October 12, 2005

Mr. Christopher M. Crane
President and Chief Executive Officer
AmerGen Energy Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1 (TMI-1) - RESPONSE TO NRC BULLETIN 2003-01, "POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY SUMP RECIRCULATION AT PRESSURIZED-WATER REACTORS [PWRs]" (TAC NO. MB9620)

Dear Mr. Crane:

This letter acknowledges receipt of your response dated August 6, 2003, to Nuclear Regulatory Commission (NRC) Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors," dated June 9, 2003. The NRC issued Bulletin 2003-01 to all PWR licensees requesting that they provide a response, within 60 days of the date of Bulletin 2003-01, that contains either the information requested in following Option 1 or Option 2 stated in Bulletin 2003-01:

Option 1: State that the emergency core cooling system (ECCS) and containment spray system (CSS) recirculation functions have been analyzed with respect to the potentially adverse post-accident debris blockage effects identified in the Discussion section, and are in compliance with all existing applicable regulatory requirements.

Option 2: Describe any interim compensatory measures that have been implemented or that will be implemented to reduce the risk which may be associated with potentially degraded or nonconforming ECCS and CSS recirculation functions until an evaluation to determine compliance is complete. If any of the interim compensatory measures (ICMs) listed in the Discussion section will not be implemented, provide a justification. Additionally, for any planned interim measures that will not be in place prior to your response to this bulletin, submit an implementation schedule and provide the basis for concluding that their implementation is not practical until a later date.

You provided an Option 2 response.

Bulletin 2003-01 discussed six categories of ICMs: (1) operator training on indications of and responses to sump clogging; (2) procedural modifications, if appropriate, that would delay the switchover to containment sump recirculation (e.g., shutting down redundant pumps that are not necessary to provide required flows to cool the containment and reactor core, and operating the CSS intermittently); (3) ensuring that alternative water sources are available to refill the refueling water storage tank (RWST) or to otherwise provide inventory to inject into the reactor

core and spray into the containment atmosphere; (4) more aggressive containment cleaning and increased foreign material controls; (5) ensuring containment drainage paths are unblocked; and (6) ensuring sump screens are free of adverse gaps and breaches.

You stated in your response of August 6, 2003, that you had implemented the following ICM: an emergency operating procedure revision to include specific ECCS throttling criteria based on indications of ECCS flow restriction, including additional details on how to identify pump cavitation - ICM category #1 (we note that you stated that low pressure injection flow will be maintained above a value ensuring adequate core cooling as long as pump damage is not imminent).

You also stated in your response that you would be implementing the following ICMs:

(1) Licensed Operator Requalification Training including enhanced ECCS throttling criteria (by August 31, 2003) - ICM category #1;

(2) Improvement of the TMI-1 containment closeout inspection procedures to specifically address dirt, dust and small debris accumulation (by September 30, 2003 - ICM category #4; and

(3) Development of a specific procedure for cleaning and inspecting the floor drains in containment, and coordination of this new procedure with the existing containment closeout procedure (by September 30, 2003) - ICM category #5.

You further stated in your response, including justifications, that you would not at this time be implementing the following ICMs:

(1) Procedural modifications, if appropriate, that would delay the switchover to containment sump recirculation through reduced borated water storage tank (BWST) drawdown;

(2) Ensuring that alternative water sources are available to refill the BWST or to otherwise provide inventory to inject into the reactor core and spray into the containment; and

(3) Establishing new procedures for ensuring sump screens are free of adverse gaps and breaches.

In a July 6, 2004, response to a June 8, 2004, NRC request for additional information (RAI) you:

(1) Described in more detail your technical basis for not implementing an ICM to ensure that alternative water sources are available to refill the BWST, or to otherwise provide inventory to inject into the reactor core and spray into the containment;

(2) Discussed new, post-switchover, low-pressure injection (LPI) pump throttling and containment spray pump shutdown procedure changes to ensure adequate net positive suction head (NPSH) margin (based on the design assumption of 50% sump screen blockage) - ICM category #1;

(3) Stated that high-pressure injection (HPI) throttling or shutdown, and containment spray shutdown prior to switchover to ECCS recirculation, and based on permitting plant conditions both already exist in TMI emergency procedures - ICM category #2; and

(4) Provided a discussion of the Westinghouse Owners Group (WOG) recommended compensatory measures (candidate operator actions (COAs) that have been or will be implemented at TMI-1 (a B&W plant) under new B&W Owners Group (BWOG) Generic Emergency Operation Guidelines (GEOGs), a discussion of evaluations or analyses performed to determine whether these COAs are acceptable for TMI-1, and technical rationales for those COAs not being implemented by TMI-1. These recommendations were contained in WOG report WCAP-16204, Revision 1 "Evaluation of Potential ERG and EPG Changes to Address NRC Bulletin 2003-01 Recommendations (PA-SEE-0085)" dated March, 2004.

Specifically, in regard to the TMI-1 applicable WOG-recommended COAs, you stated that you:

(1) Had incorporated a TMI-1 modified version of WOG COA A1a (secure one spray pump prior to switchover) and WOG COA A1b (secure both spray pumps prior to switchover) as discussed above - ICM category #2,

(2) Considered your post-switchover LPI pump throttling procedures (see above) to be reasonably similar in effect to WOG COA A4 (early termination of one low-pressure safety injection/residual heat removal pump prior to recirculation alignment) - ICM category #1,

(3) Had considered and rejected, for low flow rate reasons, WOG COA A5 (refill of BWST) and COA A6 (inject more than one BWST volume from a refilled BWST or by bypassing the BWST);

(4) Had implemented WOG COA A8 (provide guidance on symptoms and identification of containment sump blockage) and COA A9 (develop contingency actions in response to: containment sump blockage, loss of suction, and cavitation) - ICM category #1; and

(5) Had already implemented WOG COA A10 (early termination of one train of HPSI/High-head injection prior to recirculation alignment signal [RAS]) through existing procedures to shut down HPI pumps as soon as RCS pressure allows - ICM category #2.

In your July 6, 2004, response you also stated that you had rejected WOG COA A2 (manually establish one train of containment sump recirculation prior to automatic actuation) and WOG COA A7 (provide more aggressive cooldown and depressurization following a small-break loss-of-coolant accident (LOCA)), since the relatively long BWST drawdown time allows for substantial core cooling prior to switchover to ECCS recirculation.

In a January 19, 2005, response to a December 17, 2004, supplemental RAI you:

(1) Clarified and elaborated on an earlier RAI response relating to BWST refill (eliminating reference to using a containment spray pump to refill the BWST and also eliminating reference to the potential risk of flooding of certain EQ instrumentation in the lower portion of containment),

(2) Stated that plant operators are aware that the leakage rate, and therefore the necessary injection rate, will be lower as reactor pressure is reduced, so that they will not act to inhibit cooldown unnecessarily (promoting "aggressive cooldown" conditions for medium and large-break LOCAs - ICM category #2,

(3) Provided a detailed discussion of a recently completed assessment of ECCS downstream components potentially in the path for sump fluid, concluding that the component's openings are larger than the sump screen openings, and that oil and cooling systems are closed (separate from potentially debris-laden fluids), and

(4) Elaborated on your decision to not secure, by procedure independent of plant conditions, one or both CS pumps prior to sump recirculation. Your rationales included: (a) minimal benefit relative to an existing long duration time to switchover (BWST drawdown of approximately 28 minutes in the most limiting LOCA events) relative to core cooling needs; (b) operator burden early in an event; (c) resultant reduction of dose mitigation capability; and (d) the ability to eventually throttle the LPI pumps while then securing one or both core spray pumps (depending on potential dose consequences) should sump clogging indications arise.

In a letter dated August 18, 2005, you provided supplemental information regarding WOG-recommended COA A5 (refill of BWST) and COA A6 (inject more than one BWST volume from a refilled BWST or by bypassing the BWST). You committed to revise the site emergency operating procedures to incorporate interim measures to include initiating BWST refill after switchover to recirculation (COA A5) by September 15, 2005, and to develop guidance for injecting more than one BWST volume from a refilled BWST or for injecting from alternate water sources (COA A6) by September 30, 2005. TMI-1 has existing procedures for refilling the BWST from the spent fuel pool and the condensate storage tanks, and stated in a letter dated September 26, 2005, that the technical support center guidance procedure currently being developed will recommend an alternate injection path using a normal makeup (MU)/RCS fill capability to have other transfer pumps draw from one of the reactor coolant bleed tanks and pump through the MU system to the RCS. If RCS pressure is too great to allow adequate injection flow, the TSC guidance will also consider having the transfer pumps supply the MU tank (the volume control tank) and then align an HPI pump to draw from this tank into the RCS.

The NRC staff has considered your Option 2 response for compensatory measures that were or to have been implemented to reduce the interim risk associated with potentially degraded or nonconforming ECCS and CSS recirculation functions. Based on your response, the NRC staff considers your actions to be responsive to, and meet the intent of, Bulletin 2003-01. Please

retain any records of your actions in response to Bulletin 2003-01, as the NRC staff may conduct subsequent inspection activities regarding this issue.

Should you have any questions, please contact me at 301-415-1451.

Sincerely,

/RA/

Peter S. Tam, Senior Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-289

cc: See next page

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ACCESSION NO.: **ML052710116** *SE provided. No substantive changes.

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