



UNITED STATES
EPA REGIONAL OFFICE
MONTGOMERY, ALABAMA

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MEMORANDUM FOR: Karl R. Goller, Director
Division of Siting, Health, and Safeguards Standards, SD

THRU: Robert A. Purple, Assistant Director *RA Purple*
for Radiological Health and Safeguards Standards, SD

Michael A. Parsont, Acting Chief *MA Parsont*
Radiological Health Standards Branch, SD

FROM: Harold T. Peterson
Radiological Health Standards Branch, SD

SUBJECT: TELEPHONE CONVERSATIONS WITH MEMBERS OF EPA OFFICE
OF RADIATION PROGRAM'S STAFF ON CLEAN AIR ACT

On October 30, 1978 I received a telephone request from Ted Fowler, a technical staff member of EPA's Eastern Environmental Radiation Facility (EERF) in Montgomery Alabama, requesting copies of the data which NRC submitted to EPA regarding airborne releases from non-fuel cycle NRC licensed facilities. The request stemmed from an internal EPA transfer of the responsibility for developing regulations for implementing the Clean Air Act of these NRC licensees from EPA Headquarters to the Montgomery Alabama Facility. Apparently, EPA headquarters did not transmit all of the data that we had previously provided to them, to the Montgomery facility. I am having the information previously transmitted to EPA reproduced so that it can be resupplied to EPA.

On November 2, 1978 I also received a telephone call from James Hardin, a member of EPA's Office of Radiation Program's (ORP) headquarters staff, which confirmed this transfer. These calls were made to me because of personal acquaintance and because of my role as an initial NRC contact on the Clean Air Act.

The principle points of these conversations were:

1. They plan to submit a detailed formal request to NRC for additional specific information. I expect that this request will be directed to Mr. Minogue as he was mentioned in Rowe's August 22, 1977 letter to the Executive Director for Operations as the NRC contact.
2. The ORP staff has not examined the basis for the Vinyl Chloride or Asbestos risk values that EPA Assistant Administrator Hawkins had indicated to Mr. Minogue would be used for assessing the comparability of the risks associated with adopting 40 CFR Part 190 under the Clean Air Act. At face value the lifetime risk associated with the 40 CFR

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Part 190 dose limit of 25 mrem/year is estimated to be approximately 10^{-3} over a 70-year lifetime (see Attachment). However, this risk is for the lifetime of the maximally exposed individual and includes non-fatal cancers as well as genetic damage. I cannot believe that it is at all comparable to the reputed vinyl chloride risk of 10^{-7} .

We are aware of the following actions taken by EPA to acquire more information on NRC licensed and Agreement-State licensed operations:

1. EPA has let several contracts to prepare (pinner) surveys of emissions from radiopharmaceutical manufacturers and other by-product material users.
2. EPA has contacted the Nuclear Engineering Corporation requesting permission to do on-site measurements of airborne emissions from one of their low-level burial grounds.

I plan to send EPA two complete sets of our previous data submittals together with copies of NUREG -0116 and NUREG-0216 which update the Environmental Survey of the Nuclear Fuel Cycle (WASH-1248) and were requested by Fowler of EPA. One set will go to him and one to Hardin's Supervisor, Gordon Burley at EPA headquarters.

I also recommend that:

seems premature, maybe more useful to wait for request. JAP.

1. The OELD working group on the Clean Air Act or a higher NRC management group meet to formulate a position on the expected EPA formal request for more specific information.
2. Efforts be made (perhaps Mr. Minogue to Hawkins of EPA) to obtain the EPA criteria documents for vinyl chloride and asbestos and other documents which provide the basis for the reported risk estimates so that the bases for these values may be examined by NRC staff.

Harold T. Peterson
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Attachment:
Risk Estimate Calculation

Evaluation of the Risk Equivalent to
the 40 CFR Part 190 Dose Limits

Based upon conversations with the EPA staff, they are using the following factors for the health risk from radiation.

	Health Effects. per 10^6 man-rem	Risk per rem
Fatal Cancers	200	2×10^{-4}
Non-Fatal Cancers	200	2×10^{-4}
Genetic Effects	<u>200</u>	2×10^{-4}
	600	6×10^{-4}

These numbers are slightly lower than the health risk values given in Vol. III of EPA's Environmental Analysis of the Uranium Fuel Cycle (ppC-16 - C-17) in that the genetic component there was 300×10^{-6} .

WASH-1258 Appendix I EIS, Vol I (Table 5-2 p 5-12, Table 5 -3 p 5-14)

	Risk per 10^6 man-rem	Derived Risk per rem
Leukemia Deaths	26	0.26×10^{-4}
Other Fatal Cancers	75	0.75×10^{-4}
Total Fatal Cancers		1.00×10^{-4}
Thyroid Cancer	110	1.10×10^{-4}
		2.10×10^{-4}
Genetic Disease (equilibrium)	36-900	1.80×10^{-4}

The genetic component is comparable to EPA's revised genetic risk. The somatic (cancer) risks in WASH-1258 are for the absolute risk model. Bob Baker has provided the following table which uses the geometric mean of the relative and absolute risks:

Effect	Risk per 10^6 man-rem			Risk per rem
	Absolute 30-yr Plateau	Relative Lifetime Plateau	Geometric Mean	
Leukemia	26	37	31	0.31×10^{-4}
Other Fatal Cancers	61	420	160	1.60×10^{-4}
Lung Cancer	15	110	40	0.40×10^{-4}
GI Tract	12	84	32	0.32×10^{-4}
Bone Cancer	2	17	6	0.06×10^{-4}
Total Cancers				2.69×10^{-4}
Thyroid Cancer	100	200	140	1.40×10^{-4}
Total Cancer				4.09×10^{-4}
Compare to EPA Total Cancer				4.0×10^{-4}

Hence, EPA's total cancer risk per rem is comparable to what we have also derived from the 1972 BEIR Report.

The health risk associated with an annual exposure of 25 mrem (0.025 rem/yr) using the EPA estimates is:

$$\begin{array}{l}
 5 \times 10^{-6} \text{ fatal cancers/yr} \\
 5 \times 10^{-6} \text{ non-fatal cancers/yr} \\
 5 \times 10^{-6} \text{ genetic injuries/yr} \\
 \hline
 15 \times 10^{-6} \text{ health effects/yr}
 \end{array}$$

For a person exposed to 25 mrem/yr from birth to death (70 years), the lifetime risk is:

$$\begin{array}{l}
 350 \times 10^{-6} \text{ fatal cancers} \\
 350 \times 10^{-6} \text{ non-fatal cancers} \\
 350 \times 10^{-6} \text{ genetic injuries} \\
 \hline
 1050 \times 10^{-6} \text{ health effects}
 \end{array}$$

Lifetime risk of 1.0×10^{-3} associated with 25 mrem/yr for 70 years