ENCLOSURE 2

ENVIRONMENTAL IMPACT APPRAISAL (EIA)

FOR AMENDMENT TO EXTEND OPERATING

LICENSES FOR ST. LUCIE UNIT 1

TO 40 YEARS

By letter dated Feburary 28, 1986, Florida Power and Light Company (FPL) requested an amendment to its Operating License for St. Lucie Unit 1, to extend its duration to 40 years from the date of OL issuance. The staff has compared the 30 year assessment of offsite radiological impacts performed for St. Lucie Unit 1 in the Final Environmmental Statement (FES) dated June 1973, with the impact of 40 years of operation derived from estimates for 40 years of operation of a model light water reactor similar to St. Lucie Unit 1. The environmental radiological assessments performed for St. Lucie Unit 2 in the FES dated April 1982, and the Unit 2 Final Safety Analysis Report were also utilized, since they consider 40 years of operation and contain 1980 population statistics and projections through the year 2020. St. Lucie Unit 2 received a forty year license beginning with the issuance of the OL in 1983.

1.0 RADIOLOGICAL IMPACTS - GENERAL PUBLIC

The staff considered the radiological impacts expected as a result of a hypothetical design basis accident at St. Lucie Unit 1 and from normal plant operation including the impact of revised population estimates.

cc w/enclosures:
C.E. Rossi
G. Lainas
A. Thadani
W. Minners
R. Bosnak

ENCLOSURE 1

SAFTETY EVALUATION REPORT

ST. LUCIE UNIT 1

AMENDMENT TO EXTEND OPERATING LICENSE TO 40 YEARS

By letter dated February 28, 1986, Florida Power and Light Company (FP&L) requested an amendment to its Operating License (OL) DPR-67 for St. Lucie Unit 1 to extend its duration to 40 years from the date of OL issuance. St. Lucie 1 is currently licensed for plant operation for 40 years commencing with the issuance of the construction permit, which was on July 1, 1970. Thus, the current license will expire at midnight, July 1, 2010. FPL requested that the license expiration date be changed to March 1, 2016. The staff has previously granted a forty year operating license to St. Lucie Unit 2 beginning from the date of operation rather than the date of construction.

The following evaluation was conducted to assure that the licensee's ALARA measures and dose projections are applicable for the additional years of plant operation and are in accordance with 10 CFR Part 20 and Regulatory Guide 8.8, "Information Relevant To Ensuring That Occupational Radiation Exposures At Nuclear Power Stations Will Be As Low As Reasonably Achievable" (Revision 3).

1.0 ALARA MEASURES

FPL stated that operating and maintenance personnel will follow specific plans and procedures to ensure that ALARA goals are achieved in the

In 1982, (updated Safety Analysis Report, St. Lucie Unit 1, and Final Environmental Statement, St. Lucie Unit 1, June 1973), the staff evaluated the regional demography and found the land area within a 25 mile radius, as indicated by the population statistics, to be flat with dense vegetation, including pine tree and fresh water marshes, typical of Florida Coastal swamps. The population within 50 miles of the plant was 310,000 in 1970, 573,048 in 1981, with 1,006,452 projected for the year 2000 and and 1,710,139 projected for the year 2030. The entire area is experiencing a large population growth which is expected to continue until limited either by physical constraints such as traffic conjestion and the availability of potable water, or by zoning restrictions. The outer boundary of the low population zone (LPZ) is at a nominal distance of one mile from the plant. Based on the 1968 census, the LPZ population was about 1,980, 10,326 in 1981, 12,506 (estimated) in 1983, and the projected resident population for the LPZ for 2030 is 83,599. The nearest population center with more than 25,000 people is the City of Fort Pierce, Florida, whose nearest boundary is about 4 miles northwest of the site. The staff concludes that, based upon these population estimates, the current Exclusion Area Boundary, Low Population Zone, and nearest population center distances will likely be unchanged from those used for licensing the unit. Therefore, the conclusion reached in the staff's Safety Evaluation in 1973 that St. Lucie Unit 1 meets the requirements of 10 CFR Part 100 remains unchanged.

In the FES, the staff also calculated the dose commitment to the human population residing around St. Lucie Unit 1 in order to assess the impact

on people from radioactive material released as part of the normal operation of the plant. The annual dose commitment was calculated to be the dose that would be received over a 50-year period following the intake of radioactivity for one year under the conditions that would exist 15 years after the plant began operation. The 15 year period was chosen as representing the midpoint of plant life and was incorporated into the dose model by allowing for buildup of long life radionuclides in the soil. The buildup factor mainly affects the estimated doses for radionuclides with half-lives greater than a few years that are ingested by humans. For a plant licensed for 40 years, increasing the buildup period from 15 to 20 years would increase the dose from long life radionuclides via the ingestion pathways by less than one-third. It would have much less of an effect on a dose from shorter lived radionuclides. Table V-5 of the FES indicates that the estimated doses via the ingestion pathways are well below the annual dose design objectives of 10 CFR 50, Appendix I. For example, the ingestion dose to the thyroid from St Lucie Units 1 and 2 is 3 mrem/yr compared to a dose design objective of 15 mrem/yr. Thus, the staff concludes that an increase of even as much as one-third in these pathways would remain well below the dose design objectives of 10 CFR 50, Appendix I and will not be significant.

Additionally, the total-body population doses from effluent releases have been well below projected values (NUREG/CR-2850, Volume 4, June 1986; Annual Environmental Report, 1985). The St. Lucie Unit 1 annual offsite dose calculation values are well below PWR averages, and have typically been so for each year of operation. These values are expected to remain

typical for plant operations through the year 2016. Thus, an increase of even as much as 10% in these pathways would remain well below the Appendix I guidelines and would not be significant. The staff expects some changes in calculational methodology and reported values as a result of St. Lucie Unit 2 operations, however, these have been previously evaluated for radiological impact in accordance with staff criteria, and found acceptable.

2.0 ENVIRONMENTAL IMPACTS - URANIUM FUEL CYCLE

The impacts on the uranium fuel cycle considered for the FES were originally based on 30 years of operation of a model light water reactor (LWR). The fuel requirements for the model LWR were assumed to be one initial core load and 29 annual refuelings (approximately 1/3 core per refueling). In considering the annual fuel requirement for 40 years for the model LWR, fuel use is averaged over a 40-year operating life (1 initial core and 39 refuelings of approximately 1/3 core) which results in a slight reduction compared to the annual fuel requirement averaged over a 30-year operating life. The net result is an approximately 1.5% reduction in the annual fuel requirements for the model LWR due to averaging the initial core load over 40 years, instead of 30 years. This small reduction in fuel requirements would not lead to significant changes in the annual impacts on the uranium fuel cycle.

For St. Lucie Unit 1, the licensee projects four additional refueling cycle years and two non-refueling cycle years over the extended plant life for Unit 1. The staff concludes that there will not be any changes

to the FES with regard to uranium fuel cycle impact in order to consider 40 years of operation. If anything, the values in the FES become more conservative when a 40 year period of operation is considered, particularly since the licensee is extending the refueling cycle intervals from 12 months to 18 months. This section is discussed in more detail in NUREG-0842, "Final Environmental Statement related to the operation of St. Lucie Plant, Unit No. 2, USNRC, April 1982.

3.0 ENVIRONMENTAL IMPACTS - OCCUPATIONAL EXPOSURES

The staff has evaluated the licensee's dose assessment for the years 2010 to 2016 (the additional years during which St. Lucie Unit 1 would operate), and compared it with current St. Lucie Unit 1 and overall industry occupational dose experience. The average dose for St. Lucie Unit 1 over the recent five year period covering 1980-1981 have been 578 person-rem per year, which is comparable to the current five year average of 569 person-rem dose per unit per year for operating pressurized water reactors in the United States. The staff expects that St. Lucie Unit 1 will incur an average annual dose of about 560 person-rem for each additional year of operation. The total occupational dose projected over the period of the operating license extension is approximately 3360 person-rem, and considers 3 to 4 additional refuelings during this period, with no major unanticipated maintenance. This is only a small fraction of the 271,183 person-rem accumulated by all operating reactors over a similar five year period (1980-1984). The staff expects that increased doses from maintenance and corrosion product build-up will be offset by a continually improving ALARA program,

dose-saving plant modifications, and fewer major modifications, but that overall, average annual doses could increase by about 10%. St. Lucie Unit 1 has been average in numbers of workers receiving measurable doses, but well below average in dose per worker during this same period, compared to other U.S. PWR's. Overall, occupational radiation exposures can be expected to remain about as estimated in the FES and as experienced during the initial operation period.

St. Lucie Unit 1 has averaged less than half the volume of solid radwaste shipped by the average PWR over the period 1980-1985, and ranks mid-range in overall volume of radwaste shipped during this same period. Occupational doses and population doses from radwaste processing and shipping are well within the estimates made in the FES. Radioactive waste shipments are expected to remain at about the present level for the remaining life of the plant.

Spent fuel will be stored in the reracked spent fuel pool (previously evaluated by the staff for radiological environment consequences) in lieu of shipment offsite as stated in the FES, and in accordance with current national policy. Any further expansion of on-site spent fuel storage capacity (such as through rod consolidation) will be further evaluated for radiological environmental effects by the NRC staff at the time it is proposed.

The staff concludes that the licensee's occupational dose assessment is acceptable, and their radiation protection program is adequate to ensure

that occupational radiation exposures will be maintained ALARA and in continued compliance with the requirements of 10 CFR Part 20.

4.0 CONCLUSION

Based on the above, the staff concludes that the impacts associated with a 40-year operating license duration are not significantly different from those associated with a 30-year operating license duration and are not significantly different from those assessed in the St. Lucie Unit 1 FES. Therefore, the staff finds the proposed license extention to be acceptable.

5.0 REFERENCES

1. "Final Environmental Statement Related to the St. Lucie Plant Unit No. 1," U.S. Nuclear Regulatory Commission, June 1973.

2. NUREG-0713, Volume 6, "Occupational Radiation Exposure at Commercial Nuclear Power Plants and Other Facilities," 1984, U.S. Nuclear Regulatory Commission, Office of Nuclear Regulatory Research, B. Brooks.

3. EGG-PHY-7209, "Technical Evaluation Report for the Radiological Effluent Release and Environmental Operating Reports for 1984," St. Lucie Plant Units 1 and 2.

4. NUREG-0842, "Final Environmental Statement related to the operation of St. Lucie Plant Unit No. 2," U.S. Nuclear Regulatory Commission, April 1982.

5. NUREG-0843, "Safety Evaluation Report related to the operation of St. Lucie Plant Unit No. 2," U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, October 1981, September 1982 (Supplement No. 2), June 1983 (Supplement No. 4), April 1983 (Supplement No. 3).

6. Florida Power Light Company, "St. Lucie Plant Unit No. 1," Updated FSAR, 1982.

ENCLOSURE 3
PEICSB SALP INPUT

Plant: St. Lucie Unit 1
Licensee: Florida Power and Light Company
Docket Nos.: 50-335
SER Subject: Extension of Operating License Duration

PERFORMANCE PARAMETERS:
(1) Management Involvement in Assuring Quality
(2) Approach to Resolution of Technical Issues from a Safety Standpoint
(3) Response to NRC Initiatives
(4) Staffing (Including Management)
(5) Reporting and Analysis of Reportable Events
(6) Training and Qualification Effectiveness
(7) Any other SALP Functional Area

PERFORMANCE PARAMETER	NARRATIVE DESCRIPTION OF LICENSEE'S PERFORMANCE	CATEGORY/RATING
1	FPL's submittal and interactions with the staff were adequate to enable task completion. However, the technical issues and administrative matters involved in the extension request were more complex than originally considered by the licensee in their February 28, 1986 submittal. Concern over an adequate assessment of the full scope of matters addressed in the FES was not evident, and the submittal lacked essential major considerations such as the occupational dose impact and fuel cycle impact. Other available licensee data did have much of the information, however, this data was not cited by the licensee. Additional management oversight could have corrected this problem.	2

PERFORMANCE PARAMETER	NARRATIVE DESCRIPTION OF LICENSEE'S PERFORMANCE	CATEGORY/RATING
2	The applicant's submittal did not consider several of the technical issues involved when comparing initial FES impact assessments with the proposed extension of the operating life to 40 years, notably, occupational dose impacts, population changes and population dose impacts, fuel usage changes, and spent fuel disposition. Resolution of most staff concerns was accomplished by review of other licensee technical information including Unit 1 & 2 FSAR's FES's, SER's, and annual radiological environmental impact reports.	2
3	The licensee responded promptly to a staff request for additional information. Pertinent additional information necessary to address staff inquiries was generally available, however, from existing licensee documents.	2
4	Not Applicable	N/A
5	Not Applicable	N/A
6	Not Applicable	N/A
7	Not Applicable	N/A

Overall Rating: 2