

November 5, 2007

MEMORANDUM TO: Harold K. Chernoff, Chief  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

FROM: Peter Bamford, Project Manager */ra/*  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

SUBJECT: THREE MILE ISLAND, UNIT NO. 1 - ELECTRONIC TRANSMISSION,  
DRAFT REQUEST FOR ADDITIONAL INFORMATION REGARDING  
REACTOR BUILDING SUMP PH CONTROL SYSTEM BUFFER  
CHANGE (TAC NO. MD5963)

The attached draft request for additional information (RAI) was sent by electronic transmission on October 31, 2007, to Mr. David Distel, at AmerGen Energy Company, LLC (AmerGen). This draft RAI was transmitted to facilitate the technical review being conducted by the Nuclear Regulatory Commission (NRC) staff and to support a conference call with AmerGen in order to clarify certain items in the licensee's submittal. The draft RAI is related to AmerGen's submittal dated June 29, 2007, and previous response to a request for additional information dated October 19, 2007, regarding a proposed change to the reactor building sump pH buffering agent from sodium hydroxide to trisodium phosphate. The draft question was sent to ensure that the question was understandable, the regulatory basis was clear, and to determine if the information was previously docketed. Additionally, review of the draft RAI would allow AmerGen to determine and agree upon a schedule to respond to the RAI. This memorandum and the attachment do not represent an NRC staff position.

Docket Nos. 50-289

Enclosure: As stated

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\*via email

OFFICE	LPL1-2/PM	CSGB/BC
NAME	PBamford	AHiser*
DATE	11/505/2007	10/31/2007

## **DRAFT**

### REQUEST FOR ADDITIONAL INFORMATION

#### REGARDING REACTOR BUILDING SUMP

#### PH CONTROL SYSTEM BUFFER CHANGE

#### THREE MILE ISLAND UNIT 1

#### DOCKET NO. 50-289

By letter dated June 29, 2007, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML072070257), AmerGen Energy Company, LLC, the licensee, submitted a license amendment request pertaining to the replacement of the containment sump buffer at Three Mile Island (TMI), Unit 1. By letter dated October 4, 2007, ADAMS Accession No. ML072670549, additional information was requested by the Nuclear Regulatory Commission (NRC) staff. The TMI response dated October 19, 2007, ADAMS Accession No. ML072980699, was incomplete regarding question number nine. Therefore, a response to the supplemental question below is requested.

#### **Original Question #9**

TMI is proposing to switch to TSP [trisodium phosphate] as a buffering chemical. Testing indicates that TSP in the presence of dissolved calcium can result in rapid precipitation of calcium phosphate, which can create significant head loss across a sump strainer covered with a debris bed. Provide a list of all potential sources and amounts of calcium within the TMI containment and provide the calculated dissolved calcium concentration in a post-LOCA pool. Provide the relative chemical precipitate loading predicted by the WCAP-16530-NP model for TMI with TSP and at the maximum projected pH value (8) for the pool.

#### **Supplemental Question**

Your response to the NRC staff's question in letter dated October 19, 2007, regarding calcium sources and dissolved calcium concentration in the post-LOCA pool (Question #9) did not contain sufficient detail for the staff to complete its review. Testing has shown that TSP in the presence of dissolved calcium can result in rapid formation of calcium phosphate precipitates that can be detrimental to ECCS operability. Licensees who use TSP need to ensure that their plant specific calcium loading will not create a precipitate load that challenges the operability of their strainers. Although calcium silicate insulation is the most significant source of calcium in most containments, there are many other sources that must be considered. Calcium may be dissolved from other insulation materials such as mineral wool, marinate board, and other micro-porous insulation materials. Calcium leached from concrete can contribute to chemical effects, especially in containments with large areas of uncoated concrete, or containments in which concrete may be eroded by direct jet impingement. Because of the concerns listed above, the staff requested in letter dated October 4, 2007, that TMI provide the potential calcium sources and provide the dissolved calcium level following a LOCA. The staff specifically requests a response to the following information from the previous RAI #9 in order to complete our review of this amendment request:

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- A.) Provide a complete list of potential calcium sources in the TMI-1 containment, including their expected contribution to calcium loading and the basis for the estimated contribution from each source.
- B.) Provide the calculated dissolved calcium level in the post-LOCA sump pool.
- C.) Provide a comparison of post-LOCA precipitate loading under existing buffer and proposed buffer at the maximum projected pH value (8) for the pool. This may be done using the WCAP-16530 model or other means.