CHARLES H. CRUSE
Vice President
Nuclear Energy

Baltimore Gas and Electric Company
Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657
410 495-445.

BGE

December 17, 1997

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
Calvert Cliffs Independent Spent Fuel Storage Installation, Docket No. 72-8
Response to NRC Request for Additional Information Regarding Bulletin 96-04: Chemical, Galvanic, or other Reactions in Spent Fuel Storage and Transportation Casks

REFERENCES:

(a) Letter from Ms. M. G. Bailey (NRC) to Mr. C. H. Cruse (BGE), dated November 17, 1997, Request for Additional Information Based on the Nuclear Regulatory Commission's Acceptance of VECTRA Technologies' Response to NRC Bulletin 96-04

(b) Letter from Mr. C. H. Cruse (BGE) to NRC Document Control Desk, dated August 19, 1996, Response to NRC Bulletin 96-04: Chemical, Galvanic, or other Reactions in Spent Fuel Storage and Transportation Casks

(c) NRC Bulletin 96-04: Chemical, Galvanic, or other Reactions in Spent Fuel Storage and Transportation Casks, dated July 5, 1996

By letter dated November 17, 1997 (Reference a), you informed us of your acceptance of the information prepared by VECTRA Technologies, Inc. in response to NRC Bulletin 96-04, "Chemical, Galvanic, or other Reactions in Spent Fuel Storage and Transportation Casks" (Reference c), which was incorporated in our response to Bulletin 96-04 (Reference b). In your November 17, 1997 letter, you also enclosed a request for additional information (RAI) regarding our implementation of the recommendations made in VECTRA's response, which "supersedes in its entirety [your] RAI dated April 8, 1997." Attachment (1) to this letter provides our response to your latest RAI enclosed in Reference (a).

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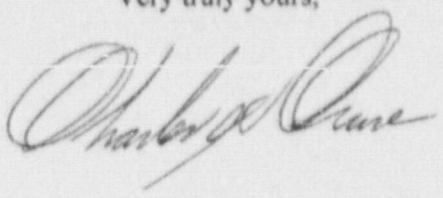
Should you have questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,



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

I, Charles H. Cruse, being duly sworn, state that I am Vice President, Nuclear Energy Division, Baltimore Gas and Electric Company (BGE), and that I am duly authorized to execute and file this response on behalf of BGE. 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 BGE 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 17th day of December, 1997.

WITNESS my Hand and Notarial Seal:

Laura A. Martin
Notary Public

NOTARY PUBLIC STATE OF MARYLAND
My Commission Expires July 1, 1998

My Commission Expires:

December 17th, 1997
Date

CHC/GT/dlm

Attachment: (1) Response to the NRC's November 17, 1997, Request for Additional Information Regarding Bulletin 96-04, "Chemical, Galvanic, or other Reactions in Spent Fuel Storage and Transportation Casks"

cc: R. S. Fleishman, Esquire
J. E. Silberg, Esquire
A. W. Dromerick, NRC
Director, Project Directorate I-1, NRC
H. J. Miller, NRC
Resident Inspector, NRC
M. G. Bailey, NRC
R. I. McLean, DNR
J. H. Walter, PSC
D. Dawson, Trans Nuclear

ATTACHMENT (1)

Response to the NRC's November 17, 1997, Request for Additional Information Regarding Bulletin 96-04, "Chemical, Galvanic, or other Reactions in Spent Fuel Storage and Transportation Casks"

Baltimore Gas & Electric Company
Docket Nos. 50-317, 50-318, and 72-08
December 17, 1997

ATTACHMENT (1)

Response to the NRC's November 17, 1997, Request for Additional Information Regarding Bulletin 96-04, "Chemical, Galvanic, or other Reactions in Spent Fuel Storage and Transportation Casks"

NRC Request:

Describe in detail how the recommendations made in the VECTRA Technologies, Inc. (VECTRA) Report No. 31-B9604-102, Revision 2, for hydrogen control and monitoring will be implemented. At a minimum, the information provided should:

1. *Describe the methods used to control and monitor hydrogen before and during welding, grinding, or cutting operations associated with loading or unloading activities.*

   The methods should include continuous monitoring of the hydrogen concentration in dry shielded canisters (DSCs) with flame-sprayed aluminum. During its review of VECTRA's evaluation, the staff found that the hydrogen concentration could be highly variable in these DSCs. In addition, results of VECTRA's computer simulation also indicate that there may be an initiating event that causes a rapid increase in hydrogen generation. If not properly monitored, the hydrogen concentration could exceed VECTRA's proposed safe upper limit of 2.4% hydrogen, and the lower flammability limit of 4.0% hydrogen in a very short time in borated water.

2. *Specify the DSC hydrogen concentration that will be set as the safe upper limit before and during welding or cutting operations.*

   VECTRA has recommended a safe upper limit of 2.4% hydrogen. If a higher limit is used, justify that it provides an adequate safety margin between the amount of hydrogen produced and the lower flammability limit (4% hydrogen by volume).

3. *Describe the actions to be taken if the safe upper limit is exceeded.*

BGE Response:

1. In our August 19, 1996 response to Bulletin 96-04 (Reference 2), we indicated that our plan was to sample a number of DSC operations involving carbon steel coated with flame-sprayed aluminum, and reevaluate the situation whether to continue sampling. However, since the NRC staff has expressed its belief in continuous monitoring of the hydrogen concentration in DSCs with flame-sprayed aluminum (Reference 1), we will continuously monitor the DSC vapor space during welding or cutting of the shield plug to ensure that VECTRA's recommended safe limit is not exceeded.

   As described in Reference (2), we use two procedures to control all Independent Spent Fuel Storage Installation (ISFSI) welding, grinding and cutting operations; ISFSI-01 for loading activities and ISFSI-02 for unloading activities. Both procedures use the same general method to control and monitor hydrogen during operations involving DSCs containing carbon steel coated with flame-sprayed Aluminum. The following is a description of the method used during a loading activity:

   Before the Transfer Cask/DSC is placed into the Spent Fuel Pool, the Vent Port Fitting is removed from the DSC. This creates a clear 1/2-inch path for any gases to leave the DSC. Once the Transfer Cask/DSC has been removed from the Spent Fuel Pool, 60 gallons of water is removed from the DSC. This creates a 4-inch air space below the

Shield Plug. A 1/4-inch tube is then inserted into the Vent Port approximately 12 inches. Inserting the tube 12 inches allows the air space below the Shield Plug to be directly sampled. A gas monitor capable of detecting hydrogen gas is then connected to the tube. The monitor is calibrated per Calvert Cliffs calibration procedures. From this point in the loading activity until the final Shield Plug weld passes the dye penetrate test, the monitor continually samples the DSC air space. Operators also monitor the 1/4-inch tube for water bubbles that may slow or stop the air flow. In addition, during welding or cutting processes, an inert cover gas is used to cover the flame area of the welding and cutting machine. The combination of an inert cover gas and an open vent line during a welding or cutting operation significantly reduces the likelihood of any hydrogen buildup or ignition.

2. In our August 19, 1996, response to Bulletin 96-04 (Reference 2), we had conservatively set 50% of the lower flammability limit of hydrogen as the safe upper limit before and during welding or cutting operations. The 50% limit was based on the fact that we were only planning to sample a number of DSC operations involving carbon steel coated with flame-sprayed aluminum, and reevaluate the situation whether to continue sampling. As discussed above, since we are now committed to continuously monitor hydrogen concentration in all DSCs with flame-sprayed aluminum, we have adopted VECTRA's recommendation of 60% of the lower flammability limit of hydrogen (i.e., 2.4% hydrogen by volume) as a safe upper limit before and during welding or cutting operations.

3. As we stated in our August 19, 1996 response to Bulletin 96-04 (Reference 2), if the safe upper limit is exceeded, all welding or cutting operations will be stopped and the DSC air space will be purged. Purging will be done with filtered plant air. The DSC air space will be retested for presence of hydrogen before restarting any welding or cutting operation.

REFERENCES:

(1) Letter from Ms. M. G. Bailey (NRC) to Mr. C. H. Cruse (BGE), dated November 17, 1997, Request for Additional Information Based on the Nuclear Regulatory Commission's Acceptance of VECTRA Technologies' Response to NRC Bulletin 96-04

(2) Letter from Mr. C. H. Cruse (BGE) to NRC Document Control Desk, dated August 19,1996, Response to NRC Bulletin 96-04: Chemical, Galvanic, or other Reactions in Spent Fuel Storage and Transportation Casks