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

November 7, 1994
ST-HL-AE-4923
File No.: G09.06
10CFR50.90,
10CFR50.92, 10CFR51

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

South Texas Project
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
Unit 1 and Unit 2 Technical Specification 3.9.2

Houston Lighting & Power Company (HL&P) proposes to amend its Operating Licenses NPF-76 and NPF-80 for the South Texas Project Electric Generating Station (STPEGS), Units 1 and 2, by incorporating the attached proposed change to Technical Specification 3.9.4. The purpose of this amendment is to permit both containment personnel airlock doors to be open while moving fuel during refueling operations.

HL&P has reviewed the attached proposed amendment pursuant to 10CFR50.92 and determined that it does not involve a significant hazards consideration. In addition, HL&P has determined that the proposed amendment satisfies the criteria of 10CFR51.22(c)(9) for categorical exclusion from the requirement for an environmental assessment. The South Texas Project Electric Generating Station Nuclear Safety Review Board has reviewed and approved the proposed changes.

The required affidavit, along with a Safety Evaluation and No Significant Hazards Consideration Determination associated with the proposed changes, and the marked up effected pages of the Technical Specifications are included as attachments to the letter.

Project Manager on Behalf of the Participants in the South Texas Project

A001

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

If you should have any questions concerning this matter, please call Mr. S. H. Head at (512) 972-7136 or myself at (512) 972-8664.

J. F. Groth
Vice President,
Nuclear Generation

LW/pas

Attachment:
1. Affidavit
2. Safety Evaluation and No Significant Hazards Consideration Determination
3. Mark-ups of Proposed Change to Technical Specifications 3.9.2

c:

Leonard J. Callan
Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011

Thomas W. Alexion
Project Manager
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001 13H15

David P. Loveless
Sr. Resident Inspector
c/o U. S. Nuclear Regulatory Comm.
P. O. Box 910
Bay City, TX 77404-910

J. R. Newman, Esquire
Newman, Bouknight & Edgar, P.C.
STE 1000, 1615 L Street, N.W.
Washington, DC 20036

K. J. Fiedler/M. T. Hardt
City Public Service
P. O. Box 1771
San Antonio, TX 78296

J. C. Lanier/M. B. Lee
City of Austin
Electric Utility Department
721 Barton Springs Road
Austin, TX 78704

G. E. Vaughn/C. A. Johnson
Central Power and Light Company
P. O. Box 2121
Corpus Christi, TX 78403

Rufus S. Scott
Associate General Counsel
Houston Lighting & Power Company
P. O. Box 61067
Houston, TX 77208

Institute of Nuclear Power
Operations - Records Center
700 Galleria Parkway
Atlanta, GA 30339-5957

Dr. Joseph M. Hendrie
50 Bellport Lane
Bellport, NY 11713

Richard A. Ratliff
Bureau of Radiation Control
Texas Department of Health
1100 West 49th Street
Austin, TX 78756-3189

U. S. Nuclear Regulatory Comm.
Attn: Document Control Desk
Washington, D. C. 20555-0001

J. R. Egan, Esquire
Egan & Associates, P.C.
2300 N Street, N.W.
Washington, D.C. 20037

ATTACHMENT 1

AFFIDAVIT

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT

I, J. F. Groth, being duly sworn, hereby depose and say that I am Vice President, Nuclear Generation, of Houston Lighting & Power Company; that I am duly authorized to sign and file with the Nuclear Regulatory Commission the attached revision to proposed changes to Technical Specification 3.9.4; that I am familiar with the content thereof; and that the matters set forth therein are true and correct to the best of my knowledge and belief.

John Groth

J. F. Groth
Vice President,
Nuclear Generation

STATE OF TEXAS)
)
)

Subscribed and sworn to before me, a Notary Public in and for the State of Texas, this 7th day of NOVEMBER, 1994.

B. DIANA SCHUMANN
Notary Public, State of Texas
My Commission Expires 7-1-95

B. Diana Schumann

Notary Public in and for the
State of Texas

ATTACHMENT 2

SAFETY EVALUATION
AND
NO SIGNIFICANT HAZARDS
CONSIDERATION DETERMINATION
FOR
ALLOWING THE PERSONNEL AIRLOCK
TO BE OPEN DURING FUEL MOVEMENT

SAFETY EVALUATION AND NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION TO PERMIT BOTH PERSONNEL AIRLOCK DOORS TO BE OPENED DURING FUEL MOVEMENT

Background

Technical Specification 3.9.4, "Containment Building Penetrations," requires that a minimum of one containment personnel airlock door, as well as other containment penetrations, be closed during core alterations and movement of irradiated fuel within the containment. Fuel handling accident analysis assumptions are reflected in the Section 15.7.4 of the South Texas Project Updated Final Safety Analysis Report. The accident analysis assumes that in the event of a fuel handling accident inside containment, the containment is isolated and calculated offsite radiological consequences of the accident are well within the 10 CFR 100 exposure guidelines. The fuel handling accident analysis assumes a minimum water level of 23 feet above the Reactor Vessel Flange at the time of the accident and a minimum decay time of 42 hours prior to fuel movement. These two accident analysis assumptions are reflected by South Texas Project Technical Specifications.

During a refueling outage, other work in the containment does not stop during fuel movement and core alterations. This requires that personnel operate the containment personnel airlock doors to enter and exit the containment. During a recent refueling outage at South Texas Project, it is conservatively estimated that there were 1500 entries made into containment while fuel movement/core alteration activities were in progress. Such heavy use of the containment personnel airlock was not anticipated during its design. As a result of this unexpectedly heavy use, failures of the door hinge pin, the door seals, the three-way equalizing valves, and other components have occurred throughout the industry. South Texas Project has used trained, dedicated door operators in an effort to minimize damage to the door, but problems have persisted. Potential failures of the containment personnel airlock doors raise the concern that the containment personnel airlock might not be able to be sealed in the event of an accident.

There are a large number of people in the containment during a refueling outage, even during fuel movement and core alterations. Should a fuel handling accident occur, it would take a number of cycles of the containment personnel airlock to evacuate personnel from within the containment. With each containment personnel airlock cycle, more containment air would be released. While waiting for their turn to exit, the workers would be exposed to the released activity. From a practical standpoint, Specification 3.9.4 will not prevent all radioactive releases from the containment following a fuel handling accident. Alternatively, the Shift Supervisor could invoke 10 CFR 50.54(x), order both doors of the containment personnel airlock opened while the personnel in the containment are evacuated, and then close the doors. In either case, there is a release of activity into the atmosphere. Under the proposed change, the containment could be evacuated without invoking 10 CFR 50.54(x) and then sealed. This would reduce the dose to workers in the event of an accident while maintaining acceptable doses to the public.

SAFETY EVALUATION AND NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION TO PERMIT BOTH PERSONNEL AIRLOCK DOORS TO BE OPENED DURING FUEL MOVEMENT

In order to assure that doses to the public remain within acceptable ranges, South Texas Project performed a revised fuel handling accident analysis which assumed that the containment personnel airlock is open at the time of the accident. The analysis determined that it is not necessary to have containment closure at the time of the accident in order to show acceptable site boundary doses following a fuel handling accident. The revised analysis considered two cases, one assuming the reactor was subcritical for 95 hours prior to the accident and a second assuming it was subcritical for 165 hours. The offsite and control room doses of both cases of the revised accident analysis remain within acceptable limits.

The proposed change is generically applicable to those Pressurized Water Reactors which are required to have the containment personnel airlock closed during fuel movement and core alterations. Some Pressurized Water Reactors are not required to close the containment personnel airlock during fuel movement and core alterations. Justification for such specifications include a containment personnel airlock which opens into a filtered area of the Auxiliary Building, such as the Spent Fuel Pool, or continuous use of a filtered containment exhaust. However, the majority of Pressurized Water Reactors have specifications similar to South Texas Project and can make use of this proposed change to Technical Specification 3.9.4. This proposed change has been presented to the Technical Specification Improvement Program lead plants. The Pressurized Water Reactor owners groups are moving to incorporate the proposed change into the Improved Standard Technical Specifications. However, South Texas Project is scheduled for an outage this spring and would benefit from this change to the current Technical Specifications.

Proposed Change

Houston Lighting & Power proposes to modify Technical Specification 3.9.4, Containment Building Penetrations. A markup of the proposed change to the Technical Specification and its Bases is included as Attachment 3 of this request.

SAFETY EVALUATION AND NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION TO PERMIT BOTH PERSONNEL AIRLOCK DOORS TO BE OPENED DURING FUEL MOVEMENT

The proposed change revises Specification 3.9.4, Containment Building Penetrations, to allow the containment personnel airlock to be open during fuel movement and core alterations provided that one containment personnel airlock door is operable, there is 23 feet of water above the reactor vessel flange, and a qualified individual is available to close a containment personnel airlock door. This individual must be able to respond and to close the containment personnel airlock within the required time when directed. Consistent with the Bases of the Improved Standard Technical Specifications, in order for a containment personnel airlock door to be operable, it must be capable of being closed and the containment personnel airlock doorway must not be blocked. The use of removable protective covers for the door seals and sealing surfaces is permitted. The proposed change has no effect on the equipment hatch or the auxiliary airlock.

Safety Evaluation

The purpose of the current requirement to have one containment personnel airlock door closed during core alterations and fuel movement is to prevent the release of radioactive material in the event of a fuel handling accident. A revised South Texas Project fuel handling accident analysis was performed which evaluated two cases of the containment personnel airlock doors being open at the time of the accident. Case 1 assumed that reactor had been subcritical for 95 hours prior to fuel movement. Case 2 assumed the reactor had been subcritical for 165 hours prior to fuel movement. Both cases analyzed assumed that there was 23 feet of water above the Reactor Vessel Flange at the time of the accident. This assumption is consistent with Regulatory Guide 1.25 and South Texas Project Technical Specifications 3.9.10, Water Level - Refueling Cavity, 3.9.11.1 - Water Level - Storage Pools - Spent Fuel Pool, and 3.9.11.2 - Water Level - In-Containment Storage Pool.

The doses for each case of the revised fuel handling accident inside containment have been compared to the doses of the current design basis and acceptance criteria doses.

The evaluation of case 1 requires closure of a containment personnel airlock door within 30 minutes of the accident. Closure of a door in 30 minutes terminates the release of radioactivity and provides doses which are within acceptable limits. Case 2 postulated the release for 2 hours as per the requirements of Regulatory Guide 1.25. In order to obtain doses of acceptable levels for this release time period, it was assumed that the reactor was subcritical for 165 hours.

SAFETY EVALUATION AND NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION TO PERMIT BOTH PERSONNEL AIRLOCK DOORS TO BE OPENED DURING FUEL MOVEMENT

All doses associated with the proposed change are less than the acceptance criteria as stated by NUREG-0781, Safety Evaluation Report related to the operation of South Texas Project, Units 1 and 2, and Code of Federal Regulations - 10CFR Part 50, Appendix A, General Design Criteria 19.

Current Licensing Basis

The containment personnel airlock at the South Texas Project is a double, inflatable seal airlock provided with an air supply system, a pressure equalizing system, and an electrical and instrumentation system. The containment personnel airlock air supply system has two Class 2 air tanks per door and provides complete redundancy required to meet single failure criteria. Each seal has its own air tank and check valve to supply air to the seal in case of loss of plant air. A separate hydraulic system is provided to operate each door. The containment personnel airlock barrels are inserted through existing containment wall sleeves; then the attachment collars furnished with the airlocks are welded to the sleeves. The containment personnel airlock barrel has an 11-foot-6-inch inside diameter with sufficient length to provide a minimum clear distance of approximately 8 ft between doors.

The containment personnel airlock has two doors in series, each with inflatable seals. The clear opening of the door is 5 ft wide by 8 ft high. The personnel airlock door seals can be leak tested by pressurizing the area between the seals through a pipe tap which is located in each door. The entire containment personnel airlock can be leak tested by pressurizing through the emergency air supply. The personnel airlock is designed so that if a Design Basis Accident occurs, the pressure will seat the doors into the airlock frame. When the entire personnel airlock is leak tested, the pressure is forcing the inner door (reactor end) open, or into the unseated position. In order to prevent the personnel airlock door from being unseated, test clamps and lugs (strong backs) are provided to hold the reactor end door in place during leak testing.

The two doors for the containment personnel airlock are electrically and mechanically interlocked so that one door cannot be opened unless the second door is sealed. A pressure-equalizing valve at each door is provided to equalize pressure across the doors when personnel are entering or leaving the containment. The valves are properly interlocked so that they both cannot open at the same time, and each valve can be operated only when the opposite door is closed and locked. Provisions are made to bypass the interlock to permit both doors to be opened when safe to do so.

SAFETY EVALUATION AND NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION TO PERMIT BOTH PERSONNEL AIRLOCK DOORS TO BE OPENED DURING FUEL MOVEMENT

The air supply and leak rate monitoring system solenoid valves (located outside containment) are closed upon receipt of a containment isolation phase A signal. These lines are considered containment penetrations and are detailed in the South Texas Project UFSAR. They are designed in accordance with 10CFR50, Appendix A, GDC 57 and tested in accordance with 10CFR50, Appendix J.

The prime concern for this proposed Technical Specification amendment is the effect on design doses when both doors of the containment personnel airlock are open at the time of the accident. Specifically, the South Texas Project fuel handling accident, which is classified as an ANS Condition IV event, was reanalyzed. The design basis fuel handling accident is defined as the dropping of a spent fuel assembly during fuel handling. This results in the rupture of the cladding of the fuel rods in the assembly and the fuel assembly upon which it is dropped.

During refueling operations the Normal Containment Purge Subsystem is typically operating. Should a fuel handling accident occur inside containment, the Reactor Containment Building Purge Isolation monitors are capable of identifying that the activity release has occurred and initiating containment isolation.

The assumptions postulated in the revised calculation of the radiological consequences of a fuel handling accident in the Reactor Containment Building are consistent with the assumptions of Regulatory Guide 1.25 and are summarized below.

a. The accident occurs at least 95 hours after plant shutdown. Radioactive decay of the fission product inventory during this interval is taken into account.

b. All the rods in one fuel assembly rupture, plus an additional 50 fuel rods assumed to be damaged by the dropped fuel assembly.

c. The assembly damaged is the highest powered assembly in the core. The values for the individual fission product inventories in the damaged assembly were calculated based upon the total core activities with a radial peaking factor of 1.7.

d. The minimum water depth is 23 feet above the Reactor Vessel Flange.

e. Damaged rods are assumed to release their gas gap activities. The gas gap activities consists of iodides and noble gases. The gas gap consist of 10% of all iodides, except I-131 which is 12%. It also consists of 10% of all noble gases, except for Kr-85 which is 30%.

SAFETY EVALUATION AND NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION TO PERMIT BOTH PERSONNEL AIRLOCK DOORS TO BE OPENED DURING FUEL MOVEMENT

f. The noble gases released to the spent fuel pool or refueling water are released at ground level to the environment. Credit is assumed for isolation of the Containment.

g. The iodine gap inventory is composed of 99.75 percent inorganic species and 0.25 percent organic species.

h. The refueling pool water decontamination factors for iodine are taken as 165 in accordance with Regulatory Guide 1.25.

i. The iodides escaping from the refueling water pool in the Reactor Containment Building are exhausted until the containment is automatically isolated and the containment personnel airlock is closed. A ground level release with no filtration is assumed.

j. The 0 to 2 hour accident dispersion factors given in Table 15.B-1 of the South Texas Project UFSAR are applicable.

k. The radioactive material that escapes from the pool to the reactor containment building is released from the building over a two hour time period.

The revised South Texas Project fuel handling accident differs from the current analysis in that the containment personnel airlock doors are assumed to be open at the time of the accident. The revised analysis also evaluated two separate cases. One in which the accident occurred 95 hours after the reactor was subcritical, i.e., shutdown, and a second case in which the accident occurred 165 hours after the reactor was subcritical. The revised analysis assumes that all containment penetrations except the airlock are automatically isolated. For case 1, the airlock is assumed to be closed by operator action 30 minutes after the accident. For case 2, door closure is assumed to occur 2 hours after the accident to be consistent with assumption k above.

SAFETY EVALUATION AND NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION TO PERMIT BOTH PERSONNEL AIRLOCK DOORS TO BE OPENED DURING FUEL MOVEMENT

Impact of Proposed Change

The proposed change contains restrictions on allowing both containment personnel airlock doors to be open to ensure that at least one door will be available to perform its safety function. The restriction to have 23 feet of water above the reactor vessel flange is consistent with both the South Texas Project fuel handling accident analysis and other Technical Specifications. Requiring a door to be operable ensures that a door is available to be closed in the event of an accident. Prohibiting the blocking of the doorway by cables, hoses, etc., also ensures that the door can be closed. The use of removable protective covers for the door seals and sealing surfaces is permitted. Requiring that an individual is available to respond to the containment personnel airlock when directed , to close the door following evacuation of the containment will minimize the release of radioactive material.

This change represents the potential for an increased dose at the site boundary due to a fuel handling accident. However, the doses remain well below the acceptable limits for each case analyzed. The small increase in doses is offset by the decreased potential radiation dose to workers in the event of a fuel handling accident, and the increased reliability of the containment personnel airlock door in the event of an accident.

SAFETY EVALUATION AND NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION TO PERMIT BOTH PERSONNEL AIRLOCK DOORS TO BE OPENED DURING FUEL MOVEMENT

No Significant Hazards Consideration Determination

Houston Lighting & Power has evaluated the proposed amendment against the criteria of 10CFR50.59 as follows:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

The proposed change to Technical Specification 3.9.4, Containment Building Penetrations, would allow the containment personnel airlock to be open during fuel movement and core alterations. The containment personnel airlock is closed during fuel movement and core alterations to prevent the escape of radioactive material in the event of a fuel handling accident. The containment personnel airlock is not an initiator to any accident. Whether the containment personnel airlock doors are open or closed during fuel movement and core alterations has no affect on the probability of any accident previously evaluated.

The proposed change does alter assumptions previously made in evaluating the radiological consequences of the fuel handling accident inside the reactor containment building. The proposed change allows for the containment personnel airlock to be open during refueling. The radiological consequences described in this change are bounded by those given in the South Texas Project Safety Evaluation Report and General Design Criteria 19. All doses for the proposed change are less than the acceptance criteria, therefore, there is no significant increase in the consequences of an accident previously analyzed.

The proposed change will significantly reduce the dose to workers in the containment in the event of a fuel handling accident by accelerating the containment evacuation process. The proposed change will also significantly decrease the wear on the containment personnel airlock doors and, consequently, increase the reliability of the containment personnel airlock doors in the event of an accident.

Since the probability of a fuel handling accident is unaffected by the airlock door positions, and the increased doses do not exceed acceptance limits, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

SAFETY EVALUATION AND NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION TO PERMIT BOTH PERSONNEL AIRLOCK DOORS TO BE OPENED DURING FUEL MOVEMENT

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change affects a previously evaluated accident, e.g., a fuel handling accident inside containment. The existing accident has been modified to account for the containment personnel airlock doors being opened at the time of the accident. It does not represent a significant change in the configuration or operation of the plant and, therefore, does not create the possibility of a new or different type of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

The margin of safety is reduced when the offsite and control room doses exceed the acceptance criteria in the STP SER. As previously discussed in the response to question 1, the offsite and control room doses are below the acceptance criteria. Therefore, this proposed change does not significantly reduce the margin of safety.

Implementation Plan

Houston Lighting & Power requests an implementation time of 30 days from the effective date of the approved license amendment to facilitate distribution and to make appropriate changes to plant documents.