Florida Power & Light Company, 700 Universe Boulevard, P.O. Box 14000, Juno Beach, FL 33408-0420

FPL

DEC 1 1 2006

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555-0001

L-2006-256
10 CFR 20.1003

RE: Florida Power and Light Company
St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251

FPL Energy Seabrook, LLC
Seabrook Station
Docket No. 50-443

FPL Energy Duane Arnold, LLC
Duane Arnold Energy Center
Docket No. 50-331

Application to Use Weighting Factors for External Exposure

Pursuant to footnote 2 to the "Organ Dose Weighting Factors" table in 10 CFR Part 20.1003, Florida Power & Light Company (FPL), the licensee for the St. Lucie Nuclear Plant, Units 1 and 2, and the Turkey Point Nuclear Plant, Units 3 and 4, FPL Energy Seabrook, LLC (FPL Energy Seabrook), the licensee for Seabrook Station, and FPL Energy Duane Arnold, LLC, the licensee for Duane Arnold Energy Center, collectively FPL, hereby request Nuclear Regulatory Commission (NRC) approval to use weighting factors for calculating external whole body dose. The application is provided as an enclosure to this letter.

Specifically, FPL requests approval to apply the weighting factors specified in the consensus technical standard, American National Standards Institute, HPS N13.41-1997, "Criteria for Performing Multiple Dosimetry" to assign Total Effective Dose Equivalent from external sources of radiation.

As described in the application, approval would improve assessment of occupational dose to individuals from exposure to highly non-uniform radiation fields.

The technical basis for this application is the consensus technical standard approved by the American National Standards Institute – Accredited HPS N13 Committee. The

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Standard is practical and consistent with the organ or tissue weighting factors in 10 CFR Part 20.1003.

By letter dated December 20, 2004, as supplemented by letter dated February 23, 2005, Southern California Edison (SCE) requested approval to use weighting factors for calculating external whole body dose as described above. By letter dated May 10, 2005 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML051320194), the NRC staff concluded that authorization of this request was acceptable, and within the provisions of Title 10 of the Code of Federal Regulations, Part 20.

Florida Power & Light Company would like to begin using weighting factors for external exposures during the April 2007, St. Lucie Unit 1 refueling outage. Therefore, FPL is requesting the subject authorization by March 1, 2007.

Should there be any questions, please contact Joe Danek at (561) 694-4213.

Sincerely yours,

J.A. Stall
Senior Vice President, Nuclear and
Chief Nuclear Officer

Enclosure: Application to Use Weighting Factors for External Exposure

cc:	Regional Administrator, Region I	w/enclosure
	Regional Administrator, Region II	"
	Regional Administrator, Region III	"
	USNRC Project Manager, St. Lucie and Turkey Point	"
	Senior Resident Inspector, USNRC, St. Lucie	"
	Senior Resident Inspector, USNRC, Turkey Point	"
	USNRC Project Manager, Seabrook Station	"
	Senior Resident Inspector, USNRC, Seabrook Station	"
	USNRC Project Manager, Duane Arnold Energy Center	"
	Senior Resident Inspector, USNRC, Duane Arnold Energy Center	"

ENCLOSURE

APPLICATION TO USE WEIGHTING FACTORS FOR EXTERNAL EXPOSURE

APPLICATION TO USE WEIGHTING FACTORS FOR EXTERNAL EXPOSURE

1.0 INTRODUCTION

1.1 PURPOSE

Pursuant to footnote 2 to the "Organ Dose Weighting Factors" table in 10 CFR Part 20.1003, FPL requests approval to use weighting factors for calculating external whole body dose.

Specifically, FPL requests approval to use weighting factors specified in American National Standards Institute technical standard HPS N13.41 (HPS N13.41-1997, "Criteria for Performing Multiple Dosimetry", approved December 1996) for assessing effective dose equivalent (EDE) based on direct measurement of external exposures using personnel dosimeters. The assigned EDE is the sum of each dosimeter measurement modified by its appropriate weighting factor.

1.2 REGULATORY EVALUATION

Dose limits in 10 CFR Part 20 are specified in the dose quantity total effective dose equivalent (TEDE). TEDE is defined in 20.1003 as the sum of the external dose quantity called deep dose equivalent (DDE) plus the internal dose quantity called committed effective dose equivalent.

Footnote 2, in the "Organ Dose Weighting Factors" table in 10 CFR 20.1003, permits the use of weighting factors for external exposure with prior NRC approval. FPL seeks NRC approval to use weighting factors to calculate the external exposure quantity EDE and to use EDE in place of DDE in the calculation of TEDE.

2.0 TECHNICAL JUSTIFICATION

2.1 IMPROVED ASSESSMENT OF DOSE

In uniform radiation fields, the dosimeter used to measure whole body dose is worn on the chest. The dosimeter measures radiation exposure using an operational dose quantity called DDE.

When the radiation field is highly non-uniform, either the chest dosimeter is moved to the part of the whole body expected to receive the highest dose or additional dosimeters are worn so that the highest whole body dose can be measured.

Difficulties arise because the annual occupational dose limit is based on the stochastic risk from whole body exposure, which is related to the dose quantity EDE. While the use of DDE as a surrogate quantity to approximate EDE works well in uniform radiation

fields, in highly non-uniform radiation fields, a more accurate estimate of EDE is needed to improve the assessment of occupational dose.

2.2 COMPARTMENT FACTORS

HPS N13.41 provides a method for assessing EDE based on measurements of DDE at specific areas of the body called "compartments" and applying appropriate weighting factors called "compartment factors". A compartment factor "relates the fractional risk to the organs underlying the measurement location to the total risk from uniform irradiation of the whole body."

HPS N13.41, Appendix A describes how the 10 CFR Part 20 organ or tissue weighting factors are apportioned to each "compartment" based on the associated underlying organs and tissues. The resulting compartment factors used to calculate EDE are listed below:

HPS N13.41 COMPARTMENT FACTORS

Compartment Name	Compartment Factor
Head and neck	0.10
Thorax, above the diaphragm	0.38
Abdomen, including the pelvis	0.50
Upper right arm	0.005
Upper left arm	0.005
Right thigh	0.005
Left thigh	0.005

2.3 CHEST COMPARTMENT

Consistent with FPL's current practice, a single chest dosimeter will measure the dose to both the thorax and abdomen compartments. The combined compartments will be called the chest compartment.

2.4 DOSIMETER SELECTION AND PLACEMENT

NRC Inspection Procedure 71121.01, "Access Control To Radiologically Significant Areas" issue date 03/06/02, Section 03.04(c) "Dosimeter selection and placement criteria," will be used to provide adequate criteria for monitoring the part of the body expected to receive the highest dose.

2.5 DOSE ASSIGNMENT

The DDE for each compartment will be determined from dosimeters worn at that location. When no dosimeter is worn at a particular compartment, DDE will be determined from the dosimeter positioned where the exposure is judged to be similar. The assigned EDE will be the sum of each DDE measurement multiplied by its appropriate compartment factor.

The assigned lens dose equivalent (LDE) will be the higher of the head or chest dosimeters. The assigned shallow dose equivalent (SDE) will be the highest of any whole body dosimeter.

2.6 ADDITIONAL CONSIDERATIONS

The following provisions are included to address NRC Request for Additional Information associated with San Onofre's submittal;

(1) FPL's application seeks approval to calculate the external dose quantity EDE using the compartments, compartment factors, and method of summation specified in HPS/ANSI N13.41. EDE will be used in place of DDE in the calculation of TEDE. FPL's application does not seek approval to use the ANSI Standard's Section 4, "Criteria for When to Use Multiple Dosimeters" or Section 5.5 "Alternatives to the Use of Multiple Dosimeters".

(2) FPL will monitor the part of the whole body within each compartment (and/or composite compartment) that receives the highest dose. FPL will use the criteria in our current procedures addressing dosimeter selection and placement. These procedures use criteria consistent with guidance found in NRC Inspection Procedure 71121.01, issue date 03/06/02.

(3) The same National Voluntary Laboratory Accreditation Program (NVLAP) accredited dosimeters will be worn at the same whole body locations after the application is approved as they are today. Because we will continue to monitor the part of the body expected to receive the highest dose, the dosimeter orientation toward the source will not change. Therefore, there are no new challenges to the dosimeter's angular response characteristics resulting from approval of this application.

2.7 CONCLUSION

Accurate assessment of occupational dose from external sources of radiation in highly non-uniform radiation fields requires a method for assessing EDE. NRC approval of this application will improve the accuracy of licensee assessment of occupational dose.

FPL will assess EDE based on the consensus technical standard, HPS N13.41. This standard was approved by the American National Standards Institute – Accredited HPS N13 Committee on 20 June 1996. At the time of balloting, the HPS N13 Committee membership included representatives from the Nuclear Regulatory Commission and the National Council on Radiation Protection and Measurements.

The HPS N13.41 consensus technical standard has previously been approved for use by the NRC for evaluating occupational dose to medical personnel wearing lead aprons in Regulatory Issue Summary 2002-06, "Evaluation Occupational Dose for Individuals Exposed to NRC-Licensed Material and Medical X-Rays," dated April 16, 2002.

The proposed method will monitor the part of the whole body expected to receive the highest dose using the criteria for dosimeter selection and placement found in current NRC inspection procedures.