



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 187 TO FACILITY OPERATING LICENSE NO. DPR-69
BALTIMORE GAS AND ELECTRIC COMPANY
CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NO. 2
DOCKET NO. 50-318

1.0 INTRODUCTION

By letter dated October 2, 1995, the Baltimore Gas and Electric Company (BGE or the licensee) submitted a request for changes to the Calvert Cliffs Nuclear Power Plant (CCNPP), Unit No. 2, Technical Specifications (TSs). The proposed change would increase the allowed outage time (AOT) of one train of the two train control room ventilation system from 7 days to 30 days (for the loss of the emergency power supply only) during the refueling outage of Unit No. 1 in the spring of 1996. This is a change just for that specific time period needed to implement a plant modification to add a fourth safety related (SR) emergency diesel generator (EDG) to the electrical supply and distribution system.

2.0 BACKGROUND

Currently, Calvert Cliffs has three SR EDGs to provide the onsite emergency power supply for both units. One SR EDG is dedicated to each unit, with the third acting as a "swing" SR EDG capable of providing power to either unit. During the Unit No. 1 1996 refueling outage, BGE will connect a fourth SR EDG to provide emergency electrical power. After the refueling outage, Calvert Cliffs will then have two SR EDGs dedicated to each unit. This work is necessary to improve system reliability and to complete BGE's commitments under the Station Blackout rule.

In order to connect the fourth SR EDG to Engineered Safety Features (ESF) Bus No. 11, the bus will have the emergency power SR EDG and the normal power source (offsite) isolated at various times throughout the process. Unit No. 1 will be in either Mode 5 or Mode 6 during this installation work. The shutdown unit is only required to have one SR EDG operable in accordance with TS 3.8.1.2. The risk to Unit No. 1 of isolating power from ESF Bus No. 11 will be evaluated as part of the normal outage preparation process. While the work on ESF Bus No. 11 is being performed, the "swing" SR EDG will be operable and capable of providing emergency power to the other Unit No. 1 ESF Bus (No. 14), as required by TS 3.8.1.2.

However, there are several components supporting Unit No. 2 continued operation which are affected by the loss of power to Unit No. 1 ESF Bus No. 11. The only component described in the TSs is the No. 11 Control Room

Emergency Ventilation System (CREVS). The No. 11 CREVS is one of two redundant CREVS for the common Control Room. As such, it is required by TS 3.7.6.1 to be operable whenever either unit is in Modes 1 through 4.

During the Unit No. 1 refueling outage, the emergency power is to be isolated from the bus first. At that time the No. 11 CREVS will be declared inoperable per Unit No. 2 TS 3.7.6.1.a and b because it has no emergency power supply. The No. 11 CREVS is still capable of performing its safety function assuming that offsite power source is available. The risk to the operating unit is increased by the removal of the emergency power to the No. 11 CREVS.

About 3 days after the emergency power is removed from ESF Bus No. 11, work on the bus that requires all power be isolated from the bus is scheduled for about 3 days. At this time the No. 11 CREVS becomes incapable of performing its safety function. The plant will remain in Action Statement 3.7.6.1.a and b. If normal power is not restored to ESF Bus No. 11 within 7 days of its removal, the actions in Action Statement 3.7.6.1.a and b will be commenced. If No. 12 CREVS becomes inoperable during this period, the plant will enter TS 3.0.3. Unit No. 2 would be at an increased risk because, if an accident requiring control room isolation occurred on Unit No. 2 during this time and if at the same time a failure occurred within No. 12 CREVS (or a failure occurred in the power supplies to No. 12 CREVS), the safety function of the CREVS would not be met.

After the scheduled 3-day outage of the offsite power source to ESF Bus No. 11, the risk described above is reduced when the offsite power source is reconnected to the bus. The No. 11 CREVS becomes capable of performing its safety function again with the offsite power source available. It remains inoperable with regard to the TSs because the emergency power is not restored. Unit No. 2 remains in the Action Statement, but is actually in a safer state than with ESF Bus No. 11 deenergized.

In addition, work is scheduled to align a non-safety-related (NSR) EDG (No. 0C Diesel Generator) to ESF Bus No. 11 about 8 days after the SR EDG is removed from the bus. This action further reduces risk because there are now two independent power sources available to the bus. However, the plant remains in the Action Statement because the OC EDG is not SR. If the OC EDG is not available to provide power to ESF Bus No. 11 as scheduled, efforts will be made to make it available commensurate with the level of risk during this evolution.

The new SR EDG is expected to be tied in to ESF Bus No. 11, tested and declared Operable about 14 days after the existing SR EDG is removed from the bus. At that time, the Action Statement will be exited because No. 11 CREVS has both its normal and emergency power supplies. This action further reduces the risk to the operating unit, Unit No. 2.

Even though BGE expects to have emergency power available to ESF Bus No. 11 within about 14 days, it is requesting that the Action Statement be extended to 30 days to allow for any unforeseen installation and testing issues that

might arise as the work is being done. This should alleviate the need for emergency or exigent relief from the NRC during the outage.

3.0 EVALUATION

Calvert Cliffs Updated Final Safety Analysis Report describes the two, redundant emergency ventilation systems for the Control Room. The safety function of the CREVS is to maintain the Control Room habitable for operators and to maintain the environment needed for continued equipment operation. The CREVS utilizes fans, dampers, filters and compressors to accomplish its safety functions. To allow for a single failure of the system, the Control Room is served by two redundant, 100% capacity CREVS. Each of the CREVS is powered from a different ESF bus, which are powered from different SR EDGs.

During the outage, one of the CREVS (No. 11) will lose its emergency power source for up to 30 days while the existing SR EDG is disconnected from ESF Bus No. 11 and a new SR EDG is installed on that bus. This is longer than allowed by TS 3.7.6.1. During the TS 7-day AOT, an operating unit is allowed by the TSs to remove one of the CREVS trains from service, thereby eliminating the single failure protection. This temporary relaxation of the single failure criteria, consistent with overall system reliability considerations, provides a limited time to make modifications, repair equipment and conduct testing. The consequences of a design basis accident coincident with a loss of offsite power and a failure of the redundant CREVS trains during the additional 23-day period are the same as those during the 7-day AOT. BGE believes that the requested extension (7 days to 30 days) is acceptable based on the limited time requested, the reliability of the redundant train, the temporary addition of a NS EDG for a portion of the time, and the low potential for a loss of normal (offsite) power.

The only design basis event which could interrupt normal power to both CREVS trains is a loss of offsite power. The offsite power consists of three 500 kV transmission-lines which meet in a common switchyard, and a separate 69 kV transmission line which connects to our 13 kV busses. The three 500 kV lines are independent of each other and are mounted on weather-resistant towers along a single right of way. The 69 kV transmission line comes into a separate substation on the site along a different right of way (meeting General Design Criteria 17 requirements) and is buried for most of its length on BGE property. Two of the transmission lines (one 500 kV and the 69 kV line) are connected to non-BGE power sources. Two ways which offsite power could be inadvertently lost are through maintenance activities and weather-related events. To reduce the possibility that maintenance activities could contribute to a loss of offsite power, BGE will restrict maintenance activities on its portion of three of the offsite transmission lines until the emergency power SR EDG is restored to ESF Bus No. 11. This restriction provides additional margin beyond the two transmission lines required by TS 3.8.1.1.

The design and construction of the four transmission lines lessens their vulnerability to weather-related events. Tornados and hurricanes are weather-

related threats to the transmission system. BGE anticipates that all of the work on the ESF Bus No. 11 will be completed before the time of year when tornados and hurricanes have historically been a problem at Calvert Cliffs. The probability of tornados and hurricanes striking Calvert Cliffs were previously evaluated for the Station Blackout rule. The probabilities reported were 7.7×10^{-6} per year for tornados and 0.13 per year for hurricanes. Winter ice storms are another potential threat to the transmission system. Although data on ice accumulation is not available, the temperatures are generally above freezing and snowfall and sleet are not likely during March and April. Southern Maryland Electric Co-op has not had ice damage to their transmission lines in the last 40 years and the lines are designed to remain functional with a one-half inch coating of ice. The 500 kV lines are designed to remain functional with a one-and-one-half inch coating of ice and also have not experienced any ice damage.

Based on the design of the transmission system, the time of year, and the short time duration that the work is scheduled, the NRC staff has determined that the potential vulnerability of the transmission system to a weather-related event is acceptable.

Other factors which could have an impact on the ability of the CREVS to perform its safety function are the reliability of the unaffected CREVS train and the vulnerability of the remainder of the SR ESF busses with regard to the work done on ESF Bus No. 11. The No. 12 CREVS train is reliable based on its performance during the past year. Following a plant shutdown in 1991 (LER 91-006) due to the CREVS being declared inoperable, an extensive system evaluation was performed. Based on the results of this evaluation, BGE took steps to improve the availability, reliability, and maintainability of the CREVS. Some of the steps taken included:

- 1) A change in system engineering personnel responsible for the system.
- 2) Additional training, from the vendor, for both the maintenance and engineering groups.
- 3) Approval and installation of several minor modifications aimed at improving system reliability.
- 4) Reviewing performance monitoring methods and improving where required.
- 5) Reinforcing the importance of the system to operations, engineering, and maintenance groups.

This heightened awareness has resulted in a pro-active instead of reactive approach to maintaining the system, the effect of which is seen in the last 15 months when there was only one unplanned entrance into a TS Action Statement, which BGE anticipated through performance monitoring and procurement of replacement components had already been initiated.

Normal quarterly scheduled maintenance and preventive maintenance for the #12 CREVS falls during the weeks of February 19, 1995, through February 24,

1995, and May 13, 1995, through May 18, 1995. Currently, the requested 30-day Action Statement window is scheduled for March 18, 1995, through April 17, 1995, so there is no need to expedite or postpone any preventive maintenance work on the 12 CREVS. Additionally, BGE does not plan to remove the SR EDG from the No. 12 CREVS while in the Action Statement for the No. 11 CREVS. If an unforeseen circumstance causes the loss of the SR EDG to No. 12 CREVS while in this condition, the appropriate Action Statement for a loss of both CREVS will be followed as previously discussed.

The remaining ESF busses are not vulnerable to degradation due to the work on ESF Bus No. 11. The ESF busses are electrically isolated from each other and the work on ESF Bus No. 11 will not by itself impact the other busses. The relays and breakers associated with the removal of the existing SR EDG from the bus and its subsequent dedication to Unit No. 2 are the existing relays and breakers for that bus. Additionally, the work on ESF Bus No. 11 will be coordinated with scheduled maintenance activities on Unit No. 2. This will ensure that equipment needed to support Unit No. 2 operation is not inappropriately removed from service while in the Unit No. 2 CREVS Action Statement. In addition, BGE has plans in place to manage plant risk so that the risk associated with this evolution does not cause the annual core damage frequency, as calculated by the Calvert Cliffs Probabilistic Risk Assessment, to be exceeded. In addition, as noted above, a temporary NS EDG will be added to ESF Bus No. 11 for a portion of the requested AOT.

Therefore, the NRC staff has determined that the reliability of the No. 12 CREVS and the designed electrical separation and work control for the ESF busses is sufficient and is acceptable.

4.0 SUMMARY

Based on the above evaluation, the NRC staff has concluded that the proposed Unit No. 2 TS change that extends the AOT for one train of the CREVS (for loss of the emergency power source only) from 7 days to 30 days for a one-time period, not to exceed the 30 days, during the Unit No. 1 1996 refueling outage is acceptable.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Maryland State official was notified of the proposed issuance of the amendment. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the

amendment involves no significant hazards consideration, and there has been no public comment on such finding (60 FR 56363). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: T. Wambach
D. McDonald

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