REFUELING OPERATIONS

## 3/4.9.14 DECAY TIME - STORAGE POOL

### LIMITING CONDITION FOR OPERATION

3.9.14 The irradiated fuel assemblies in the fuel storage pool shall have decayed for at least 1180 hours, unless more than one-third core is placed into the pool, in which case the irradiated fuel assemblies shall have decayed for 1490 hours.

APPLICABILITY: Prior to movement of the spent fuel cask into the fuel cask compartment.

ACTION:

With irradiated fuel assemblies having a decay time of less than 1180 hours, or 1490 hours in the case of more than one-third core discharge, suspend all activities involving movement of the spent fuel cask into the fuel cask compartment. The provisions of Specification 3.0.3 are not applicable.

### SURVEILLANCE REQUIREMENTS

4.9.14 The irradiated fuel assemblies in the fuel storage pool shall have been determined to have decayed for at least 1180 hours, or 1490 hours in the case of more than one-third core discharge, by verification of the date and time from the most recent sub-criticality prior to movement of the spent fuel cask into the fuel cask compartment.

3/4.9.12 FUEL POOL VENTILATION SYSTEM-FUEL STORAGE

The limitations on the fuel handling building ventilation system ensures that all radioactive material released from an irradiated fuel assembly will be filtered through the HEPA filters and charcoal adsorber prior to discharge to the atmosphere. The OPERABILITY of this system and the resulting iodine removal capacity are consistent with the assumptions of the accident analyses.

3/4.9.13 SPENT FUEL CASK CRANE

The maximum load which may be handled by the spent fuel cask crane is limited to a loaded single element cask which is equivalent to approximately 25 tons. This restriction is provided to ensure the structural integrity of the spent fuel pool in the event of a dropped cask accident. Structural damage caused by dropping a load in excess of a loaded single element cask could cause leakage from the spent fuel pool in excess of the maximum makeup capability.

3/4.9.14 DECAY TIME - STORAGE POOL

The minimum requirements for decay of the irradiated fuel assemblies in the entire spent fuel storage pool prior to movement of the spent fuel cask into the fuel cask compartment insure that sufficient time has elapsed to allow radioactive decay of the fission products. The decay time of 1180 hours is based upon one-third of a core placed in the spent fuel pool each year during refueling for ten years to fill the pool. The decay time of 1490 hours is based upon one-third of a core being placed in the spent fuel pool each year during refueling for seven years following which an entire core is placed in the pool to fill it. The cask drop analysis assumes that all of the irradiated fuel in the filled pool (3-1/3 cores) is ruptured and follows Regulatory Guide 1.25 methodology, except that a Radial Peaking Factor of 1.0 is applied to all irradiated assemblies.

# SAFETY EVALUATION FOR

# STORAGE POOL DECAY TIME

## 1. INTRODUCTION

The Final Safety Analysis Report (FSAR) for St. Lucie Unit No. 1, at page 9.1-33m, states that the radius of fall of a spent fuel shipping cask into the spent fuel pool is 133 inches. This value was used in the Safety Evaluation which was submitted with FPL's request, dated August 31, 1977, to increase the storage capacity of the spent fuel pool from 310 to 728 fuel assemblies. As used in that evaluation, this radius of fall for a potential cask drop would have resulted in a total of 168 fuel assemblies being impacted. The radiological evaluation performed followed that described in the FSAR, using Regulatory Guide 1.25 methodology and assuming each of the impacted assemblies to be the equivalent of the highest burnup assembly. It was determined that the release thus calculated would remain within 10% of 10 CFR Part 100 limits if the fuel decay time for the 168 assemblies were 1553 hours or greater. Amendment No. 22 to Operating License DPR-67 approving the increased storage capacity was therefore issued on March 29, 1978, with a decay time of 1553 hours required for those assemblies stored in the modules nearest the fuel cask compartment.

It has since been determined that an error existed in the FSAR analysis for the drop of the spent fuel cask into the spent fuel pool. The analysis was originally performed assuming a single pendulum which gave a drop radius of 133 inches. The FSAR methodology, however, specifies a double pendulum, which gave a drop radius of 248 inches. This meant that a dropped cask could impact more fuel elements.

## 2. DISCUSSION

The proposed amendment to the Technical Specifications would require that prior to movement of the spent fuel cask into the fuel cask compartment, all irradiated fuel assemblies in the spent fuel pool have a decay time of at least 1180 hours, unless more than one-third of a full core is discharged to the pool at once, in which case the decay time is to be 1490 hours. These decay times are based upon an analysis which conservatively assumes that all of the fuel in a full pool (3-1/3 cores) is ruptured as a result of a potential cask drop. The

analysis is identical to that used in the FSAR and the safety evaluation accompanying FPL's request to increase spent fuel storage capacity, except that the appropriate value for assembly burnup has been used. The earlier analysis used a Radial Peaking Factor (RPF) of 1.65 as specified in Regulatory Guide 1.25 to represent the highest burnup fuel assembly to which all the impacted fuel assemblies would be equated. While this value may be appropriate for the analysis of a postulated accident involving a single assembly, it is grossly conservative when applied to an analysis involving 1/3 of a core whose fuel assemblies have various exposure histories. An RPF of 1.0 has been selected as being more representative for the off-load of one or more regions from the core and has been applied to each assembly in the present analysis. The resultant decay times are those which are necessary to assure that offsite exposures will be within 10% of 10 CFR Part 100 limits. Two cases have been evaluated:

Case I - One-third of a core is placed in the spent fuel pool each year during refueling for ten years.

Case II- One-third of a core is placed in the spent fuel pool each year during refueling for seven years. Following the eighth year of operation, the entire core is removed from the reactor and placed into the pool at once.

A summary of the results of the evaluation is shown in the table below.

| | DECAY TIME (HRS.) AND DOSE (REM)* | | | |
|---|---|---|---|---|
| | Case I (HRS.) | (10-year) (REM) | Case II (HRS.) | (8-year) (REM) |
| Thyroid: | 1180 | 29.66 | 1490 | 29.27 |
| Whole Body: | 1180 | 0.076 | 1490 | 0.078 |

* Regulatory Guide 1.25 methodology used, except that the Radial Peaking Factor for each assembly is equal to 1.0.

3. CONCLUSIONS

Since, as described above, the resultant exposures remain within the limits stated in the FSAR, it is concluded that the requested amendment does not involve an unreviewed safety question.

Further, the amendment requested does not involve significant new safety information of a type not considered by a previous Commission safety review of the facility. It does not involve a significant increase in the probability or consequences of an accident, does not involve a

significant decrease in a safety margin, and therefore does not involve a significant hazards consideration. It is therefore concluded that there is reasonable assurance that the health and safety of the public will not be endangered by this action.