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DEFENSE ATOMIC SUPPORT AGENCY
ARMED FORCES RADIOBIOLOGY RESEARCH INSTITUTE
BETHESDA, MARYLAND 20014

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MEMORANDUM FOR LCDR WM. O. K. Rentz

Enclosed are the comments on FRC Report No. 8 which I promised you. I am also sending a copy without this note to Mr. Palmiter.

I believe that in the future it would be wise for the FRC to prepare an acceptable background document before the memorandum is sent to the President for his approval. I can visualize difficulties if this does not happen.

Encl (2)

H. O. WYCKOFF
Deputy Director, Scientific

Comments on FRC/2/8/6
Proposed Revision

Par 1.1 - It is my feeling that preliminary documents should not be released in such a manner that they can be referenced.

Par 1.2 - Would this read better as "The Uranium requirement for nuclear power is increasing as its need for military purposes is decreasing. This increase maintains the uranium mining industry as an activity of . . . "

3rd sentence. After the word "industry" insert the words "in the United States."

4th sentence. Delete.

Par 1.3 - Would this read better as "Uranium produces various radioactive nuclides in the process of its decay. One of these decay products is radon. Radon gas formed . . ."

Page 2, line 4. "And retained in the miner's respiratory system where they irradiate tissues in the system."

Page 2, line 9. Many nonuranium mines also have a uranium hazard. Perhaps one should indicate that the comparison between the uranium miners and other kinds of miners includes in the latter case only those mines without uranium hazard but with all of the other hazards connected with uranium mining.

Par. 1.4 - Couldn't the first sentence be deleted?

Page 4, lines 1-5. Would this read better as "This curtailed rate reflects a lower current Governmental requirement, but includes some stockpiling for projected requirements of the developing electric power industry."

Page 4, lines 5-8. It is unclear as to whether or not the 28,300 tons includes the 18,000 tons.

Par. 1.9 - This paragraph is confusing. It speaks of electrical requirements in terms of kilowatts, tons of mined ore, and tons of U_3O_8. These are not easily relatable quantities. Perhaps the first sentence could be deleted and the remainder modified.

Page 5, line 2. I suspect that the word "economic" is not the best word. Perhaps one should indicate that uranium oxide at this price would be competitive with fossil fuels for power production.

Par. 1.10 - As some of this material has already been covered in par. 1.4 some condensation may be possible.

Par. 1.11 - I don't understand the reason for comparing the worth of the mined uranium with that of the other mined metals.

Page 6, lines 15-16. It seems to me that the size of the mine is defined in terms of the men employed. It is not clear whether the "men employed" include only the underground workers.

Page 7, line 6. Insert the word "uranium" after the word "produced." Also delete the word "average" same line.

Page 8, par. 1.15, line 1. Instead of the word "traumatic" would it be better to say "serious nonradiation induced?"

Page 8, par. 1.16, line 7. Is the word "experience" the correct one?

Page 8, heading "Physical Hazards", suggest deletion.

Page 8, par 1.17, line 4. Suggest change the word "explosives" to the word "explosions."

Page 9, par. 1.20, line 4. Suggest deletion of the words "approval plates of."

Page 9, par. 1.21, line 5. Suggest "these threshold limits. . ."

Page 10, Par 1.22 - Suggest deletion.

Page 11, par "3.9 - One might wonder how the 5,000 workers were chosen. This is especially true since earlier in the text it was pointed out that no mill workers, open pit miners and above ground workers, encountered a serious radiation hazard. One might also wonder why the FRC only focused on a subgroup of 1,981 white miners.

Page 11, par "3.10, lines 3-4. According to page 2, line 9, the incidence of lung cancer in uranium miners is greater than that of workers in other kinds of uranium mines. This would seem to be a better comparison.

Par "3.10, line 5. The words "person years" is unclear. Also in this line the word "groups" is later called "categories."

Page 12, line 6. The age group is not given in Table 6. Also the second "category" should probably be "subcategory."

Page 12, line 10. Should one substitute for the word "similarly" the word "simultaneously"?

Page 12, line 16. Should one insert after the word "died" the words "during this period"?

Page 13, line 3. Should one insert the words "of nonminers" after the word "group"?

Page 13, line 4. One might question whether all of these five digits are significant. The same question might arise on page 12, line 23, regarding the number 16.59.

Page 13, line 16. Should one add the words "but now" before the word "with"?

Page 16, line 9. Does the word "expected" have a different meaning here than in Table 6?

Table 6. Shouldn't the word "per" before the word "year" be deleted? This would then be parallel to the words "person years" used in an earlier column.

Page 19, lines 10-12. This sentence seems to say the same as the previous one. Perhaps it could be deleted.

Page 19, line 13. For the words "as related" insert the word "compared."

Page 19, line 14. For the words "the results" insert the words "the trend with cumulative WLM."

Page 19, line 18. Should one insert the word "synergistic" for the word "relationship"?

Page 21, line 5. Suggest deletion of the word "comprehensive."

Page 21, line 15. Suggest use of the word "with" instead of the word "of."

Page 22, line 3. Would this read better in part as ". . .error for the individuals in one. . ."?

Page 26, line 17. Delete the word "potential."

Page 31, line 17. Are the words "in the industry" necessary?

Page 31, lines 19/20. Are the words "to different levels" necessary?

Page 31, line 21. Could one replace the words "the difference between each exposure level" with the words "such reduced exposures"?

I am surprised that the research and development needs does not include a recommendation for more detailed analysis of possible models. If a realistic model could be developed then one could use the same physical quantities for predicting radiation hazard as is used for other types of irradiation.

Comments on FRC Report NO. 8

Page 10, 2.3, lines 1/2. For the word "intensities" substitute the words "exposure rate" in the first line and in the second line "rates."

2.3, last sentence. The dose rate produced at the surface of the body when the body is near broken ores may be as high as 25 rads/h but because of the high attenuation of these radiations and the limited time a person spends near the broken ores such irradiations are of relatively minor importance.as an external radiation hazard under mining conditions.

Page 18, 3.4. Is there a real difference between 1 and 1.93(sic)?

3.5, line 7. Would "the number of deaths" be better than "incidence of mortality"?

Page 21, 3.17. Would the word "requires" be better than "is subject to"?

Page 22, 3.19, first line. Shouldn't the second word be "and"?

Page 34, 4.5, second sentence. I suspect that time is an important factor here, although it is not stated in the sentence. One might also question the first part of the sentence talking about "unit volume", and the second part talking about the "third power of the volume."

4.7, line 6. Should the period come after reference 5/?

Page 35, 4.10, line 7. Should the fifth word be "an"? Should one indicate also that the persons included in obtaining a "mine index" were only those engaged in underground planning, and did not include those whose primary job was at the surface?