



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NOS. 209 AND 213 TO FACILITY OPERATING

LICENSE NOS. DPR-44 and DPR-56

PECO ENERGY COMPANY
PUBLIC SERVICE ELECTRIC AND GAS COMPANY
DELMARVA POWER AND LIGHT COMPANY
ATLANTIC CITY ELECTRIC COMPANY

PEACH BOTTOM ATOMIC POWER STATION, UNIT NOS. 2 AND 3

DOCKET NOS. 50-277 AND 50-278

1.0 INTRODUCTION

By letter dated April 7, 1994, as supplemented by letters dated June 2 and September 6, 1994 and June 16 and July 13, 1995, the PECO Energy Company (the licensee) submitted a request for changes to the Peach Bottom Atomic Power Station, Unit Nos. 2 and 3, Technical Specifications (TS). The requested changes would provide for an increased TS allowed out-of-service time (AOT) for the Peach Bottom emergency diesel generators (EDG) based on the availability of a power tie-line from the Conowingo Hydroelectric Station.

2.0 EVALUATION

At a meeting on May 15, 1992, the licensee proposed installation of a tie line from the Conowingo Hydroelectric Station as an alternate AC power source in order to satisfy the requirements of 10 CFR 50.63, "Loss of All Alternating Current Power." The staff approved this modification as an acceptable resolution to the requirements of 10 CFR 50.63 in a supplemental safety evaluation dated October 23, 1992. The licensee informed the NRC of completion of this modification by letter dated November 4, 1994.

By letter dated April 7, 1994, the licensee proposed to extend the TS AOT for a single inoperable EDG from the current 7-day allowance to a 30-day allowance. The licensee proposed that use of a 30-day AOT be contingent upon the availability of the Conowingo tie line. The licensee also proposed imposition of reporting requirements for an inoperable tie line, surveillance requirements for the AAC line, a change to the TS bases, as well as an administrative change regarding the internal referencing of the diesel generator TS.

The staff provided a request for additional information to the licensee on July 7, 1994. The licensee responded in a letter dated September 6, 1995. On April 7, 1995, the staff informed the licensee that it could not accept a

30-day AOT. The staff stated:

The staff finds that it is not prudent to approve a 30-day EDG AOT extension based on a small (5.5 percent) reduction in CDF only, since uncertainties and limitations exist in probabilistic approaches. The staff believes that although PRA is a valuable analytical tool, it needs to be used in conjunction with other technical considerations, such as operating experience and engineering judgment. In addition, the proposed AAC source is not safety grade and has to be aligned manually to the safety buses and therefore is not a one-for-one substitution for an EDG. Furthermore, standard TS allow plant operation with one inoperable EDG for only 3 days. The TS for PBAPS allow plant operation with one inoperable EDG for 7 days. The staff recognizes that the licensee for PBAPS needs AOT relief to properly maintain the EDGs, but not beyond what is reasonable and adequate. The staff believes that a 30-day AOT extension is too long a period of time for an EDG to be out-of-service and, as a result, it might not get the attention that is required to maintain its reliability and availability to respond to emergencies.

The staff believes that 14 days is a sufficient time to perform most maintenance activities. This length of time is based on industry experience; for example, a maximum of 216 hours (13.5 days considering two shifts working 8 hours a shift) is needed for a major overhaul. Therefore, the staff has determined that 14 days should be considered as the maximum AOT on a permanent basis. (An extension beyond 14 days should be considered only on a one-time basis.)

On the basis of the above determination, the staff finds that the licensee's proposal to change the EDG AOT from 7 to 30 days is unacceptable.

However, the staff did state that a 14-day AOT would be acceptable provided the licensee made certain additional commitments. Those requested commitments are detailed in the April 7, 1995 letter.

By letter dated June 16, 1995 and July 13, 1995, the licensee responded to the staff's April 7, 1995 position. The licensee's final proposed changes are described below:

2.1 Proposed Change to TS Section 3.9.B for PBAPS Units 2 and 3

The licensee proposed to change TS Section 3.9.B. Currently TS Section 3.9.B reads as follows:

3. With one diesel generator inoperable, restore the inoperable diesel generator and associated emergency bus to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

The amended TS section would read:

3.a. With one diesel generator inoperable:

1. Verify correct breaker alignment, required equipment available, and indicated power available for the Conowingo line immediately and once per 12 hours thereafter;

AND

2. Restore the diesel generator to operable status within 14 days from the time that the diesel generator became inoperable.

3.b. If the requirements of 3.9.B.3.a.1 above cannot be met, either:

1. Restore the diesel generator within the next 7 days (not to exceed 14 days from the time that the diesel generator became inoperable);

OR

2. Satisfy the requirements of 3.9.B.3.a.1 above within the next 7 days and restore the diesel generator within 14 days from the time that the diesel generator became inoperable.

3.c If the requirements of 3.9.B.3.a.2 or 3.9.B.3.b cannot be met, then be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

2.2 Proposed Addition to TS Section 3.9.B.8 for PBAPS Units 2 and 3

The licensee proposed to add TS Section 3.9.B.8, which reads as follows:

3.9.B.8 With the Conowingo line not available for 15 days, notify the NRC.

4.9.B.8 Verify once/month correct breaker alignment, required equipment available, and indicated power available from the Conowingo line.

2.3 Proposed Addition to TS Bases Section 4.9 for PBAPS Units 2 and 3

The licensee proposed to add the following information to TS Section 4.9:

Verification of the Conowingo line may include a combination of:

- 1) circuit breaker line-up on the Conowingo side (Susquehanna Substation) is verified by Unit 1, PBAPS being powered from Conowingo line,
- 2) circuit breaker verification of PBAPS Unit 2 and 3 switchgear, and
- 3) communication with the Conowingo Control Room to ensure that required equipment at Conowingo is available.

The extended diesel generator outage afforded by an available Conowingo tie line is intended to allow completion of the diesel generator overhaul; however, subject to the diesel generator reliability program, INPO performance criteria, and good operating practices, extended diesel generator outages are permitted for other reasons. Activities or conditions that increase the probability of a loss of offsite power (i.e., switchyard maintenance or severe weather) should be considered when scheduling a diesel generator outage. In addition, the effect of other plant equipment being out of service should be considered when scheduling a diesel generator outage. The staff's evaluation of the licensee's response is provided below. The conditions discussed below correspond to the commitments requested by the staff in the April 7, 1995 letter.

In response to condition 1, the licensee stated that the current TS include a limiting condition for operation (LCO) 3.0.D that states that a system, subsystem, train, component, or device that is determined to be inoperable solely because its emergency power source is inoperable (i.e., the EDG is out of service for preventive maintenance) may be considered operable for the purpose of satisfying its LCO if all of its redundant systems, subsystems, trains, components, and devices are operable. Unless this condition is satisfied, the unit shall be placed in Hot Shutdown within 6 hours and in Cold Shutdown within 36 hours.

This LCO provides a positive measure for preventing the testing and maintenance of any redundant system, subsystem, train, component, or device that renders that equipment inoperable. Testing of systems, subsystems, trains, components, and devices that does not render that equipment inoperable [i.e., TS-required emergency core cooling system (ECCS) testing] can be performed without invoking the restrictions of LCO 3.0.D. The licensee considers LCO 3.0.D to be an adequate, positive measure for controlling testing and maintenance during EDG outages. Accordingly, no additional changes to the TS are proposed. The staff finds this response acceptable based on the existing TS requirements.

In response to condition 2, the licensee stated that the overall EDG unavailability used in the probabilistic risk assessment (PRA) supporting the

EDG AOT was 30 days per EDG per year, for a total of 120 days per year. The licensee maintains an overall average goal of EDG availability of 0.975. This goal corresponds to 36.5 days of EDG unavailability per year $[(1-0.975) \text{ times } (365 \text{ days}) \text{ times } (4 \text{ EDGs})]$. Considerable margin exists between the unavailability goal of 36.5 days per year and the value assumed in the PRA of 120 days per year. The 0.975 EDG availability goal is based on an Institute of Nuclear Power Operations (INPO) performance indicator. This performance indicator is monitored, and results are reported to station managers. At present, implementation of the maintenance rule for the EDG is scheduled for the summer of 1995, and it is anticipated that an availability performance indicator derived from the INPO performance indicator will be the performance criterion. Based on the licensee's response, the staff concludes that overall unavailability of the EDGs will be adequately controlled by the licensee.

The licensee amended the TS change request to provide verification of the availability of the Conowingo tie line when an EDG is inoperable.

Regarding condition 4, the licensee stated that on-line maintenance is controlled and scheduled through the Unit Coordinator. The Unit Coordinator is trained in the interactions of systems and is responsible for assessing the impact of removing a system from service on the overall probabilistic safety assessment (PSA). To minimize the impact on the PSA, procedural guidance has been issued. This procedure, AG-43, "Guideline for the Performance of System Outages," is designed to provide decision-making and planning guidance for the execution of system outages based on PSA insights and sound operating judgment. This procedure incorporates guidance from both the NRC and INPO and provides instructions for scheduling and planning system outages and maintenance activities during power operation. This guidance is also intended to be referenced when emergent work affects ongoing planned system outages. The procedure includes the following guidance:

- 1) Use sound operating judgment and PSA insights to determine system outage frequency and duration.
- 2) Do not schedule outages on systems important to PSA during a planned plant transient.
- 3) If an EDG is inoperable, maintenance of systems and components should only be performed in accordance with GP-23, "Diesel Generator Outages." (This procedure provides guidance on equipment that may be affected by an EDG being out of service.)

The licensee also stated that the frequency of the EDG preventive maintenance is not dictated by convenience, but rather by the manufacturer's recommendations. The licensee is participating in an industry effort to reevaluate this schedule. Based on the above discussion, the staff concludes that the licensee has adequate controls in place for voluntary entry into limiting conditions for operation to perform maintenance.

Regarding condition 5, the licensee stated that it concurs with this philosophy which is incorporated into the operation of PBAPS. If an LCO is entered, the reason is monitored and tracked by station managers. If an LCO is entered inappropriately, the station managers will take corrective actions.

The staff finds that, based on the licensee's response, the licensee has adequate controls in place for voluntary entry into limiting conditions for operation to perform maintenance.

In response to condition 6, the licensee stated that LCO 3.0.D prevents removing a safety system from service when an EDG is unavailable to provide power to a redundant safety system. Further, AG-43, "Guidance for the Performance of System Outages," includes guidance on the impact of removing a system from service. Some systems, because of their redundant function, should not be removed from service when another system is out of service, although some systems may best be taken out of service when a compatible system is removed from service. This synergistic effect is controlled and monitored by AG-43 and the effect of non-safety systems is analyzed as well. The staff concludes, based on the licensee's response, that the licensee has adequate controls in place to ensure that the removal of safety systems for maintenance while EDGs are inoperable is minimized.

Regarding condition 7, the licensee stated that with an EDG removed from service, the likelihood for transients involving a loss of offsite power (LOOP), and electrical distributions should be minimized. Accordingly, PBAPS has implemented AG-43 to provide guidance on the interaction of systems. Further, to minimize the likelihood of these transients, AG-101, "Implementation Document for Substation Interface Agreement Operating Activities," has been developed. This procedure defines the role and responsibilities of station personnel and the offsite power system director. These responsibilities include having the Power System Director notify the Unit Coordinator of scheduled work activities or severe weather that could increase the likelihood of a LOOP. Based on the licensee's response, the staff concluded that the licensee has adequate controls in place to ensure that actions which may increase the likelihood of a plant transient during periods of EDG maintenance are minimized.

In response to condition 8, the licensee stated that PBAPS has implemented AG-108, "Preparation for Severe Weather." This procedure and the emergency response procedures provide guidance to station personnel on the appropriate actions to take in anticipation of severe weather. These recommendations include returning any EDG or other equipment important to safety to operable status. Based on the licensee's response, the staff concluded that the licensee has adequate controls in place to ensure that equipment important to safety, including EDGs, are not scheduled for maintenance during expected adverse weather.

Regarding condition 9, the licensee stated that this condition appears to be contrary to guidance issued by both the NRC and the EDG manufacturer. Generic Letter (GL) 84-15, "Proposed Staff Actions to Improve and Maintain Diesel

Generator Reliability," stated the staff's concern about the number of additional EDG tests that were required by TS for some operating plants licensed earlier. The staff has concluded that excessive testing results in degradation of the EDGs. The licensee submitted a series of TS change requests in response to GL 84-15 to eliminate the requirement to test the remaining three EDGs when one EDG was inoperable, provided that it had been determined that the inoperability was not due to a common-cause failure. The NRC reviewed and approved this request in a safety evaluation dated April 5, 1994.

The EDG manufacturer has also issued guidance stating that unloaded starts of the EDG should be minimized because of a concern about fuel accumulating in the exhaust manifold. The relatively low exhaust temperature of low loaded operation prevents this fuel from vaporizing and could cause a fire in the exhaust manifold.

The licensee believes that this increased testing in accordance with condition 9 is unnecessary because no additional assurance of EDG operability is developed, and the testing is imprudent to perform because it is injurious to the EDG. On the basis of this information, the licensee decided not to include the additional testing requirement of condition 9 in the TS.

The staff reviewed the licensee's response to condition 9 and concluded that existing EDG testing requirements were adequate and that additional testing during periods when one EDG was inoperable were not necessary.

For the reasons described above, including the discussion of a 14-day AOT and the licensee's response to each of the commitments requested in the April 7, 1995 letter, the staff concludes that the proposed TS changes are acceptable.

3.0 STATE CONSULTATION

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

4.0 ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.21, 51.32, and 51.35, an environmental assessment and finding of no significant impact have been prepared and published in the Federal Register on August 10, 1995 (60 FR 40866). Accordingly, based upon the environmental assessment, the staff has determined that the issuance of the amendment will not have a significant effect on the quality of the human environment.

5.0 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

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