



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 52 TO FACILITY OPERATING LICENSE NPF-68
AND AMENDMENT NO. 31 TO FACILITY OPERATING LICENSE NPF-81

GEORGIA POWER COMPANY, ET AL.

VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2

DOCKET NOS. 50-424 AND 50-425

INTRODUCTION

A letter of November 11, 1991, as revised and supplemented on January 23, 1992, Georgia Power Company (licensee) requested license amendments to change the Technical Specifications (TS) for the Vogtle Electric Generating Plant, Units 1 and 2. The proposed TS change concerns surveillance requirements for the control room emergency filtration system (CREFS), the piping penetration area filtration and exhaust system (PPAFES), and the fuel handling building post-accident ventilation system (FHBPAVS). These surveillance requirements pertain to the minimum heater power dissipation, and the laboratory testing method, test conditions and acceptance criteria for the charcoal inside the charcoal adsorbers. The associated TS Bases would also be revised to reflect these changes.

Specifically, the licensee proposed the following:

- (1) Change the heater power dissipation from " 118 ± 6 kW" to "a minimum of 95 kW" for TS 4.7.6.e.4 (CREFS), from " 80 ± 4 kW" to "a minimum of 65 kW" for TS 4.7.7.d.4 (PPAFES), and from " 20 ± 2 kW" to "a minimum of 16 kW" for TS 4.9.12.d.4 (FHBPAVS). Delete a footnote for PPAFES in TS 4.7.7.d.4.
- (2) Change the testing requirements for the adsorber decontamination efficiency and relative humidity from "99.8%" to "90%" efficiency and from "70%" to "95%" relative humidity for TS 4.7.7.b.2 and 4.7.7.c (PPAFES) and for TS 4.9.12.b.2 and 4.9.12.c (FHBPAVS).
- (3) Add the phrase "in accordance with ASTM D3803-89" to the end of each of the following TS for the laboratory testing method of a representative carbon sample: TS 4.7.6.c.2 and 4.7.6.d (CREFS), TS 4.7.7.b.2 and 4.7.7.c (PPAFES), and TS 4.9.12.b.2 and 4.9.12.c (FHBPAVS).
- (4) Change the last sentence in the Bases section of TS B 3/4.7.6 (CREFS) to read:

ANSI N510-1980 and ASTM D3803-89 will be used as a procedural guide for surveillance testing. Heaters are provided to ensure that the relative humidity of the airstream entering the adsorbers does not exceed 70 percent. Verification of heater power dissipation (kW) for surveillance testing is referenced to 460 volts.

- (5) Add the following statements after the second sentence in the Bases section for TS B 3/4.7.7 (PPAFES):

Heaters are not required for controlling the relative humidity of the air stream through the adsorbers following a LOCA since no credit is taken for heaters in the dose analyses. However, the heaters are available during accident conditions as defense-in-depth. Verification of heater power dissipation (kW) for surveillance testing is referenced to 460 volts.

Replace the last sentence with the following:

Adsorber testing is based on methyl iodide penetration, and safety analysis credited decontamination efficiency used for dose analyses is based on no humidity controls (i.e., inside containment) consistent with Regulatory Guide 1.52.

- (6) Change the last sentence of TS B 3/4.9.12 (FHBPAVS) to the following:

ANSI N510-1980 and ASTM 3803-89 will be used as procedural guides for surveillance testing. Verification of heater power dissipation (kW) for surveillance testing is referenced to 460 volts.

The licensee's letter of January 23, 1992, forwarded the proposed corresponding changes to the final safety analysis report (FSAR). The revised FSAR sections and tables described the effects of the proposed TS changes on the original dose analyses. The licensee will include these changes in the annual FSAR update.

2.0 EVALUATION

2.1 Revised Accident Analysis

The licensee indicated in its November 11, 1991, submittal that credit was not being taken for the heater function for the PPAFES and the FHBPAVS. Therefore, since relative humidity would be uncontrolled, the licensee assumed, consistent with the guidance contained in Regulatory Guide 1.52, that the adsorber efficiencies would no longer be 99 percent for elemental and organic forms of radioiodine but would be reduced to 90 percent and 30 percent, respectively. With these new adsorber efficiencies, it was necessary for the licensee to reevaluate the consequences of the accident analyses involving these systems. Thus, the licensee provided revised accident analysis in support of the proposed TS changes.

The licensee indicated that it had not utilized the adsorption and filtration capability of the FHBPAVS in analyzing the dose consequences of a fuel handling accident to the control room operator and at the Exclusion Area Boundary (EAB) and the Low Population Zone (LPZ). The licensee demonstrated, in its January 23, 1992, submission, that the projected doses at the EAB and the LPZ from a fuel handling accident were within the acceptance criteria in Standard Review Plans (SRPs) 6.4 and 15.7.4 of NUREG-0800. The NRC staff performed independent calculations which verified the licensee's conclusion that, even without the credit for the adsorber in the FHBPAVS, the EAB, LPZ, and control room operator doses would be acceptable. Therefore, the IS changes proposed for the FHBPAVS are acceptable.

The releases resulting from a Loss of Coolant Accident (LOCA) at Vogtle occur via three pathways: containment purge, containment leakage and ECCS recirculation leakage. The post-accident emergency core cooling system (ECCS) recirculation loop leaks into areas served by the PPAFES. With the change in adsorber efficiency because of the lack of relative humidity control for the PPAFES, it was necessary for the licensee to recalculate the LOCA doses to determine the new offsite consequences associated with ECCS recirculation leakage. In its revised accident evaluation, not only did the licensee modify the removal efficiencies for elemental and organic forms of radioiodine to 90 percent and 30 percent, but the licensee also modified the assumption for the quantity of ECCS recirculation leakage from the operating license stage FSAR value of 50 gpm for the duration of the accident to 2 gpm for the duration of the accident. In its Safety Evaluation Report of June 1985, the NRC staff noted that the leakage rate of 50 gpm was larger than necessary and could be reduced substantially. The licensee committed to implement a program which would reduce the leakage in accordance with the Three Mile Island (TMI)-2 Action Plan requirements. The 2 gpm value is consistent with the licensee's program and is acceptable for the LOCA evaluation.

While the licensee only calculated the thyroid dose contribution associated with the ECCS leakage, the NRC staff independently recalculated the thyroid dose contribution for all LOCA pathways to the EAB, LPZ and control rooms. Also, the staff does not accept the licensee's assumption for the distribution of the forms of radioiodine in the containment. Rather, the staff used the distribution contained in Regulatory Guide 1.3 for the elemental, particulate and organic forms of radioiodine. From its independent calculations, the staff determined that the control room operator, EAB and LPZ doses were all within the dose criteria associated with SRP 6.4 and 10 CFR Part 100. These criteria and the staff's recalculated doses are presented below:

	<u>Thyroid Doses from a LOCA (rem)</u>		
	<u>EAB</u>	<u>LPZ</u>	<u>Control Room</u>
Containment Leakage	49.3	45.4	18.0
ECCS Leakage	2.9	16.5	7.6
Containment Purge	<u>4.3</u>	<u>0.7</u>	<u><.1</u>
Total	56.5	62.6	25.7
Acceptance Criteria	300	300	30

2.2 Heater Capacity

The licensee notes that the current TS surveillance requirements for filtration heaters are quite conservative in that they are based upon the rated capacity that was stated in the purchase specification for the heaters. This value exceeds the minimum value needed to support the filter system's design basis function of maintaining site and control room doses within the limits of 10 CFR Part 100 and General Design Criterion 19 or Appendix A to 10 CFR Part 50. However, the licensee also stated that system confirmatory calculations prepared by its architect/engineer had not addressed the effect of terminal voltage on the capacity of the heaters. The licensee indicated that the proposed revision to these TS surveillance requirements would increase the margin of safety between the heaters' actual power and the power required to fulfill the filtration unit's design functions.

The existing TS requires Units 1 and 2 to conform with the 18 month surveillance for heater power dissipation rates of 118 (± 6 kW), 80 (± 4 kW), and (20 ± 2 kW) when tested in accordance with Section 14 of American National Standards Institute (ANSI) Standard N510-1980 for all heaters in the filter trains for the CREFS, PPAFES, and FHBPAVS, respectively. The proposed TS change requires the licensee to verify the revised minimum heater dissipation rates (referenced to 460 volts) of 95 kW, 65 kW, and 16 kW for the CREFS, PPAFES, and FHBPAVS, respectively. The licensee stated that it will not change the level of fire protection provided for the charcoal filters to protect charcoal from ignition, and thus the upper limit of the heaters' capacity is not required to limit excessive heat dissipation by the heaters. The licensee stated that humidity control heater function is not credited for PPAFES and FHBPAVS in its revised accident analyses. However, the proposed heater dissipation rates are consistent with the design basis functional requirements to provide for defense-in-depth and are retained instead of the procurement values. The proposed CREFS heater dissipation rate (95 kW) required to maintain the relative humidity less than 70 percent is credited in the revised accident evaluation. This rate is based on worst case conditions of 19,000 cfm (+ 10 percent) air flow (TS 4.7.6.C.3 maximum value), a conservative initial room temperature of 86.9 °F, and a relative humidity of 100 percent before entering the heater. The licensee calculated the CREFS heater output to be 74 kW at the worst degraded voltage of 414 V, which is bounded by the proposed TS value of 95 kW at 460 V (corresponding to approximately 77 kW at 414 V). This value is more than 18 percent below the heater's derated (installed) capacity of 118 kW at 460 V (87.8 kW at 414 V). The licensee also provided an analysis demonstrating that the as-built heater dissipation capacity exceeds the minimum requirements for heat dissipation.

The proposed TS changes would delete a footnote for TS 4.7.7.d.4 for the PPAFES. On January 15, 1991, the NRC issued Amendments 37 (Vogtle Unit 1) and 17 (Unit 2) which changed TS 4.7.7.d.4 by adding a footnote that was effective only until restart following the fourth refueling outage of Unit 1 and until restart following the second refueling outage of Unit 2. These outages have now been completed and the footnote is, therefore, obsolete. The staff also agrees with the licensee's proposed deletion of this footnote because the licensee's revised accident analyses do not credit PPAFES humidity control or heater function (nevertheless, these proposed TS maintain heaters for defense-in-depth) and the NRC staff conducted an independent analysis of the licensee's evaluation and found it acceptable. Therefore, removal of the footnote has no impact on safety and is acceptable.

The proposed revisions to TS BASES 3/4.7.6, B 3/4.7.7, and B 3/4.9.12 reflect the corresponding proposed TS changes for heater capacity, relative humidity, filter decontamination efficiency, and laboratory testing of a representative carbon sample. These proposed revisions are consistent with the proposed TS changes for CREFS, PPAFES, and FHBPAS. Therefore, the proposed revision to the TS BASES for CREFS, PPAFES, and FHBPAS are acceptable.

2.3 Laboratory Testing of Charcoal

The licensee agreed to revise the TS to require laboratory testing of a representative carbon sample in accordance with the ASTM D3803-89 standard. Testing to the ASTM-D3803-89 standard is more reflective of the actual charcoal capability than the method presently referenced in the existing TS and is consistent with the information presented in Information Notice 87-32. The licensee proposed an acceptance criteria of 10 percent for methyl iodide penetration for the PPAFES and FHBPAS as being consistent with the guidance of Regulatory Guide 1.52 for a system inside containment without relative humidity control. The licensee's new LOCA analysis had assumed a decontamination efficiency equivalent to removing 30 percent of the organic iodine (70 percent penetration) and 90 percent for elemental iodine. This was reduced from the previous values of 99 percent for both organic and elemental forms of iodine.

With these changes in the assumed adsorber efficiency, the licensee proposed that the acceptance criteria for the laboratory test of the charcoal would increase the safety factor between the allowed methyl iodide penetration and the assumed dose analysis value from five (1.0 percent/0.2 percent) to seven (70 percent/10 percent) for both the PPAFES and FHBPAS. This safety factor is consistent with the guidance in Regulatory Guide 1.52 for uncontrolled humidity.

The licensee has proposed a methyl iodide removal of 90 percent or greater as the acceptance criteria for laboratory testing of the charcoal for surveillance requirements 4.7.7.b.2, 4.7.7.c, 4.9.12.b.2 and 4.9.12.c for the FHBPAS and the PPAFES.

The licensee stated in its proposed change to Bases Sections 3/4.7.7 and 3/4.9.12, "Adsorber testing is based on methyl iodide penetration, and safety analysis credited decontamination efficiency used for dose analyses is based on no humidity controls (i.e., inside containment) consistent with Regulatory Guide 1.52." As noted in Table 2 of Regulatory Guide 1.52, for a system within containment without relative humidity control, the adsorber efficiency and testing requirements are only addressed for a two inch bed. Both the FHBPAS and PPAFES have four inch charcoal beds. To avoid future confusion and possible inspection problems, it should be clear to the licensee that the new acceptance criteria for the laboratory testing of the charcoal for the FHBPAS and the PPAFES in surveillance requirements 4.7.7 and 4.9.12, respectively, are based upon the allowable penetration for a two inch test bed.

Moreover, for the above reasons, the staff finds the proposed change for the decontamination efficiency of the PPAFES and FHBPAS filters and the proposed new laboratory testing criteria acceptable.

Based on the evaluation in Sections 2.1, 2.2, and 2.3 above, the staff finds that the CREFS, PPAFES, and FHBPAS design will continue to conform to the guidelines of 10 CFR Part 100 and to meet requirements of General Design Criterion (GDC) 19, "Control Room." The staff also finds that the licensee's proposal meets GDC 42, "Inspection of Containment Atmosphere Cleanup Systems," and GDC 43, "Testing of Containment Atmosphere Cleanup Systems," and is consistent with the intent of the Standard Technical Specifications. Thus, the proposed changes are acceptable.

3.0 STATE CONSULTATION

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

4.0 ENVIRONMENTAL CONSIDERATION

The amendments change surveillance requirements. The NRC staff has determined that the amendments involve 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 amendments involve no significant hazards consideration, and there has been no public comment on such finding (57 FR 5026 dated February 11, 1992). Accordingly, the amendments meet 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 amendments.

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) 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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