October 17, 2005

Mr. George Vanderheyden, Vice President
Calvert Cliffs Nuclear Power Plant, Inc.
Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, MD 20657-4702

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2 - RESPONSE TO NRC BULLETIN 2003-01, "POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY SUMP RECIRCULATION AT PRESSURIZED-WATER REACTORS" (TAC NOS. MB9563 AND MB9564)

Dear Mr. Vanderheyden:

This letter acknowledges receipt of your response dated August 8, 2003 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML032270048), 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 (ADAMS No. ML031600259). The NRC issued Bulletin 2003-01 to all pressurized-water reactor (PWR) licensees requesting that they provide a response, within 60 days of the date of Bulletin 2003-01, that contains the information requested in either Option 1 or Option 2 as 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 (ICMs) 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 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.

In your August 8, 2003, letter, you provided a response to Option 2.

Bulletin 2003-01 discussed the following 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.

In your August 8, 2003, letter, you provided the following information:

(1) all sump strainer materials are stainless steel and are, therefore, able to withstand long-term exposure to a boric acid environment - ICM category #6;

(2) containment cleanliness controls already provide explicit guidance for continuously maintaining the containment clean during shutdown conditions (foreign material controls), and the closeout procedure directs the identification and removal of trash and debris from all areas inside containment (with particular instructions for inspecting and cleaning the lowest level of the containment) - ICM category #4;

(3) containment closeout controls require inspection of the containment sump for evidence of structural distress or abnormal corrosion - ICM category #6;

(4) containment coating controls ensure that degraded coatings are identified and repaired and/or replaced - ICM category #4;

(5) during containment recirculation, operators are trained to monitor high-head safety injection pump flow, discharge pressure, and motor amperage for indications of sump blockage, and to take appropriate action such as reducing pump flow rates - ICM category #1;

(6) Severe Accident Management Guidelines direct Technical Support Center (TSC) personnel to recommend the establishment of alternate sources of water/flowpath alignments for reactor coolant system (RCS) injection in the event of sump blockage, within containment water level structural limits - ICM category #3; and

(7) although containment drains are inspected for debris/blockage, Calvert Cliffs has a conservative net-positive suction head (NPSH) calculation, which assumes that the refueling pool drain and the drain in the reactor pedestal annular area are clogged - ICM category #5.

You also stated in your response that you would consider enhancements to current operator training relative to sump clogging, and that this evaluation would, if applicable, be completed by January 31, 2004.

You further stated, and included supporting justifications, that you would not be implementing the following ICM: procedural modifications, if appropriate, that would delay the switchover to containment pump recirculation. You stated that you would evaluate all such actions, in collaboration with the Westinghouse Owners Group (WOG), to determine if any such actions are beneficial.

In a November 8, 2004, letter (ADAMS No. ML043150282) responding to an NRC request for additional information (RAI) dated September 10, 2004, you stated that you had evaluated operator sump clogging responses and determined that a lesson plan and a formal procedure modification were to be created and used to reinforce these existing operator actions, with all actions to be completed by June 30, 2005 - ICM category #1.

In your November 8, 2004, RAI response, you provided a detailed discussion of your evaluation of WOG report WCAP-16204, Revision 1, "Evaluation of Potential ERG and EPG Changes to Address NRC Bulletin 2003-01 Recommendations (PA-SEE-0085)," and its 11 applicable candidate operator actions (COA) as follows:

(1) COA 1a, "Secure One CS Pump Before Recirculation Alignment," by concluding that voluntarily terminating one CS train and then losing the other train via single-failure early in an event would result in so harsh a containment environment that it would adversely affect the qualification of certain pieces of electrical equipment which are required to be operable, and that, therefore, this COA would not be implemented;

(2) COA 1b, "Operator Action to Secure Both Spray Pumps," by concluding that voluntarily terminating one CS train and then losing the other train via single-failure early in an event would result in so harsh a containment environment that it would adversely affect the qualification of certain pieces of electrical equipment which are required to be operable, and that, therefore, this COA would not be implemented;

(3) COA 2, "Manually Initiate One Train of Containment Sump Recirculation Before a Recirculation Actuation Signal," by concluding that timing factors effectively prevent this action during large-break loss-of-coolant accidents (LOCAs), and for small-break LOCAs, low flow rates due to RCS back-pressure could lead to catastrophic low-pressure safety injection (LPSI) pump damage, and that, therefore, this COA would not be implemented;

(4) COA 3, "Terminate One Train of HPSI Following a Recirculation Actuation Signal," by concluding that this COA results in an unacceptable increase in NPSH requirements over existing procedures, which already require significant throttling of both high-pressure safety injection (HPSI) pumps, and that, therefore, this COA would not be implemented;

(5) COA 4, "Terminate Low Pressure Safety Injection Pump Before Recirculation Actuation Signal," by concurring with the WOG WCAP-16204 analysis that this is not a net-benefit action, and that, therefore, this COA would not be implemented;

(6) COA 5, “Refill the Refueling Water Tank (RWST),” by concluding that Calvert Cliffs will modify its emergency operating procedures (EOPs) for a LOCA to include a step instructing that preparations be made to refill the RWST - ICM category #3;

(7) COA 6, “Inject Into RCS from Refilled RWST, or by Bypassing RWST,” by concluding that Calvert Cliffs will modify its EOPs to include steps instructing that preparations be made to allow injection from an alternate source directly into the RCS - ICM category #3;

(8) COA 7, “Provide More Aggressive Cooldown and Depressurization Following a Small-Break LOCA,” concluding that current Calvert Cliffs procedures currently allow for aggressive cooldown within safety limits - ICM category #2;

(9) COA 8, “Provide Guidance on Symptoms and Identification of Sump Blockage as Well as Contingency Actions to be Taken in the Event of Sump Blockage,” by concluding that Calvert Cliffs will modify its EOPs for a LOCA to include a step instructing that the ECCS pumps should be monitored for a loss of suction (CS and HPSI flow, discharge pressure, motor current, and noise) - ICM category #1;

(10) COA 9, “Develop Contingency Actions in Response to Containment Sump Blockage, Loss of Suction, and Cavitation,” by concluding that if any conditions of COA 8 are detected, operators are instructed to secure CS pumps and shift to containment air coolers while monitoring HPSI pumps for indications that flow throttling, or flow stoppage, and shifting to severe accident management guidelines are required - ICM category #1;

(11) COA 10, “Terminate HPSI Prior to Recirculation Actuation Signal,” by concluding that Calvert Cliffs concurs with the WOG that unacceptable conditions would result in single-failure situations, and that, therefore, this COA would not be implemented; and

(12) COA 11, “Prevent or Delay Containment Spray for Small Break LOCAs (<1.0 Inch Diameter) in Ice Condenser Plants,” (not applicable to Calvert Cliffs’ dry containment design).

In a letter dated August 4, 2005 (ADAMS No. ML052210385), responding to questions raised in a July 5, 2005, conference call with the NRC staff, you amplified your responses regarding COA 5, COA 6, and COA 7 as follows:

(1) COA 5, “Refill the Refueling Water Tank (RWST),” by stating that, under EOPs 05-1 and 08-1 for Unit 1, if there is a recirculation actuation signal, the operators are directed to refill the refueling water tank (RWT), and similar information exists for Unit 2 - ICM category #3;

(2) COA 6, “Inject Into RCS from Refilled RWST, or by Bypassing RWST,” by stating that under EOP 08-1 the steps exist for accomplishing RWT injection from a refilled RWT - ICM category #3; and

(3) COA 7, “Provide More Aggressive Cooldown and Depressurization Following a Small-Break LOCA,” by stating that changes have been made to EOP-05 and EOP-08 basis documents, which clearly state that cooldown during a LOCA should be as aggressive as plant conditions allow, and that this change is being incorporated into applicable training programs - ICM category #2.

In an August 30, 2005, response (ADAMS No. ML052440255) to questions raised during an August 11, 2005, conference call with the NRC staff, you discussed COA 6, “Inject Into RCS from Refilled RWST, or by Bypassing RWST,” by stating that the opposite unit RWT is the alternate source for RWT makeup water (with two such paths for RWT cross-tie refill existing), and the multiple alternate (RWT bypass) injection paths are from the opposite unit RWT (2 paths), the spent fuel pools (2 paths), and the condensate storage tanks - ICM category #3.

The NRC staff has considered your Option 2 response for compensatory measures that were or were to have been implemented to reduce the interim risk associated with potentially degraded or nonconforming ECCS and CSS recirculation functions. Based on the information in your responses, 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 301-415-1457 or the Lead Project Manager for this issue, Alan Wang, at 301-415-1445.

Sincerely,

/RA/

Patrick D. Milano, Sr. Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-317 and 50-318

cc: See next page

(2) COA 6, “Inject Into RCS from Refilled RWST, or by Bypassing RWST,” by stating that under EOP 08-1 the steps exist for accomplishing RWT injection from a refilled RWT - ICM category #3; and

(3) COA 7, “Provide More Aggressive Cooldown and Depressurization Following a Small-Break LOCA,” by stating that changes have been made to EOP-05 and EOP-08 basis documents, which clearly state that cooldown during a LOCA should be as aggressive as plant conditions allow, and that this change is being incorporated into applicable training programs - ICM category #2.

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Should you have any questions, please contact me at 301-415-1457 or the Lead Project Manager for this issue, Alan Wang, at 301-415-1445.

Sincerely,

/RA/

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Division of Licensing Project Management
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Docket Nos. 50-317 and 50-318
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