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Baltimore Gas and Electric Company  
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Lusby, Maryland 20657  
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October 6, 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  
Exemption from 10 CFR 50.48, Appendix R, Requirements

REFERENCES: (a) NRC Information Notice 95-36, Supplement 1: "Potential Problem with Post-Fire Emergency Lighting," dated June 10, 1997  
(b) Letter from Mr. G. C. Creel (BGE) to NRC Document Control Desk, dated June 29, 1990, "Request for Exemption 10 CFR 50, Appendix R, Emergency Lighting"

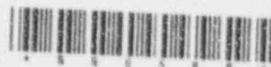
Pursuant to the requirements of 10 CFR 50.12(a), Baltimore Gas and Electric Company requests permanent exemption from the emergency lighting requirements specified in 10 CFR Part 50, Appendix R. Specifically, Section III.J of Appendix R, "Emergency Lighting," states that "emergency lighting units with at least an eight-hour battery supply shall be provided in all areas for operation of safe shutdown equipment and in access and egress routes thereto." An exemption is requested from the requirement to have eight-hour duration, battery-powered emergency lighting units in exterior access routes to yard structures, in high radiation areas, and inside switchgear cabinets. Baltimore Gas and Electric Company believes that the exemption requirements of 10 CFR 50.12 are satisfied. Special circumstances are present, as described in 10 CFR 50.12(a)(2)(ii) and (iii), to warrant granting the exemption. The exemption is requested for the life of the plant.

**THE REQUIREMENTS OF 10 CFR 50.12 ARE MET**

The standards set forth in 10 CFR 50.12 provide that specific exemptions may be granted which:

- are authorized by law;

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- will not present an undue risk to the public health and safety;
- are consistent with the common defense and security; and
- are accompanied by special circumstances.

Baltimore Gas and Electric Company believes the requested exemption is clearly authorized by law and is consistent with the common defense and security. The remaining standards for the exemption are also satisfied, as described below.

**I. The Requested Exemption Does Not Present An Undue Risk to the Public Health and Safety**

Appendix R of 10 CFR Part 50 requires the ability to achieve and maintain safe shutdown following a fire event. In order to achieve post-fire safe shutdown, plant operators need to perform activities at various locations throughout the plant. To support performing these activities, Appendix R.III.J requires eight-hour, battery-powered emergency lights to illuminate those locations where operators must perform actions and the routes to and from these locations. Reference (a) notes that the objective of this requirement is "to ensure that in the event of a fire, plant personnel can access and operate equipment and components that must be manually operated to effect safe plant shutdown. Because such activities may extend over a considerable period of time both during and after the fire, eight-hour battery emergency lighting capability is specified to allow sufficient time for normal lighting to be restored, with a margin for unanticipated events."

The installation of fixed eight-hour, battery-powered emergency lighting does not always represent the optimum method to illuminate action locations or access routes. Calvert Cliffs has identified several locations where other emergency lighting methods, such as security lighting or portable lighting, achieve the underlying purpose of Appendix R, Section III.J.

**A. Use of the Security Lighting System in Lieu of a Battery-Powered System**

The security lighting system will be used to provide illumination of exterior access routes. Since the security system is not battery powered, an exemption to Appendix R.III.J is required. The security lighting system provides illumination of the exterior area of the plant, and it meets the security lighting illumination requirements of 10 CFR Part 73. Illumination levels in the affected areas of the plant will be more than adequate for post-fire safe shutdown. An advantage of using the security lighting system during a post-fire safe shutdown is that this is the lighting that operators use under normal conditions.

In our physical security plan, we committed to power our security lighting system from an independent, uninterruptible power supply. The security lighting system is backed up by a security emergency diesel generator that is located in a separate structure from other plant area buildings. Therefore, the security emergency diesel generator is not vulnerable to a single fire requiring safe shutdown. The security emergency diesel generator has a fuel capacity in excess of eight hours. Additionally, unlike a battery-powered light, the security emergency diesel generator is not vulnerable to battery depletion. Consequently, security lighting will meet the

operators' need for lighting in exterior areas for a greater time than would only be available from an eight-hour battery. Security personnel ensure that the security lighting and its emergency power supply are maintained and available when needed.

The staff has previously approved exemptions to Appendix R.III.J for the use of security lighting in lieu of eight-hour, battery-backed emergency lighting (Federal Register Notice: Vermont Yankee Nuclear Power Corporation Exemption, 62FR15545). We have concluded the use of the security lighting system in lieu of a battery-powered system will not present an undue risk to the public health and safety.

#### **B. Use of Portable Lights**

We have found situations where the use of portable lights is preferable to the use of fixed, eight-hour, battery-powered emergency lighting to illuminate action locations. Portable lights can provide equivalent or better illumination levels to that of fixed emergency lighting.

Similar to the exemption request made in Reference (b), the portable lights will be battery-powered and have a duration of eight-hours. The portable lights will be available in pre-designated Appendix R lockers at pre-designated locations. Access to them will be physically and administratively limited and use will be limited to operations personnel for emergencies only; consequently, the portable lights will be dedicated and controlled. Maintenance and testing for portable lights will be done following the manufacturer's guidance.

#### *High Radiation Areas:*

As part of the post-fire safe shutdown procedures, operators must briefly (i.e., for a few minutes) enter high radiation areas. The operator functions required in these areas typically consist of valve repositioning or position verification, and are compatible with the use of portable lighting. The operator only needs to be in high radiation areas long enough to perform these functions. Access and egress routes to the high radiation areas and the area where the portable lights will be stored have fixed eight-hour battery-powered emergency lights. During a post-fire safe shutdown, the use of portable lighting in high radiation areas achieves the underlying purpose of Appendix R.III.J.

#### *Switchgear Cabinet Interiors:*

As part of the post-fire safe shutdown procedures, operators must briefly (i.e., for about a minute each) enter switchgear cabinets for operation of safe shutdown equipment. The rooms where the cabinets are located have adequate emergency lighting installed to illuminate the face of the switchgear cabinets. When standing in the opened switchgear cabinet doorway, the operator's body casts a shadow on the interior of the switchgear cabinet. This is also true even when normal lighting is available. Because of these shadows, operators routinely use hand-held flashlights when entering these cabinets. We propose using eight-hour, battery-powered portable lighting for entry into these cabinets during post-fire safe shutdown conditions. During a post-fire safe shutdown, eight-hour,

battery-powered portable lighting used when entering switchgear cabinets achieves the underlying purpose of Appendix R.III.J.

With the features described above, there is reasonable assurance that adequate lighting for all required areas is provided. Therefore, we have concluded the use of portable lights for high radiation areas and switchgear cabinet interiors in lieu of a fixed, eight-hour, battery-powered emergency lighting system will not present an undue risk to the public health and safety.

## II. Special Circumstances

The following special circumstances from 10 CFR 50.12(a)(2) are present:

*Application of the regulation in this particular circumstance is not necessary to achieve the underlying purpose of the rule.*

As described above, the use of other emergency lighting methods, such as security lighting or portable lighting, provides an equally reliable lighting source and adequate illumination levels in high radiation areas, inside switchgear cabinets, and in exterior access routes to yard areas. Eight-hour, battery-powered portable lighting is compatible with operator actions required in high radiation areas and inside switchgear cabinets. Additionally, we note that while we are requesting exemption to credit these eight-hour, battery-powered portable lights in the locations without fixed lighting described above, we intend to provide them as a redundant backup to fixed lighting for all other areas. Portable lighting clearly meets the objective of ensuring that plant personnel can access and operate equipment and components that must be manually operated to effect safe shutdown.

*Compliance would result in undue hardships or costs that are significantly in excess of those contemplated when the regulation was developed.*

Typically, we have used fixed, eight-hour, battery-powered emergency lighting to meet the requirements of Appendix R.III.J. For post-fire operator access in exterior yard areas, installation of fixed battery-powered emergency lighting would be excessively redundant to an existing, independent, uninterruptible power supply for security lighting required by 10 CFR Part 73 and the physical security plan.

Installation and maintenance of fixed emergency lighting in high radiation areas is not consistent with reducing radiation exposure to "As Low As Reasonably Achievable." The increased level of exposure and generated waste is not justified when an equally reliable option clearly exists. Portable lights will be tested with minimal exposure to workers in a location outside high radiation areas.

Installation of fixed emergency lighting in switchgear cabinets is not feasible. Physical space and seismic qualification requirements preclude installing fixed emergency lighting inside switchgear. Installation and subsequent testing and maintenance of emergency lighting units inside switchgear cabinets could also increase unnecessary challenges to plant safety systems.

**III. Interim Compensatory Measures**

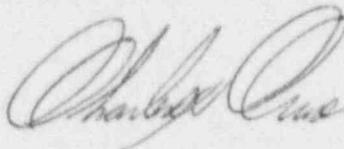
In addition to the lighting for which exemption is requested, we currently provide flashlights for the operators in the Appendix R lockers. These are available in pouches assigned to each operator at the start of a fire. These flashlights are checked quarterly. The pouches also contain spare batteries that are replaced quarterly. The combination of flashlights and spare batteries will provide adequate illumination for the operator as interim compensatory measures in the areas addressed by this exemption request.

**CONCLUSION**

The use of the security lighting for exterior access paths, and the use of eight-hour, battery-powered portable lighting for high radiation areas and inside switchgear cabinets, provide a method of post-fire safe shutdown illumination equivalent to the fixed eight-hour, battery-powered emergency lighting required by Appendix R.III.J.

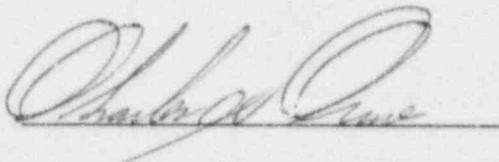
Should you have questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,



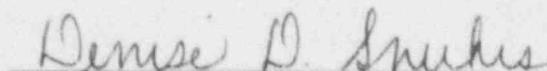
STATE OF MARYLAND :  
: TO WIT:  
COUNTY OF CALVERT :

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 Exemption Request 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 Calvert, this 6th day of October, 1997.

WITNESS my Hand and Notarial Seal:

  
Notary Public

My Commission Expires:

2/2/98  
Date

CHC/TWG/dlm

cc: R. S. Fleishman, Esquire  
J. E. Silberg, Esquire  
A. W. Dromerick, NRC  
Director, Project Directorate I-1, NRC

H. J. Miller, NRC  
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R. I. McLean, DNR  
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