

The Light company

Houston Lighting & Power South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

March 1, 1990
ST-HL-AE-3387
File No.: G9.06, G20.01
10CFR50.90
10CFR50.92
10CFR51

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

South Texas Project Electric Generating Station
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
Proposed Amendment to the
Unit 1 and Unit 2 Technical Specification 5.3.1

Pursuant to 10CFR50.90, Houston Lighting & Power Company (HL&P) hereby proposes to amend its Operating Licenses NPF-76 and NPF-80 by incorporating the attached proposed change to the Technical Specifications for the South Texas Project Electric Generating Station (STPEGS) Units 1 and 2.

The proposed change consists of allowing a maximum enrichment of Uranium 235 (U-235) of 4.5 weight percent to allow STPEGS to increase fuel discharge burnups in the future. A cycle specific Reload Safety Evaluation, including an environmental evaluation considering offsite radiological consequences will be performed prior to exceeding the burnup assumptions in the STPEGS FSAR.

HL&P has reviewed the attached proposed amendment pursuant to 10CFR50.92 and determined that it does not involve a significant hazards consideration. The basis for this determination is provided in the attachments. In addition, based on the information contained in this submittal and in the NRC Final Environmental Statement related to the operation of STPEGS Units 1 and 2, HL&P has concluded that, pursuant to 10CFR51, there are no significant radiological or non-radiological impacts associated with the proposed action and the proposed license amendment will not have a significant effect on the quality of the environment.

The STPEGS Nuclear Safety Review Board has reviewed and approved the proposed changes.

In accordance with 10CFR50.91(b), HL&P is providing the State of Texas with a copy of this proposed amendment.

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A Subsidiary of Houston Industries Incorporated

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If you should have any questions concerning this matter, please contact Mr. M. A. McBurnett at (512) 972-8530 or myself at (512) 972-7138.



S. L. Rosen
Vice President
Nuclear Engineering and Construction

GCS/nl

- Attachments:
1. Significant Hazards Evaluation for a Maximum U-235 Enrichment of 4.5 Weight Percent
 2. Proposed Technical Specification Change 5.3.1
 3. Criticality Analysis of the South Texas Units 1 and 2 Fresh Fuel Racks
 4. Mark-up of the Updated Final Safety Analysis Report

Houston Lighting & Power Company
South Texas Project Electric Generating Station

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter)	
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Houston Lighting & Power)	Docket Nos. 50-498
Company, et al.,)	50-499
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South Texas Project)	
Units 1 and 2)	

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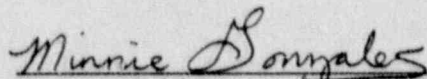
S. L. Rosen being duly sworn, hereby deposes and says that he is Vice President, Nuclear Engineering and Construction, of Houston Lighting & Power Company; that he is duly authorized to sign and file with the Nuclear Regulatory Commission the attached proposed change to the South Texas Project Electric Generating Station Technical Specification 5.3.1 is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge and belief.



S. L. Rosen
Vice President
Nuclear Engineering and Construction

Subscribed and sworn to before me, a Notary Public in and for The State of Texas this 1st day of March, 1990.





Minnie Gonzales
Notary Public in and for the
State of Texas

ATTACHMENT 1
SIGNIFICANT HAZARDS EVALUATION FOR A
MAXIMUM U-235 ENRICHMENT OF 4.5 WEIGHT PERCENT

ATTACHMENT 1

SIGNIFICANT HAZARDS EVALUATION FOR A MAXIMUM U-235 ENRICHMENT OF 4.5 WEIGHT PERCENT

Background

In order to reduce fuel costs and conserve spent fuel storage, STPEGS is planning to increase discharge burnups. This will require storage of fuel with enrichments higher than those currently allowed by Technical Specifications. The current Technical Specification 5.3.1 contains a maximum enrichment limit of 3.5 weight percent for U-235. STPEGS currently plans to receive shipments of 3.6 weight percent fuel in June of 1990. Therefore, a change to Technical Specification 5.3.1 will be required.

STPEGS may store new fuel in either the Fresh Fuel Racks or Region I of the High Density Spent Fuel Racks.

STPEGS performed an analysis for storing new fuel in Region I of the High Density Spent Fuel Racks with enrichments up to 4.5 weight percent U-235. The High Density Spent Fuel Racks have also been analyzed for storage of spent fuel with initial enrichments up to 4.5 weight percent U-235. These analyses were submitted to the NRC by letter (ST-HL-AE-2417) dated March 8, 1988. The NRC approved this proposal in the Amendment 2 to Operating License, NPF-76 dated November 1, 1988. The same design was approved for Unit 2 at the time its operating license was issued.

The Safety Evaluation below confirms acceptability of the STPEGS Fresh Fuel Racks for storage of new fuel with enrichments of up to 4.5 weight percent U-235.

Proposed Change

Change Technical Specification 5.3.1 to allow a maximum U-235 enrichment of 4.5 weight percent.

Safety Evaluation

Westinghouse has completed a "Criticality Analysis of the South Texas Units 1 and 2 Fresh Fuel Racks". This analysis demonstrates that Westinghouse 17x17STD, XL, OFA, and Vantage 5 fuel with an enrichment of 4.5 weight percent can be stored in every location of the fresh fuel rack (Attachment 3).

The NRC Standard Review Plan (SRP) 9.1.1, "New Fuel Storage" requires that effective multiplication factor (K_{eff}) be maintained less than 0.95 for full density moderation and less than 0.98 for low density moderation.

The design bases for preventing criticality outside the reactor is that there is a 95 percent probability at a 95 percent confidence level that the K_{eff} of the fuel assembly array will be less than 0.95. This is recommended in ANSI 57.3-1983 and in the NRC letter to all Power Reactor Licensees dated April 14, 1978.

Determination of Significant Hazards

Pursuant to 10CFR50.91 this analysis provides a determination that the proposed change to Technical Specifications does not involve any significant hazards consideration as defined in 10CFR50.92.

- (1) The proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated. A criticality analysis was performed for the Fresh Fuel racks at STPEGS. This analysis demonstrates that the criteria of the Standard Review Plan, Section 9.1.1 "New Fuel Storage" is met. The fresh fuel racks when fully loaded in a flooded condition maintain K_{eff} at 0.9252 which is below the required maximum of 0.95. The fresh fuel racks under low density conditions maintain a K_{eff} of 0.9361 which is below the maximum of 0.98. Additionally, the evaluation of a fuel assembly drop demonstrated that the K_{eff} remains below 0.95. The High Density Spent Fuel Racks have been approved for storage of spent fuel up to 4.5 weight percent U-235 and Region I of these racks has been approved for storage of new fuel with enrichments up to 4.5 weight percent.

Therefore, since the above conditions are the accidents previously evaluated and K_{eff} is maintained within the appropriate acceptance criteria the probability or consequences of an accident previously evaluated are not significantly increased.

- (2) The proposed change does not create the possibility of a new or different kind of accident from any previously evaluated. There are no new scenarios for new accidents or equipment malfunctions created by the proposed change. Additionally, there are no changes to systems or fuel handling procedures as a result of the proposed change.
- (3) The proposed change does not involve a significant reduction in a margin of safety. The Standard Review Plan, Section 9.1.1 provides the margin to criticality. The worst case K_{eff} evaluated is within the acceptance criteria of the Standard Review Plan. Therefore, the proposed change does not significantly reduce the margin of safety.

Conclusion

Based on the above, HL&P concludes that the proposed change satisfies the significant hazards consideration standards of 10CFR50.92(c) and a no significant hazards consideration finding is justified.

Safety Evaluation, Cont'd.

In the criticality analysis performed for STPEGS for full water density a moderator density of 1.0 gm/cm^3 was selected with the water at 68°F . This results in a K_{eff} of 0.9252 at a 95/95 probability confidence level. Since K_{eff} is less than 0.95, including uncertainties, the acceptance criteria is met.

The maximum rack K_{eff} under low density moderation conditions occurs at 0.043 gm/cm^3 water density. The K_{eff} under these conditions including uncertainties is 0.9361. This K_{eff} at a 95/95 probability confidence level is below 0.95 and the acceptance criteria for criticality is met.

The analytical methods used are AMPX for the neutron cross section generation and KENO-IV, a Monte Carlo computer code for the reactivity determination. These codes have been found acceptable by the NRC staff because the results obtained for the criticality experiments are satisfactory and these codes are widely used by the industry for fuel storage rack analyses. Additional details of the criticality analytic methods are contained in Attachment 3.

In evaluating the postulated accidents under normal conditions the fresh fuel racks are normally dry. The introduction of water is a worst case scenario. The full density and low density optimum moderation cases are bounding accident situations which result in the bounding K_{eff} . In the evaluation of a fuel assembly drop, ANSI N16.1-1975 does not require two unlikely independent concurrent events to protect against a criticality accident. Therefore, the absence of a moderator in the fresh fuel racks is the initial condition of an accident involving a fuel assembly dropping. The maximum reactivity increase for postulated accidents will be less than 10% delta k/k . The normal, dry fresh fuel rack reactivity is less than 0.70. Therefore, for postulated accidents the maximum rack K_{eff} will be less than 0.95.

The fission product inventories identified in Appendix 15A of the Updated Final Safety Analysis Report are bounding for a core-average burnup of 23,740 Megawatt Days/Metric ton (MWD/MT). A cycle specific Reload Safety Evaluation is performed for each cycle. A cycle specific Reload Safety Evaluation, including an environmental evaluation considering offsite radiological consequences, will be performed prior to exceeding a core-average burnup of 23,740 MWD/MT. These evaluations will be performed in accordance with 10CFR50.59.