Dominion Resources Services, Inc.
5000 Dominion Boulevard, Glen Allen, VA 23060
Web Address: www.dom.com

Dominion®

September 22, 2008

U.S. Nuclear Regulatory Commission
Attention: Executive Director for Operations
Washington, DC 20555-0001

Serial No. 08-0565
NL&OS/GAW R0
Docket Nos. 50-305
50-245/336/423
50-338/339
50-280/281
License Nos. DPR-43
DPR-21/65/NPF-49
NPF-4/7
DPR-32/37

DOMINION ENERGY KEWAUNEE, INC. (DEK)
DOMINION NUCLEAR CONNECTICUT, INC. (DNC)
VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
KEWAUNEE POWER STATION
MILLSTONE POWER STATION UNITS 1, 2 AND 3
NORTH ANNA AND SURRY POWER STATIONS UNITS 1 AND 2
REQUEST FOR SUPPLEMENTAL INFORMATION FOR APPLICATION TO USE WEIGHTING FACTORS FOR EXTERNAL EXPOSURE

On August 18, 2008, DEK, DNC and Dominion, pursuant to footnote 2 to the "Organ Dose Weighting Factors" table in 10 CFR 20.1003, submitted a request to use 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 (TEDE) from external sources of radiation (Serial No. 08-0430). Specifically, DEK, DNC and Dominion requested approval to use weighting factors for calculating external whole body dose. The technical basis for this request was provided as an attachment to the letter.

On September 9, 2008, a telephone conference was held between the NRC and DNC to discuss supplemental information needed as a result of the NRC's Acceptance Review process. The request for supplemental information (RSI) was provided to DEK, DNC, and Dominion by NRC letter dated September 11, 2008.

The attachment to this letter provides a revised technical basis for DEK, DNC and Dominion to request the use of weighting factors and incorporates the information that addresses the NRC RSI discussed on the September 9, 2008, telephone conference.

This submittal supersedes in its entirety the August 18, 2008, request. Additionally, the August 18, 2008, request inadvertently omitted Millstone Power Station Unit 1. This letter corrects that omission.

If you have any questions or require additional information, please contact Mr. Geoffrey Wertz at (804) 273-3572.

Sincerely,

Leslie N. Hartz
Vice President - Nuclear Support Services
Dominion Energy Kewanee, Inc.
Dominion Nuclear Connecticut, Inc.
Virginia Electric and Power Company

Attachment: Application to Use Weighting Factors for External Exposure

Commitments made by this letter: None

cc: U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, Pennsylvania 19406-1415

U.S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Suite 23T85
Atlanta, Georgia 30303

U.S. Nuclear Regulatory Commission
Region III
2443 Warrenville Road
Suite 210
Lisle, Illinois 60532-4352

NRC Senior Resident Inspector
Kewaunee Power Station

NRC Senior Resident Inspector
Millstone Power Station

NRC Senior Resident Inspector
North Anna Power Station

NRC Senior Resident Inspector
Surry Power Station

cc: (continued)

Mr. P. S. Tam
NRC Project Manager – Kewaunee
U. S. Nuclear Regulatory Commission
One White Flint North
Mail Stop O-8 H4A
11555 Rockville Pike
Rockville, Maryland 20852-2738

Mr. John Hickman
NRC Project Manager – Millstone Unit 1
U. S. Nuclear Regulatory Commission
Two White Flint North
Mail Stop O-8 F5
11555 Rockville Pike
Rockville, Maryland 20852-2738

Ms. C. J. Sanders
NRC Project Manager - Millstone Units 2 and 3
U. S. Nuclear Regulatory Commission
One White Flint North
Mail Stop O-8 B3
11555 Rockville Pike
Rockville, Maryland 20852-2738

Ms. D. N. Wright
NRC Project Manager – Surry and North Anna
U. S. Nuclear Regulatory Commission
One White Flint North
Mail Stop O-8 H4A
11555 Rockville Pike
Rockville, Maryland 20852-2738

Mr. J. F. Stang, Jr.
NRC Project Manager
U. S. Nuclear Regulatory Commission
One White Flint North
Mail Stop O-8 G9A
11555 Rockville Pike
Rockville, Maryland 20852-2738

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

ATTACHMENT

APPLICATION TO USE WEIGHTING FACTORS FOR EXTERNAL EXPOSURE

DOMINION ENERGY KEWAUNEE, INC. (DEK)
DOMINION NUCLEAR CONNECTICUT, INC. (DNC)
VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
KEWAUNEE POWER STATION
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APPLICATION TO USE WEIGHTING FACTORS FOR EXTERNAL EXPOSURE

1.0 INTRODUCTION

1.1 PURPOSE

Pursuant to 10 CFR 20.1003, "Weighting factor W_T," Dominion Energy Kewaunee, Inc. (DEK), Dominion Nuclear Connecticut, Inc. (DNC), and Virginia Electric and Power Company (Dominion), request approval to use weighting factors for calculating external whole body dose.

Specifically, DEK, DNC and Dominion request approval to use weighting factors specified in HPS N13.41-1997 (HPS N13.41-1997, "Criteria for Performing Multiple Dosimetry," approved December 1996, American National Standards Institute, Inc.) 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.

The assigned EDE will be used as a component part in the calculation of total effective dose equivalent (TEDE).

This application is not intended to seek approval to use other methods or standards that are outlined in HPS N13.41-1997.

1.2 REGULATORY EVALUATION

Dose limits in 10 CFR 20 are specified in the dose quantity TEDE. TEDE is defined in 10 CFR 20.1003 as the sum of the effective dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).

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. DEK, DNC and Dominion seek NRC approval to use weighting factors to calculate the external exposure quantity EDE and to use 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 deep dose equivalent (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 N13.41-1997 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 N13.41-1997, Appendix A describes how the 10 CFR 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 N13.41-1997 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 DEK, DNC and Dominion'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. To ensure that the calculation of EDE is conservative, DEK, DNC and Dominion will measure the dose to the highest portion of the thorax and abdomen and place the dosimeter at that location.

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 representative. 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 also included in this request:

(1) DEK, DNC and Dominion's application seeks approval to calculate the external dose quantity EDE using the compartments, compartment factors, and method of summation specified in HPS N13.41-1997. EDE will be used in place of DDE in the calculation of TEDE. DEK, DNC and Dominion's application does not seek approval to use HPS N13.41-1997, Section 4, "Criteria for When to Use Multiple Dosimeters" or Section 5.5 "Alternatives to the Use of Multiple Dosimeters."

(2) DEK, DNC and Dominion will monitor the part of the whole body within each compartment (and/or composite compartment) that receives the highest dose. DEK, DNC and Dominion 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 the part of the body expected to receive the highest dose will continue to be monitored, 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.

DEK, DNC and Dominion 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.