AmerGen

AmerGen Energy Company, LLC
Three Mile Island Unit 1
Route 441 South, P.O. Box 480
Middletown, PA 17057

Telephone 717 944 7621

An Exelon/British Energy Company

10 CFR 50.90

February 19, 2001
5928-01-20056

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Dear Sir/Madam:

SUBJECT: THREE MILE ISLAND, UNIT 1 (TMI Unit 1)
OPERATING LICENSE NO. DPR-50
DOCKET NO. 50-289
EXIGENT TECHNICAL SPECIFICATION CHANGE REQUEST NO. 309,
RESPONSE TO SECOND VERBAL REQUEST FOR ADDITIONAL
INFORMATION

In response to the NRC's second verbal request on February 16, 2001, enclosed is the AmerGen Engineering Evaluation Request (EER) Job Order No. 00193871, Revision 0, "Evaluate the Seismic Capability of the Secondary Services River Water System," dated February 19, 2001. This EER concludes that the relevant portions of the Secondary Services River (SR) Water System and the in-line components are equivalent to seismically qualified configurations and are adequate to supply the cooling water normally supplied by the Nuclear Services River (NR) Water System while a portion of NR System piping is taken out of service for repair work.

The NRC staff also verbally requested the basis for our conclusion that there would be no unacceptable consequences if NR were lost. A description of what would happen if NR flow were lost was provided in the submittal of Exigent Technical Specification Change Request (TSCR) No. 309. As described in the submittal, there are no unacceptable consequences only if compensatory actions are taken. Those actions include restoring river water flow to the Nuclear Services heat exchangers by starting additional pumps or by isolating the portion of the Secondary River system that was not evaluated for seismic capability by closing the valve, SR-V-2. With these compensatory actions, there are no unacceptable consequences. It is estimated that these actions would be completed in less than 30 minutes from the time river water flow was lost. As shown in the original submittal of Exigent TSCR No. 309, there is at least a period of 72 hours before action is required.

If NR flow were lost indefinitely, then the temperatures would rise for all components cooled by the Nuclear Services and Intermediate Services heat exchangers. Without the compensatory actions mentioned above, unacceptable consequences would not occur for at least 72 hours. The pertinent issues are:

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a) Control Building temperature would rise. Alternate means of maintaining control building temperature are provided by existing plant procedures. These methods would ensure that cooling would be adequate for all safety related components in the control tower for at least 72 hours. No analysis was performed beyond 72 hours.

b) Spent Fuel Pool (SFP) temperatures would slowly rise. The SFP temperature would remain below design temperatures and below bulk pool boiling temperatures for at least 14 days.

c) Temperatures in the rooms with the motor-driven emergency feedwater (EFW) pumps would rise. These temperatures, with or without the EFW pumps operating, would remain within design limits for at least 72 hours without any compensatory actions. No analysis was performed for the effects past 72 hours.

With a loss of NR indefinitely, the plant could be safely shutdown to at least a hot shutdown condition. An analysis was not performed to determine if the plant could be brought to cold shutdown without river water flow to the nuclear services or intermediate services heat exchangers. Credit was taken for using the compensatory actions to re-establish river water flow prior to cooldown.

Please contact George Rombold at (717) 948-8554 if you have any questions regarding this submittal.

Sincerely yours,

Mark E. Warner
Vice President, TMI Unit 1

MEW/mrk

Enclosure: EER Job Order No. 00193871, Revision 0, "Evaluate the Seismic Capability of the Secondary Services River Water System"

cc: USNRC Regional Administrator, Region I
USNRC TMI Senior Resident Inspector
USNRC TMI Unit 1 Senior Project Manager
Chairman, Board of Supervisors of Londonderry Township
Chairman, Board of County Commissioners of Dauphin County
Director, Bureau of Radiation Protection, PA Department of Environmental Resources
File No. 01025

AMERGEN ENERGY COMPANY, LLC

Three Mile Island, Unit 1
Operating License No. DPR-50
Docket No. 50-289
Exigent Technical Specification Change Request No. 309, Second Verbal Request For Additional Information

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COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF DAUPHIN)

This response to a second verbal Request for Additional Information is submitted in support of Licensee's request to change Appendix A to Operating License No. DPR-50 for Three Mile Island, Unit 1. Included is the response to NRC requests in a conference call on February 16, 2001. 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: _____
Vice President, TMI Unit 1

Notarial Seal
Linda C. Witter, Notary Public
Londonderry Twp., Dauphin County
My Commission Expires Sept. 25, 2004
Member, Pennsylvania Association of Notaries

Sworn and subscribed to before me this 19th day of February, 2001.

SEAL:

_____
Notary Public

AmerGen

ENGINEERING EVALUATION REQUEST

EP-046T
Revision 5

JO#: 00193871

Rev.: 0

Title / Request: Evaluate the Seismic Capability of the Secondary Services River Water System **RPTD Date:** 02/11/01

Tag Number: Various **Sys. Code:** 532

___ **Equivalent Replacement (use EP-047T)**
___ Set Point/Set Point Tolerance (include EP-053T items)
_X_ **Technical Evaluation / Guidance**
___ **Other**
___ **Repair Procedure**
___ **Modification (use EMP-002T)**

(check all that apply)

("N/A" all that do not apply)

1.0 SAFETY CLASSIFICATION (check one):

_____ **NSR** **(Note: A Safety Determination is required for every Evaluation - use 1000-ADM-1291.01)**
_X_ **RR**
_____ **OTHR**
_____ **N/A** (explain): _____

2.0 OBJECTIVE:

Evaluate the seismic capability of piping and components of the Secondary Services River Water System (SR, system 532) for the region of the system proposed for temporary service during repair to the Nuclear Services River Water System (NR, System 531). Specific elements included in this evaluation are as shown in section 4.

This EER augments and updates EER #00193634 to provide supporting examples to Section 5.0, item B, additional References to Section 3.0 and updates the background discussion of the regulatory process in Section 4.0. Additionally, minor editorial corrections to the text are included.

3.0 REFERENCES:

See Continuation on Page 2.

4.0 DESIGN BASIS STATEMENT:

See Continuation on Page 2.

5.0 RESOLUTION:

See Continuation on Page 3.

6.0 ACTION PARTY REQUIREMENTS & AFFECTED DOCUMENTS (includes close-out requirements):

None

Ted Noble **Responsible Engineer**	2/19/01 **Date**	J Piazza **Manager of Engineering**	2/19/01 **Date**
Eric Eisen **Responsible Technical Reviewer**	2/19/01 **Date**	RALPH MUNZ **QR or (QV) (circle one)**	2-19-01 **Date**

cc:
S Queen, J Piazza, S Dunkelberger, D Fiorello, R Snow, K Eichenlaub, E Eisen

3.0 REFERENCES:

1. Deleted
2. GAI Drawings
   a. 302202, River Water System, Flow Diagram
   b. 303121, Piping Composite, Overall Yard Plan
   c. 303122, Piping Composite, Overall Yard Plan – Details
   d. 303133, Piping Composite, Overall Yard Plan – River Water Pumps
   e. 303135, Above Ground Yard Piping Composite – Plans and Sections
3. Generic Implementation Procedure (GIP) for Seismic Verification of Nuclear Plant Equipment, Rev 2, Corrected 2/14/92.
4. Calculation HAGPU-08/98-052, Hopper and Associates
5. Piping Analysis ME-159, Gilbert Associates Inc.
6. TMI Line List, SYS-LL-TMI-1
7. Price Brothers Co. Drawings,
   a. Drawing Number 34.69-L3, Heat Exchanger Vault Area Piping Layout
   b. Drawing Number 34.69-L7, Tie-ins at Intake Screen House
   c. Drawing Number 34.69-1, Design Sheet
8. Metropolitan Edison Company Letter to the USNRC, Arnold to O'Reilly, Supplement to License Event Report 76-42/1P, dated March 10, 1977.

4.0 DESIGN BASIS STATEMENT (cont'd):

The capability of piping and components of the Secondary Services River Water System for the region of the system proposed for temporary service during repair to the Nuclear Services River Water System must meet or exceed the performance standards of a Seismic Class I design. That is, a maximum prescribed seismic disturbance will not impair the ability of the system to perform in effecting a safe shutdown of the plant.

A license amendment request has been submitted to the NRC seeking approval to use SR system piping to supply the cooling water normally supplied by the NR system while a portion of NR system piping is taken out of service for the required repair work. Specific topics of this evaluation of the installed piping and components to maintain pressure boundary integrity are:

A. Seismic capability of the 30" SR header located in the Auxiliary Building Heat Exchanger Vault between the SI/SIII class break at NR-V-0006 and SR-V-0002. This includes validation of the piping beyond the SR valve to piping anchorage at the wall penetrations and the 30" SR inlet to the wall penetration. Additionally, SR-V-0002 capability to be manually operated after the SSE via Operator Action to isolate non-seismic system piping in the Turbine Building.
B. Seismic capability of the 30" SR underground prestressed concrete cylinder pipe (PCCP) between the Heat Exchanger Vault and the Intake Screen and Pump House (ISPH).
C. Seismic capability of the 30" SR header and 16" branch lines below the operating floor (308'-0") of the ISPH.
D. Seismic capability of the 16" SR supply piping at 308'-0" of the ISPH to the check valves, SR-V-0009A/B/C.

To this end, a walkdown of the applicable and accessible portions of the SR and NR systems and table top review of the drawings, Reference 2, has been performed to assess the ruggedness of design and construction. The walkdown, additionally, was intended to identify any potential seismic interaction or instances of large relative displacements, which could impair the pressure boundary integrity. Although not specifically applicable to piping systems, the methodology presented in the GIP, Reference 3, is generally employed to evaluate interaction potential and walkdown technique.

In addition, records of prior analysis or evaluation of this piping for seismic capability were reviewed.

5.0 **RESOLUTION (cont'd):**

A walkdown of accessible piping and components of the Secondary Services River Water System and document reviews indicate substantial ruggedness of the relevant portions of the system.

A. The 30" SR header located in the Auxiliary Building Heat Exchanger Vault between the SI/SIII class break at NR-V-0006 and SR-V-0002, including the piping to anchorage at the wall penetrations and the 30" SR supply to the wall penetration are constructed and supported in a manner comparable to the contiguous NR piping, which is within the SI boundary. Additionally, SR-V-0002 is judged adequate to remain capable of being manually operated after the SSE to isolate non-seismic system piping in the Turbine Building. Although the motor operator is assumed to be unavailable due to its BOP power, the configuration similar to seismically qualified NR-V-0006 assures no debilitating physical damage to the operating mechanism. It is therefore adequate to perform system isolation after the SSE, if required, via operator action

   In addition to the qualitative analysis above, existing analyses performed by Hopper and Associates, Reference 4, found the maximum pipe stress under combined loads (deadweight, pressure and SSE) to be within the code allowable stress.

   The Secondary Services River Water System piping (Reference 6, Line No. SR-002) is identical in line specification to the Nuclear Services River Water System piping (Reference 6, Line No. NR-002). Each system is designed as Line Specification 150-1.

   Therefore, this piping is adequate to perform the intended function during and after the SSE.

B. The 30" Secondary Services River Water System (Reference 6, Line No. SR-001) underground prestressed concrete cylinder pipe (PCCP) between the Heat Exchanger Vault and the Intake Screen and Pump House (ISPH) is identical in specification, design and construction to NSR/SI Nuclear Services River Water System (Reference 6, Line No. NR-001) pipe. Both lines are constructed to Reference 7. The SR system PCCP piping is equivalent to the NR system PCCP piping in all respects. For example:

   1. Both piping systems are designated by the symbol "S" on the flow diagram, Reference 2.a., meaning Line Specification 125-3 per Reference 6. That is, the piping is Reinforced Concrete Water Pipe, Steel cylinder Type, prestressed, in accordance with AWWA C301-64.
   2. Both piping systems are 30" in diameter, laid at BOP 290'-0", approximately 12 feet below grade.
   3. Materials for both piping systems were purchased from the same vendor, Price Brothers Co., Dayton, Ohio, under the same contract.
   4. Vendor drawings are common to several river water systems, including SR and NR systems. As an example, the design sheet (Reference 7c) refers to the design specifications as "Three Mile Island Sta. Concrete Cooling Water Piping". The design specifications for 30" PCCP are not distinguished by specific water systems.
   5. Discussion contained in correspondence, Reference 8, indicates that all six of the PCCP river water lines between the Intake Screen and Pump House and the Heat Exchanger Vault, including the 30" NR and SR lines, are installed in a similar manner. The reference also reiterates the line similarities such as PCCP, common vendor, and design standards.
   6. Reference 8 describes the installation process used to lay the concrete piping for all six lines between the Intake Screen and Pump House and the Heat Exchanger Vault. The six lines are the 20" Reactor Building Emergency Cooling A and B, the 24" Decay Heat A and B, the 30" Nuclear Services and the 30" Secondary Services. The process described in Reference 8 is common to all the lines. The following is the relevant excerpt from the reference:

"All of the pipe runs were laid approximately 10 feet below grade level. Installation of the pipe was performed by first surveying the affected area, then excavating to a depth of 6" (+1") below the bottom of the pipe elevation. Sand was then laid and compacted up to the elevation which matched the bottom of the pipe. After the pipe sections were joined together, another survey of the top of pipe elevation was taken. Sand was then placed on both sides of the pipe in layers and compacted until the pipe was covered with 6" (+1") of sand. Finally the controlled backfill was placed in compacted layers until grade elevation was reached."

C. The 30" SR header and 16" branch lines below the operating floor (308'-0") of the ISPH penetration are constructed and supported in a manner comparable to similar NR piping in the same area. The walkdown confirmed that there are no seismic interaction concern or instances of potential large displacements affecting smaller branch lines.

Additionally, analysis performed by the design A/E for the NR piping includes this portion of SR piping as part of ME-159. Reference 5, indicates that the maximum stress due to combined loads including seismic is within the code allowable.

As noted above, both the SR and NR systems are designed as Line Specification 150-1(Reference 6).

Therefore, this piping is adequate to perform the intended function during and after the SSE.

D. The seismic capability of the 16" SR supply piping at 308'-0" of the ISPH to the check valves, SR-V-0009A/B/C is judged adequate to maintain the pressure boundary. It is noted from the walkdown that this typical, relatively short section of piping is well supported and is similar in design to Seismic Class I (SI) piping in the area. Check valve, SR-V-0009A/B/C, is judged adequate seismically. Check valves are inherently rugged per Reference 3, section 3.3.5.

Therefore, this piping is adequate to perform the intended function during and after the SSE.

As described above, the relevant portions of the Secondary Services River Water System and the in-line components are equivalent to seismically qualified configurations and are adequate to supply the cooling water normally supplied by the NR system while a portion of NR system piping is taken out of service for the repair work.

Reference Number: N/A

Safety Determination/50.59 Screening Review

Division	Doc. No. EER #00193871	Rev. No. 0
TMI Engineering	SE No. N/A	Rev. No. N/A
Document/Activity Title Evaluate the Seismic Capability of the Secondary River Water System		

		Yes	No
1.	Is this a new document or activity or a substantive revision to an existing document? (A new document is considered equivalent to a substantive revision.) If YES, proceed to answer Question 2. If NO, then procedure 1000-ADM-1291.01 is not applicable and documentation of nuclear safety determination is not required.	X	
2.	Does the document or activity change the design or description of the facility, even temporarily, from that which is contained in the SAR?		X
3.	Does the document or activity change a procedural or operating description, even temporarily, from that which is contained in the SAR?		X
4.	Does the document or activity involve any tests or experiments that are not described in the SAR?		X
5.	Does this document or activity conflict with the requirements of the plant Technical Specifications?		X

If any of the answers to Questions 2, 3, 4 or 5 are YES, prepare a written safety evaluation. If the answers to Questions 2, 3, 4, and 5 are NO, this precludes the occurrence of the Unreviewed Safety Question or Technical Specification change and a written Safety Evaluation is NOT required. Provide written statements which support the determination that no unreviewed Safety Question or Technical Specification change is involved. These written statements shall provide justification for the NO answers to Questions 2, 3, 4 and 5. Specify the Licensing Basis documents and sections which were researched during this review. Use separate sheets for documenting your statements and attach them to this form. Provide page numbers (with this form identified as "Page 1 of ").

PRINT OR TYPE NAME AND SIGN:	DATE
Owner: Ted Noble T H Noble	2/19/01
Responsible Technical Reviewer: E Eisen Eric Eisen	2/19/01

EER 00193871 provides an Engineering evaluation of the seismic capability of piping and components of the Secondary Services River Water System (SR, system 532) for the region of the system proposed for temporary service during repair to the Nuclear Services River Water System (NR, System 531).

This document does not change the design or description of the facility, even temporarily, from that which is contained in the SAR because, as stated above, it provides an assessment of the inherent capability of the piping and components in the SIII (non-seismic) classified SR system. Any changes to the design or description of the facility which may be required to effect a repair to the NR piping are addressed by separate 50.59 reviews of the repair and in a License Amendment Request. This document does not result in any changes to the facility.

This document does not change a procedural or operating description, even temporarily, from that which is contained in the SAR because it provides an assessment of the inherent capability of the piping and components in the SIII (non-seismic) classified SR system. Any changes to operating descriptions or procedures which may be required to effect a repair to the NR piping are addressed by separate 50.59 reviews of the repair and in a License Amendment Request. This EER does not result in any changes to procedures or operation of the plant.

This document does not involve any tests or experiments that are not described in the SAR because no tests or experiments are involved in the performance of this Engineering evaluation, an assessment of an existing plant configuration only. No other activity is performed.

This document does not conflict with the requirements of the plant Technical Specifications because it documents an assessment of an existing plant configuration only. Utilization of the SR system piping for Nuclear Safety Related service is addressed by separate 50.59 reviews and in a License Amendment Request.

The following Licensing Basis documents and sections were researched during this review:

- UFSAR, section 5.1.1.1.d, 5.4.4, 5.4.5 and 9.6
- Technical Specification contents