Multiplying this differential flux in the active material by the fission cross section per cm^3, σ_+, considered as a function of τ' and integrating from $\tau' = 0$ to $\tau' = \tau_1'$, one obtains the fission rate per cm^2 produced between x and x + dx by first group neutrons reflected from the water.

$$I f_s^1 (x)\, dx = I F_1 \exp(x/L_1)\, d(x/L_1),\ x \leq 0 \tag{8}$$

Here, F_1 is a dimensionless constant representing the total fission rate per cm^2 of slab, produced by first-group reflected slow neutrons, per unit incident fast-neutron current into the water.

$$F_1 = (3L_1)/(2\lambda l) \int_0^{\tau_1'} d\tau'\, \sigma_f AB(A + B) \tag{9}$$

A and B are the functions of τ' defined in Eq. 5. For a given active material F_1 may be determined by numerical integration.

A second group of neutrons, $\tau = \tau_1$ to τ_2, where τ_2 is the age of thermalized neutrons in water was similarly treated. The diffusion equations for this group are similar to Eqs. 1a and 1b. The source term, Q_2, replacing $I \exp[-x/l]/l$ in Eq. 1a is simply the number of neutrons removed per sec per cm^3 from group 1, namely according to Eq. 4a:

$$Q_2 \equiv [\lambda(n\nu)_1/3\tau'] = (I/l)(1 - \sqrt{\tau_1'}/l)^{-1} A(\tau_1')[e^{-x/l} - (\sqrt{\tau_1'}/l)(1 + S_1 l/\lambda) \cdot B(\tau_1')\, e^{-x/\sqrt{\tau_1'}}] \tag{10}$$

$$\tau' = \tau_1'$$

The effective absorption rate per cm^3 from the second-group neutrons of age between τ_1 and τ ($\tau_1 \leq \tau \leq \tau_2$) is $\lambda(n\nu)_2/3\tau''$, where $\tau'' = \tau - \tau_1$. Equation 1b is altered only insofar as to replace Λ_1 and $\sigma_a^{(1)}$ by Λ_2 and $\sigma_a^{(2)}$, the average mean free path and absorption cross section per cm^3 of second group neutrons in the active material.

The solutions for the second-group neutron flux are similar to Eqs. 4a and 4b.

$$(n\nu)_2 = [(3\ I\ \tau'')/(\lambda l)]\ [A_2 e^{-x/l} + B_2 e^{-x/\sqrt{\tau_1'}} + C_2 e^{-x/\sqrt{\tau''}}] \tag{11a}$$

$$(N\nu)_2 = [(3\ I\ \tau'')/(\lambda l)]\ D_2 e^{x/L_2} \tag{11b}$$

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