(136)

DOCKET NUMBER
PROPOSED RULE PR 20
45FR67018

EAST CAROLINA UNIVERSITY
GREENVILLE, NORTH CAROLINA 27834

OFFICE OF
SAFETY and HEALTH

Telephone: (919) 757-6166

November 7, 1980

Secretary, U. S. Nuclear Regulatory Commission
Docketing and Service Branch
Washington, D. C. 20555

Dear Sirs:

Reference: Docket Number PR 20 (45FR67018)

As a background and personal introduction I would like to state that I have worked for educational and research institutions for 30 years. I am certified by the American Board of Health Physics.

I would like to add the following facts in support of the proposal to allow immediate and relatively unrestricted disposal of ^{14}C in scintillation fluids and animal tissue by each licensee in the amount of 1Ci per year.

1. The biosphere now contains an estimated 135×10^{6}Ci of ^{14}C.
2. The world wide production (all sources) is 38×10^{3}Ci/year.
3. The release of 6Ci of ^{14}C in liquid scintillation fluids and animal tissue would add a much smaller does increment than calculated.
4. Present burial procedures do not insure containment for an appreciable part of the half like of ^{14}C. Consider man made structures of 5000 years age and contrast them to present radioactive land fill burial operations.

Consider the present radiation does due to ^{14}C ingested from the world pool. What percentage of natural background does this represent? To increase this dose to double the present level would require doubling the production and release of ^{14}C for 57,000 years (10 half lives). While local concentrations can be assumed (and avoided by incineration at thousands of points and release to water at similar thousands of points) these concentrations cannot be substantiated for extended time period of thousands of years because of the natural mobility and mixing of air and water.

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I submit that the calculated doses while attainable in specific circumstance, are several orders of magnitude higher than the long term averages. Further, when the ^{14}C dose is contrasted to radium dose from ingestion of radium in water and air, the proposed release of ^{14}C will give a negligible dose.

To answer the question of dose due to internal emitters, NCRP (45-1975) gives less than 1 mrem/year as the ^{3}H plus ^{14}C dose, with more than 99% of this due to ^{14}C. All other internally deposited radio-nuclides (must of them naturally occurring) gives a dose of 30 to 60 mrem/year. Since it can be shown, that if the release of man-made ^{14}C is made equal to the natural production of ^{14}C, it will take 57,000 years to approach the 2 mrem/year dose rate, this becomes a minor change, such as moving ones residence to a few hundred feet above sea level from sea level.

In addition my 30 years of experience lead me to believe the research conducted has and will result in life expectancy increase hundreds to thousands of times greater than life shortening due to the ^{14}C dose increase.

It can also be shown, mathematically as well as intuitively, that considering the total world population of billions, that considering a gradual build up at a rate of doubling one small factor in 57,000 years, makes inequalities in concentration over periods such as the average life expectancy, of no consequence to the total population.

In summary, release of ^{14}C and ^{3}H as proposed, will cause an average dose increase to the world population from these radio-nuclides of less than 0.1%. I support $16,000,000 for medical research rather than hauling and interring ^{14}C and ^{3}H low level waste composed of animals and scintillation materials.

Very truly yours,

Francis B. deFriess
Consultant, Radiation Safety Office
East Carolina University

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