



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NOS. 38 AND 29 TO  
FACILITY OPERATING LICENSE NOS. NPF-76 AND NPF-80  
HOUSTON LIGHTING & POWER COMPANY  
CITY PUBLIC SERVICE BOARD OF SAN ANTONIO  
CENTRAL POWER AND LIGHT COMPANY  
CITY OF AUSTIN, TEXAS  
DOCKET NOS. 50-498 AND 50-499  
SOUTH TEXAS PROJECT, UNITS 1 AND 2

1.0 INTRODUCTION

By letter dated October 30, 1991 (ST-HL-AE-3906), Houston Lighting & Power Company (the licensee) requested changes to the Updated Final Safety Analysis Report (UFSAR) for the South Texas Project, Units 1 and 2. The changes to the UFSAR would revise various sections to reflect the extension of the core operating cycles and the associated increase in the fuel burnup. The amendment request was made pursuant to the requirements of 10 CFR 50.59(c) because the review by Houston Lighting and Power Company identified the changes as an unreviewed safety question.

2.0 EVALUATION

The possible safety consequences of increasing fuel burnup are related to fuel integrity issues and changes in the radionuclide inventories in the core and resultant changes in the consequences of the release of those nuclides during serious reactor accidents. The fuel integrity issues were not included as part of the unreviewed safety question because the existing discussion of the fuel in the UFSAR and incorporated references bound the proposed burnup levels of approximately 45 gigawatt-days per metric ton (GWD/MT) for region average discharge. The potential radiological consequences related to the changes in radionuclide inventories were addressed by the licensee's amendment request and were divided into potential public and personnel dose consequences and potential equipment environmental qualification consequences.

Public and Personnel Dose Consequences

The licensee's submittal noted that NUREG/CR-5009 "Assessment of the Use of Extended Burnup Fuel in Light Water Power Reactors," in discussing the impacts of different categories of accidents, concluded that for accidents in which

the core remains intact with only volatile fission products involved, no increases in impacts would occur. For these cases involving fuel melt, increased burnup would only impact a few fission products and the actinides. NUREG/CR-5009 concluded that the uncertainty involved in determining the overall risk to the public was greater than increases in the inventory of materials.

This NUREG also concluded that the expected iodine gas release fractions for certain fuel types is 0.12 instead of the value of 0.10 previously assumed when considering the radiological impacts of fuel handling accidents. Thus, the calculated offsite (thyroid) doses would increase by 20 percent over those calculated using the assumptions contained in Regulatory Guide 1.25, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors." The analyzed fuel handling accident thyroid doses would thus increase from the previously calculated value of 24.6 rem to 29.5 rem.

In addition, the licensee addressed the issue of worker occupational doses and determined that normal plant cleanup systems could handle any expected increase in systems radionuclide inventories. The licensee also noted that extended burnup fuel would not significantly impact plant shielding design and that radiation zones, both inside and outside the plant, would not be impacted by this change. The licensee noted that occupational doses would not change as a result of the expected small increase in inventory; further, the licensee noted that NUREG/CR-5009 stated that since fewer refueling outages would be expected, worker doses from refueling operations would be expected to decrease.

The staff has reviewed the information submitted by the licensee related to the use of longer fuel cycles and has concluded that the analyzed fuel handling accident consequences, although increased, remain well within the guideline values of 10 CFR Part 100. Further, any postulated increase in occupational exposures arising from the expected small increase in radionuclide inventory would be more than offset by the expected decrease in refueling outage exposures. This finding is consistent with the staff's review of the extension of the South Texas Project Unit 2 initial core which was documented in Supplement 6 of NUREG-0781, "Safety Evaluation Report Related to the Operation of South Texas Project, Unit 2."

#### Equipment Environmental Qualification Consequences

In addition to the potential for impacting public and personnel exposures to radiation, the changes to the inventories of radionuclides resulting from extending fuel burnups also have the potential to increase the radiation exposure to plant equipment required to mitigate an accident. The licensee evaluated the radiation doses due to the proposed change and found that, although doses in some plant areas were increased above the previously cited values in the UFSAR, the increased doses remained bounded by the qualification data with sufficient margin as required by 10 CFR 50.49 and staff positions provided in NUREG-0588, Revision 1, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment."

The staff has reviewed the information provided by the licensee and concluded that the impact on plant equipment resulting from increased dose values associated with extending fuel burnups are acceptable.

### 3.0 STATE CONSULTATION

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

### 4.0 ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.21, 51.32, and 51.33, an environmental assessment and finding of no significant impact was published in the Federal Register on May 28, 1992 (57 FR 22494).

Accordingly, based upon the environmental assessment, the Commission has determined that issuance of these amendments 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

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