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Joseph William Oliver
235 E. Holly St., #201
Pasadena, Calif., 91101
1- -00

Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD., 20852

Dear Person,

Federal+state regulators are already allowing radio-active waste from nuclear power+weapons production to be re-cycled for commercial products, & they are in the process of further relinquishing control over this material.

So, since there is no way of determining the use of this radio-active material after it has been re-cycled -

I want to urge you to oppose this re-cycling of radio-active material, or at least require its labeling.

Thank you,

Joel Oliver

P.S. Enclosed is an estimate of worst case concentrations.

DS10

Estimate of the eventual concentrations
of materials after multiple re-cyclings
of radio-active material for a worst case model.

A worst case model for multiple re-cyclings of radio-active material would be (where) –

Rw	(raw material)
Re	(re-cycled material)
Re'	(re-cycled radio-active material)
$a, b, + c$	(respective initial concentrations)

1st re-cycling $\quad aRw + bRe + cRe'$

2nd re-cycling $\quad aRw + b(aRw + bRe + cRe') + cRe'$

$$aRw + abRw + b^2Re + cbRe' + cRe'$$

$$a(1+b)Rw + b^2Re + c(1+b)Re'$$

3rd re-cycling $\quad aRw + b[a(1+b)Rw + b^2Re + c(1+b)Re'] + cRe'$

$$aRw + abRw + ab^2Rw + b^3Re + cbRe' + cb^2Re' + cRe'$$

$$a(1+b+b^2)Rw + b^3Re + c(1+b+b^2)Re'$$

Pattern $\quad a(1+b+b^2+\cdots+b^{n-1})Rw + b^nRe + c(1+b+b^2+\cdots+b^{n-1})Re'$

But $\quad b^n \to 0$ as $n \to \infty$

So $\quad a(1+b+b^2+\cdots+b^{n-1})Rw + c(1+b+b^2+\cdots+b^{n-1})Re'$

And $\quad a(1+b+b^2+\cdots+b^{n-1}) + c(1+b+b^2+\cdots+b^{n-1}) = 1$

$$(a+c)(1+b+b^2+\cdots+b^{n-1}) = 1$$

So $\therefore$ $\quad (1+b+b^2+\cdots+b^{n-1}) = \dfrac{1}{a+c}$

Then $\dfrac{a}{a+c} R_u + \dfrac{c}{a+c} R_e'$

would be the eventual concentrations

And $$\frac{\dfrac{c}{a+c}}{\dfrac{a}{a+c}} = \frac{c}{a}$$

would be the eventual ratio.

It is interesting to note that –

Expansion $\quad (1 + b + b^2 + \cdots + b^{n-1} + \cdots) = \dfrac{1}{1-b}$

$$= \frac{1}{a+c}$$

So another expression for the eventual concentrations would be –

$$\frac{a}{1-b} Rw + \frac{c}{1-b} Re'$$

And

$$\frac{\frac{c}{1-b}}{\frac{a}{1-b}} = \frac{c}{a}$$

The same expression for the eventual ratio.