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An Exelon/British Energy Company

10 CFR 50.90

August 22, 2001
5928-01-20209

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

SUBJECT: THREE MILE ISLAND, UNIT 1 (TMI UNIT 1)
OPERATING LICENSE NO. DPR-50
DOCKET NO. 50-289
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION – LICENSE AMENDMENT REQUEST NO. 249 CONTAINMENT INTEGRITY DURING REFUELING OPERATIONS

Dear Sir or Madam:

This letter provides additional information in response to NRC verbal request for additional information as discussed with NRC staff on June 18, 2001 and June 29, 2001, regarding the TMI Unit 1 License Amendment Request No. 249 submitted for NRC review on January 23, 2001. Enclosure 1 to this letter provides an itemized response to each of the NRC's questions as discussed above.

Additionally, this letter provides a clarification, as discussed below, to the use of Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors" in the dose calculations supporting TMI Unit 1 License Amendment Request No. 249. This analysis utilized the guidance of Regulatory Guide 1.183, Section 3.2, Table 3 - Non-LOCA Fraction of Fission Product Inventory in GAP, in determining the release fractions for the fuel rods assumed to be damaged in the postulated fuel handling accident. Regulatory Guide 1.183, Section 3.2, Table 3, footnote 11 states the release fractions listed in Table 3 are acceptable for fuel with a peak burnup up to 62,000 MWD/MTU provided that the maximum linear heat generation rate does not exceed 6.3 kw/ft peak rod average power for burnups exceeding 54,000 MWD/MTU.

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TMI Unit 1 operating Cycle 14 (Fall 2001) will include one fuel assembly with four lead test rods with M5 cladding that are planned to be irradiated to a maximum of 69,000 MWD/MTU in Cycle 14 to provide data on fuel and materials performance at higher burnups. AmerGen Energy Company, LLC (AmerGen) received NRC approval to exceed 62,000 MWD/MTU for these four rods in one lead test assembly in NRC letter dated May 18, 2001. Since these four rods are part of a one-cycle lead test assembly program, the criteria of Regulatory Guide 1.183, Section 3.2, Table 3, footnote 11 has not been applied to the lead test rods of this assembly for the fuel handling accident dose calculations submitted in License Amendment Request No. 249.

AmerGen has also identified that some fuel assemblies in the current TMI Unit 1 operating Cycle 13 and the subsequent operating Cycle 14 (Fall 2001) have the potential to exceed the 54,000 MWD/MTU and 6.3 kw/ft criteria of Regulatory Guide 1.183, Section 3.2, Table 3, footnote 11 for a short period of time at the end-of-cycle operation depending on the actual cycle burnups achieved. The following table lists the number of fuel assemblies (FA) that may not meet the peak pin power/ burnup criteria for use of Regulatory Guide 1.183 non-LOCA gap release fractions.

	No. of FA >54GWD/MTU And 6.3 kw/ft	**Approx. Peak Rod Avg. Power when >54GWD/MTU**	**Approx. Duration of Operation Outside R.G. 1.183 Criteria (days)**
Cycle 13	4	7.1	45
	4	7.1	19
	8	6.5	22
Cycle 14	4	6.6	8
	4	6.9	26

As can be seen from the above tabulation, only a few fuel assemblies are potentially affected and only for relatively short durations at end-of-cycle 13 and 14. AmerGen has performed a bounding assessment of the possible affects on the overall radiological dose results previously submitted. This assessment doubled the iodine release fraction previously used for additional conservatism to compensate for a higher peak pin power/burnup and included the conservative assumptions from the original analysis. Particulate cesium and rubidium are retained by the water in the reactor cavity (per Regulatory Guide 1.183, B.3) and are not considered in this assessment. This is considered a bounding conservative assessment of the potential affects of the identified peak pin power/burnup condition. The estimated results demonstrate only minimal potential impact, as defined by 10 CFR 50.59, on the previously calculated doses which remain well within the allowable dose criteria as specified in Regulatory Guide 1.183 and 10 CFR 50.67; and therefore, do not affect the original licensing basis analysis submitted on January 23, 2001.

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

Very truly yours,

Mark E. Warner
Vice President, TMI Unit 1

MEW/djd

Enclosures: 1) Response to Request for Additional Information
2) Summary of Regulatory Commitments

cc: H. J. Miller, USNRC Administrator, Region I
T. G. Colburn, USNRC Senior Project Manager
J. D. Orr, USNRC Senior Resident Inspector
File No. 00109

AMERGEN ENERGY COMPANY, LLC

THREE MILE ISLAND, UNIT 1

Operating License No. DPR-50
Docket No. 50-289
Response to Request for Additional Information -
License Amendment Request No. 249

COMMONWEALTH OF PENNSYLVANIA)

COUNTY OF DAUPHIN) **SS:**

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This Response to Request for Additional Information is submitted in support of Licensee's request to change the Technical Specifications for Three Mile Island, Unit 1. All statements contained in this submittal have been reviewed, and all such statements made and matters set forth therein are true and correct to the best of my knowledge.

AmerGen Energy Company, LLC

BY: Mark E Warner
Vice President, TMI Unit 1

Sworn and Subscribed to before me
This 22nd day of August 2001.

Vivia V. Gallimore
Notary Public

Notarial Seal
Vivia V. Gallimore, Notary Public
Kennett Square Boro, Chester County
My Commission Expires Oct. 6, 2003
Member, Pennsylvania Association of Notaries

ENCLOSURE 1

TMI UNIT 1

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
LICENSE AMENDMENT REQUEST NO. 249
CONTAINMENT INTEGRITY DURING REFUELING OPERATIONS

1. **NRC Question**

Paragraph 2, Section II, Reason for Change, states that a footnote will be added to Technical Specification Sections 3.8.6 and 3.8.7 to identify the requirement for administrative controls associated with closure of the personnel and emergency air lock doors and other mechanical penetrations. The marked up TS submitted indicates that sections 3.8.6 and 3.8.7 will be changed by inserting different language. Please clarify whether current TS section 3.8.6 and 3.8.7 will be changed or will the current sections remain with a footnote that amplifies or places conditions on the current TS?

Response

The proposed change, as submitted in AmerGen letter to the NRC dated January 23, 2001, revises Technical Specification Section 3.8.6 to require that at least one door in each of the personnel and emergency air locks is capable of being closed; and revises Technical Specification Section 3.8.7 to require that other penetrations are capable of being closed by an isolation valve, blind flange, manual valve, or equivalent. These sections are also revised to include an asterisk in the stated requirement associated with the words "capable of being closed". The asterisk in Sections 3.8.6 and 3.8.7 is provided with a footnote at the bottom of the submitted markup of Technical Specification page 3-44. The proposed footnote is identified as "Insert A to Page 3-44" in the January 23, 2001 submittal markup Technical Specification pages. This footnote provides the commitment to administrative controls associated with closure of the airlock doors and other open penetrations.

2. **NRC Question**

Paragraph 2, Section II, Reason for Change, states that the existing TS requirements for containment purge and exhaust isolation valve closure are not affected by this proposed change. During refueling operations, if a fuel handling accident inside containment (FHAIC) were to occur, the containment purge and exhaust isolation valve must function properly to prevent/ mitigate the potential release of radioactivity to the environment. Provide the bases for the containment purge and exhaust isolation valve closure remaining the same under alternate source term methodology for the FHAIC?

Response

The FHAIC analysis assumes that all of the activity is immediately released from the damaged fuel into the surrounding water for decontamination and transport into the containment. The activity is assumed to mix with 100% of the containment volume to calculate a hypothetical maximum release rate (165,780 cfm) to remove 99.99% of the activity distributed in the containment volume. The volumetric release rate (cfm) is dependent on the duration of the release (2 hours) and the remaining fraction of activity in the containment volume (0.0001). In comparison, the flow rate through the purge and exhaust line is 14,000 cfm, which is much smaller than the assumed "leakage" through the open personnel hatch. The additional 14,000 cfm flow would not affect the total dose since 99.99% of the activity is assumed to be released to the environment linearly over a 2-hour period.

3. **NRC Question**

Paragraph 3, Section II, Reason for Change, states that TS section 3.8.7 is revised to provide equivalent isolation methods for other penetrations consistent with B&W Owners Group Standard Technical Specifications, Section 3.9.3.c.1, NUREG-1430, April 1995. This NUREG indicates that equivalent methods must be approved and may include use of a material that can provide a temporary, atmospheric pressure ventilation barrier for other containment penetrations during fuel movements. Provide clarification or explanation of your equivalent isolation methods?

Response

In the past TMI Unit 1 has employed gasketed swing-away blind flanges with internally fire foamed penetrations. The blind flanges are rated to the systems design pressure to which they are attached (typically 150 pound or greater). The purpose of the foam is to maintain a leak-tight seal around the temporary hoses, cables, etc., maintain separation between radiological/non-radiological areas, and maintain fire area separation during cold shut-down conditions. In the event that timely containment closure is required, the fire foamed penetration alone would provide this function. An internal engineering change request is written to evaluate any equivalent method selected, and would be the basis for any procedure change(s) addressing same.

4. **NRC Question**

Paragraph 4, Section II, Reason for Change, states that TS Section 3.8.11 is added to specify the requirement to maintain at least 23 feet of water over top of the reactor vessel flange and the actions required if this level is not maintained. What are the associated surveillance requirements for this TS addition? If there are no surveillance requirements provide the bases for not including a surveillance to ensure proper water level is being maintained.

Response

TMI Unit 1 Surveillance Procedure 1301-1, "Shift and Daily Checks," will be revised to require that on a shiftly basis, when moving irradiated fuel, that the Fuel Transfer Canal level is > 23 feet above the reactor vessel flange. This procedure will further be revised to reference Technical Specification 3.8.11, and indicate that the shiftly check is to ensure compliance with Technical Specification 3.8.11.

In addition, the TMI Unit 1 Fuel & Control Component Shuffles Refueling Procedure 1505-1 will require daily verification that water level is > 23 feet above the reactor vessel flange.

5. **NRC Question**

The proposed amendment, if approved, would allow both doors of the containment personnel airlock (PAL) to be open during fuel movement and core alterations. Please provide an explanation to the following:

- How will the appropriate personnel be aware of the OPEN status of the containment during core alterations and fuel handling,

- How or by what methods (e.g., automatic or manual, and if manual will training be provided to responsible personnel) will rapid closure of the air lock be completed considering the need for disconnect and removal capability for hoses, cables, ramps, and door seal protective covers? How long will it take to close each one door of the PALs to isolate containment to include the equipment hatch? In order to maintain this prompt closure time, what procedures or practices will be implemented?

- Ensure that an individual is designated and readily available to close the airlock following the evacuation that would occur in the event of an accident.

Response

During times when "Containment Integrity" (as defined by Technical Specification 1.7) is not required, an alternate administrative process (Enclosure 4 of Procedure 1101-3) is used to track the status of all containment penetrations. The process is used to authorize work on any penetration. The process requires that a means to isolate the penetration be maintained. The log provides a current list of penetrations, which would need to be isolated if an event occurred where reactor isolation was desired.

The TMI Unit 1 Fuel & Control Component Shuffles Refueling Procedure 1505-1 Data Sheet 4, currently requires review of the "Low Pressure Containment Boundary Closure Device Status" log (Enclosure 4 of Operating Procedure 1101-3, "Containment Integrity & Access Limits", located in the primary and secondary system log) and ensures that none of the containment penetrations associated with process lines have been altered such that they provide direct access from the containment atmosphere to the outside atmosphere. Procedure 1505-1 would be revised to reflect the proposed Technical Specification change, and ensure continued awareness by the Shift Operating/Refueling crews.

In addition, TMI Unit 1 Surveillance Procedure 1301-1 Data Sheet 3, "Checks Applicable at Cold Shutdown & Refueling Shutdown," Section C.4, requires shiftly checks to review the same Enclosure 4 of Operating Procedure 1101-3 to confirm that containment closure is available for all penetrations.

The airlock doors are closed manually. This task is performed by qualified operators.

The airlocks do not typically have hoses, cables, ramps, or seal protective covers installed during refuel outages. Hoses and cables are typically routed through available containment penetrations. However, should hoses, cables, ramps, seal protective covers, or other items be installed through the airlock doors during refuel outages, administrative controls will require that qualified personnel be designated, that required tools or equipment be identified and staged, and that the required guidance be provided on how to achieve containment closure within one hour.

The equipment hatch airlock is equipped with a monorail which is installed each outage. In past refueling outages the work force has been tasked with this area of responsibility, placed on stand-by, and ready to respond should quick disassembly of the monorail be required. The monorail is designed to be quickly disconnected to support closure of at least one airlock door within one hour with a trained and dedicated work force on stand-by. The personnel hatch monorail is rarely used and is compact, and readily removable.

The Containment Integrity and Access Limits Procedure 1101-3 which contains the "Low Pressure Containment Boundary Closure Device Status" log (Enclosure 4 of Operating Procedure 1101-3, located in the primary and secondary system log) would be revised to provide the necessary administrative controls to ensure that prompt closure would be implemented.

6. **NRC Question**

The licensee in its submittal has not addressed the ability to monitor possible radioactive releases. How will compliance with 10 CFR 50, Appendix A, General Design Criteria 64, be met as it relates to the monitoring of effluents from the open PAL doors or any other penetrations (e.g., equipment hatch)?

Response

When the airlock doors or other penetrations are open, the reactor building purge system will be in operation. The purge system maintains the reactor building under negative pressure so that any leakage through the open airlock doors or any other penetrations is from the environment into the reactor building. As a result, effluents are released via the normal purge exhaust system and are quantified in accordance with effluent control procedure 6610-ADM-4250.12, "Releasing Radioactive Gaseous Effluents - Reactor Building Purges".

Should the purge system become inoperable when the airlock doors or other penetrations are open, samples are collected via installed and portable air samplers located in the reactor building. The results of these samples, along with conservative estimates of air flow out of the building, would be used to quantify effluent releases in accordance with TMI Unit 1 effluent control procedure 6610-ADM-4250.07, "Non-Routine Effluent Releases".

TMI Unit 1 Operating Procedure 1101-3, "Containment Integrity and Access Limits," will be revised to provide for the placement of continuously operated particulate and radioiodine air sampling equipment inboard open airlocks during core alteration and fuel handling activities. The collection media will be analyzed for radioactivity daily or more frequently as needed. This data will support environmental release determinations in the event that an open airlock becomes a release pathway.

It should be noted that the proposed change does not include the TMI Unit 1 equipment hatch outer barrel enclosure.

ENCLOSURE 2

SUMMARY OF REGULATORY COMMITMENTS

The following table summarizes those regulatory commitments established in this document. Any other actions discussed in the submittal represent intended or planned actions by AmerGen. They are described to the NRC for the NRC's information and are not regulatory commitments.

COMMITMENT	COMMITTED DATE OR "OUTAGE"
1. TMI Unit 1 Surveillance Procedure 1301-1, "Shift and Daily Checks," will be revised to require that on a shiftly basis, when moving irradiated fuel, that the Fuel Transfer Canal level is > 23 feet above the reactor vessel flange. This procedure will be revised to reference Technical Specification 3.8.11, and indicate that the shiftly check is to ensure compliance with Technical Specification 3.8.11.	1R14
2. TMI Unit 1 Fuel and Control Component Shuffles Refueling Procedure 1505-1 will require daily verification that water level is > 23 feet above the reactor vessel flange.	1R14
3. TMI Unit 1 Procedure 1505-1 will be revised to reflect the proposed Technical Specification change, and ensure continued awareness by the Shift Operating/Refueling crews.	1R14
4. Should hoses, cables, ramps, seal protective covers, or other items be installed through the hatches during refuel outages, administrative controls will require that qualified personnel be designated, that required tools or equipment be identified and staged, and that the required guidance be provided on how to achieve containment closure within one hour. Operating Procedure 1101-3, "Containment Integrity and Access Limits will be revised to provide the necessary administrative controls to ensure prompt closure would be implemented.	1R14

COMMITMENT	COMMITTED DATE OR "OUTAGE"
5. Operating Procedure 1101-3, "Containment Integrity and Access Limits" will be revised to provide for the placement of continuously operated particulate and radioiodine air sampling equipment inboard open airlocks during core alteration and fuel handling activities.	1R14