**Calvert Cliffs Nuclear Power Plant**
Constellation Generation Group, LLC

1650 Calvert Cliffs Parkway
Lusby, Maryland 20657

**Constellation Energy Group**

May 20, 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
Additional Information Concerning the License Amendment Request to Revise the Refueling Operations Section of the Technical Specifications

**REFERENCES:**

(a) Letter from Mr. G. Vanderheyden (CCNPP) to Document Control Desk (NRC), dated March 1, 2004, Response to Request for Additional Information Concerning the License Amendment Request to Revise the Refueling Operations Section of the Technical Specifications

(b) Letter from Mr. P. E. Katz (CCNPP) to Document Control Desk (NRC), dated August 6, 2002, License Amendment Request: Revisions to the Refueling Operations Section of the Technical Specifications

This letter provides clarifying information to the information that was provided in Reference (a). This information supports and/or clarifies the information provided in Reference (b). This information does not affect the No Significant Hazards Consideration Determination or the Environmental Impact Review of Reference (b).

Reference (a) provided information concerning the current analysis for Control Room doses. It has been determined that additional information would provide some clarification to the current Control Room dose analysis. This clarifying information is provided below.

In the mid-1990's Calvert Cliffs performed in-leakage testing of the Control Room and identified excessive in-leakage. Major modifications were implemented to reduce the amount of in-leakage. Subsequent testing performed over the years has demonstrated significant reduction in in-leakage.

The most limiting unfiltered in-leakage into the Calvert Cliffs Nuclear Power Plant (CCNPP) Control Room is 3000+/-250 cubic feet per minute (CFM), which is less than the in-leakage value of 3500 CFM assumed in the CCNPP design basis radiological analyses.

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The latest CCNPP Control Room tracer gas testing that resulted in the 3000+/-250 CFM unfiltered in-leakage was performed in January 2000. The test was performed by Nucon International, Inc. who is a 10 CFR Part 50, Appendix B vendor. The test determined the overall in-leakage into the Control Room via a Sulfur Hexaflouride (SF6) decay test per American Society for Testing and Materials E-741 guidance. The Control Room test configuration was 100% continuous recirculation mode, which is the accident lineup. Subsequent informal tests have shown in-leakage values that are consistent with the January 2000 test.

The CCNPP design basis radiological analysis that is currently credited in our Updated Final Safety Analysis Report (UFSAR) was completed in September 2000. The design basis analysis is based on a Maximum Hypothetical Accident (MHA) and a Fuel Handling Accident (FHA) in Containment with the following assumptions:

a. The atmospheric dispersion coefficient from the Containment to the Control Room was assumed to be 7.7E-4 (0-8 hours), 4.5E-4 (8-24 hours), 2.5E-4 (1-4 days), and 6.3E-5 (4-30 days). These values are based on three years of onsite data.

b. The Control Room volume is assumed to be 166,000 $ft^3$ in accordance with the design value.

c. The Control Room is in continuous recirculation (accident) mode with 3500 CFM of unfiltered leakage.

d. The Control Room recirculation filter flow starts at 2.1 seconds on a high radiation signal. The portion of the recirculation flow which passes through the 90% efficient post-loss-of-coolant accident filters is $2,000 \pm 10\%$ CFM.

e. The Control Room occupancy factors are assumed to be 1.0 (0-1 day), 0.6 (1-4 days), and 0.4 (4-30 days), per Standard Review Plan 6.4-19, Revision 2.

f. The self-contained breathing apparatus (SCBA) was assumed to have a Protection Factor of 10,000.

The proposed change (Reference b) would allow containment penetrations to be opened under administrative control during movement of irradiated fuel assemblies within Containment. The majority of the containment penetrations that would be allowed open under administrative control would open into the Auxiliary Building penetration room, which has a filtered release. Since the Control Room atmospheric dispersion coefficient assumes uniform containment leakage over the containment surface and no filtration is assumed prior to reaching the Control Room ventilation system, this analysis bounds both filtered and unfiltered release paths. The filters in the Auxiliary Building penetration room provide an additional conservatism beyond the calculated results. Therefore, any release of radioactivity from containment penetrations following a FHA would be bounded by our current analysis.

The radiological analyses concluded that the Control Room post-loss-of-coolant accident thyroid dose will be maintained below the [General Design Criterion (GDC) 19] 30-day limit of 30 rem, if planned protective measures (i.e., SCBAs) are implemented within 32 minutes for a MHA and 82 minutes for a FHA in Containment. The use of SCBAs and Potassium Iodide (KI) tablets by the Control Room operators following an accident is consistent with Calvert Cliffs' Emergency Response Plan. There are sufficient SCBAs staged in the Control Room to provide protection to all Control Room operators following an accident and that additional SCBAs are staged elsewhere onsite for operators coming on-shift. The methodology employed for these analyses is contained in UFSAR, Chapters 9 and 14. The calculated

Control Room operator doses for the FHA in Containment is provided below in Table 1. Detailed results are provided only for the FHA in Containment because it is the incident of concern for this proposed amendment.

**Table 1**

| | | FHA in Containment Design Basis FHA Dose (Rem) | Regulatory Limit (Rem) |
|---|---|---|---|
| Control Room In-leakage (CFM) | | 3500 | |
| Control Room | Thyroid Dose | 29.8 | 30 |
| | Whole Body Dose | 2.60 | 5 |
| | Beta Skin Dose | 1.15 | 30 |
| Time to Don SCBAs (Minutes) | | 82 | |

The current analysis for the FHA in Containment assumes the radioactive release is unfiltered and the proposed change (Reference b) will not result in higher in-leakage into the Control Room. Therefore, the current FHA analysis bounds the Containment configuration when containment penetrations are opened under administrative control.

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

Very truly yours,

Bruce S. Montgomery
Manager, CCNPP-Engineering Services

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

I, Bruce S. Montgomery, being duly sworn, state that I am Manager, Engineering Services - Calvert Cliffs Nuclear Power Plant, Inc. (CCNPP), and that I am duly authorized to execute and file this License Amendment Request 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 CALVERT, this 20th day of May, 2004.

**WITNESS** my Hand and Notarial Seal:

Notary Public LYNN M. TAYLOR

My Commission Expires: 2/1/06
Date

BSM/GV/DJM/bjd

cc: J. Petro, Esquire
J. E. Silberg, Esquire
Director, Project Directorate I-1, NRC
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