

March 9, 2001

Mr. Mark E. Warner  
Vice President - TMI Unit 1  
AmerGen Energy Company, LLC  
P.O. Box 480  
Middletown, PA 17057

SUBJECT: TMI-1 - AMENDMENT RE: REVISED STEAM GENERATOR TUBE FAILURE  
ACCIDENT ANALYSIS DOSE CONSEQUENCE (TAC NO. MA9774)

Dear Mr. Warner:

The Commission has issued the enclosed Amendment No. 230 to Facility Operating License No. DPR-50 for the Three Mile Island Nuclear Station, Unit 1 (TMI-1), in response to your application dated August 9, 2000, as supplemented February 22, 2001.

The amendment approves a revision to the Updated Final Safety Analysis Report (UFSAR) to reflect a revised steam generator tube failure accident analysis which includes the dose resulting from the postulated post-accident steam release through the main steam safety valves. The existing radiological dose calculations described in the UFSAR do not account for this release.

A copy of the related safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

Timothy G. Colburn, Senior Project Manager, Section 1  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosures: 1. Amendment No. 230 to DPR-50  
2. Safety Evaluation

cc w/encls: See next page

Mr. Mark E. Warner  
Vice President - TMI Unit 1  
AmerGen Energy Company, LLC  
P.O. Box 480  
Middletown, PA 17057

March 9, 2001

SUBJECT: TMI-1 - AMENDMENT RE: REVISED STEAM GENERATOR TUBE FAILURE  
ACCIDENT ANALYSIS DOSE CONSEQUENCE (TAC NO. MA9774)

Dear Mr. Warner:

The Commission has issued the enclosed Amendment No. 230 to Facility Operating License No. DPR-50 for the Three Mile Island Nuclear Station, Unit 1 (TMI-1), in response to your application dated August 9, 2000, as supplemented February 22, 2001.

The amendment approves a revision to the Updated Final Safety Analysis Report (UFSAR) to reflect a revised steam generator tube failure accident analysis which includes the dose resulting from the postulated post-accident steam release through the main steam safety valves. The existing radiological dose calculations described in the UFSAR do not account for this release.

A copy of the related safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

Timothy G. Colburn, Senior Project Manager, Section 1  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosures: 1. Amendment No. 230 to DPR-50  
2. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION:

PUBLIC	OGC	M. Gamberoni	PDI-1RF	J. Lee
W. Beckner	R. Barrett	B. Platchek, RI	MO'Brien	P. Wilson
E. Adensam	T. Colburn	G. Hill (2)	ACRS	

Accession Number: ML010160451

\* SE provided. No substantive changes made.

OFFICE	PDI-1\PM	E	PDI-2\LA	E	SPSB/SC(A)		OGC		PDI-1\SC	
NAME	TColburn		MO'Brien		PWilson*		STurk		MGamberoni	
DATE	03/1/01		3/1/01		SE dtd 01/05/01		3/5 /01		3 /8 /01	

OFFICIAL RECORD COPY



AMERGEN ENERGY COMPANY, LLC

DOCKET NO. 50-289

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 230  
License No. DPR-50

1. The Nuclear Regulatory Commission (the Commission or NRC) has found that:
  - A. The application for amendment by AmerGen Energy Company, LLC (the licensee), dated August 9, 2000, as supplemented February 22, 2001, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, changes to the Updated Final Safety Analysis Report (UFSAR) to reflect the revised steam generator tube failure accident analysis dose calculations for postulated steam release through the main steam safety valves referenced in Chapter 14 of the UFSAR as set forth in the application for amendment by AmerGen Energy Company, LLC, dated August 9, 2000, as supplemented February 22, 2001, are authorized.
3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

Marsha Gamberoni, Chief, Section 1  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Date of Issuance: March 9, 2001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 230 TO FACILITY OPERATING LICENSE NO. DPR-50  
AMERGEN ENERGY COMPANY, LLC  
THREE MILE ISLAND NUCLEAR STATION, UNIT 1  
DOCKET NO. 50-289

## 1.0 INTRODUCTION

By letter dated August 9, 2000, AmerGen Energy Company, LLC (the licensee), submitted a request for approval of changes to the Three Mile Island Nuclear Station, Unit 1 (TMI-1), Updated Final Safety Analysis Report (UFSAR). The staff obtained additional clarifying information from the licensee by electronic mail following a December 20, 2000, telephone conversation which is documented in a memorandum from T. Colburn to M. Gamberoni dated January 18, 2001, ADAMS Accession No. ML010180414, and the licensee's letter dated February 22, 2001. The additional clarifying information did not change the initial proposed no significant hazards consideration determination or expand the amendment beyond the scope of the original notice (65 FR 62382).

## 2.0 BACKGROUND

The licensee requested approval of a change to the TMI-1 UFSAR Section 14.1.2.10, "Steam Generator Tube Failure," analysis to include the radiological consequence resulting from the radioactive steam release directly to the atmosphere through the main steam safety valves (MSSVs) which would occur during a postulated steam generator tube failure. This fission product release pathway had not been previously recognized by the licensee, and the current TMI-1 UFSAR does not account for the contribution from this release pathway. The revised radiological consequence resulting from the steam generator tube failure accident would be increased above the values currently assumed in the TMI-1 UFSAR accident analysis, but would remain within the limits contained in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 100.

## 3.0 EVALUATION

Following the reactor trip resulting from the steam generator tube failure, the turbine stop valves will close resulting in lifting of the MSSVs and the release of radioactive steam to the atmosphere. The current radiological dose assessment does not account for the contribution from this release path. The licensee estimated that the MSSVs will be lifted for less than two minutes until the turbine bypass valves are opened routing the radioactive main steam to the condenser. The licensee assumed two minutes of full flow steam release to be conservative. During this two-minute period, the licensee estimated that 80,000 lbm (pounds mass) of main steam will be released to the atmosphere through the MSSVs and that 5145 lbm of primary

coolant will be leaked into the secondary coolant system. In its radiological consequence analysis, the staff used no partitioning of noble gases or iodines in the released steam. This new release pathway resulted in additional radiological consequences of 7.9 rem to the thyroid and 0.1 rem to the whole body at the exclusion area boundary (EAB). The revised total integrated doses at the EAB resulting from the steam generator tube failure and the major parameters used for the dose calculation by the staff for this release pathway are shown in Attachments 1 and 2, respectively.

The staff has determined that the proposed change to the TMI-1 UFSAR is acceptable. The staff's acceptance is based on (1) the staff's review of the licensee's analysis of the radiological consequence, and (2) the revised total integrated doses at the EAB, which were calculated by the licensee and independently confirmed by the Nuclear Regulatory Commission (NRC) staff, still meeting the dose acceptance criteria specified in the Standard Review Plan, Section 15.6.3., and still being a small fraction of the 10 CFR Part 100 guidelines.

#### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendment. The State official had no comments.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (65 FR 62382). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

#### 6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Attachments: 1. Table 1, "Radiological Consequences at Exclusion Area Boundary, Steam Generator Tube Failure"  
2. Table 2, "Major Parameters Used in Computing Radiological Consequence"

Principal Contributor: J. Lee

Date: March 9, 2001

**Table 1**  
**Radiological Consequences at Exclusion Area Boundary**  
**Steam Generator Tube Failure**  
**(rem)**

	Thyroid	WB
MSSV release	7.9	0.1
Releases other than from MSSVs <sup>(1)</sup>	1.07	0.31
Total	8.97	0.41
Dose Acceptance Criteria <sup>(2)</sup>	30	2.5

<sup>(1)</sup> Current TMI Unit 1 UFSAR Table 14.1-21

<sup>(2)</sup> SRP 15.6.3 dose acceptance criteria



**Table 2**

**Major Parameters Used in Computing Radiological Consequence**

<u>Parameter</u>	<u>Value</u>
MSSV closure time, sec	120
Amount of steam released, lbm	8E+4
Amount of primary coolant leaked, lbm	5145
Fission product concentration, $\mu\text{Ci/gm}$ DEI-131	
Primary coolant	10.44
Secondary coolant	0.1
Iodine Partition factor	
Released steam	1
Steam generator water	100
Dose conversion factor	FGR* No. 11 and 12
Breathing rate, $\text{m}^3/\text{sec}$	3.74E-4
Atmospheric dispersion factor at EAB	
0 to 2 hours, $\text{sec}/\text{m}^3$	8E-4

\* Federal Guidance Report

