

## CONTAINMENT SYSTEMS

### CONTAINMENT LEAKAGE

#### LIMITING CONDITION FOR OPERATION

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3.6.1.2 Containment leakage rates shall be limited to:

- a. An overall integrated leakage rate of:
  1.  $\leq L_a$ , 0.50 percent by weight of the containment air per 24 hours at  $P_a$ , (39.6 psig), or
  2.  $\leq L_t$ , 0.32 percent by weight of the containment air per 24 hours at a reduced pressure of  $P_t$ , (19.8 psig).
- b. A combined leakage rate of  $\leq 0.60 L_a$  for all penetrations and valves subject to Type B and C tests as identified in Table 3.6-1 when pressurized to  $P_a$ .
- c. A combined leakage rate of  $\leq 0.27 L_a$  for all penetrations identified in Table 3.6-1 as secondary containment bypass leakage paths when pressurized to  $P_a$ .

APPLICABILITY: MODES 1, 2, 3 and 4.

#### ACTION:

With either (a) the measured overall integrated containment leakage rate exceeding  $0.75 L_a$  or  $0.75 L_t$ , as applicable, or (b) with the measured combined leakage rate for all penetrations and valves subject to Types B and C tests exceeding  $0.60 L_a$ , or (c) with the combined bypass leakage rate exceeding  $0.27 L_a$ , restore the leakage rate(s) to within the limit(s) prior to increasing the Reactor Coolant System temperature above 200°F.

#### SURVEILLANCE REQUIREMENTS

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4.6.1.2 The containment leakage rates shall be demonstrated at the following test schedule and shall be determined in conformance with the criteria specified in Appendix J of 10 CFR 50 using the methods and provisions of ANSI N45.4-1972:

- a. Three Type A tests (Overall Integrated Containment Leakage Rate) shall be conducted at 40  $\pm$  10 month intervals during shutdown at either  $P_a$  (39.6 psig) or at  $P_t$  (19.8 psig) during each 10-year

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## CONTAINMENT SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- service period. The third test of each set shall be conducted during the shutdown for the 10-year plant inservice inspection.
- b. If any periodic Type A test fails to meet either  $.75 L_a$  or  $.75 L_t$ , the test schedule for subsequent Type A tests shall be reviewed and approved by the Commission. If two consecutive Type A tests fail to meet either  $.75 L_a$  or  $.75 L_t$ , a Type A test shall be performed at least every 18 months until two consecutive Type A tests meet either  $.75 L_a$  or  $.75 L_t$  at which time the above test schedule may be resumed.
- c. The accuracy of each Type A test shall be verified by a supplemental test which:
1. Confirms the accuracy of the Type A test by verifying that the difference between supplemental and Type A test data is within  $0.25 L_a$  or  $0.25 L_t$ .
  2. Has a duration sufficient to establish accurately the change in leakage between the Type A test and the supplemental test.
  3. Requires the quantity of gas injected into the containment or bled from the containment during the supplemental test to be equivalent to at least 25 percent of the total measured leakage rate at  $P_a$  (39.6 psig) or  $P_t$  (19.8 psig).
- d. Type B and C tests shall be conducted with gas at  $P_a$  (39.6 psig) at intervals no greater than 24 months except for tests involving air locks.
- e. The combined bypass leakage rate shall be determined to be  $< 0.27 L_a$  by applicable Type B and C tests at least once per 24 months except for penetrations which are not individually testable; penetrations not individually testable shall be determined to have no detectable leakage when tested with soap bubbles while the containment is pressurized to  $P_a$  (39.6 psig) during each Type A test.
- f. Air locks shall be tested and demonstrated OPERABLE per Surveillance Requirement 4.6.1.3.



PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

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e. At least once per 18 months by:

1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is  $< 4.15$  inches Water Gauge while operating the ventilation system at a flow rate of  $2000 \text{ cfm} \pm 10\%$ .
2. Verifying that on a containment isolation signal or chlorine accident detection signal, the system automatically isolates the control room within 35 seconds and switches into a recirculation mode of operation with flow through the HEPA filters and charcoal adsorber banks.
3. Verifying that the system maintains the control room at a positive pressure of  $\geq 1/8$  inch W.G. relative to the outside atmosphere during system operation with  $\leq 450$  cfm outside air intake.

f. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove  $\geq 99\%$  of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the ventilation system at a flow rate of  $2000 \text{ cfm} \pm 10\%$ .

g. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove  $\geq 99\%$  of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the ventilation system at a flow rate of  $2000 \text{ cfm} \pm 10\%$ .

## SAFETY EVALUATION

Re: St. Lucie Unit 1  
Docket No 50-335  
Proposed Amendment  
Containment & Control Room Leakage

### I. Introduction

This evaluation supports a proposal to (1) increase the combined leakage rate allowed for all penetrations identified as secondary containment bypass leakage paths, and (2) increase the limit on outside air intake into the control room during the recirculation mode of operation. The sought after bypass leakage rate of 27% was previously evaluated in Appendix 6B of the FSAR. The reevaluation discussed herein is based on a more conservative containment modeling technique. The current limit on control room outside air intake is based on the original control room post-LOCA habitability evaluation that is presented in FSAR section 15.4.1.2.5(d). The evaluation did not take credit for the operation of the "backfitted" Iodine Removal System (IRS) and Shield Building Ventilation System (SBVS) heaters. The reevaluation discussed below uses the same control room models and assumptions presented in the FSAR in addition to the operation of the "backfitted" systems.

### II. Discussion

The St. Lucie Unit 1 calculations estimating whole body and thyroid doses from a postulated loss of coolant accident (LOCA) have been revised. The revised analysis uses a more conservative containment release model. The analysis was previously presented in Appendix 6B of the FSAR and was based on a single volume well-mixed containment activity release model as well as the "backfit" containment bypass fraction of 27%. The difference between the FSAR analysis and the analysis described herein is that a more conservative two compartment containment model is used that takes into account the difference in iodine scrubbing effectiveness between the regions of the containment that receive or do not receive spray coverage. The volume of the containment atmosphere that is sprayed is conservatively assumed to be 86%. Mixing is assumed to occur between the sprayed and unsprayed regions at a rate of 4 volumes of unsprayed region per hour. The only other change in assumptions from those presented in Appendix 6B of the FSAR is that it takes 44 minutes for the sprays to reduce the elemental iodine concentration in the containment by the allowable factor of 100 rather than the previous period of 28 minutes. The removal of particulate iodine by the sprays is terminated at 1 hour. The pH of the sodium hydroxide solution at the spray nozzle will be between 8.5 and 11. The revised offsite LOCA doses are presented in Table 1. Although the revised thyroid doses for both the exclusion zone boundary and low population zone are somewhat higher because a more conservative model was used, they are still well within the 300 rem limit set by 10 CFR 100 for the reactor siting criteria.

In the process of developing revised offsite LOCA dose calculations, it was determined that Technical Specification leak testing criteria could be made less stringent. The current Specifications set a 12% limit on unfiltered

SAFETY EVALUATION (Continued)

secondary containment bypass leakage and a 100 CFM limit on Control Room in-leakage. The revised LOCA analysis discussed above justifies a containment bypass leakage of up to 27% and a control room inleakage of up to 450 CFM.

The LOCA doses presented in Table 1 are based on a bypass leakage of 27% and the more conservative containment model. All other FSAR assumptions have been retained. The revised 30 day post-LOCA control room doses are presented in Table 2 and are compared to those presented in the FSAR. The control room dose model used in the reevaluation is identical to the model described in chapter 15 of the FSAR. The only change in assumptions is that the IRS and SBVS heat "backfits" have been incorporated and the containment bypass leakage increased to 27% value. Control room inleakage is conservatively limited to 450 CFM. This maximum value of inleakage, plus the Control Room air conditioning System, assures that the relative humidity of the air at the inlet of the control room's charcoal filters is less than 70%. Relative humidity must be maintained below this value in order that the assumed charcoal efficiencies presented on FSAR page 15.4.1-20d can be obtained. The effect of a postulated chlorine release on the control room habitability was also reevaluated. The chlorine release evaluation illustrated a value for inleakage of 568 CFM which is above the limitation imposed by the relative humidity requirements.

III. Conclusion

We have concluded, based on the considerations discussed above, that: (1) the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

TABLE I

REEVALUATION OF FSAR OFFSITE LOCA DOSES  
FOR 27% SHIELD BUILDING BYPASS LEAKAGE

	<u>*FSAR</u>	<u>**AMENDMENT</u>
2 Hour Thyroid Dose at 1555 Meters (EZB)	66 rem	75 rem
2 Hour Whole Body Dose at 1555 Meters (EZB)	4 rem	4 rem
30 Day Thyroid Dose at 1609 Meters (LPZ)	150 rem	167 rem
30 Day Whole Body Dose at 1609 Meters (LPZ)	5.5 rem	6 rem

\*Post iodine removal systems backfit case per FSAR Appendix 6B at page 6B-17.

\*\* Post Iodine removal systems backfit case per FSAR Appendix 6B with additional calculational conservatisms as noted in text.

TABLE II

REEVALUATION OF FSAR CONTROL ROOM LOCA DOSES FOR THE  
POST IODINE REMOVAL SYSTEMS BACKFIT CASE WITH 450 CFM INLEAKAGE

	<u>*FSAR</u>	<u>**AMENDMENT</u>
Control Room Thyroid Dose	30 rem	12.5 rem
Control Room Whole Body Dose	1.7 rem	3.0 rem
Control Room Skin Dose	17.8 rem	27.0 rem

\*FSAR case at page 15.4.1-20d with no credit for iodine removal system backfits and 100 CFM control room inleakage.

\*\*Post iodine removal systems backfit case with additional calculational conservatisms as noted in text and 450 CFM control room inleakage.



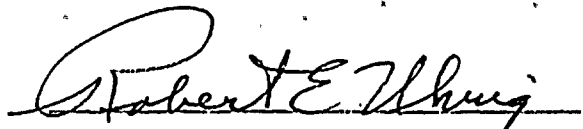
STATE OF FLORIDA )  
 )  
COUNTY OF DADE )

ss.

Robert E. Uhrig, being first duly sworn, deposes and says:

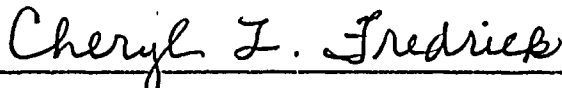
That he is a Vice President of Florida Power & Light Company,  
the Licensee herein;

That he has executed the foregoing document; that the state-  
ments made in this said document are true and correct to the  
best of his knowledge, information, and belief, and that he  
is authorized to execute the document on behalf of said  
Licensee.

  
Robert E. Uhrig

Subscribed and sworn to before me this

18 day of April, 1980



NOTARY PUBLIC, in and for the county of Dade,  
State of Florida

My commission expires: \_\_\_\_\_

Notary Public, State of Florida at Large  
My Commission Expires October 30, 1983  
Bonded thru Maynard Bonding Agency



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