April 11, 2001

MEMORANDUM TO: Maitri Banerjee, Acting Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

FROM: Timothy G. Colburn, Sr. Project Manager, Section 1 ***/RA/*** P. Milano
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: FORTHCOMING MEETING WITH REPRESENTATIVES OF AMERGEN ENERGY COMPANY, LLC (AMERGEN), REGARDING THREE MILE ISLAND NUCLEAR STATION, UNIT 1 (TMI-1) STEAM GENERATOR INSPECTION (TAC NO. MB0664)

DATE & TIME: Wednesday, April 25, 2001
9:30 a.m. - 4:00 p.m.

LOCATION: U.S. Nuclear Regulatory Commission (NRC)
One White Flint North
11555 Rockville Pike, Room O-14-B-8
Rockville, Maryland

PURPOSE: Working level meeting to discuss issues related to the licensee's December 6, 2000, application for license amendment related to steam generator inspection for TMI-1. A list of discussion items is attached.

PARTICIPANTS:* Participants of the meeting include members of the Office of Nuclear Reactor Regulation (NRR).

NRC	AmerGen
T. Colburn, NRR	R. Knight
L. Lund, NRR	G. Rombold, et.al.
E. Sullivan, NRR	

Docket No. 50-289

Attachment: As stated

cc: Licensee and Service List

CONTACT: T. Colburn, NRR
(301) 415-1402

*Meetings between NRC technical staff and applicants or licensees are open for interested members of the public, petitioners, intervenors, or other parties to attend as observers pursuant to Commission Policy Statement on "Staff Meetings Open to the Public: Final Policy Statement," 65 *Federal Register* 56964, 9/20/2000.

April 11, 2001

MEMORANDUM TO: Maitri Banerjee, Acting Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

FROM: Timothy G. Colburn, Sr. Project Manager, Section 1 ***/RA/*** P. Milano
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: FORTHCOMING MEETING WITH REPRESENTATIVES OF AMERGEN ENERGY COMPANY, LLC (AMERGEN), REGARDING THREE MILE ISLAND NUCLEAR STATION, UNIT 1 (TMI-1) STEAM GENERATOR INSPECTION (TAC NO. MB0664)

DATE & TIME: Wednesday, April 25, 2001
9:30 a.m. - 4:00 p.m.

LOCATION: U.S. Nuclear Regulatory Commission (NRC)
One White Flint North
11555 Rockville Pike, Room O-14-B-8
Rockville, Maryland

PURPOSE: Working level meeting to discuss issues related to the licensee's December 6, 2000, application for license amendment related to steam generator inspection for TMI-1. A list of discussion items is attached.

PARTICIPANTS:* Participants of the meeting include members of the Office of Nuclear Reactor Regulation (NRR).

NRC	AmerGen
T. Colburn, NRR	R. Knight
L. Lund, NRR	G. Rombold, et.al.
E. Sullivan, NRR	

Docket No. 50-289

Attachment: As stated

cc: Licensee and Service List

CONTACT: T. Colburn, NRR
(301) 415-1402

DISTRIBUTION

PUBLIC	PDI-1 R/F	Hard Copy
B. Sheron	J. Shea, EDO RI	T. Colburn
J. Zwolinski/S. Black	D. Screnci	M. O'Brien
E. Adensam	ACRS	Receptionist OWFN
M. Banerjee	OGC	Receptionist TWFN
M. King	L. Lund	
OPA	E. Sullivan	
B. Platchek,RI		

PMNS (Meeting Announcement Coordinator)

*Meetings between NRC technical staff and applicants or licensees are open for interested members of the public, petitioners, intervenors, or other parties to attend as observers pursuant to Commission Policy Statement on "Staff Meetings Open to the Public: Final Policy Statement," 65 *Federal Register* 56964, 9/20/2000.

Accession Number: ML010990205

OFFICE	PDI-1/PM	PDI-1/LA	PDI-1/SC		
NAME	PMilano for TColburn	MO'Brien	MBanerjee		
DATE	4/10/01	4/10/01	4/10/01		

OFFICIAL RECORD COPY

TMI Discussion Items for April 25, 2001, Meeting With AmerGen on Steam Generator Inspection and Alternate Repair Criteria for Volumetric Inner Diameter Intergranular Attack Degradation

1. AmerGen stated in their 12/6/00 submittal that “AmerGen has concluded that the inside diameter intergranular attack (ID IGA) indications are not growing in either size or depth.” This statement is an apparent contradiction to the inspection findings listed in the following two paragraphs. These paragraphs indicate because tubes are being plugged, the ID IGA indications are indeed growing. If eddy current analyst or technique uncertainty is the primary reason for apparent indication “growth”, provide the staff with information on how you confirmed this to be the case as opposed to real indication growth.

   “In 1997, 100 percent of the inservice steam generator tubes were inspected with bobbin coil eddy current probes. While a number of tubes were plugged as a result of ID IGA indications that exceeded the 40% through-wall (TW) criterion, no ID IGA indications were found which exceeded the 0.52" circumferential extent criterion, and only one tube was found with an indication that required repair as a result of exceeding the 0.25" axial extent criterion.”

   “In 1999, 100% of the inservice steam generator tubes were inspected with bobbin coil eddy current probes. No ID IGA indications were found which exceeded the 0.52" circumferential extent criterion; three ID IGA indications were found that exceeded the 0.25" axial extent criterion. Two ID IGA indications were removed from service based on bobbin probe depth estimates of 40% and 43% through-wall.”

2. AmerGen provided the staff with a table that compared eddy current results from the outage 13R inspection with results from previous inspections. This table, Table III-4, “Average Growth for ID IGA Indications,” was contained in the January 7, 2000, “Report on the 1999 Outage 13R Eddy Current Examinations of the Three Mile Island Unit 1 (TMI-1) Once-Through Steam Generator (OTSG) Tubing.”

   The staff discussed this table with the licensee during a January 12, 2001, conference call. The licensee indicated that during 12R and 13R, they performed a 100% bobbin probe examination with follow-up motorized rotating pancake coil (MRPC) examinations of all the ID IGA identified by the bobbin probe. In previous outages, the licensee did not perform an MRPC examination of every ID IGA flaw.

   Please confirm that Table III-4 contains the subset of indications that have a measured voltage or length from a previous outage for comparison. Please discuss why the number of observed axial and circumferential extent indications for 12R to 13R was higher than the number of indications used to compare bobbin volts for the same period. Please discuss how the number of indications listed as bobbin volts compares with the list of indications listed as bobbin % TW.

   In general, it is difficult for the staff to determine from the information submitted for this license amendment and information submitted previously if the total number of ID IGA indications are increasing in each successive outage, or if the number is relatively stable. Because the information presented in the table is divided into subsets of what has been detected in each outage by eddy current inspection, the staff cannot assess the population of the ID IGA indications found in each outage.

Attachment

In order for the staff to evaluate the numbers of new indications found each outage, in comparison to the previously detected ID IGA indications, the staff needs the data presented in a different manner. For outages 11R to 13R, please provide the total number of the ID IGA indications found below the kinetic expansion each outage in a table, separated into 0.2V (as measured by bobbin) bins. In addition to the number of indications, please provide the number of tubes that contain the ID IGA indications found below the kinetic expansion for each outage in a table. Please provide the number of tubes with known ID IGA indications and total number of the ID IGA indications taken out of service by plugging for each outage listed above.

3. In a September 15, 1997 response to an NRC Request for Additional Information Regarding Technical Specification Change Request No. 268, GPU Nuclear stated that a growth study of the ID IGA indications using MRPC data would be performed (question #4). GPU Nuclear indicated that approximately 100 indications would be used, comparing 10R and 11R MRPC data with 12R MRPC data. In Table III-4, "Average Growth for ID IGA Indications," which was contained in the January 7, 2000 "Report on the 1999 Outage 13R Eddy Current Examinations of the TMI-1 OTSG Tubing," only 11 indications (10 in SG A and 1 in SG B) are used from 10R for the growth study. How were the other indications dispositioned?

4. In the 4/13/99 one-cycle amendment, NRC identified areas of weakness in the licensee's ID IGA growth rate study. A number of variables were identified which were not specifically addressed in the growth rate studies and are as follows: (1) bobbin probe wear, (2) calibration practices and standards, (3) differences in data acquisition hardware, and (4) data analyst uncertainty.

   Please provide the staff with a discussion as to how each of the above listed variables have been addressed in the growth rate studies. This discussion should include any procedural changes that were made, what hardware was affected, and acceptance criteria for the above variables. For example, how will the probes, techniques, analyst guidelines to be used in the outages to follow be consistent with the above variables?

5. The 12/6/00 submittal states that the results of the growth assessments showed no statistically significant growth in the ID IGA and that the changes were less than the statistical uncertainty of the measurement techniques. Please discuss the methodology used for assessing growth in each outage. What statistical tests are being used to make this growth assessment, and what is the acceptance criteria?

6. In the 4/13/99 one-cycle amendment (License Amendment 209) approving an ARC for the ID IGA, the staff strongly encouraged the licensee to pursue the development of a qualified eddy current technique which can reliably depth size the ID IGA in accordance with the original 40-percent tube repair limit. The staff stated that if this path were pursued, further TS amendments would not be required to address this mode of degradation.

   In response, AmerGen indicated in the 12/6/00 submittal that it had developed a bobbin coil examination technique for depth sizing inside diameter IGA/IGSCC for indications that provide an eddy current signal of sufficient strength and clarity. Further, Amergen stated

that the ID IGA, that can be reliably depth-sized using the bobbin coil probe, will be depth-sized with the site-qualified bobbin coil technique and repaired if it measures $\geq$ 40% TW or is found by measurement to exceed either the circumferential or axial length criteria.

Please provide information on the Electric Power Research Institute (EPRI) Appendix H qualification of this bobbin coil technique, especially the data that supports a 0.89 probability of detection (POD) at 42% TW for the freespan ID IGA with the bobbin probe. Discuss the specifics of how the data set that supports this qualification is representative of the conditions at TMI (e.g., noise levels, signal-to-noise ratios, flaw signal characteristics, etc.). Describe the data set in detail. Describe in detail the performance demonstration techniques applied to the ID IGA removed from TMI-1 SGs and the results of the performance demonstration. Discuss how sizing of indications is relied upon to assure leakage integrity.

7. AmerGen has concluded in previous submittals that MRPC and Plus Point are able to conservatively assess the axial and circumferential extents of TMI-1 IGA flaws. However, AmerGen stated in the 12/6/00 submittal that it may be possible for AmerGen to use probes other than bobbin and MRPC to conservatively assess the morphology and extents of the ID IGA flaws. For this alternate repair criteria, the staff will review bobbin and rotating pancake coil (RPC)/Plus Point qualification data. Use of any other probes for this alternate repair criteria would require approval from the NRC staff.

8. Discuss how in-situ testing is relied upon to assure leakage integrity. Discuss, as applicable, the statistical evaluation of in-situ testing as it relates to the confidence it provides to ensuring tube integrity. Were the 12R in-situ tests still bounding for the 13R outage in the context of the ID IGA? Is the selection criteria consistent with the latest revision to the EPRI Steam Generator In-Situ Pressure Test Guidelines? Please provide the inspection data for the bounding 12R in-situ test, and compare with the bounding values found for the 13R inspection data.

9. How is the ID IGA evaluated for the condition monitoring and operational assessment for the TMI-1 steam generators? If the ID IGA degradation is not found to be dormant, how will the leakage and structural integrity be assessed for the upcoming cycle?

10. From the “Report on the 1999 Outage 13R Eddy Current Examinations of the TMI-1 OTSG Tubing,” you identified five tubes that had outer diameter (OD) volumetric “Patch-Like” IGA typical of OD volumetric IGA found in other OTSG’s. Discuss whether this is an active mechanism, and in which outages it has been detected. Where has the OD IGA been found, and what was the root cause for this degradation? How was the OD IGA detected? Discuss the detection capability of the OD IGA. Discuss how tubes with the OD IGA indications are dispositioned. Discuss how the OD IGA is addressed in condition monitoring and operational assessments, including the case of the OD and the ID IGA occurring at the same location.

cc:
Robert Fraile
Plant Manager
AmerGen Energy Company, LLC
P. O. Box 480
Middletown, PA 17057

Michael Ross, Director,
Work Management
AmerGen Energy Company, LLC
P.O. Box 480
Middletown, PA 17057

James A. Hutton
Director - Licensing
PECO Energy Company
Nuclear Group Headquarters
Correspondence Control Desk
P.O. Box 195
Wayne, PA 19087-0195

Edwin C. Fuhrer
Manager - Regulatory Engineering
AmerGen Energy Company, LLC
P.O. Box 480
Middletown, PA 17057

Edward J. Cullen, Jr., Esquire
PECO Energy Company
2301 Market Street (S23-1)
Philadelphia, PA 19103

Jeffrey A. Benjamin
Licensing - Vice President
Exelon Corporation
1400 Opus Place, Suite 900
Downer's Grove, IL 60521

Chairman
Board of County Commissioners
of Dauphin County
Dauphin County Courthouse
Harrisburg, PA 17120

Chairman
Board of Supervisors
of Londonderry Township
R.D. #1, Geyers Church Road
Middletown, PA 17057

Senior Resident Inspector (TMI-1)
U.S. Nuclear Regulatory Commission
P.O. Box 219
Middletown, PA 17057

Regional Administrator
Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Robert B. Borsum
B&W Nuclear Technologies
Suite 525
1700 Rockville Pike
Rockville, MD 20852

David J. Allard, Director
Bureau of Radiation Protection
Pennsylvania Department of
Environmental Resources
P.O. Box 2063
Harrisburg, PA 17120

Dr. Judith Johnsrud
National Energy Committee
Sierra Club
433 Orlando Avenue
State College, PA 16803

John F. Rogge, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

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

Eric Epstein
TMI Alert
4100 Hillsdale Road
Harrisburg, PA 17112