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U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Three Mile Island, Unit I (TMI Unit 1)
Operating License No. DPR-50
NRC Docket No. 50-289

Subject: Additional Information – Technical Specification Change Request No. 326: Elimination of Containment Equipment Hatch Closure During Refueling (TAC No. MC4904)

References:
1) AmerGen Energy Company, LLC letter to NRC, dated July 29, 2005 (5928-05-20176), "Response To Request For Additional Information – Technical Specification Change Request No. 326: Elimination of Containment Equipment Hatch Closure During Refueling"

2) AmerGen Energy Company, LLC letter to NRC, dated October 20, 2004 (5928-04-20162), "Technical Specification Change Request No. 326 – Elimination of Containment Equipment Hatch Closure During Refueling"

This letter provides additional information regarding the use of the TMI Unit 1 existing missile shield barrier to achieve the prompt closure requirement for the containment equipment hatch opening in the event of a Fuel Handling Accident Inside Containment (FHAIC) during refueling activities, as described in Reference 1. TMI Unit 1 has reevaluated the closure methods for the containment equipment hatch opening and has determined that the existing missile shield barrier will be utilized in lieu of the originally proposed temporary cover design. The commitments regarding the defense-in-depth measures to promptly close the containment equipment hatch opening in the event of an FHAIC remain applicable to the use of the missile shield barrier.

Since the missile shield barrier will be utilized to achieve closure of the containment equipment hatch opening in lieu of the original temporary cover, several minor editorial changes to the originally proposed TMI Unit 1 Technical Specification page markups (Reference 2) are provided in Attachment 1. The changes consist of the following:

- Clarification to add "missile shield" to Bases page 3-45 inserts.
- Clarification to add "as may apply" to Technical Specification 3.8.6 and Bases page 3-45, and add "personnel hatch" to Bases page 3-45, to clarify applicability since the equipment hatch emergency airlock will not necessarily be in place.
- Editorial change only relocating "the equipment hatch opening" insert in same sentence.

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These wording changes only provide a clarification of the closure method and editorial revision, and have no impact on the original safety analysis or no significant hazards consideration evaluation conclusions provided in Reference 2. The revised Technical Specification pages provided in Attachment 1 replace the pages originally submitted in Reference 2.

If any additional information is needed, please contact David J. Distel at (610) 765-5517.

I declare under penalty of perjury that the foregoing is true and correct.

Respectfully,

8/17/05
Executed On

Pamela B. Cowan
Director - Licensing & Regulatory Affairs
AmerGen Energy Company, LLC

Attachment: 1) Revised TS Page Markups

cc: S. J. Collins, USNRC, Administrator, Region I,
D. M. Kern, USNRC, Senior Resident Inspector, TMI Unit 1
P. S. Tam, USNRC, Senior Project Manager, TMI Unit 1
File No. 04092

ATTACHMENT 1

Revised TS Page Markups

Revised Technical Specification Pages

3-44
3-45
3-45a

3.8 FUEL LOADING AND REFUELING

Applicability: Applies to fuel loading and refueling operations.

Objective: To assure that fuel loading and refueling operations are performed in a responsible manner.

Specification

3.8.1 Radiation levels in the Reactor Building refueling area shall be monitored by RM-G6 and RM-G7. Radiation levels in the spent fuel storage area shall be monitored by RM-G9. If any of these instruments become inoperable, portable survey instrumentation, having the appropriate ranges and sensitivity to fully protect individuals involved in refueling operation, shall be used until the permanent instrumentation is returned to service.

3.8.2 Core subcritical neutron flux shall be continuously monitored by at least two neutron flux monitors, each with continuous indication available, whenever core geometry is being changed. When core geometry is not being changed, at least one neutron flux monitor shall be in service.

3.8.3 At least one decay heat removal pump and cooler shall be operable.

3.8.4 During reactor vessel head removal and while loading and unloading fuel from the reactor, the boron concentration shall be maintained at not less than that required for refueling shutdown.

3.8.5 Direct communications between the control room and the refueling personnel in the Reactor Building shall exist whenever changes in core geometry are taking place the equipment hatch opening and

3.8.6 During the handling of irradiated fuel in the Reactor Building at least one door in each of the personnel and emergency air locks shall be capable of being closed.* ~~The equipment hatch cover shall be in place with a minimum of four bolts securing the cover to the sealing surfaces.~~ (as may apply)

3.8.7 During the handling of irradiated fuel in the Reactor Building, each penetration providing direct access from the containment atmosphere to the outside atmosphere shall be either:

1. Closed by an isolation valve, blind flange, manual valve, or equivalent, or capable of being closed,* or

2. Be capable of being closed by an operable automatic containment purge and exhaust isolation valve.

(the equipment hatch opening,)

*Administrative controls shall ensure that appropriate personnel are aware that air lock doors and/or other penetrations are open, a specific individual(s) is designated and available to close ~~the~~ air lock doors and other penetrations as part of a required evacuation of containment. Any obstruction(s) (e.g., cable and hoses) that could prevent closure of an air lock door or other penetration will be capable of being quickly removed.

(the equipment hatch opening,)

3.8.8 If any of the above specified limiting conditions for fuel loading and refueling are not met, movement of fuel into the reactor core shall cease; action shall be initiated to correct the conditions so that the specified limits are met, and no operations which may increase the reactivity of the core shall be made.

3.8.9 The reactor building purge isolation valves, and associated radiation monitors which initiate purge isolation, shall be tested and verified to be operable no more than 7 days prior to initial fuel movement in the reactor building.

3.8.10 Irradiated fuel shall not be removed from the reactor until the unit has been subcritical for at least 72 hours.

3.8.11 During the handling of irradiated fuel in the Reactor Building at least 23 feet of water shall be maintained above the level of the reactor pressure vessel flange, as determined by a shiftly check and a daily verification. If the water level is less than 23 feet above the reactor pressure vessel flange, place the fuel assembly(s) being handled into a safe position, then cease fuel handling until the water level has been restored to 23 feet or greater above the reactor pressure vessel flange.

Bases

Detailed written procedures will be available for use by refueling personnel. These procedures, the above specifications, and the design of the fuel handling equipment as described in Section 9.7 of the UFSAR incorporating built-in interlocks and safety features, provide assurance that no incident could occur during the refueling operations that would result in a hazard to public health and safety. If no change is being made in core geometry, one flux monitor is sufficient. This permits maintenance on the instrumentation. Continuous monitoring of radiation levels and neutron flux provides immediate indication of an unsafe condition. The decay heat removal pump is used to maintain a uniform boron concentration. The shutdown margin indicated in Specification 3.8.4 will keep the core subcritical, even with all control rods withdrawn from the core (Reference 1). The boron concentration will be sufficient to maintain the core $k_{eff} \leq 0.99$ if all the control rods were removed from the core, however only a few control rods will be removed at any one time during fuel shuffling and replacement. The k_{eff} with all rods in the core and with refueling boron concentration is approximately 0.9. Specification 3.8.5 allows the control room operator to inform the reactor building personnel of any impending unsafe condition detected from the main control board indicators during fuel movement.

(as may apply) (equipment hatch opening, the equipment hatch opening,

Per Specification 3.8.6 and 3.8.7, the personnel and emergency air lock doors, and penetrations may be open during movement of irradiated fuel in the containment provided a minimum of one door in each of the air locks and penetrations are capable of being closed in the event of a fuel handling accident, and the plant is in REFUELING SHUTDOWN or REFUELING OPERATION with at least 23 feet of water above the fuel seated within the reactor pressure vessel. The minimum water level specified is the basis for the accident analysis assumption of a decontamination factor of 200 for the release to the containment atmosphere from the postulated damaged fuel rods located on top of the fuel core seated in the reactor vessel. Should a fuel handling accident occur inside containment, a minimum of one door in each personnel and emergency air lock and the open penetrations will be closed following an evacuation of containment. Administrative controls will be in place to assure closure of at least one door in ~~each~~ air lock, as well as other open containment penetrations, following a containment evacuation.

INSERT (A)

P → INSERT (B) (within 45 minutes)

Provisions for equivalent isolation methods in Technical Specification 3.8.7 include use of a material (e.g. temporary sealant) that can provide a temporary, atmospheric pressure ventilation barrier for other containment penetrations during fuel movements.

the personnel hatch

closure of the equipment hatch using a temporary hatch cover, or the permanent hatch will be capable of being rolled into place with at least one air lock door capable of being closed, (e.g. missile shield)

when containment integrity is to be maintained.

Specification 3.8.9 requires testing of the reactor building purge isolation system. This system consists of the four reactor building purge valves and the associated reactor building purge radiation monitor(s). The test verifies that the purge valves will automatically close when they receive initiation signals from the radiation detectors that monitor reactor building purge exhaust. The test is performed no more than 7 days prior to the start of fuel movement in the reactor building to ensure that the monitors, purge valves, and associated interlocks are functioning prior to operations ~~that could result in a fuel handling accident within the reactor building. For conservatism,~~ the Fuel Handling Accident analysis assumes that the four purge valves remain open.

Specification 3.8.10 is required as the safety analysis for the fuel handling accident was based on the assumption that the reactor had been shutdown for 72 hours (Reference 2).

REFERENCES

(1) UFSAR, Section 14.2.2.1 - "Fuel Handling Accident"

(2) UFSAR, Section 14.2.2.1(2) - "FHA Inside Containment"

INSERT A TO PAGE 3-45:

(e.g. missile shield)

With the plant in REFUELING SHUTDOWN or REFUELING OPERATION, neither the equipment hatch or temporary equipment hatch cover are credited in any Fuel Handling Accident Analysis. When a temporary equipment hatch cover is used in place of the equipment hatch, there are no special requirements for sealing, pressure retention, or complete blocking of the opening for this cover. When the equipment hatch is rolled in place as the method of covering the hatch opening, it need not be bolted to the opening.

INSERT B TO PAGE 3-45:

When irradiated fuel movement is in progress and containment integrity is not maintained, the Reactor Building Purge Exhaust System is operated to facilitate air flow into the Reactor Building through the open containment equipment hatch. The Reactor Building purge valve high radiation interlock will be bypassed to ensure continued air flow into the Reactor Building in the event of a Fuel Handling Accident. The Reactor Building Purge Exhaust radiation monitor will be maintained operable. There are no special requirements to achieve continuous air flow into the Reactor Building.