

**ATTACHMENT (1)**

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**DESCRIPTION OF CIRCUMSTANCES AND SAFETY BASIS**

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#### **Background**

Calvert Cliffs Nuclear Power Plant (CCNPP) is a two-unit site. The Unit 2 Emergency Safety Features electrical system relies on two emergency diesel generators (EDGs). Unit 1 also has two EDGs. In addition, there is a non-safety-related, augmented quality, station blackout 5400 kW diesel generator (DG) available. The No. 2A EDG is a Fairbanks-Morse diesel generator, as are the Nos. 1B and 2B EDGs. The No. 1A EDG and No. 0C DG are Societe Alsacienne De Constructions Mecaniques De Mulhouse (SACM) diesel generators.

#### **Plant Condition**

On January 24, 2002, a biannual inspection of the No. 2A EDG was underway. Technical Specification 3.8.1, Condition B, was entered for the inspection on No. 2A EDG at 3:00 a.m. on January 24, 2002. During the inspection, wear was noted on the flexible drive gear. This gear drives the auxiliary pumps necessary for DG operation. The amount of wear found was unexpected because the flexible drive gear only had about 50 hours of operation since the last biannual inspection. Unit 2 remained in Limiting Condition for Operation 3.8.1, Condition B, since taking No. 2A EDG out-of-service for inspection. Unit 2 is now in Limiting Condition for Operation 3.8.1, Condition H, and is operating under the enforcement discretion granted on January 27, 2002.

#### **Apparent Cause**

The root cause investigation has identified an apparent problem within the pump flexible drive assembly (crosshead). The lube oil pump drive gear bearing bore was found out-of-round. We believe that this out-of-round condition caused the lube oil pump drive shaft gear to improperly mesh with the flexible drive gear. This resulted in destructive pitting on the flexible drive gear. A vendor representative was brought in to inspect the gear train. Vendor inspection supports the suspected cause at this time. The root cause investigation is continuing while repairs are underway. Disassembly of the front end has been completed and reassembly started. The No. 1B EDG has also been inspected for similar wear and this worn condition was not found. The No. 2B EDG will be inspected after the No. 2A EDG has been returned to service. The vendor confirms that accelerated wear of this type on the flexible drive gear is unexpected. A review of industry experience found no appropriate historical events.

#### **Schedule**

A replacement flexible drive gear is being installed. Installation of this gear requires substantial disassembly of the diesel engine, procurement of the parts, engine reassembly, and post-maintenance testing. Experienced technical representatives from the EDG vendor are onsite assisting in the repair process. Parts have been delivered. In addition, we have a spare EDG engine onsite that we can obtain parts from, if needed. A project management schedule has been developed and is as follows:

- Disassemble engine, clean parts – 29 hours
- Repair and reassemble the engine – 60 hours

Activities associated with testing and inspection of the EDG – 29 hours

These activities began at 7:00 a.m. on January 26, 2002, and are scheduled to be complete and the EDG declared operable by 11:00 p.m. on January 31, 2002. To perform these activities, Calvert Cliffs is requesting enforcement discretion in the form of a one-time, 6-day extension to the 72-hour Completion Time. Although the schedule time to complete these activities is less than six days, the additional time is requested for contingency activities beyond ones the schedule has already included. Without this

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discretion, Unit 2 would have commenced shutdown by 3:00 a.m. EST on January 27, 2002. If additional problems are discovered during the repair process that cannot be resolved in the approved timeframe, we will shut down Unit 2 as soon as that determination is made.

#### **Other Plant Equipment**

The other EDGs onsite have been tested recently at full load for an hour. The No. 2B EDG was tested on January 13, 2002, the No. 1B EDG was tested on January 6, 2002, the No. 1A EDG was tested on January 20, 2002, and the No. 0C DG was tested on January 9, 2002. Equipment required for feed and bleed operations in the Reactor Coolant System is operable (e.g., high pressure safety injection pumps, charging pumps, power-operated relief valves [PORVs]). The auxiliary feedwater pumps are also operable. The condition of the reactor coolant pump seals is normal. There are no significant operator work-around issues on Unit 2, and particularly on the systems mentioned above.

#### **Risk Insights**

Preventing plant challenges during shutdown conditions has been, and continues to be, an important aspect of ensuring safe operation on the plant. Entry into and operation of shutdown cooling is not without risk including the risk associated with increased radioactive waste streams from the operation of the shutdown cooling system. These risks must be considered when the plant is required to shut down. Continuing to use the steam generators to remove heat from the core and to provide steam for the turbine-driven auxiliary feedwater pumps is preferable for this time. In addition, the Reactor Coolant System remains in a steady-state mode with the reactor coolant pumps in operation. Pressure and temperature transients are avoided.

The effect of remaining in Mode 1 for this extended time was evaluated using risk insights. Calvert Cliffs has evaluated the risk associated with remaining in Mode 1 in this degraded condition and compared it to the risk associated with unit shutdown and startup.

The Unit 2 risk of operating for six days with the No. 2A EDG out-of-service was determined by:

- Using a Seismic, Fire, and Internal Events probabilistic risk assessment with average unavailabilities (Unit 2 impacts for external events estimated using the Unit 1 Model).
- Screening high wind events (tornadoes and hurricanes) as out-of-season.

Improving the operator actions to start and refuel the No. 0C DG. Operator action is required to refuel the No. 0C fuel oil day tank when it is depleted.

Given these conditions, the quantified risk was determined to be approximately 3E-7.

The risk of shutting down with the No. 2A EDG out-of-service was determined by:

- Reviewing the shutdowns and startups since 1980 and determining the number of plant challenges (plant trips) that occurred during these transients. Each plant trip was then qualitatively reviewed to determine if it would be applicable given the improvements made to the plant since these events and the plant conditions (e.g., time in fuel cycle) that exist for this potential Unit 2 shutdown.
- Trips that occurred during a normal shutdown were evaluated as having the same risk impact as if they occurred at 100% power.

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- Trips that occurred during normal startups were evaluated as having 50% of the risk of the same transient occurring at 100% power.

The shutdown period (after normal shutdown but before normal startup) was evaluated as having 20% of the risk of the at-power condition.

Given these conditions, the quantified risk was determined to be approximately 1E-7.

The following qualitative issues were not considered in the above analysis:

- There is a benefit to providing a dedicated operator to cross-connect key motor control centers (MCCs) following a loss of non-safety-related power to 4 kV Bus 21. Cross-tying the MCCs ensures that both PORV block valves are available, both PORVs can be opened, the safety injection MOVs are powered, etc. Due to fire concerns, the PORV and PORV block valve are powered from opposite facility MCCs. In some accident sequences a single PORV spuriously opens. With both MCCs energized, the open PORV can be readily isolated. Motor control center cross-connection also improves the ability to achieve once-through-core-cooling (RCS feed-and-bleed). Calvert Cliffs Nuclear Power Plant requires both PORVs to open for once-through-core-cooling during scenarios when feedwater (auxiliary and main) is lost at the plant trip. The MCC cross-tie action was identified as important through a review of key probabilistic risk assessment contributors given No. 2A EDG is out-of-service. Improved operator actions due to understanding the importance of this action, and by having a dedicated operator to perform these actions, results in a reduction in risk.

By limiting the performance of discretionary maintenance or testing, there is improved defense-in-depth. This results in a reduction in risk.

Review of the operator actions to be taken on a loss of offsite power improves the likelihood of success of these actions. This results in a reduction in risk.

The presence of all four offsite circuits maximizes the reliability of offsite power. The Calvert Cliffs key probabilistic risk assessment does not explicitly provide credit for the benefit of the third high-line. A more detailed analysis of the benefit of the additional high-line results in a reduction in risk.

Limiting the conduct of maintenance or testing on the offsite power system reduces the likelihood of losing offsite power. This specifically applies to switchyard maintenance. This impact was not explicitly included in the risk analysis.

- The benefit of providing an assigned operator, to control auxiliary feedwater control valves in the event that flow control is lost following a loss of offsite power, was also identified through a review of important risk contributors. Local control of auxiliary feedwater due to the loss of instrument air or due to degraded instrumentation is more important when No. 2A EDG is not available. Improved operator actions due to understanding the importance of this action and by having an assigned operator to perform these actions results in a reduction in risk.
- Low magnitude seismic event impacts on No. 0C DG were not considered, since these impacts affect non-critical ventilation, especially in light of the current low outside temperatures.

The above qualitative actions were not quantified.

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The qualitative portion of our risk assessment included multiple compensatory measures that were not included in our quantitative risk assessment. We believe that the qualitative risk reduction offsets the quantitative risk assessment, such that this Notice of Enforcement Discretion request is safety and risk neutral.

#### **Compensatory Measures**

During the period that we are in non-compliance with the Technical Specifications, we have implemented a number of risk-management measures.

- We will not perform elective maintenance on the No. 2B EDG.
- Calvert Cliffs has a high quality, non-safety-related 5400 kW No. 0C DG installed that can be aligned to either Unit 2 4 kV vital bus. The No. 0C DG would be available if the No. 2B EDG were to fail during an event where emergency electrical power was required. A dedicated operator in the Control Room has been assigned and trained to utilize No. 0C DG. This operator is in addition to the normal shift crew complement to ensure that there is no conflict in resources if the actions are required.

The same dedicated operator has also been assigned to cross-connect key MCCs to provide power to necessary equipment in the event of a loss of offsite power.

- During the period that we are in non-compliance with the Technical Specifications, we will not perform any discretionary maintenance or testing on any Unit 2 safety-related equipment. Required surveillance testing will be performed.
- We have reviewed with the plant operators the actions to be taken should a loss of offsite power occur while No. 2A EDG is not available.

If the plant is threatened by severe weather with the potential to interrupt offsite power during the period that we are in non-compliance with the Technical Specifications, we will shut down Unit 2.

- All four offsite circuits are available, though only two are required to be operable by the Technical Specifications.
- During the period that we are in non-compliance with the Technical Specifications, Calvert Cliffs will not conduct maintenance or testing on the offsite power system.
- An operator has been assigned to control the auxiliary feedwater flow control valves in the event that flow control is lost following a loss of offsite power.

#### **Conclusion**

We have considered the possibility of significant hazards associated with this period of non-compliance with the Technical Specifications (see Attachment 2) and determined that there are none. We have determined that the requested period of non-compliance with the Technical Specifications will not present an undue risk to the plant or to the health and safety of the public. Additionally, operation of Calvert Cliffs Unit 2 during the period of non-compliance with the Technical Specifications will result in no adverse consequences to the environment in that there will be no significant change in the types or significant increases in the amounts of any effluents that may be released offsite, and in no significant increase in individual or cumulative occupational radiation exposure. Therefore, we request that the NRC grant the requested Notice of Enforcement Discretion.

**ATTACHMENT (2)**

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**DETERMINATION OF NO SIGNIFICANT HAZARDS**

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## ATTACHMENT (2)

### DETERMINATION OF NO SIGNIFICANT HAZARDS

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Calvert Cliffs Nuclear Power Plant is requesting regional enforcement discretion from certain requirements of the Calvert Cliffs Technical Specifications. The Technical Specifications require that, when in Modes 1-4 with one of the separate and independent diesel generators inoperable, the inoperable diesel generator must be restored to operable status within 72 hours. If the inoperable diesel generator is not restored to operable status, the unit must be placed in Mode 3 within 6 hours and Mode 5 within 36 hours. This request for regional enforcement discretion is being made to avoid an unnecessary plant transient as the result of full compliance with the Technical Specifications. Calvert Cliffs Nuclear Power Plant wishes to extend the 72-hour Completion Time by 6 days. Therefore, Calvert Cliffs is requesting Enforcement Discretion from the Nuclear Regulatory Commission to allow the one emergency diesel generator to be inoperable for 6 days longer than the Technical Specification Completion Time of 72 hours without exiting Mode 1. The additional time is needed to repair and test the EDG.

The proposed enforcement discretion has been evaluated against the standards in 10 CFR 50.92 and has been determined to not involve a significant hazards consideration, in that operation of the facility during the period of the enforcement discretion:

*Would not involve a significant increase in the probability or consequences of an accident previously evaluated.*

The emergency diesel generators (EDGs) provide onsite electrical power to vital systems should offsite electrical power be interrupted. Calvert Cliffs Unit 2 has two safety-related EDGs. The EDGs are not an initiator to any accident previously evaluated. Therefore, this extended period of operation with the EDG out-of-service will not increase the probability of an accident previously evaluated.

The EDGs act to mitigate the consequences of design basis accidents that assume a loss of offsite power. For that purpose, redundant EDGs are provided to protect against a single failure. During the Technical Specification 72-hour Completion Time, an operating unit is allowed by the Technical Specifications to remove one of the EDGs from service, thereby losing this single failure protection. This operating condition is considered acceptable. The consequences of a design basis accident coincident with a failure of the redundant EDG during the period of Technical Specification non-compliance are the same as those during the 72-hour Completion Time. Furthermore, as a compensatory action, Calvert Cliffs will not perform any discretionary maintenance or testing on any Unit 2 safety-related equipment during the period of non-compliance with the Technical Specifications. This will reduce the risk that other mitigating equipment would not be available in the event of a design basis accident. Therefore, during the period of non-compliance, there is no significant increase in consequences of an accident previously evaluated.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. *Would not create the possibility of a new or different type of accident from any accident previously evaluated.*

During the period of non-compliance with the Technical Specifications, the plant will not be in a new configuration nor will any unusual operator actions be required. The EDGs are not an initiator to any accident, but are designed to respond should an accident occur.

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### DETERMINATION OF NO SIGNIFICANT HAZARDS

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Therefore, the proposed change does not create the possibility of a new or different type of accident from any accident previously evaluated.

3. *Would not involve a significant reduction in a margin of safety.*

During the period of the 72-hour Technical Specification Completion Time when one EDG is out-of-service during power operation, the margin of safety is allowed to be reduced. This time period is a temporary relaxation of the single failure criteria, which, consistent with overall system reliability considerations, provides a limited time to repair the equipment and conduct testing. Calvert Cliffs is requesting an extension to this limited time. Calvert Cliffs has also instituted a number of compensatory measures that reduce the possibility of a plant transient or a loss of offsite power. Calvert Cliffs concludes that the period of non-compliance with the Technical Specifications beyond that allowed by the Completion Time does not result in a significant further reduction in the margin of safety, based on our management of plant risk, the availability of the an alternate diesel generator, the reliability of the redundant EDG, and other compensatory measures.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.