

October 7, 2008

Mr. Charles G. Pardee
Chief Nuclear Officer and Senior Vice President
Exelon Generation Company, LLC
Chief Nuclear Officer
AmerGen Energy Company, LLC
200 Exelon Way
Kennett Square, PA 19348

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1 - NRC TRIENNIAL FIRE
PROTECTION INSPECTION REPORT 05000289/2008009

Dear Mr. Pardee:

On September 12, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Three Mile Island Station, Unit 1. The enclosed inspection report documents the inspection results, which were discussed on September 12, 2008, with Mr. W. Noll 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.

Based on the results of this inspection, the NRC identified one finding of very low safety significance (Green) that was a violation of NRC requirements. However, because of the very low safety significance and because it is entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest the NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for 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 NRC Resident Inspector at the Three Mile Island Station.

In accordance with Title 10 of the Code of Federal Regulations Part 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS).

Mr. Charles G. Pardee

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(the Public Electronic Reading Room).

Sincerely,

/RA/

John F. Rogge, Chief
Engineering Branch 3
Division of Reactor Safety

Docket No. 50-289
License No. DPR-50

Enclosure: Inspection Report No. 05000289/2008009
w/Attachment: Supplemental Information

Mr. Charles G. Pardee

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cc w/encl:

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.: 05000289

License No.: DPR-50

Report No.: 05000289/2008009

Licensee: AmerGen Energy Company, LLC

Facility: Three Mile Island Station, Unit 1

Location: P.O. Box 480
Middletown, PA 17057

Dates: August 25, 2008 – September 12, 2008

Inspectors: D. Orr, Senior Reactor Inspector, DRS
J. Lilliendahl, Reactor Inspector, DRS
M. Patel, Reactor Inspector, DRS

Approved by: John F. Rogge, Chief
Engineering Branch 3
Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000289/2008009; 08/25/2008 - 09/12/2008; AmerGen Energy Company, LLC; Three Mile Island Station, Unit 1; Triennial Fire Protection Team Inspection, Fire Protection.

This report covered a two-week triennial fire protection team inspection by specialist inspectors. One Green NCV was 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," Rev. 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

Green. The team identified that AmerGen allowed fire brigade members to use elevators during response to a fire, when the power or control to the elevator could be lost as a result of a fire. This finding was determined to be of very low safety significance (Green) and a NCV of the Three Mile Island Nuclear Station, Unit 1 Operating License condition 2.c.(4), "Fire Protection."

The team determined that this finding was more than minor because it was associated with the external factors attribute (fire) of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, AmerGen allowed fire brigade members to use elevators during fires which could disable the elevator, potentially trapping fire brigade members and delaying their efforts to extinguish fires in safe shutdown areas. The team assessed this finding in accordance with NRC IMC 0609, Appendix M, Significance Determination Process Using Qualitative Criteria because IMC 0609, Appendix F, Fire Protection Significance Determination Process specifically excludes findings associated with the performance of the fire brigade. Therefore this finding required regional branch chief review in accordance with IMC 0612, Power Reactor Inspection Reports. This finding was screened to very low safety significance (Green) based on IMC 0609 Appendix M, Significance Determination Process Using Qualitative Criteria and the following considerations: the limited exposure time when brigade members would be in the elevator and AmerGen's practice that the entire brigade did not enter the elevator all at once. The team determined that this finding had a cross cutting aspect in the area of problem identification and resolution because when the issue of elevator usage by fire brigade members was raised by the NRC residents on November 29, 2007, the issue was not fully evaluated (P.1(c)). (Section 1R05.04)

B. Licensee-Identified Violations

None.

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REPORT DETAILS

Background

This report presents the results of a triennial fire protection inspection conducted in accordance with NRC Inspection Procedure (IP) 71111.05T, "Fire Protection." The objective of the inspection was to assess whether AmerGen Energy Company, LLC, (AmerGen) has implemented an adequate fire protection program and that post-fire safe shutdown capabilities have been established and are being properly maintained at the Three Mile Island (TMI) Station, Unit 1. The following fire areas (FAs) and fire zones (FZs) were selected for detailed review based on risk insights from the TMI Individual Plant Examination of External Events (IPEEE):

- CB-FA-2A
- CB-FA-3A
- CB-FA-3D
- AB-FZ-6

The inspection team evaluated AmerGen's fire protection program (FPP) against applicable requirements which included plant Technical Specifications, Operating License Condition 2.C.4, NRC Safety Evaluations, 10 CFR 50.48, and 10 CFR 50 Appendix R. The team also reviewed related documents that included the Updated Final Safety Analysis Report (UFSAR), Section 9.9 and the Fire Hazards Analysis Report (FHAR).

Specific documents reviewed by the team are listed in the attachment.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R05 Fire Protection (IP 71111.05T)

.01 Post-Fire Safe Shutdown From Outside Main Control Room (Alternative Shutdown) and Normal Shutdown

a. Inspection Scope

Methodology

The team reviewed the safe shutdown analysis, operating procedures, piping and instrumentations drawings (P&IDs), electrical drawings, the UFSAR and other supporting documents to verify that hot and cold shutdown could be achieved and maintained from outside the control room for fires that rely on shutdown from outside the control room. This review included verification that shutdown from outside the control room could be performed both with and without the availability of offsite power. Plant walkdowns were also performed to verify that the plant configuration was consistent with

Enclosure

that described in the FHAR. These inspection activities focused on ensuring the adequacy of systems selected for reactivity control, reactor coolant makeup, reactor decay heat removal, process monitoring instrumentation, and support systems functions. The team verified that the systems and components credited for use during this shutdown method would remain free from fire damage. The team verified that the transfer of control from the control room to the alternative shutdown locations would not be affected by fire-induced circuit faults (e.g., by the provision of separate fuses and power supplies for alternative shutdown control circuits).

Similarly, for fire areas that utilize shutdown from the control room, the team also verified that the shutdown methodology properly identified the components and systems necessary to achieve and maintain safe shutdown conditions.

Operational Implementation

The team verified that the training program for licensed and non-licensed operators included alternative shutdown capability. The team also verified that personnel required for safe shutdown using the normal or alternative shutdown systems and procedures are trained and available onsite at all times, exclusive of those assigned as fire brigade members.

The team reviewed the adequacy of procedures utilized for post-fire shutdown and performed an independent walk through of procedure steps to ensure the implementation and human factors adequacy of the procedures. The team also verified that the operators could be reasonably expected to perform specific actions within the time required to maintain plant parameters within specified limits. Time critical actions, which were verified included restoration of alternating current (AC) electrical power, establishing the remote shutdown panels, establishing reactor coolant makeup, and establishing decay heat removal.

Specific procedures reviewed for alternative shutdown, including shutdown from outside the control room included the following:

- OP-TM-AOP-001, Fire, Rev. 4
- OP-TM-AOP-001-A06, Fire in AB 305' Demineralizer and 1A ESV MCC Area, Rev. 1
- OP-TM-AOP-001-C2A, Fire in 1P 480V Switchgear Room, Rev. 2
- OP-TM-AOP-001-C3A, Fire in 1D ES 4160V Switchgear Room, Rev. 2
- OP-TM-EOP-020, Cooldown from Outside of Control Room, Rev. 9

The team reviewed manual actions to ensure that they had been properly reviewed and approved and that the actions could be implemented in accordance with plant procedures in the time necessary to support the safe shutdown method for each fire area. The team also reviewed the periodic testing of the alternative shutdown transfer capability and instrumentation and control functions to ensure the tests are adequate to ensure the functionality of the alternative shutdown capability.

b. Findings

No findings of significance were identified.

.02 Protection of Safe Shutdown Capabilities

a. Inspection Scope

The team reviewed the FHAR, safe shutdown analyses and supporting drawings and documentation to verify that safe shutdown capabilities were properly protected. The team ensured that separation requirements of Section III.G of 10 CFR 50, Appendix R were maintained for the credited safe shutdown equipment and their supporting power, control and instrumentation cables. This review included an assessment of the adequacy of the selected systems for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring, and associated support system functions.

The team reviewed AmerGen's procedures and programs for the control of ignition sources and transient combustibles to assess their effectiveness in preventing fires and in controlling combustible loading within limits established in the FHAR. A sample of hot work and transient combustible control permits were also reviewed. The team performed plant walkdowns to verify that protective features were being properly maintained and administrative controls were being implemented.

b. Findings

No findings of significance were identified.

.03 Passive Fire Protection

a. Inspection Scope

The team walked down accessible portions of the selected fire areas to observe material condition and the adequacy of design of fire area boundaries (including walls, fire doors and fire dampers), and electrical raceway fire barriers to ensure they were appropriate for the fire hazards in the area.

The team reviewed installation/repair and qualification records for a sample of penetration seals to ensure the fill material was of the appropriate fire rating and that the installation met the engineering design. The team also reviewed similar records for the fire protection wraps to ensure the material was of an appropriate fire rating and that the installation met the engineering design.

b. Findings

No findings of significance were identified.

.04 Active Fire Protection

a. Inspection Scope

The team reviewed the design, maintenance, testing, and operation of the fire detection and suppression systems in the selected plant fire areas. This included verification that the manual and automatic detection and suppression systems were installed, tested, and maintained in accordance with the National Fire Protection Association (NFPA) code of record or as NRC approved exemptions, and that each suppression system would control and/or extinguish fires associated with the hazards in the selected areas. A review of the design capability of the suppression agent delivery systems was verified to meet the code requirements for the hazards involved. The team also performed a walkdown of accessible portions of the detection and suppression systems in the selected areas as well as a walkdown of major system support equipment in other areas (e.g. fire pumps, storage tanks and supply system) to assess the material condition of the systems and components.

The team reviewed electric and diesel fire pump flow and pressure tests to ensure that the pumps were meeting their design requirements. The team also reviewed the fire main loop flow tests to ensure that the flow distribution circuits were able to meet the design requirements.

The team assessed the fire brigade capabilities by reviewing training, qualification, and drill critique records. The team also reviewed pre-fire plans and smoke removal plans for the selected fire areas to determine if appropriate information was provided to fire brigade members and plant operators to identify safe shutdown equipment and instrumentation, and to facilitate suppression of a fire that could impact post-fire safe shutdown capability. In addition, the team inspected the fire brigade equipment (including smoke removal equipment) to determine operational readiness for fire fighting.

b. Findings

Introduction. The team identified that AmerGen allowed fire brigade members to use elevators during response to a fire, when the power or control to the elevator could be lost as a result of a fire. This finding was determined to be of very low safety significance (Green) and a NCV of the Three Mile Island Nuclear Station, Unit 1 Operating License condition 2.c.(4), "Fire Protection."

Description. Based on FBP 11, Emergency Response Training Fire Brigade Program, FBP 11, "The use of the plant elevators during a fire is a determination made by the fire brigade leader as a part of his initial size up." At TMI, fire brigade members were trained that elevator use is acceptable after establishing that the fire is not in the vicinity of the elevator. The fire brigade utilized the elevator to transport a fire cart and other fire fighting equipment.

The team questioned the use of elevators by the fire brigade, specifically considering the routing of power and control cables for the elevators. The team focused their review

on the turbine building elevator due to its convenient location near the fire brigade storage room. AmerGen determined that control and power cables for the turbine building elevator run through the control building. The inspectors concluded that fires in certain areas of the control building, while not in the vicinity of the turbine building elevator, could damage the elevator power or control cables, which would disable the elevator. Also, if a fire occurred in any switchgear through which the elevator power was routed, then operators, by procedure, would deenergize the affected switchgear which would also disable the elevator. Fire brigade members utilizing the elevator during such circumstance risk being trapped and delayed or unable to respond.

AmerGen had committed to not using elevators in Section 5 of the Three Mile Island Fire Hazard Analysis Report in a comparison to the NRC Branch Technical Position APCSB 9.5-1, Appendix A. Part D.4(f) of this comparison states, "Elevators are not used during fire emergencies."

AmerGen documented this issue in corrective action program condition report IR 816765. AmerGen's immediate corrective actions included issuing a policy to all fire brigade members that elevators are not to be used during any fire scenario. AmerGen planned to formally evaluate the potential for prescribing future use of elevators in certain pre-fire plans, which may include a change to the BTP 9.5-1 comparison in the Fire Hazards Analysis Report. The team determined that allowing fire brigade members to use an elevator during a fire could disable the elevator is a performance deficiency.

The team also noted that fire brigade use of elevators was previously questioned by the NRC resident inspectors during their annual observation of a fire brigade drill on November 29, 2007. AmerGen initiated a condition report (IR 704915) to address the inspectors' question. AmerGen closed the IR and documented that quarterly training was performed to reiterate the requirements to ensure that the elevator was not in the area of the fire or visibly affected by the fire. The associated condition report did not fully evaluate the issue in that the routing of power and control cables was not considered.

Analysis. The team determined that this finding was more than minor because it was associated with the external factors attribute (fire) of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, AmerGen allowed fire brigade members to use elevators during fires which could disable the elevator, potentially trapping fire brigade members and delaying their efforts to extinguish fires in safe shutdown areas.

The team assessed this finding in accordance with NRC IMC 0609, Appendix M, Significance Determination Process Using Qualitative Criteria because IMC 0609, Appendix F, Fire Protection Significance Determination Process specifically excludes findings associated with the performance of the fire brigade. Therefore this finding required regional branch chief review in accordance with IMC 0612, Power Reactor Inspection Reports. This finding was screened to very low safety significance (Green)

based on IMC 0609 Appendix M, Significance Determination Process Using Qualitative Criteria and the following considerations: the limited exposure time when brigade members would be in the elevator and AmerGen's practice that the entire brigade did not enter the elevator all at once.

The team determined that this finding had a cross cutting aspect in the area of problem identification and resolution because when the issue of elevator usage by fire brigade members was raised by the NRC residents on November 29, 2007, the issue was not fully evaluated. (P.1(c))

Enforcement. Three Mile Island Nuclear Station Operating License condition 2.c.(4) requires that AmerGen Energy Company, LLC shall implement and maintain in effect all provisions of the Fire Protection Program as described in the Updated FSAR for TMI-1. The UFSAR section 9.9.2 states that the Fire Hazards Analysis Report is considered to be part of the Fire Protection Program. Section 5.0.D.4(f) of the Fire Hazards Analysis Report states, "Elevators are not used during fire emergencies." Contrary to the above, for some period of time (and observed during a fire brigade drill on November 29, 2007) until September 12, 2008, AmerGen allowed fire brigade members to use elevators during fires which could disable the elevator. Because this finding was of very low safety significance (Green) and has been entered into AmerGen's corrective action program (IR 00816765), this violation is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. **NCV 05000289/2008009-01, Inappropriate Use of Elevators by Fire Brigade Members.**

.05 Protection From Damage From Fire Suppression Activities

a. Inspection Scope

The team performed document reviews and plant walkdowns to verify that redundant trains of systems required for hot shutdown are not subject to damage from fire suppression activities or from the rupture of inadvertent operation of fire suppression systems. Specifically, the team verified that:

- A fire in one of the selected fire areas would not directly, through production of smoke, heat or hot gases, cause activation of suppression systems that could potentially damage all redundant safe shutdown trains.
- A fire in one of the selected fire areas (or the inadvertent actuation or rupture of a fire suppression system) would not directly cause damage to all redundant trains (e.g. sprinkler caused flooding of other than the locally affected train).
- Adequate drainage is provided in areas protected by water suppression systems.

b. Findings

The team identified a potential concern regarding operation of the carbon dioxide (CO₂) extinguishing system for the relay room. Specifically, the potential may exist for CO₂ to

migrate outside the relay room and affect the ability of operators to perform alternative shutdown activities. Likewise, with CO₂ migration potential outside the relay room, the potential existed for less than adequate CO₂ concentration in the relay room for fire suppression. This issue will remain unresolved pending further NRC review of AmerGen's analysis of the issue.

The team reviewed the design and testing of the CO₂ system for the relay room. The original CO₂ discharge test in 1976 had some complications which required followup evaluations, further testing, and design change modifications. After the team reviewed the subsequent testing and design change documentation, the team had two remaining concerns: potential migration of CO₂ into rooms outside the relay room and the concentration of CO₂ in the relay room.

The original test report identified significant CO₂ migration. CO₂ levels were found as high as 6% in lower elevations of the adjacent fuel handling building patio area. The CO₂ migration was addressed by several corrective actions including greater sealing of the room by installing tighter penetration seals and maintaining the doors closed instead of automatic door closing mechanisms. Because the room would then be sealed tighter, pressure relief dampers were added to prevent over pressurization of the relay room.

The team also made the following observations:

- The gaps under the two doors from the relay room to the 1D 4160VAC switchgear room and the ESAS room were approximately one inch high. This represented a potential CO₂ migration path to areas required for alternative shutdown operations.
- The relay room ventilation ducts were automatically isolated upon a CO₂ discharge with two series dampers on both the exhaust plenum and the supply plenum. On the exhaust plenum, one isolation damper (fire damper) was between the relay room and the relief dampers and the other isolation damper (ventilation damper) was downstream of the relief dampers. The relief dampers appeared to be set at a very low differential pressure (0.007 psid), and would relieve pressure into the Engineered Safeguards and Actuation System (ESAS) room, a room that required entry for alternative shutdown. This represented a potential CO₂ migration path if the fire damper did not seal tightly, and this also represented a potential for over pressurization of the relay room if the fire damper did seal tightly.
- The ESAS room contained the remote shutdown 'A' transfer panel, which was required for the alternative shutdown lineup in the event of a control room evacuation. There were also remote shutdown transfer switches in the IE 4160VAC switchgear room, which were only accessible by transiting through the ESAS room. Therefore, if CO₂ was present in the ESAS room, it may impact alternative shutdown actions.
- There was a louvered control rod drive mechanism power supply bus duct between the relay room and the fuel handling building patio area. This represented an additional potential CO₂ migration path.

The team questioned AmerGen about the potential for CO₂ to migrate from the relay room to areas required for alternative shutdown and about the potential for CO₂ over pressurization in the relay room. AmerGen was unable to locate design documentation for the modifications to the relay room after the initial testing. AmerGen entered this issue in their corrective action program (AR 815641), isolated the CO₂ system, placed a continuous fire watch in the relay room, and began a formal calculation to determine the pressure buildup in the relay room and the CO₂ migration, if any.

The team concluded that the identified issue concerning the migration and concentration of CO₂ for the relay room CO₂ system is an unresolved item pending further NRC review AmerGen's evaluation. **URI 05000289/2008009-02, Potential CO₂ Migration Outside the Relay Room Fire Area**

.06 Alternative Shutdown Capability

a. Inspection Scope

Alternative shutdown capability for the areas selected for inspection utilizes shutdown from outside the control room and is discussed in section 1R05.01 of this report.

b. Findings

No findings of significance were identified.

.07 Circuit Analysis

a. Inspection Scope

The team verified that AmerGen performed a post-fire safe shutdown analysis for the selected fire areas and the analysis appropriately identified the structures, systems, and components important to achieving and maintaining safe shutdown. Additionally, the team verified that the AmerGen's analysis ensured that necessary electrical circuits were properly protected and that circuits that could adversely impact safe shutdown due to hot shorts, shorts to ground, or other failures were identified, evaluated, and dispositioned to ensure spurious actuations would not prevent safe shutdown.

The team's review considered fire and cable attributes, potential undesirable consequences and common power supply/bus concerns. Specific items included the credibility of the fire threat, cable insulation attributes, cable failure modes, and actuations resulting in flow diversion or loss of coolant events.

The team also reviewed cable routing for a sample of components required for post-fire safe shutdown to verify that cable routing was consistent with the assumptions and conclusions of the safe shutdown analyses.

Cable failure modes were reviewed for the following components:

- IC-V-3, Intermediate Closed Cooling Isolation Valve
- RC-V-2, Pressurizer Relief Block Valve
- IC-P-1A, Intermediate Closed Cooling Water Pump A
- IC-P-1B, Intermediate Closed Cooling Water Pump B
- NS-P-1A, Nuclear Service Closed Cooling Water Pump A
- MU42-DPT, Reactor Coolant Pump Total Seal Injection Flow Transmitter

The team reviewed circuit breaker coordination studies to ensure equipment needed to conduct post-fire safe shutdown activities would not be impacted due to a lack of coordination. The team confirmed that coordination studies had addressed multiple faults due to fire. Additionally, the team reviewed a sample of circuit breaker maintenance records to verify that circuit breakers for components required for post-fire safe shutdown were properly maintained in accordance with procedural requirements.

b. Findings

No findings of significance were identified.

.08 Communications

a. Inspection Scope

The team reviewed safe shutdown procedures, the FHAR, and associated documents to verify an adequate method of communications would be available to plant operators following a fire. During this review, the team considered the effects of ambient noise levels, clarity of reception, reliability, and coverage patterns. The team also inspected the designated emergency storage lockers to verify the availability of portable radios for the fire brigade and for plant operators. The team also verified that communications equipment such as sound powered phone system cables, repeaters, and transmitters would not be affected by a fire.

b. Findings

No findings of significance were identified.

.09 Emergency Lighting

a. Inspection Scope

The team observed the placement and coverage area of eight-hour emergency lights throughout the selected fire areas to evaluate their adequacy for illuminating access and egress pathways and any equipment requiring local operation and/or instrumentation monitoring for post-fire safe shutdown. The team also verified that the battery power supplies were rated for at least an eight-hour capacity. Preventive maintenance procedures, the vendor manual, completed surveillance tests, and battery replacement

practices were also reviewed to verify that the emergency lighting was being maintained in a manner that would ensure reliable operation.

b. Findings

No findings of significance were identified.

.10 Cold Shutdown Repairs

a. Inspection Scope

The team verified that AmerGen had dedicated repair procedures, equipment, and materials to accomplish repairs of components required for cold shutdown which might be damaged by the fire to ensure cold shutdown could be achieved within the time frames specified in their design and licensing bases. The team verified that the repair equipment, components, tools, and materials (e.g. pre-cut cables with prepared attachment lugs) were available and accessible on site.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The team verified that compensatory measures were in place for out-of-service, degraded or inoperable fire protection and post-fire safe shutdown equipment, systems, or features (e.g. detection and suppression systems and equipment, passive fire barriers, or pumps, valves or electrical devices providing safe shutdown functions or capabilities). The team also verified that the short term compensatory measures compensated for the degraded function or feature until appropriate corrective action could be taken and that AmerGen was effective in returning the equipment to service in a reasonable period of time.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

4OA2 Identification and Resolution of Problems

.01 Corrective Actions for Fire Protection Deficiencies

a. Inspection Scope

The team verified that AmerGen was identifying fire protection and post-fire safe shutdown issues at an appropriate threshold and entering them into the corrective action program. The team also reviewed a sample of selected issues to verify that AmerGen had taken or planned appropriate corrective actions.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

The team presented their preliminary inspection results to Mr. W. Noll and other members of the site staff at an exit meeting on September 12, 2008. No proprietary information was included in this inspection report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

ATTACHMENT
SUPPLEMENTAL INFORMATION
KEY POINTS OF CONTACT

Licensee Personnel

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T. Dougherty, Plant Manager
T. Geyer, Engineering Programs Manager
R. Harris, Fire Systems Engineer
A. Miller, Senior Regulatory Specialist
R. Myers, Fire Marshal
W. Noll, Site Vice President
S. Queen, Engineering Director
S. Sallade, Operations Engineer
R. Sieglitz, Fire Program Engineer
B. Smith, Safe Shutdown Engineer
M. Taylor, Corporate Fire Protection Engineer

NRC

J. Rogge, Chief, Engineering Branch 3, Division of Reactor Safety
W. Schmidt, Senior Reactor Analyst, Division of Reactor Safety
D. Kern, Senior Resident Inspector, Three Mile Island Station
J. Brand, Resident Inspector, Three Mile Island Station

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000289/2008009-02	URI	Potential CO ₂ Migration Outside the Relay Room Fire Area
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Opened and Closed

05000289/2008009-01	NCV	Inappropriate Use of Elevators by Fire Brigade Members
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Closed

None

Discussed

None

LIST OF DOCUMENTS REVIEWED

Fire Protection Licensing Documents

TMI 1 Facility Operating License, License No. DPR-50
TMI 1 Updated Final Safety Analysis Report, Rev. 19
TMI 1 Fire Hazards Analysis Report, Rev. 23
NRC Letter, TMI Unit 1, 10CFR Part 50 Appendix R Exemption Request, Dated 7/11/97
NRC Safety Evaluation Report, Fire Protection, Supplement 5, Dated 11/19/80
NRC Letter and Enclosures, Fire Protection for TMI-1, Dated 12/30/86
NRC Letter and Enclosures, Fire Protection Exemptions for TMI-1, Dated 3/19/87
AP 1038, Administrative Controls – Fire Protection Program, Rev. 70

Calculations/Engineering Evaluation Reports/Design Bases Documents

Report 0003, Tests to Determine Effect of Discharge of CO₂ and Halon 1301 on Electronic Instrumentation, Rev. 0
C-1101-911-E610-001, Appendix R 72 Hour Cold Shutdown Analysis, Rev. 0
G/C 2734, Review of Associated Circuits for 10 CFR 50, Appendix R, Electrical System Studies, Short Circuit and Coordination Review, Technical Report, Rev. 0
C-1101-700-E420-015, TMI-1 Analysis of Multiple High Impedance Faults (MHIF) on Engineered Safeguards (ES) Buses, Rev. 0
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OP-AA-201-006, Control of Temporary Heat Sources, Rev. 4
OP-AA-201-008, Pre-Fire Plans, Rev. 1
OP-AA-201-009, Control of Transient Combustible Material, Rev. 7
OP-MA-201-007, Fire Protection System Impairment Control, Rev. 5
OP-TM-201-009-1001, Transient Combustible Control, Rev. 5
OP-TM-424-901, Emergency Feedwater, Rev. 1
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OP-TM-AOP-001-C2A, Fire In 1P 480V Switchgear Room, Rev. 2

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 OP-TM-AOP-001-C3A, Fire In 1D ES 4160V Switchgear Room, Rev. 2
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 OP-TM-AOP-0281, Loss of Instrument Air Basis Document, Rev. 2
 OP-TM-AOP-041, Loss of Seal Injection, Rev. 3
 OP-TM-AOP-0411, Loss of Seal Injection Basis Document, Rev. 2
 OP-TM-EOP-001, Reactor Trip, Rev. 9
 OP-TM-EOP-010, Emergency Procedure Rules, Guides and Graphs, Rev. 9
 OP-TM-EOP-020, Cooldown From Outside of Control Room, Rev. 9
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 OP-TM-EOP-004, Lack of Primary to Secondary Heat Transfer, Rev. 5
 OP-TM-EOP-009, HPI Cooling, Rev. 5
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 1420-Y-30, Repair of Appendix "R" Cold Shutdown and Remote Shutdown System Circuits, Rev. 13
 1301-15.1, Appendix "R" Cold Shutdown Repair Material Inventory, Rev. 13
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 1301-15.1, Appendix "R" Cold Shutdown Repair Material Inventory, Rev. 13

Completed Tests/Surveillances

1302-13.2A, Inspect Emergency Lights Aux Building, Completed 8/19/08
 1303-12.13, Fire System Testing Flush, Completed 8/31/07, 11/15/07
 1303-12.17, Fire System Deluge Functional Test, Completed 10/3/05, 7/2/06, 4/3/07
 1303-12.5, CO2 Fire Protection System Test, Completed 11/3/05, 11/4/07
 1303-12.8B, Fire Protection Instrumentation Functional Test (CB 338'), Completed 5/23/06, 6/30/07, 6/2/08
 1303-12.8C, Fire Protection Instrumentation Functional Test (CB 322'), Completed 1/25/06, 1/16/07, 1/18/08
 1303-12.8F, Fire Protection Instrumentation Aux Building and Fuel Handling Building Functional Test, Completed 5/23/06, 4/8/07, 11/29/07, 4/15/08, 5/1/08
 1303-12.8J, Incipient Fire Detector Instrumentation Functional Test, Completed 7/8/06, 7/12/07, 1/8/08, 4/6/08, 7/7/08
 1303-13.2B, Inspect Emergency Lights Aux Building 305' Elevation, Completed 8/4/08
 1303-13.2E, Inspect Emergency Lights Control Building 322' Elevation, Completed 7/2/08
 1303-13.2F, Inspect Emergency Lights Control Building, Completed 7/4/08
 3301-M1, Fire Pump Monthly Run, Completed 8/24/07, 10/11/07, 11/10/07
 3303-A2, Fire Service Lube Flush, Completed 6/26/08
 3303-A3, Fire Pump Capacity Test, Completed 7/2/07, 7/25/08
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1E-154-02-003, General Arrangement, Auxiliary and Fuel Handling Buildings, Rev. 10
1E-155-02-002, General Arrangement, Control Room Tower, Rev. 11
1E-155-02-003, General Arrangement, Control Room Tower, Rev. 12
1-FHA-027, Fire Area Layout - Auxiliary and Fuel Handling Buildings, Rev. 8
1-FHA-035, Fire Area Layout - Control Room Tower, Rev. 13
E-214-036, Electrical Cable Trays Control Tower Below 322'-0" & 338'-6", Rev. 20
E-214-037, Electrical Cable Trays Control Tower Below Elev. 355'-0", Rev. 20
302-231, Fire Service Water, Sheet 1, Rev. 102
302-231, Fire Service Water, Sheet 2, Rev. 12
302-231, Fire Service Water, Sheet 3, Rev. 13
302-231, Fire Service Water, Sheet 4, Rev. 6
302-231, Fire Service Water, Sheet 5, Rev. 1
E-206-011, Electrical Main One Line & Relay Diagram, Rev. 51
E-206-022, Electrical One Line & Relay Diagram 4160V. Engd. Safeguards Switchgear, Rev. 21
208-261, Electrical Elementary Diagram, 480V Switchgear (E.S.) DB-25 E.S. Motor Breaker for NS-P-1A & NR-P-1A, Rev. 1
208-351, Electrical Elementary Diagram, 480V Switchgear (E.S.) (1P-3C) Nuclear Service Closed Cooling Water Pump NS-P-1A, Rev. 8
208-426, Electrical Elementary Diagram, 480V Cont. Ctr. 1C-ESV-Unit 5C, Pressurizer Relief Block Valve RC-V-2, Rev. 7
208-527, Elementary Wiring Diag., 480V Cont. Ctr. 1A-ES-Unit 11A, Intermediate Cooling Closed Loop Pump 1C-P-1A, Rev. 8
208-528, Elementary Wiring Diag., 480V Cont. Ctr. 1B-ES-Unit 10A, Intermediate Cooling Closed Loop Pump 1C-P-1B, Rev. 7
208-756, Electrical Elementary Diagram, Remote Shutdown Transfer Switch Panel "A" "A" System, Rev. 4
209-077, Electrical Elementary Diagram, DC and Miscellaneous Intermediate Cooling Isolation Valve, IC-V-3, Rev. 10
209-078, Electrical Elementary Diagram, DC and Miscellaneous Intermediate Cooling Isolation Valve, IC-V-4, Rev. 8
210-469, Electrical Wiring Diagram, Remote Shutdown Transfer Switch Panel "B" Mounting Panel "X" and "X/B", Rev. 2
210-475, Electrical Wiring Diagram, Remote Shutdown Transfer Switch Panel "A" Mounting Panel "A" and "X", Rev. 3
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302-082, Emergency Feedwater, Rev. 24
302-279, Instrument Air, Sheets 7, 8 & 9, Revs. 11, 12 & 19
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302-640, Decay Heat Removal, Rev. 82
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302-650, Reactor Coolant System, Rev. 55
302-661, Make-Up & Purification, Rev. 59

Vendor Manuals

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Pre-Fire Plans

AB-FZ-6, Auxiliary Building Elevation 305' – Demineralizers and MCC 'A', Rev. 6
AB-FZ-6A, Auxiliary Building Elevation 305' – MCC 'B', Rev. 8
AB-FZ-7, Auxiliary Building Elevation 305' – Decay Heat Removal and Nuclear Services Closed
Cycle Cooling Pump Area, Rev. 7
CB-FA-2A, Control Building Elevation 322' – 480V ES CC-1A and 1P Swgr Rm, Rev. 7
CB-FA-3A, Control Building Elevation 338'6" – 4160V Swgr 1D Room, Rev. 6

Fire Drills and Critique

Fire Drill Records, Performed 1st Quarter 2007, 2nd Quarter 2007, 3rd Quarter 2007, 1st Quarter 2008

Hot Work and Ignition Source Permits

2007-032 2008-002 2008-013 2008-015 2008-016

Miscellaneous Documents

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Fire System Impairment Log, Dated 8/26/08
Letter from R. Wysocki to R. Prabhakar, Recommendation to Remove CO2 Nozzle Shells, Dated 10/5/76
Letter from E. Smith to D. McGettrick, Relief Damper Price Quote, Dated 12/22/77
Letter from D. Goodman to R. Ritthamel, Test of CO2 Fire Suppression System in TMI Unit 1 Cable Spreading Room, Dated 4/14/76
Letter from J. Grier to T. Wysocki, Pressure Buildup and Vent Area Calculation for the Relay Room Dated, 5/17/76
Memorandum from R. Prabhakar to D. Shovlin, Improving the Penetration Sealing of the Relay Room, Dated 3/8/1976
Memorandum from F. Grice to J. Colitz, Test of CO2 System for Cable Spreading Room, Dated 4/15/76

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PRF-3-5, Alarm Response Procedure for CO2 Sys Actuated, Rev. 17

SP-5701, Specification for Furnishing and Installing of Fire Protection and Detection Systems, Dated 7/1/69

Verbal Communication Form Dated 10/31/77 from R. Lefin to W. Brannen, CO2 in Cable Spreading Room

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Issue Reports, Action Requests, and Condition Reports

352410	618555	761107	793979	815877
363944	645674	761206	796738	815894
365794	657399	761482	798200	815902
369355	658463	764265	801808	816236
371835	732705	783106	803770	816353
381120	736124	783176	811467	816765
458671	751354	788375	812129	
526384	761038	790537	813701	
568060	761085	792886	815641	

Work Orders

A2060055	R2076275	R2076787	R2076952	R2077529
A2060056	R2076317	R2076788	R2076993	R2077551
C2016225	R2076374	R2076860	R2077091	R2078723
C2016324	R2076620	R2076861	R2077095	R2079282
R2009987	R2076621	R2076865	R2077138	R2081891
R2010381	R2076676	R2076867	R2077190	R2111884
R2039072	R2076785	R2076868	R2077195	R2112355
R2058782	R2076786	R2076935	R2077363	

LIST OF ACRONYMS

AC	Alternating Current
ADAMS	Agency Documents Access and Management System
BTP	Branch Technical Position
CFR	Code of Federal Regulations
CMEB	Chemical Engineering Branch
CO2	Carbon Dioxide
DC	Direct Current
DRS	Division of Reactor Safety
DRP	Division of Reactor Projects
ESAS	Engineered Safeguards Actuation System
FA	Fire Area
FZ	Fire Zone
FHAR	Fire Hazards Analysis Report

FPP	Fire Protection Program
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IPEEE	Individual Plant Examination of External Events
IR	Inspection Report
NCV	Non-cited Violation
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory commission
PAR	Publicly Available Records
P&ID	Piping and Instrumentation Drawing
QA	Quality Assurance
SCBA	Self-Contained Breathing Apparatus
SDP	Significance Determination Process
SER	Safety Evaluation Report
TMI	Three Mile Island
UFSAR	Updated Final Safety Analysis Report
V	Volt