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October 13, 1994

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
Use of NUREG-0800 Standard Review Plan Guidance in Evaluating the Need for
Tornado-Generated Missile Barriers

Baltimore Gas and Electric Company hereby proposes a change to the methodology used to evaluate the need for tornado missile protection for Calvert Cliffs Nuclear Power Plant (CCNPP), Units 1 and 2. The proposed methodology change will allow the use of Probabilistic Risk Assessment (PRA) techniques, consistent with NUREG-0800, Standard Review Plan (SRP), to evaluate the need for structural barriers to protect against tornado-generated missiles. NRC approval of this proposed change is requested.

DESCRIPTION OF CHANGE

The Updated Final Safety Analysis Report (UFSAR) will be changed to allow the use of PRA techniques in evaluating the need for tornado-generated missile barriers. Probability of exposures in excess of 10 CFR Part 100 guidelines of less than 10^{-6} per year per unit due to postulated tornado-generated missile strikes will be used as a conservative threshold for evaluating our compliance with draft General Design Criteria (GDC) 2. Existing plant conditions, as well as future changes to the facility, may be evaluated using this revised methodology, and determined acceptable if the total probability of exposures in excess of 10 CFR Part 100 guidelines due to postulated tornado-generated missile strikes is less than 10^{-6} per year per unit. The UFSAR will be updated on the normal cycle with a list of affected plant areas which are not designed, fabricated or erected to withstand the additional forces imposed by tornado-generated missile strikes. The list will be a subset of those systems, structures and components (SSCs) identified as "essential" in response to GDC 2. The total probability from all listed SSCs will be maintained below the 10^{-6} per year per unit threshold. The only known SSCs for inclusion in the next update will be the existing Emergency Diesel Generator (EDG) engines' intake air filter, exhaust piping and mufflers.

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BACKGROUND

As stated in our Final Safety Evaluation Report submittal (1971), the plant design and construction proceeded based upon the intent of the 1967 draft GDC. Draft GDC 2 states,

"Those systems and components of reactor facilities which are essential to the prevention of accidents which could affect the public health and safety or to mitigation of their consequences shall be designed, fabricated, and erected to performance standards that will enable the facility to withstand, without loss of the capability to protect the public, the additional forces that might be imposed by natural phenomena such as earthquakes, tornadoes, flooding conditions, winds, ice, and other local site effects. The design bases so established shall reflect: (a) appropriate consideration of the most severe of these natural phenomena that have been recorded for the site and surrounding area, and (b) an appropriate margin for withstanding forces greater than those recorded to reflect uncertainties about the historical data and their suitability as a basis for design."

The Calvert Cliffs Final Safety Analysis Report, Appendix 1A, provided a list of SSCs essential to incident prevention and mitigation of incident consequences. The list of essential systems includes "electrical power sources."

The original CCNPP licensing basis assumed a tornado-generated missile strike to exposed essential components. Accordingly, barriers to protect certain critical components against these postulated missiles were designed and constructed. While conducting a review in support of construction efforts associated with our new EDGs, we identified components of equipment subsystems required to mitigate the consequences of accidents which are not protected from tornado-generated missiles. The specific components identified are the existing EDG engines' intake air filter and exhaust piping and muffler. The unprotected components are located on the roof of the seismic Class I Auxiliary Building.

Our EDGs are defined as systems which mitigate the consequences of an accident. The Calvert Cliffs site currently has three EDGs. Normally, No. 11 EDG is dedicated to Unit 1, No. 21 EDG is dedicated to Unit 2, and No. 12 EDG is able to swing to either Unit. Each EDG is enclosed in a separate room in the Auxiliary Building. The Auxiliary Building is a Class I structure, one of whose functions is to protect the EDGs and their support systems from severe weather effects. The only EDG components which are exposed to outside weather effects are the engine intake air filter and exhaust piping and muffler. They extend through the roof of the Auxiliary Building. The top of the intake air filter is approximately 9' above the roof elevation, while the exhaust piping extends to an elevation of approximately 26' above the roof elevation. Most of the intake air filter and a portion of the exhaust piping, including the entire muffler, is located behind a 7'-6" high parapet wall along the west side of the roof; however, this parapet does not provide complete protection from all postulated tornado missiles.

TECHNICAL JUSTIFICATION

A PRA was conducted to determine the risks associated with postulated tornado-generated missile strikes on exposed EDG engine air intake and exhaust piping and components. The PRA determined that the probability of potential exposures in excess of 10 CFR Part 100 guidelines occurring as a result of tornado-generated missile strikes on the subject components is approximately 10^{-8} per year (Attachment 1).

The PRA results were evaluated in light of SRP Section 3.5.1.4, Missiles Generated by Natural Phenomena, using the acceptance criteria specified in SRP Section 2.2.3, Evaluation of Potential Accidents. Table 1 provides a comparison of the SRP and the proposed licensing basis for CCNPP.

Table 1

SRP and CCNPP Proposed Licensing Basis
Acceptance Criteria Comparison

SRP Section 3.5.1.4, Revision 2, Missiles Generated by Natural Phenomena	The methodology of identification of appropriate design basis missiles generated by natural phenomena shall be consistent with the acceptance criteria defined for the evaluation of potential accidents from external sources in SRP Section 2.2.3.
SRP Section 2.2.3, Revision 2, Evaluation of Potential Accidents	The expected rate of occurrence of potential exposures in excess of 10 CFR Part 100 guidelines of approximately 10^{-6} per year is acceptable if, when combined with reasonable qualitative arguments, the realistic probability can be shown to be lower.
CCNPP Unit Nos. 1 & 2 Proposed Licensing Basis	Tornado-generated missile protection is not required for systems designed to meet the performance standards of draft GDC 2 if the resultant aggregate probability of exposures in excess of 10 CFR Part 100 guidelines is less than 10^{-6} per year.

NUREG-0800, SRP Section 3.5.1.4, Revision 2, and Section 2.2.3, Revision 2 provides a conservatively acceptable threshold for safety due to damage caused by postulated missile strikes. We have chosen to implement the acceptance criteria of these SRP sections to evaluate the necessity of providing tornado missile protection for systems designed to meet the performance standards of draft GDC 2. The attached PRA evaluation for the EDG air intake and exhaust components identifies conservative assumptions which indicate that the actual probability is substantially lower.

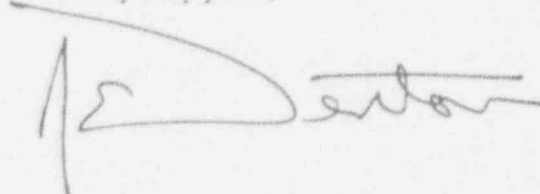
The acceptance threshold of 10^{-6} per year for exposures in excess of 10 CFR Part 100 guidelines due to a postulated missile strike is negligible when compared to the overall probability for core damage for CCNPP Units 1 and 2. The magnitude of the acceptance criteria is so small that this methodology change will not involve an increase in the probability or consequences of an accident or malfunction of equipment. Therefore, this methodology change does not adversely impact plant safety. This methodology is consistent with the work being performed for the Individual Plant Examination of External Events.

SCHEDULE

This methodology change is requested to be approved and issued by March 15, 1995. However, issuance of this change is not currently identified as having an impact on outage completion or continued plant operation.

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

Very truly yours,

A handwritten signature in dark ink, appearing to be "J. E. Silberg", written over a horizontal line.

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Attachment: Probabilistic Risk Assessment Evaluation of Tornado-Generated Missile Impact on the Calvert Cliffs Nuclear Power Plant Emergency Diesel Generator Engine Air Intake and Exhaust

cc: D. A. Brune, Esquire
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