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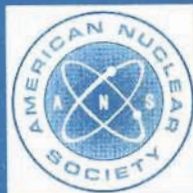
neutron and gamma-ray
fluence-to-dose factors

an American National Standard

WITHDRAWN

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Table 6
Polynomial Coefficients in the Analytic Fit of $h_E(E)$ for Neutrons*

Neutron Energy Bounds	Coefficients				
	<u>C₀</u>	<u>C₁</u>	<u>C₂</u>	<u>C₃</u>	<u>C₄</u>
AP Exposure ^a					
$E \leq 0.01$ MeV	3.430895E+00 ^b	7.725710E-01	9.834081E-02	4.903466E-03	8.149667E-05
$E > 0.01$ MeV	4.952167E+00	6.644235E-01	-1.017445E-01	-1.496004E-03	3.636748E-03
PA Exposure					
$E \leq 0.2$ MeV	3.687778E+00	1.240448E+00	1.888331E-01	1.164621E-02	2.516630E-04
$0.2 < E \leq 1$ MeV	3.965468E+00	1.012777E+00	3.608077E-01	-5.689570E-02	-2.047265E-01
$E > 1$ MeV	3.965468E+00	1.078553E+00	3.607919E-01	-4.288176E-01	9.411842E-02
LAT Exposure					
$E \leq 0.01$ MeV	8.677172E-01	2.290812E-01	2.457221E-02	7.646448E-04	0.0
$E > 0.01$ MeV	3.577644E+00	1.005248E+00	4.227422E+00 -4.227422E-02	-2.054736E-02	4.461858E-04
ROT Exposure					
$E \leq 0.01$ MeV	2.436148E+00	6.502219E-01	8.819417E-02	4.752092E-03	8.782611E-05
$E > 0.01$ MeV	4.216783E+00	8.470534E-01	-6.771566E-02	-1.213208E-02	1.829400E-03

*Polynomial coefficients in analytic fit: $h_E(E) = 10^{-12} \times \exp(C_0 + C_1X + C_2X^2 + C_3X^3 + C_4X^4)$ Sv-cm², E = energy (MeV), and $X = \ln(E)$.

^aIf the orientation of the receptor with respect to the radiation field is unknown, AP exposure geometry should be used.

^bRead as 3.430895×10^{00} .

**American National Standard
for Neutron and Gamma-Ray
Fluence-to-Dose Factors**

Secretariat
American Nuclear Society

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Foreword

(This Foreword is not a part of American National Standard for Neutron and Gamma-Ray Fluence-to-Dose Factors, ANSI/ANS-6.1.1-1991, but is included for information purposes only.)

In 1977, the American Nuclear Society (ANS) published American National Standard Neutron and Gamma-Ray Flux-to-Dose-Rate Factors (ANSI/ANS-6.1.1-1977), which provided the means for computing dose equivalent values pertinent to radiation protection from externally incident neutron and gamma-ray flux values calculated in the process of shield analysis and design. That standard, unchanged and in effect for 12 years, has been revised as recommended by Working Group ANS-6.1.1. The revision process has awaited the availability of internationally accepted data to replace those originally recommended by the National Council on Radiation Protection and Measurement (NCRP) and incorporated in the previous standard. Such data, conforming to definitions propounded by the International Commission on Radiological Protection (ICRP) and the International Committee on Radiation Units and Measurements (ICRU), have since become available and have been considered as replacements for the previous standard.

This standard provides guidelines for computing the biologically relevant dosimetric quantity in neutron and gamma-ray radiation fields pertinent to shield design. The data presented in this standard relate fluence to a quantity that is considered to be proportional to biological damage in human tissue and that is used as the basis for limiting the radiation exposure to keep the risk of occurrence of stochastic, somatic effects to the individual to within acceptable levels. That quantity is the effective dose equivalent received by an individual over a specified time interval. Tables are presented containing factors relating fluence to effective dose equivalent for monoenergetic gamma rays and neutrons, and procedures are specified for representing the tabulated data in analytical form and for computing the effective dose equivalent due to gamma rays and neutron fields having broad spectral distributions.

The membership of Working Group ANS-6.1.1 is as follows:

D. C. Kaul, Chairman, *Science Applications International Corporation*
M. Ehrlich, *National Institute of Standards and Technology*
D. R. Harris, *Rensselaer Polytechnic Institute*
W. C. Hopkins, *Bechtel Power Corporation*
G. D. Kerr, *ORNL, Martin Marietta Energy Systems, Inc.*
W. M. Lowder, *Environmental Measurement Laboratory*
K. O'Brien, *Individual*

The roster of ANS-6, Radiation Protection and Shielding, at the time of its approval of this standard was as follows:

D. K. Trubey, Chairman, *Oak Ridge National Laboratory*
E. T. Boulette, *Maine Yankee Atomic Power Company*
J. C. Celnik, *Consultant*
D. R. Harris, *Rensselaer Polytechnic Institute*
W. C. Hopkins, *Bechtel Power Corporation*
E. A. Normand, *Boeing Aerospace Company*
P. J. Persiani, *Argonne National Laboratory*

Consensus Committee N17, Research Reactors, Reactor Physics, Radiation Shielding, and Computational Methods, had the following membership at the time it reviewed and approved this standard:

T. M. Raby, Chairman

A. Weitzberg, Vice Chairman

J. D. Buchanan	Individual
A. D. Callihan	Individual
R. E. Carter	Individual
D. Cokinos	Brookhaven National Laboratory
A. De La Paz	Vista Technology, Inc.
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S. Hartzell	Power Computing
P. B. Hemmig	U.S. Department of Energy
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J. E. Hyder	Health Physics Society
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L. I. Kopp	Individual
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M. M. Ter Pogossian	American College of Radiology
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D. K. Trubey	Oak Ridge National Laboratory
S. H. Weiss	U. S. Nuclear Regulatory Commission
A. Adams, Jr. (Alt.)	
A. Weitzberg	NUS Corporation
W. L. Whittemore	Individual

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