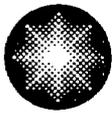


George Vanderheyden
Vice President
Calvert Cliffs Nuclear Power Plant
Constellation Generation Group, LLC

1650 Calvert Cliffs Parkway
Lusby, Maryland 20657
410.495.4455
410.495.3500 Fax



Constellation Energy

November 8, 2004

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
Response to Request for Additional Information Regarding NRC
Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump
Recirculation at Pressurized-Water Reactors"

REFERENCES:

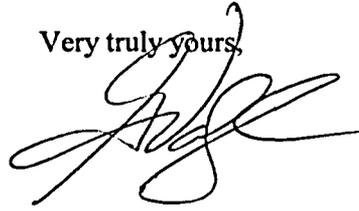
- (a) Letter from Mr. K. J. Nietmann (CCNPP) to Document Control Desk (NRC), dated August 8, 2003; "Response to NRC Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors"
- (b) Letter from Mr. R. V. Guzman (NRC) to Mr. G. Vanderheyden (CCNPP), dated September 10, 2004, "Request for Additional Information (RAI) – Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 - Bulletin 2003-01, Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors" (TAC Nos. MB9564 and MB9565)

By letter dated August 8, 2003 (Reference a), the Calvert Cliffs Nuclear Power Plant, Inc. (CCNPP) provided its response to NRC Bulletin 2003-01. By letter dated September 10, 2004 (Reference b), you requested additional information to complete your review. Attachment (1) to this letter provides CCNPP's response to your request for additional information.

A103

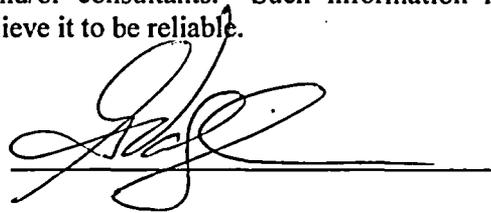
Should you have additional questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,



STATE OF MARYLAND :
: TO WIT:
COUNTY OF CALVERT :

I, George Vanderheyden, being duly sworn, state that I am Vice President - Calvert Cliffs Nuclear Power Plant, Inc. (CCNPP), and that I am duly authorized to execute and file this response on behalf of CCNPP. To the best of my knowledge and belief, the statements contained in this document are true and correct. To the extent that these statements are not based on my personal knowledge, they are based upon information provided by other CCNPP employees and/or consultants. Such information has been reviewed in accordance with company practice and I believe it to be reliable.



Subscribed and sworn before me, a Notary Public in and for the State of Maryland and County of St. Mary's, this 8th day of November, 2004.

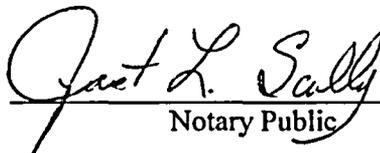
WITNESS my Hand and Notarial Seal:

My Commission Expires:

GV/GT/bjd

Attachment: (1) Response to NRC Request for Additional Information Regarding Bulletin 2003-01

cc: J. Petro, Esquire
J. E. Silberg, Esquire
R. V. Guzman, NRC


Notary Public

March 25 2007
Date

S. J. Collins, NRC
Resident Inspector, NRC
R. I. McLean, DNR

ATTACHMENT (1)

**RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION
REGARDING BULLETIN 2003-01**

ATTACHMENT (1)
RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION
REGARDING BULLETIN 2003-01

Requested Information (1)

On page 5 of Attachment 1 of CEG's [Constellation Energy's] response to Bulletin 2003-01, it states that enhancements to operator training on indications of and responses to sump clogging were being assessed, with an evaluation completion date of September 15, 2003, and an implementation date of January 31, 2004. However, CEG's response does not completely discuss the operator training to be implemented. Please provide a detailed discussion of the operating procedures to be implemented, the indications of sump clogging that the operators are instructed to monitor, and the response actions the operators are instructed to take in the event of sump clogging and loss of ECCS [Emergency Core Coolant System] recirculation capability.

CCNPP Response

As an immediate action, we developed a lesson plan and trained our operators to reinforce existing procedural guidance to address the issues raised by Bulletin 2003-01. In particular, in the event of a loss-of-coolant accident (LOCA), the operators were instructed to closely monitor fluctuations in pump flow, discharge pressure, and pump amperage for indications of pump cavitation. If pump cavitation was detected, the operators were instructed to immediately reduce pump flow rates and, if necessary, secure the pumps altogether to eliminate cavitation. In the event of a loss of ECCS recirculation capability, the operators were instructed to expeditiously implement severe accident management procedures in order to obtain alternative water sources for the ECCS pumps. We have also scheduled a formal procedure modification and associated operator training to be completed by June 30, 2005. [See our response to Requested Information (2) under Candidate Operator Actions (COA) 8 and 9 below.]

Requested Information (2)

On page 4 of Attachment 1 of CEG's response to Bulletin 2003-01, it states: "... in collaboration with the Westinghouse Owner's Group (WOG), Calvert Cliffs is evaluating the benefit of the following procedural actions:

- ii. Terminate one train of high pressure safety injection (HPSI) following a recirculation actuation signal (RAS).*
- iii. Review safety injection stop/throttle criteria to terminate unneeded safety injection pumps prior to RAS.*
- iv. Review stop and reset criteria to enable early termination and subsequent cycling of containment spray (CS) pumps as needed."*

On page 4 of Attachment 1 of CEG's response to Bulletin 2003-01, it states that potential actions to delay the onset of the RAS were to be evaluated in conjunction with the WOG. The stated evaluation completion date was March 31, 2004, and the implementation date of any changes to operator actions was to be determined. WOG has developed operational guidance in response to Bulletin 2003-01 for Westinghouse and Combustion Engineering type pressurized-water reactors.

- i. Please provide a discussion of your plans to consider implementing this new WOG guidance. Include a discussion of the WOG recommended compensatory measures that have been or will be implemented at your plant, and the evaluations or analyses performed to determine which of the WOG-recommended changes are acceptable at your plant. Provide technical justification for those WOG-recommended compensatory measures not being implemented by your plant.*

ATTACHMENT (1)
RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION
REGARDING BULLETIN 2003-01

- ii. *Include a detailed discussion of the procedures being modified, the operator training being implemented, and your schedule for implementing these compensatory measures.*

CCNPP Response

The Westinghouse Owner's Group evaluated eleven COAs in response to Bulletin 2003-01. The first ten COAs are applicable for plants with large, dry containments, such as Calvert Cliffs; the eleventh COA is applicable for plants with ice condenser containments. The following is a detailed discussion of our evaluation of the 10 COAs for applicability to Calvert Cliffs.

COA 1

Secure one CS pump before recirculation alignment.

Evaluation result:

This COA, whether interim or permanent, is not acceptable because of its potential adverse impact on equipment qualification. The successful application of this guidance depends on the timing of terminating flow for one spray train. In order to benefit from the sump blockage analysis, termination of flow would have to occur relatively soon (1/2 hour to 2 hours) after the start of the event. However, based on a previous evaluation, voluntarily terminating flow from one CS train and then losing the other train via single-failure this early in the accident will result in a significantly harsher containment environment that will adversely affect the qualification of certain electrical equipment that are required to be operable. For components such as Amphenol electrical penetrations, termination of one train of CS flow 24 hours into the event would be too early to maintain its qualification. Additionally, as discussed in NRC Information Notice 97-78, even if the equipment qualification issues were to be resolved, justifying operator action to mitigate the effects of a design basis event is a significant challenge. Therefore, we have decided not to pursue this COA.

COA 2

Manually initiate one train of containment sump recirculation earlier than a RAS.

Evaluation Result:

In the case of a large-break LOCA, RAS will be received so quickly that there will not be sufficient time to replenish the refueling water tank (RWT) prior to a RAS signal being received. For a small-break LOCA, time might exist to replenish the RWT prior to a RAS; however, during a small-break LOCA, the possibility exists that the low pressure safety injection (LPSI) pumps could be on mini-flow recirculation (i.e., not injecting into the core) because the Reactor Coolant System (RCS) pressure is too high. All of the safety injection and CS pumps have their mini-flow lines feed into a common return line to the RWT. If sump recirculation were initiated, the mini-flow isolation valves would have to be closed to prevent contaminated water from being pumped to the RWT, which is open to the atmosphere. However, if the mini-flow recirculation line is shut, there is a strong possibility that the LPSI pumps could suffer catastrophic damage in only a few minutes due to the removal of the only flow path for these pumps. Therefore, we have decided not to pursue this COA.

COA 3

Terminate one train of HPSI following a RAS.

ATTACHMENT (1)
RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION
REGARDING BULLETIN 2003-01

Evaluation Result:

The WOG procedure guideline suggests that by turning off one of the two HPSI pumps the flow to the sump can be reduced by 750 gpm (runout flow of a HPSI pump). However, our emergency operating procedure already directs that if two HPSI pumps are operating, the total two pump flow should be throttled to 1000 gpm. Thus, for example, the current flow rate of 3700 gpm (1000 gpm from two HPSI pumps, 1350 gpm each from two CS pumps) is only slightly larger than the 3300 gpm (600 gpm HPSI, 1350 gpm per CS) value that would result from the proposed procedure revision. This is a relatively small overall reduction in suction flow rate to the sump, and results in a larger HPSI pump flow (600 gpm versus 500 gpm). This increased HPSI pump flow rate increases the required net positive suction head (NPSH) by 5 feet. Our NPSH available versus NPSH required calculation has a margin of only approximately 2 feet. Thus, the NPSH increase of 5 feet represents an unacceptable change in operating margin; therefore, this procedure change will not be pursued.

COA 4

Terminate low pressure safety injection pump prior to RAS.

Evaluation Result:

The WOG reviewed this option and determined it would result in unacceptable consequences as demonstrated by a generic single failure analyses. Therefore, this action will not be implemented at CCNPP.

COA 5

Refill the RWT.

Evaluation Result:

In accordance with the WOG recommendation, CCNPP will modify its emergency operating procedures for a LOCA to include a step instructing that preparations be made to refill the RWT. This action is to be a continually applicable/non-sequential step that will improve the availability of additional water sources for the ECCS pumps, should they be required. Operator shift training will occur during the second quarter of 2005, and will be completed by June 30, 2005.

COA 6

Inject into RCS from refilled RWT, or bypassing RWT.

Evaluation Result:

In accordance with the WOG recommendation, CCNPP will modify its emergency operating procedures for a LOCA to include steps instructing that preparations be made to allow injection from an alternate source directly into the RCS. Operator shift training will occur during the second quarter of 2005, and will be completed by June 30, 2005.

COA 7

Provide more aggressive cooldown and depressurization following a small-break LOCA.

ATTACHMENT (1)
RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION
REGARDING BULLETIN 2003-01

Evaluation Result:

We have reviewed the WOG proposal for a more aggressive cooldown during a small-break LOCA and concluded that our current operating procedures already provide for as aggressive a cooldown as permitted by the safety limits. Therefore, no changes will be made as a result of this recommendation.

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.

Evaluation Result:

In accordance with the WOG recommendation, CCNPP will modify its emergency operating procedures for a LOCA to include a step instructing that the ECCS pumps should be monitored for a loss of suction. This includes:

- Lower or unstable CS or HPSI pump flow;
- Lower or unstable CS or HPSI pump discharge pressure;
- Lower or unstable CS or HPSI pump motor current; and
- Increased CS or HPSI pump noise.

Operator shift training will occur during the second quarter of 2005, and will be completed by June 30, 2005.

COA 9

Develop contingency actions in response to containment sump blockage, loss of suction, and cavitation.

Evaluation Result:

In accordance with the WOG recommendations, if any of the conditions in COA 8 are detected, operators are instructed to secure the CS pumps. At this stage of the accident, containment pressure/temperature responses will not be adversely affected by the cessation of CS flow, and the containment air coolers can be used for containment atmosphere control. The HPSI pump is then to be monitored, and the flow throttled or stopped as necessary. Plant operation would then be augmented by the severe accident management procedures. Operator shift training will occur during the second quarter of 2005, and will be completed by June 30, 2005.

COA 10

Terminate HPSI prior to RAS.

Evaluation Result:

The WOG reviewed this option and determined it would result in unacceptable consequences as demonstrated by a generic single failure analyses. Therefore, this action will not be implemented at CCNPP.

ATTACHMENT (1)
RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION
REGARDING BULLETIN 2003-01

Requested Information (3)

NRC Bulletin 2003-01 provides possible interim compensatory measures licensees could consider to reduce risks associated with sump clogging. In addition to those compensatory measures listed in Bulletin 2003-01, licensees may also consider implementing unique or plant-specific compensatory measures, as applicable. Please discuss any possible unique or plant-specific compensatory measures you considered for implementation at your plant. Include a basis for rejecting any of these additional considered measures.

CCNPP Response

We have not considered any unique or plant-specific compensatory measures other the ones addressed by WOG.