evaluation and an extent of condition review for the initial damper failure documented in IR 261059.

- IR 293790 evaluated a bent valve position indication rod on the 'B' BS pump suction motor operated valve (MOV) BS-V-3B, that occurred during the January 24, 2005, quarterly surveillance test. The inspectors performed several field walkdowns, inspected the valve and nearby scaffolding structure, and interviewed the scaffold coordinator and system engineer.
- The inspectors reviewed several IRs (249348, dated 9/1/04, and 175664, dated 9/13/03), which evaluated low flow conditions on fire service pumps FS-P-2 and FS-P-3. Specifically, during performance of the annual surveillance test per procedure 3303-A2, "Fire System Main Header Flush And Loop Test," Rev. 36, it was identified that the pumps were not meeting the 3575 GPM acceptance criteria and were only providing a total flow of 2200 GPM. The engineering evaluation identified several potential contributing factors including microbiological induced corrosion, the possibility of a lower pump capacity following pump replacements in 1989 and 2003, and inability to accurately measure actual flow rate. The evaluation, also determined that the low flow condition did not affect the ability of the system to meet its required function during a postulated fire, since actual flow requirements for safety-related areas in the plant during the worst case fire scenario were much lower (983 GPM) than the current flow of 2200 GPM.
- IR 301813 evaluated an unexpected trip of the turbine driven emergency feedwater pump (EF-P-1) during the February 15, 2005, performance of post maintenance test run per procedure OP-TM-424-203, "IST Of EF-P-1 And Valves," Rev. 1. The engineering evaluation determined that an actual over-speed condition did not exist, and that the pump trip was due to improper setting of the over speed trip lever after completion of the trip verification per the procedure. The evaluation also determined that proper setting of the trip lever was not in the procedure, and that a specific notch position was required for proper operation of the trip device. The inspectors interviewed the system engineer and plant operators, and verified that corrective actions were implemented to prevent recurrence.
- On March 29, 2005, the pressure within the 'B' 2-hour backup instrument air bank, which provides a safety-related air supply to the emergency feedwater system injection valves, was found degraded. Pressure was 1460 pounds per square inch gauge (psig), although operator logs required pressure to be maintained above 1700 psig. Operations personnel recharged the 'B' air bank and determined that the air supply had remained operable. Calculation CC-AA-309-1001, "Two Hour Backup Instrument Air System As-Built Capacity Calculation," Rev. 0 supported this determination in that the 'B' air bank would remain operable with pressure as low as 960 psig.

b. Findings

Seismic Scaffolding Contacted and/or Damaged Safety-Related Components

Introduction. The inspectors identified a Green NCV of TS 6.8.1 in that station personnel did not properly implement station procedures to erect and control the construction of scaffolding in the vicinity of safety-related equipment. The required clearance distance between the scaffold and safety-related equipment was not maintained, resulting in damage to and contact with safety-related building spray (BS) and main steam (MS) system components, respectively.

Description. On January 24, 2005, during a surveillance testing of the 'B' building spray pump (BS-P-1B), operators opened the pump suction supply valve (BS-V-3B). Valve BS-V-3B is a normally closed motor operated valve that has a safety function to open during certain accident conditions to provide building spray system flow to the reactor containment. A scaffold had been built above the valve to support scheduled inspection and replacement of a hydraulic snubber. The valve has a metal position indicating rod (attached to the valve stem) that travels in and out of the valve actuator as the valve changes position. As the valve was opened, the position indicating rod contacted the bottom of the scaffold platform and was bent (IR 293790), damaging the valve actuator. The inspectors determined that, contrary to procedure MA-AA-716-025, "Scaffold Installation, Modification, and Removal Request Process," Rev. 2, the Operations department review of the scaffold request did not identify BS-V-3A as sensitive equipment which could be adversely affected by the scaffold installation.

Engineers evaluated the bent rod condition and concluded that BS-V-3B operability was not adversely affected since no other visible damage or metal fillings around the stem/position indicator interface were observed, the subsequent valve stroke time test remained satisfactory and consistent with previous data, and the valve operated smoothly in both directions. The inspectors informed engineers that the event had the potential to damage the valve actuator internal stem nut, which may not be revealed by stroke time testing or external visual inspection. Engineers performed additional valve thrust calculations and concluded that the valve remained operable.

On March 9, 2005, engineers determined that a piston bushing on snubber MS-224, which supports the 'A' MSIV, may be improperly installed and consequently MS-224 was declared inoperable (IR 310679). Early on March 10, craft personnel constructed scaffolding to support the snubber replacement work. Their supervisor approved the scaffold for use, the snubber was replaced, and operators exited the associated TS limiting condition of operation. While verifying correct snubber configuration following snubber replacement, the inspectors observed that the scaffolding was in direct contact with the 'A' MSIV actuator in one location and within .06 inch of the actuator in another location. Independent of the inspectors, the scaffold coordinator subsequently identified the same discrepancies, contacted engineers for assistance, and modified the scaffold to resolve the discrepancies. Engineers concluded that the scaffold contact did not affect 'A' MSIV operability.

The inspectors interviewed engineers, the scaffold coordinator, and determined that 1) contrary to procedure MA-MA-796-024-001, "Scaffolding Criteria for Peach Bottom, Limerick, and TMI," Rev. 1, scaffolding was constructed in contact with the safety-related 'A' main steam isolation valve (MSIV) actuator; 2) contrary to procedure MA-AA-796-024, "Scaffold Installation, Inspection, And Removal," Rev. 3, Attachment 1 "Scaffold Inspection Check List" was not properly performed to verify scaffold was not in contact with the 'A' MSIV actuator prior to authorizing scaffold use; and 3) contrary to MA-AA-796-024, the scaffold deviated from procedure clearance requirements and was used for work activities without prior engineering evaluation and approval. Additionally, the inspectors determined that station personnel who became aware of the scaffold deficiencies did not initiate an IR to evaluate the cause and determine appropriate corrective actions. The inspectors subsequently determined there were several personnel performance issues and procedure deficiencies which contributed to the scaffold discrepancies. After further discussion with the inspectors, station personnel initiated IRs 311504, 312359, and 321797 to address these issues. Additionally station management issued a supervisory brief on scaffolding controls and an interim requirement for a senior reactor operator and a maintenance supervisor to inspect all scaffold erected near safety-related equipment prior to use.

On May 11, 2004, the NRC issued a Green finding and associated Non-Cited Violation (NCV) 05000289/2004002-01, for several examples of the licensee's failure to adequately implement procedural requirements for the control and installation of scaffold in the vicinity of safety-related equipment (IRs 180325, 197282, 198061, 204305, 180009, and 198672). Based on the identification of repetitive similar scaffold issues in the past two years, the inspectors determined that previous remedial and corrective actions to prevent recurrence of improperly installed scaffold structures were not effective.

Analysis. The inspectors concluded that not implementing station procedures to erect and control the construction of seismic scaffolding in the vicinity of safety-related equipment, which resulted in damage to and/or contact with safety-related BS and MS system components was a performance deficiency.

This issue affected the mitigating systems cornerstone and was more than minor because in that station personnel did not properly install scaffolding in safety-related areas, and did not perform required engineering evaluations when needed. This issue is considered more than minor because if left uncorrected, it could become a more significant safety concern in that inadequate constructed scaffolds could affect the availability and reliability of mitigating systems during plant operations or during a seismic event. Using NRC Manual Chapter 0609, "Significance Determination Process," Appendix A, Phase 1, this finding was determined to be of very low significance since engineers determined the scaffold as installed would not prevent the MS and BS systems from performing their safety function.

This finding is also a cross-cutting issue in the areas of (1) human performance, because craft personnel did not implement the station scaffold procedures and (2) problem resolution, because after the procedure violation was identified, station

personnel did not initially enter the issue into the corrective action program for evaluation of actions to preclude recurrence. Additionally, this finding is repetitive, in that the NRC issued a similar Green finding in May 2004 and previous corrective actions were not effective to preclude recurrence.

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, Rev. 2, February 1978. Regulatory Guide 1.33, Appendix A, recommends procedures for performing maintenance that can effect the performance of safety-related equipment. Procedures MA-MA-796-024-001, MA-AA-796-024, and MA-AA-716-025 specify requirements for the construction and control of scaffolding to ensure it does not affect the safe operation of safety-related equipment. Contrary to the above requirements, on January 24 and March 9, 2005, station personnel did not properly implement procedural requirements for the installation and evaluation of scaffolding structures in safety-related applications affecting the BS and MS systems. The required clearance distance between the seismic scaffolds and safety-related equipment were not maintained, resulting in damage to and contact with safety-related BS and MS system components respectively. Because this violation was of very low safety significance and was entered into the TMI corrective action program (IRs 293790, 311504, and 312359), this violation is being treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy: **NCV 05000289/2005002-03, Construction of Seismic Scaffolding Near Safety-Related Equipment Repeatedly Not Performed in Accordance with Procedure Requirements.**

1R16 Operator Work-arounds (71111.16)

a. Inspection Scope (1 sample)

The inspectors performed one inspection sample. The inspectors reviewed the cumulative effects of the existing operator work-arounds (OWAs), the list of operator challenges, existing operator aids and disabled alarms, and the list of open main control room deficiencies to identify any effect on emergency operating procedure (EOP) operator actions, and impact on possible initiating events and mitigating systems. The inspectors evaluated whether station personnel were identifying, assessing, and reviewing OWAs as specified in AmerGen administrative procedure OP-AA-102-103, "Operator Work-Around Program," Rev. 1.

Additionally, the inspectors reviewed the status of planned and ongoing efforts to reduce the number of open OWAs and challenges with the coordinator responsible for the program. The inspectors also toured the control room, and discussed the following items of particular concern with the responsible system engineers and operators to ensure the items were being addressed on a schedule consistent with their relative safety significance.

- Workaround AR-A2042936, Modify 4 PSIG Channel Defeat/Reset Feature
- Challenge AR-A2025300, EHC-HPU Cooling

- Challenge AR-A2082603, CF-T-1B Level Indication
- IR 288468, which documented minor deficiencies in Operator Aid posting procedure implementation

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope (8 samples)

The inspectors reviewed and/or observed eight post-maintenance test (PMT) samples to ensure: 1) the PMT was appropriate for the scope of the maintenance work completed; 2) the acceptance criteria were clear and demonstrated operability of the component; and 3) the PMT was performed in accordance with procedures. The following PMTs were observed and/or evaluated:

- Post-maintenance testing following the replacement of the Reactor Building AH-E-1A fan motor in January 2005.
- On January 26, 2005, the new 'B' decay heat removal pump (DH-P-1B) discharge vacuum breaker valve was functionally tested per procedure OP-TM-212-202, "IST of DH-P-1B and Valves From ES Standby Mode," Rev. 4 following valve replacement.
- On February 2, 2005, battery room damper AH-D-30A was tested per procedure 1303-12.8C, "Fire Protection Instrumentation Functional Test (Control Building Elevation 322)," Rev. 15 following replacement of the AH-D-30A air actuator solenoid (work order R2063917).
- On March 6, 2005, several components (inlet air regulator, 3/8 inch tubing, lock-up valve, positioner block, and four pressure gauges) of the air controller for main feedwater regulating valve FW-V-17B were replaced to correct a degraded control pressure condition. Post maintenance testing was performed in accordance with work order C2009943.
- On February 15, 2005, the turbine driven emergency feedwater pump (EF-P-1) was taken out of service for a planned maintenance outage. During the initial PMT per procedure OP-TM-424-203, "IST of EF-P-1 and Valves," Rev. 1, a turbine trip occurred. The inspectors verified that this trip was properly evaluated by engineering under IR 301813. In addition, the inspectors performed a documentation review of a subsequent PMT performed per the same procedure on February 16, 2005.

- On March 9, 2005, the 'B' inverter was taken out of service for a planned maintenance outage. The PMT was completed satisfactorily per procedure 1107-2B, "120 Volt Vital Electrical System," Rev. 11.
- On February 16, 2005, the "B" EDG was taken out of service for a planned maintenance outage. The PMT was completed satisfactorily on February 17, 2005, per surveillance test procedure 1303-4.16, "Emergency Power System," Rev. 103.
- Station battery cell B-2 individual cell voltage was consistently one of the two lowest battery cell voltages and degraded from November 2004 until February 2005. Individual cell battery charges were performed several times in February and March as corrective maintenance using procedure 1420-DC-3, "Station Battery Cell Replacement and Charging," Rev. 18. The post-charge cell voltage was measured and recorded in accordance with procedure 1420-DC-3, indicating slight voltage improvement, which met the acceptance criteria specified in 1420-DC-3.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope (5 samples)

The inspectors performed five inspection samples. The inspectors observed and reviewed the following operational surveillance tests, concentrating on verification of the adequacy of the test to demonstrate the operability of the required system or component safety function.

- On March 8, 2005, operators identified discrepancies associated with two mechanical snubbers (MS-224 and MS-226) which support the 'A' and 'C' MSIVs respectively (IR 310679 and 309798). Repair activities were performed on March 10 and 11. The inspectors reviewed snubber surveillance test records for the past 11 months per procedure 1301-9.9, "Hydraulic Snubber Visual Inspection," Rev. 47 to evaluate trends in snubber performance. In addition the inspectors reviewed the post maintenance, as-left condition of the two snubbers against the criteria specified in 1301-9.9 (IRs 311504, 312359, and 321797).
- On March 24, 2005, the inspectors performed a documentation review of the most recent calibration activities performed on the main steam line effluent radiation monitors RM-G26 and RM-G27. The calibration activities were performed per surveillance procedure 1302-17.3, "RM-G26 And G27 Calibration," Rev. 11, and were completed satisfactorily on December 11, 2003 for RM-G27, and on June 22, 2003 for RM-G-26.

- On March 11, 2005, during performance of a monthly surveillance test per procedure 1303-4.16, "Emergency Power System," Rev. 104, the 'A' EDG could not be manually loaded onto the 1E 4160V. The inspectors reviewed the engineering evaluation and troubleshooting plans for this condition documented in IR 311243. Troubleshooting activities identified a loose fuse clip connection and an intermittent high resistance contact at the synchronization control switch. The investigation also determined that the degraded condition only affected manual EDG loading and would not have prevented the 'A' EDG from automatic starting and loading on the bus during a loss of power event. The inspectors observed portion of the work activities to identify the problem, and observed the surveillance test performed after repair activities.
- On February 8, 2005, testing was performed to verify proper operability of the 'B' EDG room cooling fan and dampers (AH-E-29B, AD-H-25, AH-D-26) per repetitive task work order R2013167. The inspectors reviewed the completed test data and also compared the results with historical room temperature data taken on both EDG rooms with the engine running.
- On March 5, 2005, procedure 1303-5.5, "Control Room Emergency Filtering System Operational Test," Rev. 30, temporary change 17713 was performed to verify acceptable ventilation flow conditions in support of an evaluation of control room habitability.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope (1 Sample)

The inspectors selected one sample for review. The inspectors reviewed the following temporary modification (TM) and associated implementing documents to verify the plant design basis and the system or component operability was maintained. Procedures CC-AA-112, "Temporary Configuration Changes," Rev. 8 and CC-TM-112-1001, "Temporary Configuration Change Implementation," Rev. 1 specified requirements for development and installation of TMs.

- Temporary leak repair of a weld leak on the 1 ½ inch reactor coolant pump (RCP) seal injection return line between valve MU-V-37 and the RCP seal return cooler per work orders A2106087/C2009483. The temporary repair was performed using ASME Code Case 523-2. The inspectors performed field walkdowns of the leak, and reviewed procedure CC-AA-404, "Application Selection, Evaluation, And Control Of Temporary Leak Repairs," Rev. 5. The inspectors verified that an engineering evaluation was performed and concluded that the evaluation had implemented adequate controls and analyses to implement the seal injection repair. Additionally, the inspectors verified that

AmerGen properly considered the seal injection a temporary modification, and that plans were implemented to perform required permanent repairs during the next refueling outage.

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness [EP]**

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope (1 Sample)

The inspectors performed one inspection sample. During the period of January 11 - March 31, 2005, the NRC has received and acknowledged the changes made to TMI's Emergency Plan in accordance with 10 CFR 50.54(q), which Exelon Nuclear had determined resulted in no decrease in effectiveness to the Plan and continues to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR 50. The inspectors conducted a sampling review of the Plan changes which could potentially result in a decrease in effectiveness. This review does not constitute an approval of the changes and, as such, the changes are subject to future NRC inspection. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 4, and the applicable requirements in 10 CFR 50.54(q) were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope (1 Sample)

The inspectors performed one inspection sample. On February 17, 2005, the inspectors observed an emergency event training evolution conducted at the Unit 1 control room simulator and the technical support center to evaluate emergency procedure implementation, event classification, event notification, and protective action recommendation development. The event scenario involved multiple safety-related component failures and plant conditions warranting simulated Alert, Site Area Emergency, and General Emergency event declarations. The licensee counted this training evolution toward the Emergency Preparedness Drill/Exercise Performance (DEP) Indicator. The inspectors reviewed the station critique to determine whether the licensee critically evaluated drill performance to identify deficiencies and weaknesses. Additionally, the inspectors verified the DEP performance indicators (PIs) were properly evaluated consistent with Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment



Performance Indicator Guideline,” Rev. 2. Additional documents used for this inspection activity included:

- IR 248051 Technical Support Center Failed Facility Objectives - August 25, 2004 Exercise.
- IR 247902 August 25, 2004, Off-Year Exercise - 2 Missed DEP Opportunities.
- IR 247931 EOF unable to connect to the simulator replica plant process computer.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

4OA2 Identification and Resolution of Problems (71152)

1. Annual Sample - ‘B’ Emergency Diesel Generator Cooling Fan AH-E-29B Dampers Failed to Stroke to the Required Position

a. Inspection Scope (1 sample)

The inspectors selected one sample for review. The inspectors reviewed IR 261059, which evaluated the failure of the AH-E-29B cooling fan dampers AH-D-25 and AH-D-26 to stroke to the required position to provide cooling to the ‘B’ EDG room. This degraded condition was identified on October 7, 2004, during performance of a surveillance test while the ‘B’ EDG was already out of service for scheduled maintenance. AH-E-29B is the ‘B’ EDG room cooling fan. This fan is required to support EDG operability, by ensuring that room temperatures do not exceed the limit of 120 degrees Fahrenheit. The engineering evaluation determined that the cause was an air leak in the AH-D-25 operator diaphragm which caused outside air damper AH-D-25 to fail in the closed position. This condition prevented outside air from entering the EDG room to provide cooling.

The inspectors also reviewed IR 279083, which evaluated a minor deficiency identified by the inspectors regarding the initial engineering review for the dampers’ failure performed under IR 261059. Specifically, the inspectors noted that the initial engineering evaluation did not consider the past operability of the ‘B’ EDG caused by the condition and did not include an extent of condition review of similar diaphragms used in safety-related applications. The inspectors reviewed ‘A’ and ‘B’ EDG room ambient temperature test data taken in the last 12 months prior to the damper failures, while the EDGs were running for testing and while the EDGs were in standby. The inspectors confirmed that the degraded condition did not affect ‘B’ EDG operability, and that procedures addressed operator actions to open required doors to provide the required EDG cooling in the event that normal room cooling was degraded. In addition, based on interviews with plant technicians, the engineer determined that many similar

diaphragms are used at TMI for non-safety-related applications and no similar failures had occurred.

b. Findings

No findings of significance were identified.

2. Cross-References to PI&R Issues Reviewed Elsewhere

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. This review was accomplished by reviewing a list of daily issues reports, by reviewing selected issue reports, attending daily screening meetings, and accessing the licensee's computerized database.

Section 1R05 describes a finding in which station personnel breached fire barrier doors and did not implement compensatory measures as required by the TMI Fire Protection Program (AP-1038). Problem identification and resolution were deficient in that the performance issue was repetitively identified by the NRC and the initial actions to preclude recurrence were ineffective.

Section 1R15 describes a finding in which station personnel repeatedly constructed seismic scaffolding in a manner that degraded the reliability of safety-related components; specifically BS-V-3A and the 'A' MSIV. A similar Green finding was issued in May 2004, indicating that corrective actions have been ineffective. Problem resolution was also deficient, because after becoming aware of the scaffold procedure violations affecting the 'A' MSIV, maintenance and engineering personnel did not initiate an IR to address this performance deficiency. The inspectors subsequently identified multiple examples of procedure implementation problems associated with this scaffold activity and procedure deficiencies which were not previously identified or corrected.

4OA4 Cross-Cutting Aspects of Findings

Section 1R05 describes a finding in which station personnel breached fire barrier doors and did not implement compensatory measures as required by the TMI Fire Protection Program (AP-1038). This finding is a cross-cutting issue in the area of human performance, because station personnel did not follow TMI Fire Protection Program procedure (AP-1038).

Section 1R15 describes a finding in which station personnel constructed seismic scaffolding in a manner that degraded the reliability of safety-related components; specifically BS-V-3A and the 'A' MSIV. This finding is a cross-cutting issue in the area of human performance, because station personnel did not follow TMI scaffold control procedures MA-AA-716-025, MA-AA-796-024, and MA-MA-796-024-1001.

4OA5 OtherReview of Institute of Nuclear Power Operations Operator Training Accreditation Review

The Institute of Nuclear Power Operations (INPO) performed a periodic accreditation review of the six operator training programs (non-licensed operator, reactor operator, senior reactor operator, shift manager, shift technical advisor, and continuing training for licensed personnel) during the period July 26 - 30, 2004. The INPO National Nuclear Accrediting Board issued the accreditation assessment letter on December 21, 2004. The letter informed AmerGen that an additional 6-month period of assessment would be performed. The inspectors reviewed the letter and the associated operator training assessment report. Problems identified in the report were consistent with NRC findings and no new safety issues were identified.

4OA6 Management MeetingsExit Meeting Summary

On April 7, 2005, the resident inspectors presented the inspection results to Mr. Rusty West and other members of his staff who acknowledged the findings. The regional specialist inspection results were previously presented to members of AmerGen management. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

**SUPPLEMENTAL INFORMATION**

**KEY POINTS OF CONTACT**

Licensee Personnel

D. Atherholt, Operations Training Manager  
K. Bartes, Plant Operations Director  
T. Knisely, Security Manager  
G. Chick, Plant Manager  
L. Clewett, Director, Site Engineering  
E. Fuhrer, Regulatory Assurance  
C. Incorvati, Acting Director, Maintenance  
K. McCall, Training Director  
J. Marsden, Maintenance Rule Program Manager  
A. Miller, Regulatory Assurance  
C. Smith, Regulatory Assurance Manager  
R. West, Vice President, TMI Unit 1  
S. Wilkerson, Engineering Response Team Manager  
M. Wyatt, Corporate Training/Operations Training Program Manager

Others

R. Janati, Pennsylvania Department BRP  
M. Murphy, Pennsylvania Department BRP

**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

Opened and Closed

2005002-01	NCV	Failure To Maintain Fire Barriers For The 'A' and 'B' Makeup Pump Rooms (Section 1R05)
2005002-02	URI	Adequacy of Walkthrough Exam Administered to Control Room Supervisors (Section 1R11)
2005002-03	NCV	Construction of Seismic Scaffolding Near Safety-Related Equipment Not Performed in Accordance with Procedure Requirements. (Section 1R15)

Opened

2005002-04	URI	Adequacy of Walkthrough Exam Administered To Control Room Supervisors (Section 1R11)
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Closed

2004002-06	URI	Potential Simulator Fidelity Issues Regarding Parameter Discrepancies with 2004 Feed Pump Trip (Section 1R11)
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- 2004002-07 URI Potential Simulator Fidelity Issues Regarding Natural Circulation Transport Time (Section 1R11)
- 2004002-08 URI AmerGen's Policy to Re-Examine Using Only One Scenario Vice Two for Retake Exams Following Failures on the Annual Operating Exam may not be in Compliance with the 10 CFR 55.59 (Section 1R11)

### LIST OF DOCUMENTS REVIEWED

#### **Section 1R04: Equipment Alignment**

- 1107-4D, "Loss of 1D 4160V Bus," Rev. 1  
1107-4E, "Loss of 1E 4160V Bus," Rev. 1  
Drawing 302-011, "Main Steam Flow Diagram," Rev. 64  
Drawing 302-082, "Emergency Feedwater Flow Diagram," Rev. 22  
Drawing 302-202, "Nuclear Services River Water System," Rev. 67  
Drawing 302-353, "Diesel Generator Services-Lube Oil, Fuel oil, Air Start," Rev. 11  
Drawing 302-354, "Diesel Generator Jacket & Air Cooler-Coolant System, Gear Box Lube Oil System," Rev. 12  
Drawing 302-611, "Reactor Building Normal and Emergency Cooling Water System," Rev. 12  
Drawing 302-640, "Decay Heat Removal," Rev. 79  
Drawing 302-641, "Decay Heat Pumps 1A/B Auxiliary Systems," Rev. 6  
Drawing 302-831, "Reactor, Auxiliary, and Fuel Handling Building Ventilation Flow," Rev. 52

#### **Section 1R11: Licensed Operator Requalification**

- Scenario 7, "Loss of Main Feedwater, Failed Open PORV, Emergency Feedwater Failures, & Loss of 25F Subcooling Margin," Rev. 10  
Scenario 30, "Main Condenser Tube Leak, Control Rod Drive Problem, Loss of River Water Pumps, Turbine Transient-Reactor Trip, and Lack of Primary to Secondary Heat Transfer," Rev. 6  
1102-10, "Plant Shutdown," Rev. 92  
OP-TM-EOP-001, "Reactor Trip," Rev. 5  
OP-TM-EOP-002, "Loss of 25F Subcooled Margin," Rev. 3  
OP-TM-EOP-004, "Lack of Primary to Secondary Heat Transfer," Rev. 2  
OP-TM-EOP-006, "Loss of Coolant Accident Cooldown," Rev. 3  
OP-TM-EOP-010, "Abnormal Transients Rules, Guides, and Graphs," Rev. 3  
EP-AA-111, "Emergency Classification and Protective Action Recommendations," Rev. 10  
EP-AA-1009, "Exelon Nuclear Radiological Emergency Plan Annex for TMI Station," Rev. 3

#### **Requalification Program Procedures**

- TQ-AA-106, "Exelon Nuclear Licensed Operator Requal Training Program," Rev. 6  
TQ-AA-201, "Exelon Nuclear Examination Security and Administration," Rev. 6  
TQ-AA-106-304, "Exelon Nuclear Licensed Operator Requal Training Exam Development Job Aid," Rev. 4  
TQ-AA-106-305, "Exelon Nuclear Licensed Operator Requal Training Exam Administration Job Aid," Rev. 3  
TQ-AA-210-4102, "Performance Review Committee Data Sheet," Rev. 0

TQ-AA-106-0119, "Exelon Nuclear Licensed Operator Requal Evaluation Failure Checklist," Rev. 0  
TQ-AA-106-0119, "Exelon Nuclear Licensed Operator Requal Training Exam Administration Job Aid," Rev. 0  
TQ-AA-106-0113, "Simulator Demonstration Exam Individual Competency Evaluation Form," Rev. 1  
TQ-AA-106-210, "TSD Process Activities," Rev. 0  
OP-AA-105-102, "NRC Active License Maintenance," Rev. 5  
TQ-AA-106-0303, "Exelon Licensed Operator Training JPM Development Aid," Rev. 1  
TQ-AA-106-0304, "Exelon Licensed Operator Requal Training Exam Development Job Aid," Rev. 4  
TQ-AA-106-0305, "Exelon Licensed Operator Requal Training Exam Administration Job Aid," Rev. 3  
TQ-AA-201, "Exam Security and Administration," Rev. 6

#### Simulator Procedures

TQ-AA-301, "Simulator Configuration Management," Rev. 5  
TQ-AA-302 -0102, "TMI Plant-Referenced Simulator Certification Plan," Rev. 0  
TQ-AA-303, "Controlling Simulator Core and Thermal-Hydraulic Model Updates," Rev. 3  
TQ-AA-301-0101, "Simulator Hardware Service Level Agreement," Rev. 0  
TQ-AA-301-0102, "Simulator Software Service Level Agreement," Rev. 0  
TQ-TM-301-0102, "TMI Plant-Referenced Simulator Certification Plan," Rev. 0

#### Issue Reports

206534, 213541, 214253, 283467, 302983, 308344, 308358, 308367

#### Miscellaneous

2004 Accreditation Self Evaluation Report (ASER)  
Exelon Nuclear - "NOS Root Cause Investigation Regarding TMI Operations Training Probation #294865, DRAFT," Rev 0  
Audit #NOSA-TMI-04-06 (AR 206940), 6/28-7/2/04  
TMI Simulator Factory Acceptance Testing Schedule  
Simulator Work Request Data Base  
LOR/STA Biennial Technical Review 2003-2004

#### JPMs

11205194 - Transfer to Reactor Building Sump Recirculation.  
11205144 - Provide State BRP with Protective Action Recommendations.  
11205166 - Respond to a Lowering or Low RCS Pressure.  
11205161 - Respond to a Total Loss of ICA/NNI Power.  
080 - 12 EAL Classification.

#### Biennial Written Exams 2005

Week 1 Crew B and OPS 2, CRO and SRO  
Week 2 Crew E and OPS 3, CRO and SRO  
Week 3 Crew A and OPS 1, CRO and SRO

Reviewed the following 2003 exams for repeat questions:

RO Biennial Written Exam #1  
SRO Biennial Written Exam #1  
RO Biennial Written Exam #3  
SRO Biennial Written Exam #3  
SRO Biennial Written Exam #4  
SRO Biennial Written Exam #5  
SRO Biennial Written Exam #6

Cycle Exams

04-02, 04-04, and 04-06.

Exam Scenarios

TMI LOR Operational Simulator Scenarios # 11, 4, 12, 21, 22, and 27

**Section 1R12: Maintenance Effectiveness**

Issue Reports

095418	102122	113148	113152	113384	115824
148261	154426	157788	174924	178136	186765
197527	200121	208389	208698	217245	286662
292634					

Documents

Maintenance Rule Periodic 10 CFR 50.65 a(3) Assessment dated 9/30/03  
Focused Self Assessment Report dated 10/28/04  
ECR 04-00052, "ISPH Leakoff Funnel Replacement"  
ECR 02-01103, "New Damper Regulator for AH-D-576"  
TMI Maintenance Rule Scoping Summary Level  
List of FF/MPFF from 1/3/03 to 12/20/04  
MR Expert Panel meeting minutes, June 9, 2003  
MR Scoping Template for Aux/Fuel Handling Building Ventilation

Procedures

ER-AA-310, "Maintenance Rule Procedure," Rev. 1  
OP-TM-424-201, "IST of EF-P-2A," Rev. 1  
OP-TM-424-202, "IST of EF-P-2B," Rev. 1  
OP-TM-424-203, "IST of EF-P-1 and Valves," Rev. 1  
OP-TM-424-271, "Standby Line Up and Flow Path Verification of EFW System," Rev. 2  
1303-11.39, "HSPS-EFW Auto Initiation Surveillance," Rev. 34  
1303-11.53, "EFW Flow Surveillance," Rev. 14

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

On-Line Station Risk Evaluation Documents

OLSRED 572	OTSG Pressure Transmitter Replacement/Calibration
OLSRED 964	NS Closed Cooling Water Heat Exchanger Cleaning
OLSRED 1119	AH-E-1A Troubleshooting and Replacement

Procedures

1082.1, "TMI Risk Management Program," Rev. 4

IRs

00287025                      Tube Chatter Observed when Removing NS-C-1B from Service

**Section 1R19: Post Maintenance Testing**

Engineering Change Procedure (ECP)

04-01063                      AH-E-1A Motor Connection Upgrade

Work Orders

C2009414

**Section 1EP4: Emergency Action Level and Emergency Plan Changes**

TMI Consolidated Emergency Plan  
TMI Annex Emergency Plan and Implementing Procedures

**LIST OF ACRONYMS**

ADAMS	Agencywide Documents and Management System
ALARA	as low as is reasonably achievable
AmerGen	AmerGen Energy Company, LLC
ANSI	American National Standards Institute
AP	Administrative Procedure
ASME	American Society of Mechanical Engineers
BS	Building Spray
CFR	Code of Federal Regulations
CRS	Control Room Supervisor
DH	Decay Heat
EDG	Emergency Diesel Generator
EFW	Emergency Feedwater
FF	Functional Failure
HSPS	Heat Sink Protection System
ICS	Integrated Control System
IMC	Inspection Manual Chapter
IN	Information Notice
INPO	Institute of Nuclear Power Operations



IR	Issue Report
JPM	Job Performance Measures
LER	Licensee Event Report
LPI	Low Pressure Injection
MOV	Motor Operated Valve
MPFF	Maintenance Preventable Functional Failure
MR	Maintenance Rule
MSIV	Main Steam Isolation Valve
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
NSCCW	Nuclear Services Closed Cooling Water
OTSG	Once Through Steam Generator
PD	Performance Deficiency
PI	Performance Indicator
PMT	Post Maintenance Test
RB	Reactor Building
RPS	Reactor Protection System
SDP	Significance Determination Process
SRO	Senior Reactor Operator
SSCs	Structures, Systems and Components
SWR	Simulator Work Request
TI	Temporary Instruction
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item