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10 CFR 50.67
10 CFR 50.90

January 29, 2001

5928-00-20398

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
LICENSE AMENDMENT REQUEST No. 290 - ENGINEERED SAFEGUARDS FEATURE (ESF) SYSTEMS LEAKAGE AND CONTROL ROOM HABITABILITY

Dear Sir or Madam:

In accordance with 10 CFR 50.4(b)(1), enclosed is License Amendment Request No. 290.

The purpose of this License Amendment Request (LAR) is to revise TMI Unit 1 Technical Specification Section 4.5.4.1 to remove the existing note that restricts the applicability of the specified Engineered Safeguards Feature (ESF) Systems leakage rate limit of 15 gallons per hour to the current operating Cycle 13 and establish this value as the permanent Technical Specification limit. This restriction was imposed in Amendment No. 215, dated August 24, 1999, due to NRC generic control room habitability issues being resolved at that time. The NRC required in the Amendment No. 215 transmittal letter of August 24, 1999, that TMI Unit 1 resubmit a license amendment request along with the supporting control room habitability dose evaluation based on NRC staff's generic resolution of control room habitability concerns at least six (6) months prior to the end of Cycle 13. This License Amendment Request provides the supporting control room habitability dose evaluation to address the generic issue of unfiltered inleakage into the control room.

Since final guidance for resolution of the generic control room habitability concerns has not been issued, TMI Unit 1 has conservatively addressed the issue of unfiltered inleakage in the enclosed dose analysis in a manner consistent with the draft NEI guidance proposed in NEI 99-03 (Draft),

A003

"Control Room Habitability Assessment Guidance," October 2000. This approach was presented to NRC staff in a meeting held on November 21, 2000. TMI Unit 1 will address resolution of other non-dose related generic control room habitability issues on a schedule commensurate with completion of final NEI/NRC guidance.

This License Amendment Request also requests full scope implementation of an alternative source term for TMI Unit 1 in accordance with 10 CFR 50.67. The proposed change is based on the results of revised offsite and control room operator dose calculations for the limiting TMI Unit 1 design basis Maximum Hypothetical Accident (MHA) using an alternative source term. The revised dose calculations are performed in accordance with the guidance provided in Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors." The TMI Unit 1 Updated Final Safety Analysis Report will be updated to reflect the enclosed reanalysis upon NRC approval.

Using the standards in the 10 CFR 50.92, AmerGen Energy Company, LLC (AmerGen) has concluded that these proposed changes do not constitute a significant hazards consideration, as described in the enclosed analysis performed in accordance with 10 CFR 50.91(a)(1). Pursuant to 10 CFR 50.91(b)(1), a copy of this License Amendment Request is provided to the designated official of the Commonwealth of Pennsylvania, Bureau of Radiation Protection, as well as the chief executives of the township and county in which the facility is located.

Approval of this license amendment is requested by August 1, 2001, to support preparation for TMI Unit 1 Cycle 14 startup approximately October 1, 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) TMI Unit 1 License Amendment Request No. 290
Safety Evaluation and No Significant Hazards Consideration
(2) Affected TMI Unit 1 Technical Specification Pages

cc: USNRC Regional Administrator, Region I
USNRC TMI Unit 1 Senior Project Manager
USNRC TMI Senior Resident Inspector
D. Allard, Director, Bureau of Radiation Protection -
PA Department of Environmental Resources
Chairman, Board of County Commissioners of Dauphin County
Chairman, Board of Supervisors of Londonderry Township
File No. 98159

AMERGEN ENERGY COMPANY, LLC

THREE MILE ISLAND STATION, UNIT 1

Operating License No. DPR-50
Docket No. 50-289
License Amendment Request No. 290

COMMONWEALTH OF PENNSYLVANIA	)	
	)	SS:
COUNTY OF DAUPHIN	)	

This License Amendment Request is submitted in support of Licensee's request to change the Technical Specifications for Three Mile Island Station, Unit 1. As a part of this request, proposed marked up pages for the TMI Unit 1 Technical Specifications are also included. 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: [signature]
Vice President, TMI Unit 1

Sworn and Subscribed to before me

this 29th day of January 2001.

[signature]
Notary Public

Notarial Seal
Suzanne C. Miklosik, Notary Public
Londonderry Twp., Dauphin County
My Commission Expires Nov. 22, 2003

Member, Pennsylvania Association of Notaries

ENCLOSURE 1

TMI Unit 1 License Amendment Request No. 290

Safety Evaluation and No Significant Hazards Consideration

I. License Amendment Request No. 290

AmerGen Energy Company, LLC (AmerGen) requests that the following changed replacement page be inserted into the existing Technical Specification:

Revised Technical Specification page: 4-45

A marked up page showing the requested change is provided in Enclosure 2.

II. Reason for Change

The purpose of this License Amendment Request is to revise the TMI Unit 1 Technical Specification Section 4.5.4.1 to remove the existing note that restricts applicability of the specified allowable Engineered Safeguards Feature (ESF) Systems leakage rate limit of 15 gallons per hour to the current operating Cycle 13 and establish this value as the permanent Technical Specification limit. This allowable leak rate limit applies to portions of the ESF Systems located outside containment. The Cycle 13 restriction was imposed in TMI Unit 1 Amendment No. 215, dated August 24, 1999, due to NRC generic control room habitability issues being resolved at that time. The NRC required in the Amendment No. 215 transmittal letter of August 24, 1999, that TMI Unit 1 resubmit a license amendment request along with the supporting control room habitability dose evaluation based on NRC staff's generic resolution of control room habitability concerns at least six (6) months prior to the end of the current operating Cycle 13. This License Amendment Request provides the supporting control room habitability dose evaluation, using an alternative source term in accordance with 10 CFR 50.67, to address the generic issue of unfiltered inleakage into the control room. Technical Specification Section 4.5.4 Bases is also revised to identify 10 CFR 50.67 as the source of the dose acceptance criteria in lieu of 10 CFR Part 100, as a result of implementation of the alternative source term.

This License Amendment Request also requests full scope implementation of an alternative source term for TMI Unit 1 in accordance with 10 CFR 50.67. The proposed change is based on the results of revised offsite and control room operator dose calculations for the limiting TMI Unit 1 design basis Maximum Hypothetical Accident (MHA) using an alternative source term. The revised dose calculations are performed in accordance with the guidance provided in Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," July 2000. In accordance with Regulatory Guide 1.183, Position 1.2.1, reanalysis of the most limiting design basis accident LOCA in accordance with Regulatory Guide 1.183 constitutes a full scope application of alternative source term methodology.

Since final guidance for resolution on the generic control room habitability concerns has not been issued, TMI Unit 1 has conservatively addressed the issue of unfiltered inleakage in the enclosed dose analysis in a manner consistent with the draft NEI guidance proposed in NEI 99-03 (Draft), "Control Room Habitability Assessment Guidance," October 2000.

III. Safety Evaluation Justifying Change

The TMI Unit 1 design basis Maximum Hypothetical Accident (MHA) currently described in the TMI Unit 1 Updated Final Safety Analysis Report (UFSAR) Section 14.2.2.5, represents the limiting calculated design basis accident dose consequences for TMI Unit 1. This is evident upon examination of the total curies of activity released for each accident analyzed in the UFSAR as compared to that of the LOCA. The total amounts of curies released during a LOCA are significantly higher than all other accidents. The MSLB accident, the accident closest in severity to the LOCA, releases approximately 55% of the total activity of a LOCA and results in less control room and offsite dose. This coupled with the fact that the atmospheric dispersion factors (X/Qs) for other accident situations are the same or less, results in control room and offsite doses that are much less than for a LOCA or MSLB. The X/Qs for the FHA in the Fuel Handling Building and Waste Gas Decay Tank Rupture (WGDTR) accident are higher than the LOCA and MSLB by factors of 1.05 and 1.8, respectively. However, the total curies released in these accidents are much less as compared to a LOCA. Therefore, it can be concluded that the LOCA is the limiting accident for control room and offsite doses. The TMI Unit 1 MHA has been reanalyzed using Alternative Source Term (AST) methodology in accordance with NRC Regulatory Guide 1.183, "Alternative Radiological Source Terms For Evaluating Design Basis Accidents At Nuclear Power Reactors," July 2000. This analysis is documented in AmerGen Calculation No. C-1101-900-E000-082. Revised dose consequences are evaluated for the TMI Unit 1 Exclusion Area Boundary (EAB), Low Population Zone (LPZ), and Control Room using the NRC approved RADTRAD 3.02 computer code and Total Effective Dose Equivalent (TEDE) dose methodology.

Some characteristics of the AST (different in magnitude, timing and chemical forms) and the revised dose calculation methodology are incompatible with many of the analysis assumptions and methods currently used in the TMI Unit 1 licensing basis analysis. Therefore, the existing design input parameters and assumptions were assessed to ensure compatibility for the AST and the integrated radiological response of the plant. These assumptions are discussed below.

The following existing licensing basis post-LOCA release paths are analyzed for this event.

1. Containment Leakage

2. ESF Leakage

3. Borated Water Storage Tank (BWST) Leakage

4. Post-LOCA Containment Purge

The above release paths were analyzed with the following assumptions to incorporate additional conservatisms in the AST analysis:

1. Reactor building purge isolation time is assumed to be 60 seconds. This is significantly greater than the current licensing basis which assumes purge valve isolation in 5.0 seconds in accordance with existing design capabilities of the valves. The activity assumed in the reactor building for release through the purge line is based on a reactor coolant system (RCS) Dose Equivalent I-131 (DEI) activity of 1.0 µCi/gm. This is conservative since the TMI Unit 1 Technical Specification Section 3.1.4 limits RCS activity to 0.35 µCi/gm (DEI) during plant operation. The reactor building purge activity is assumed to be released directly to the environment with no credit for filtration. TMI Unit 1 Technical Specification Section 3.15.2 currently requires testing of HEPA filters and charcoal filters.

2. The control room emergency ventilation system is assumed to be manually initiated at 30 minutes after the LOCA event. This is conservative since the actions necessary to accomplish this are located within the Main Control Room on the H&V Panel. The control room emergency ventilation system recirculation carbon adsorber filter efficiencies are assumed to be 90% in the MHA analysis. TMI Unit 1 Technical Specification Section 3.15.1 requires testing to 95% efficiency. Control Building Envelope (CBE) unfiltered inleakage is assumed to be 1,000 cfm which represents a factor of approximately three (3) over the TMI Unit 1 control building ventilation system tracer gas test results, performed in August 2000.

Summary of Analysis

The assumptions utilized in evaluating the offsite and control room doses resulting from the postulated MHA LOCA are based on the guidance of Regulatory Guide 1.183, July 2000. The inventory of fission products in the reactor core and available for release to the containment is based on the maximum power level of 2619 MWt which is 1.02 times the current licensed rated thermal power of 2568 MWt. The TMI Unit 1 plant specific inventory used for the RADTRAD 3.02 input is shown on Table 1. The assumed core inventory release fractions, by radionuclide groups, for the gap release and early in-vessel damage states are listed in Table 2. Since the existing TMI Unit 1 design basis post-LOCA minimum sump pH is calculated to be greater than 8.0, the chemical form of radioiodine released into the containment is assumed to be 95% cesium iodide (CsI), 4.85% elemental iodine, and 0.15% organic iodide in accordance with Regulatory Guide 1.183, Appendix A.2. Also in accordance with Regulatory Guide 1.183, Appendix A.2, with the exception of elemental and organic iodine and noble gases, the remaining fission products are assumed to be in particulate form.

Containment Leakage and Post-LOCA Purge Pathways

In accordance with Regulatory Guide 1.183, Appendix A.3.1, the radioactivity released from the fuel is assumed to mix instantaneously and homogeneously throughout the free air volume of the containment as it is released. The distributions of activities are adjusted in the sprayed region (67%) and unsprayed region (33%) based on their respective volumes. The operation of one reactor building recirculation fan cooler provides a minimum air transfer rate of 25,000 cfm which provides mixing between the regions. The radioactivity release into the containment is assumed to terminate at the end of the early in-vessel phase, in accordance with Regulatory Guide 1.183, Appendix A.3.1, which is 1.8 hours after the onset of the LOCA. The total containment volume is 2,160, 000 ft^3. Therefore, the sprayed volume (67%) is 1,450,000 ft^3, and the unsprayed volume (33%) is 710, 000 ft^3. These volumes are consistent with the existing TMI Unit 1 licensing basis analysis values.

The TMI Unit 1 reactor building spray system includes two (2) spray pumps, and the reactor building emergency cooling system includes three (3) emergency fan cooler units. The iodine removal from the sprayed region is based on assuming two reactor building spray pumps and one reactor building recirculation fan cooler in operation. This is more conservative than assuming one reactor building spray pump and any feasible combinations of fan coolers because it initiates earlier leakage from ESF systems outside containment as a result of switchover from the Borated Water Storage Tank (BWST) to the containment sump recirculation mode. Reductions in airborne radioactivity in the containment sprayed region by containment spray systems and by natural deposition using "A Simplified Model of Aerosol Removal by Natural Processes in Reactor Containments," NUREG/CR-6189, July 1996, are credited in accordance with Regulatory Guide 1.183, Appendix A.3.2. The natural deposition model (Powers 95 Deposition Model) is incorporated into the RADTRAD code. This natural deposition model does not provide a starting time for the natural deposition phenomenon. Therefore, natural deposition is assumed to start at the onset of the accident along with the containment spray. The spray aerosol removal rate of 6.06 hr^{-1} is higher than the average aerosol natural deposition rate of less than 0.15 hr^{-1}. Therefore, the containment spray will dominate the removal of aerosols from the containment atmosphere during the spray operation time of 28.19 minutes when only gap activity (5% of core halogens and alkali metals) is released. Thus, initiation of natural deposition at the onset of the accident along with containment spray has an insignificant impact on the containment airborne aerosol activity. Reactor building spray is assumed to be initiated at 75 seconds after the onset of the LOCA and reactor building spray initiation signal. The assumed spray removal ratios based on the existing TMI Unit 1 design basis previously reviewed as part of TMI Unit 1 Amendment No. 215, dated August 24, 1999, are 10 hr^{-1} (elemental), 6.06 hr^{-1} (aerosol), and 0.0144 hr^{-1} (organic). Reduction in airborne radioactivity in the unsprayed region by natural deposition is also credited using the RADTRAD 3.02 Powers 95 Deposition Model for aerosols with a removal coefficient with 90 - percentile probability in accordance with Regulatory Guide 1.183, Appendix A.3.2.

The containment is assumed to leak at the design rate of 0.10% per day for the first 24 hours and reduced to 0.05% per day after the first 24 hours based on the existing TMI Unit 1 design basis and Regulatory Guide 1.183, Appendix A.3.7.

Release via the purge system prior to containment isolation is analyzed assuming a conservative isolation time of 60 seconds and a purge flow rate of 14,000 cfm for one minute. The purge release evaluation assumes that 100% of the radionuclide inventory in the RCS liquid is released to the containment at the initiation of the LOCA in accordance with Regulatory Guide 1.183, Appendix A.3.8. The RCS DEI inventory is based on a conservative value of 1.0 µCi/gm. This is conservative since the current Technical Specification limit on RCS activity is 0.35 µCi/gm dose equivalent iodine-131. The isotopic noble gas activity is conservatively based on the assumption of 1% failed fuel. No credit is assumed for the reactor building purge charcoal filters. The gap activity released during the 60 seconds of purge time is insignificant and, therefore, has not been analyzed.

ESF Leakage Pathway

In accordance with Regulatory Guide 1.183, Appendix A.5, the ESF systems that recirculate sump water outside of the primary containment are assumed to leak during their intended operation. This release source includes leakage through valve packing glands, pump shaft seals, flanged connections, and other similar components. The radiological consequences from the postulated leakage is analyzed and combined with consequences from other fission product release paths to determine the total calculated radiological consequences from the LOCA. The ESF components are located in the auxiliary building.

In accordance with Regulatory Guide 1.183, Appendix A.5.1, with the exception of noble gases, all the fission products released from the fuel to the containment are assumed to instantaneously and homogeneously mix in the primary containment sump water (54,519 ft^3) at the time of release from the core. The total ESF leakage from all components in the ESF recirculation systems is 15 gph based on TMI Unit 1 Technical Specification 4.5.4.1. This ESF leakage is doubled in accordance with Regulatory Guide 1.183, Appendix A.5.2, and assumed to start at 28.19 minutes after onset of a LOCA. This time reflects the point of switchover from the BWST to the containment sump recirculation mode of operation based on full capacity (two spray pump) operation of the reactor building spray system. Two spray pump operation maximizes reactor building spray flow and BWST drawdown, thus, providing the earliest point of switchover and resulting initiation of potential ESF System leakage. With the exception of iodine, all radioactive materials in the recirculating liquid are assumed to be retained in the liquid phase in accordance with Regulatory Guide 1.183, Appendix A.5.3.

Regulatory Guide 1.183, Appendix A.5.5, allows the use of iodine flashing factors less than 10% if justified based on the actual sump pH history and area ventilation rates. The following time-dependent ESF leakage iodine flashing factors for TMI Unit 1 have been calculated as described in the previously submitted (GPU Nuclear letter to the NRC dated October 6, 1998, 1920-98-20561) Proprietary POLESTAR Calculation No. PSAT 05656 A.04, Rev. 0, "Calculation of TMI-1 Engineered Safety Feature Component Leakage Iodine Release." These values were previously reviewed by NRC in response to TMI Unit 1 Technical Specification Change Request No. 274, dated February 2, 1999.

Time (Hrs)	Flashing Factor (%)
0 - 2	2.92
2 - 8	2.15
8 - 24	1.39
24 - 24.5	0.02
24.5 - 96	0.865
96 - 720	0.559

The radioiodine that is postulated to be available for release to the environment is assumed to be 97% elemental and 3% organic based on Regulatory Guide 1.183, Appendix A.5.6. Reduction in ESF leakage activity by dilution or holdup within buildings, or by ESF ventilation filtration systems is not credited. The ESF leakage is assumed to release directly to the environment.

<u>BWST Leakage Pathway</u>

The source term assumptions for the BWST leakage release model are the same as those used in the ESF leakage model described above, with the following exceptions:

1. The BWST leakage iodine flashing factor is assumed to be 10% in accordance with Regulatory Guide 1.183, Position A5.5.

2. The following post-LOCA BWST leak rates are used based on the existing TMI Unit 1 design basis. These values reflect ESF leakage through boundary valves to the BWST which is vented to the atmosphere. The 3 gpm value is based on the capability of leakage-detection tests and the remaining values are estimated. These values were previously reviewed and approved by NRC in Amendment No. 215, dated August 24, 1999:

Time (Hrs)	Leakage (gpm)	Leakage (cfm)
0 - 5	3	0.4012
5 - 24	1.7	0.2274
24 - 720	1.6	0.2140

3. The iodine from the BWST leakage is flashed in the BWST and released to the atmosphere from the BWST by natural displacement.

Control Room Model

The post-LOCA radioactive release pathways that contribute to the control room dose are containment leakage and purge release, ESF leakage, and BWST leakage. The activities from these sources are assumed to be released into the atmosphere and transported to the control room air intake, filtered by the control room emergency ventilation system HEPA and charcoal filters and distributed in the control building envelope. Additionally, 1,000 cfm of unfiltered inleakage to the control building envelope is postulated. Radioactive sources contributing to control room dose include airborne activity inside the control room, airborne cloud external to the control room, containment shine to the control room, and control room filter shine.

The control building envelope free air volume is approximately 250,000 ft^3. The following conservative control room emergency ventilation system flow rates have been established based on system testing in the emergency recirculation mode of operation:

Maximum Outside Air Intake for Pressurization	=	8,000 cfm
Control Building Envelope Minimum Filtered Recirculation	=	28,000 cfm
Control Building Envelope Unfiltered Inleakage	=	1,000 cfm

The control room emergency filtration system including the charcoal and HEPA filters are credited with 90% and 99% efficiency, respectively. These efficiencies are bounded by the existing TMI Unit 1 Technical Specification Section 3.15 requirements. The control building envelope is automatically isolated from the first floor of the control building on an engineered safeguards signal and the normally operating ventilation fans also are tripped. The emergency ventilation system is conservatively assumed to be manually initiated 30 minutes after the postulated LOCA occurs. This is conservative since the actions necessary to accomplish this are located within the Main Control Room on the H&V Panel. During the initial 30 minutes, a total of 5,000 cfm unfiltered air flow is assumed into the control building envelope. This represents the 1,000 cfm control building envelope unfiltered inleakage throughout the accident plus an additional 4,000 cfm which is one-half of the maximum outside air intake flow. The control building envelope unfiltered inleakage rate of 1,000 cfm represents a factor of approximately three (3) over the TMI Unit 1 tracer gas test results described below.

TMI Unit 1 control room envelope tracer gas testing was performed in August 2000 to establish a measured unfiltered inleakage rate. This testing was performed in accordance with ASTM E741-93 with the ventilation system in the emergency lineup configuration. Unfiltered inleakage flow rates were determined to be 233 ±129 scfm for the "A" ventilation train and 189 ± 103 scfm for the "B" ventilation train. Tracer gas methods also quantified the maximum outside air supply flowrate. Consistent with the existing TMI Unit 1 licensing basis, this testing also confirmed that all rooms inside the control building envelope were at a positive pressure relative to adjacent areas outside the envelope, and the main control room was maintained at a positive pressure of at least 0.1 inches w.g. with respect to adjacent areas of the control building envelope. These test results verify that the control building envelope is being adequately maintained, and that the proposed analysis conservatively bounds measured unfiltered inleakage into the control room. Additionally, TMI Unit 1 has performed system modifications to eliminate single active failure modes in the control building ventilation dampers that contributed to unfiltered inleakage into the control building envelope. These modifications have improved system reliability and increased system leak tightness which have enhanced overall control room habitability performance. The tracer gas test included the ventilation equipment rooms in the control building envelope via temporary modifications. Permanent modifications will be completed prior to the start of the 14R outage to make these rooms a permanent part of the control building envelope.

Atmospheric Dispersion Coefficients

Atmospheric dispersion coefficients (X/Q) utilized for Exclusion Area Boundary (EAB), Low Population Zone (LPZ), and control room operator dose are identical with the existing UFSAR accident analysis values previously approved by NRC in TMI Unit 1 Amendment No. 210, dated April 15, 1999, and Amendment No. 215, dated August 24, 1999. The X/Q's for the control room were developed using the methodology of the NRC computer code ARCON96, as previously approved by NRC in TMI Unit 1 Amendment No. 215, dated August 24, 1999. It should be noted that the containment to ventilation exhaust pathway, previously analyzed for Amendment No. 215, no longer exists since the potential leak path has been permanently isolated. Control room dose analysis input values are shown on Table 3 and site boundary analysis input values are shown on Table 4.

Radiological Dose Consequences

The results of the revised TMI Unit 1 post-LOCA MHA EAB, LPZ and Control Room operator dose analysis based on application of the alternative source term methodology in accordance with Regulatory Guide 1.183 are tabulated below. These doses remain within the allowable dose criteria as specified in 10 CFR 50.67 and Regulatory Guide 1.183.

Post-LOCA Activity Release Pathway	**Post-LOCA TEDE Dose (Rem) Receptor Location**		
	Control Room	**EAB**	**LPZ**
Containment Leakage	1.6149E+00	2.4009E+01	1.3757E+01
ESF Leakage	1.4549E+00	8.2731E-01	7.5068E-01
BWST Leakage	4.5060E-02	5.5973E-04	4.7894E-02
Containment Purge	4.2695E-03	2.6571E-02	4.6500E-03
Containment Shine	0.0000E+00	0.0000E+00	0.0000E+00
External Cloud	0.0000E+00	0.0000E+00	0.0000E+00
CR Filter Shine	1.8362E-02	0.0000E+00	0.0000E+00
Total	**3.1375E+00**	**2.4863E+01**	**1.4560E+01**
Allowable TEDE Limit 10 CFR 50.67 and R.G. 1.183, Table 6	**5.00E+00**	**2.50E+01**	**2.50E+01**

Equipment Qualification (EQ)

In accordance with Regulatory Guide 1.183, Section 6, (Assumptions For Evaluating The Radiation Doses For Equipment Qualification), the NRC staff is assessing the effect of increased cesium releases on EQ doses to determine whether licensee action is warranted. Until such time as this generic issue is resolved, licensees may use either the AST or the TID-14844 assumptions for performing the required EQ analyses. However, no plant modifications are required to address the impact of the difference in source term characteristics (i.e., AST vs TID-14844) on EQ doses pending the outcome of the evaluation of the generic issue.

Therefore, no further evaluation, other than reviewing current EQ status, has been taken. Equipment important to safety remains unaffected by the implementation of AST.

IV. Environmental Consideration

10 CFR 51.22(c)(9) provides criteria for and identification of licensing and regulatory actions eligible for categorical exclusion from performing an environmental assessment. A proposed amendment to an operating license for a facility requires no environmental assessment if operation of the facility in accordance with the proposed amendment would

not: (1) involve a significant hazards consideration, (2) result in a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (3) result in a significant increase in individual or cumulative occupational radiation exposure.

AmerGen has reviewed this license amendment and has determined that it meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(c), no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of the proposed license amendment. The basis for this determination is as follows:

1. The proposed license amendment does not involve a significant hazards consideration as described in Item V of this evaluation.

2. As discussed in the no significant hazards evaluation, the changes proposed by this amendment do not result in a significant change or significant increase in the offsite dose consequences for the TMI Unit 1 limiting design basis Maximum Hypothetical Accident (MHA). Approval of an alternative source term for TMI Unit 1 establishes a new licensing and design basis for assessment of accident consequences. It does not change actual accident sequences or progressions; only the regulatory assumptions regarding accidents will be affected. The allowable ESF leak rate limit utilized in the MHA analysis is consistent with current Technical Specification limits. Therefore, the proposed amendment will not result in a significant change in the types or increase in the amounts of any effluents that may be released offsite.

3. As discussed in the no significant hazards evaluation, the changes proposed by this amendment do not result in a significant increase in control room operator dose during the limiting design basis MHA. In addition, the proposed changes do not require operator or other actions that could increase occupational radiation exposure. Therefore, the proposed amendment will not result in a significant increase in individual or cumulative occupational radiation exposure.

V. <u>No Significant Hazards Consideration</u>

AmerGen has determined that this License Amendment Request poses no significant hazards considerations as defined by 10 CFR 50.92.

1. Operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed permanent Technical Specification limit on ESF Systems leak rate is identical with the existing licensing basis value and is conservatively reevaluated for the limiting design basis Maximum Hypothetical Accident (MHA) using alternative source term methodology. Implementation of the alternative source term in accordance with Regulatory Guide 1.183 does not affect the design or operation of the facility, and therefore, does not significantly increase the probability of an accident previously evaluated. Based on the results of this reanalysis, it has been demonstrated that with the requested Technical Specification change, the offsite and control room dose consequences for this limiting event remain within the allowable dose criteria specified in 10 CFR 50.67 and Regulatory Guide 1.183.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Operation of the facility in accordance with the proposed amendment would not create the possibility of a new or different kind of accident from any accident previously evaluated.

   The proposed permanent Technical Specification limit on ESF leak rate and implementation of the alternative source term in accordance with Regulatory Guide 1.183 does not affect the design, functional performance, or operation of the facility or of any equipment within the facility. Modifications supporting the proposed change have been evaluated and determined not to create the possibility of a new or different kind of accident from any accident previously evaluated.

   Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Operation of the facility in accordance with the proposed amendment would not involve a significant reduction in a margin of safety.

   The proposed change involves implementation of the alternative source term in accordance with 10 CFR 50.67 and Regulatory Guide 1.183, and maintains the current Technical Specification limit on ESF Systems leak rate. The reanalysis of the limiting design basis MHA has been performed using conservative methodologies as specified in Regulatory Guide 1.183. Margin has been maintained to ensure that the accident analysis dose consequences bound the postulated event scenarios. The calculated offsite and control room dose consequences for this limiting event are within the acceptance criteria as specified in 10 CFR 50.67 and Regulatory Guide 1.183.

   Therefore, the proposed change does not involve a significant reduction in a margin of safety.

VI. Implementation

AmerGen requests that the amendment authorizing this change become effective upon issuance and implemented within 30 days.

TABLE 1

TMI Unit 1 Plant Specific Nuclide Inventory

File For RADTRAD 3.02 Input

Isotope	Core Isotopic Activity (Ci) A	Core Thermal Power (MWt) B	Core Activity Ci/MWt A/B	Isotope	Core Isotopic Activity (Ci) A	Core Thermal Power (MWt) B	Core Activity Ci/MWt A/B
CO-58	6.69E+05	2619	.2553E+03	TE-131M	1.02E+07	2619	.3898E+04
CO-60	5.11E+05	2619	.1953E+03	TE-132	1.02E+08	2619	.3885E+05
KR-85	1.05E+06	2619	.3991E+03	I-131	7.15E+07	2619	.2729E+05
KR-85M	2.33E+07	2619	.8889E+04	I-132	1.03E+08	2619	.3944E+05
RB-86	1.64E+05	2619	.6270E+02	I-133	1.50E+08	2619	.5708E+05
KR-87	4.60E+07	2619	.1755E+05	I-134	1.66E+08	2619	.6346E+05
KR-88	6.48E+07	2619	.2475E+05	I-135	1.39E+08	2619	.5323E+05
SR-89	7.84E+07	2619	.2992E+05	XE-133	1.50E+08	2619	.5708E+05
SR-90	8.45E+06	2619	.3227E+04	XE-135	5.51E+07	2619	.2103E+05
SR-91	1.07E+08	2619	.4068E+05	CS-134	1.71E+07	2619	.6539E+04
SR-92	1.12E+08	2619	.4276E+05	CS-136	4.74E+06	2619	.1808E+04
Y-90	8.72E+06	2619	.3330E+04	CS-137	1.15E+07	2619	.4381E+04
Y-91	9.59E+07	2619	.3662E+05	BA-139	1.38E+08	2619	.5259E+05
Y-92	1.12E+08	2619	.4288E+05	BA-140	1.33E+08	2619	.5070E+05
Y-93	1.25E+08	2619	.4778E+05	LA-140	1.35E+08	2619	.5143E+05
ZR-95	1.24E+08	2619	.4717E+05	LA-141	1.26E+08	2619	.4798E+05
ZR-97	1.26E+08	2619	.4814E+05	LA-142	1.23E+08	2619	.4705E+05
NB-95	1.24E+08	2619	.4754E+05	CE-141	1.22E+08	2619	.4645E+05
MO-99	1.36E+08	2619	.5183E+05	CE-143	1.21E+08	2619	.4617E+05
TC-99M	1.19E+08	2619	.4537E+05	CE-144	9.80E+07	2619	.3741E+05
RU-103	1.09E+08	2619	.4168E+05	PR-143	1.19E+08	2619	.4537E+05
RU-105	7.27E+07	2619	.2777E+05	ND-147	4.97E+07	2619	.1897E+05
RU-106	4.11E+07	2619	.1570E+05	NP-239	1.35E+09	2619	.5139E+06
RH-105	6.86E+07	2619	.2621E+05	PU-238	3.86E+05	2619	.1475E+03
SB-127	7.48E+06	2619	.2854E+04	PU-239	3.01E+04	2619	.1148E+02
SB-129	2.26E+07	2619	.8625E+04	PU-240	3.24E+04	2619	.1238E+02
TE-127	7.41E+06	2619	.2831E+04	PU-241	1.34E+07	2619	.5127E+04
TE-127M	9.94E+05	2619	.3797E+03	AM-241	2.06E+04	2619	.7883E+01
TE-129	2.22E+07	2619	.8492E+04	CM-242	4.85E+06	2619	.1853E+04
TE-129M	3.33E+06	2619	.1271E+04	CM-244	3.93E+05	2619	.1499E+03

TABLE 2

PWR Core Inventory Fraction Released Into Containment

Group	**Gap Release Phase**	**Early In-Vessel Release Phase**
Timing (Hrs)	**30 Sec - 0.50 Hr**	**0.50 - 1.80 Hr**
Noble Gases	0.05	0.95
Halogens	0.05	0.35
Alkali Metals	0.05	0.25
Tellurium Metals	0.00	0.05
Ba, Sr	0.00	0.02
Noble Metals	0.00	0.0025
Cerium Group	0.00	0.0005
Lanthanides	0.00	0.0002

TABLE 3

Control Room Model Parameters

Control Room X/Qs for Containment Leakage	
Time	X/Q (sec/m^3)
0-2	3.40E-04
2-8	2.25E-04
8-24	1.02E-04
24-96	7.16E-05
96-720	4.99E-05
Control Room X/Qs For ESF Leakage	
Time	X/Q (sec/m^3)
0-2	3.02E-03
2-8	2.08E-03
8-24	1.02E-03
24-96	6.63E-04
96-720	4.37E-04
Control Room X/Qs For BWST Leakage	
Time	X/Q (sec/m^3)
0-2	8.45E-04
2-8	5.23E-04
8-24	2.49E-04
24-96	1.77E-04
96-720	1.19E-04
Control Room Occupancy Factors	
Time (Hr)	%
0-24	100
24-96	60
96-720	40
Control Room Operator Breathing Rate	3.50E-04 (m^3/sec)

TABLE 4

Site Boundary Release Model Parameters

EAB X/Q (0-2 Hrs)	8.0E-04 sec/m^3
LPZ X/Qs (0-720 Hrs)	
Time	X/Q (sec/m^3)
0-2	1.4E-04
2-8	6.0E-05
8-24	3.9E-05
24-96	1.6E-05
96-720	4.0E-06
Offsite Breathing Rate	
Time	(m^3/sec)
0-8	3.5E-04
8-24	1.8E-04
24-720	2.3E-04

ENCLOSURE 2

Affected TMI Unit 1 Technical Specification Pages

4.5.4 ENGINEERED SAFEGUARDS FEATURE (ESF) SYSTEMS LEAKAGE

Applicability
Applies to those portions of the Decay Heat, Building Spray, and Make-Up Systems, which are required to contain post accident sump recirculation fluid, when these systems are required to be operable in accordance with Technical Specification 3.3.

Objective
To maintain a low leakage rate from the ESF systems in order to prevent significant off-site exposures and dose consequences.

Specification

4.5.4.1 The total maximum allowable leakage into the Auxiliary Building from the applicable portions of the Decay Heat, Building Spray and Make-Up System components as measured during refueling interval tests in Specification 4.5.4.2 shall not exceed 15 gallons per hour.~~*~~

4.5.4.2 Once each refueling interval the following tests of the applicable portions of the Decay Heat Removal, Building Spray and Make-Up Systems shall be conducted to determine leakage:

a. The applicable portion of the Decay Heat Removal System that is outside containment shall be leak tested with the Decay Heat pump operating, except as specified in "b".

b. Piping from the Reactor Building Sump to the Building Spray pump and Decay Heat Removal System pump suction isolation valves shall be pressure tested at no less than 55 psig.

c. The applicable portion of the Building Spray system that is outside containment shall be leak tested with the Building Spray pumps operating and BS-V-1A/B closed, except as specified in "b" above.

d. The applicable portion of the Make-Up system on the suction side of the Make-Up pumps shall be leak tested with a Decay Heat pump operating and DH-V-7A/B open.

e. The applicable portion of the Make-Up system from the Make-Up pumps to the containment boundary valves (MU-V-16A/D, 18, and 20) shall be leak tested with a Make-Up pump operating.

f. Visual inspection shall be made for leakage from components of these systems. Leakage shall be measured by collection and weighing or by another equivalent method.

~~*NOTE: This leak rate limit is only applicable for the Cycle 13 operating cycle.~~

Bases
The leakage rate limit of 15 gph (measured in standard room temperature gallons) for the accident recirculation portions of the Decay Heat Removal (DHR), Building Spray (BS), and Make-Up (MU) systems is based on ensuring that potential leakage after a loss-of-coolant accident will not result in off-site dose consequences in excess of those calculated to comply with the 10 CFR ~~100~~ 50.67 limits (Reference 1 and 2). The test methods prescribed in 4.5.4.2 above for the applicable portions of the DH, BS and MU systems ensure that the testing results account for the highest pressure within that system during the sump recirculation phase of a design basis accident.

References
(1) UFSAR, Section 6.4.4 - "Design Basis Leakage:" and, Table 6.4-3 - "Leakage Quantities to the Auxiliary Building"
(2) UFSAR, Section 14.2.2.5(d) - "Effects of Engineered Safeguards Leakage During Maximum Hypothetical Accident"