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RADIATION TOLL ON MOUNTAIN PEOPLE.

Symbol: KAS:RPO

A. Summary

(1) Maximum Levels Allowed by Atomic Energy Commission:

- (a) Measured by count rate: 3.0 R per quarter, whole body gamma radiation.
- (b) Air content: 1 micro curie per cubic meter averaged over 24 hour period as of 3 days after shot.
- (c) Water content: 5×10^{-3} micro curie per cubic centimeter averaged over 24 hours as of 3 days after shot.

Level Doses as Allowed by Atomic Energy Commission:

Shot No. 7 - 50 KT on 300' tower - level equivalent to 7 R per quarter at Riverside Cabins, Nevada, population 12 people. This equals a life-time dose of 11 R.

- (b) Shot No. 2 - 32 KT on 300' tower - level equivalent to 5.5 R per quarter at Hawthorne, Nevada, population about 200 people. This equals a life-time dose of 3 R.

- (c) Shot No. 2 - 32 KT on 300' tower - level equivalent to 3 R per quarter at Lincoln Mine, Nevada, population about 200 people. This equals a life-time dose of 3.6 R.

CLASSIFICATION CANCELLED
BY AUTHORITY OF DOD/DRG
REVIEWED 11/11/82

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- (d) Shot No. 1 - 12 KT on 300' tower - level equivalent to 2.1 KT per quarter at Rockville, Utah, population about 200 people. This equals a lifetime dose of 2.15 R.
- (e) Maximum air content: .17 micro curies per cu.m. which is lower than maximum allowable by a factor of 6. Found at Mesquite, Nevada.
- (f) Maximum water content: 8.7×10^{-5} micro curies per cc. which is lower than maximum allowable by factor of 100. Found in Virgin River, Nevada irrigation canal.

B. Discussion

(1) Qualifications:

Figures in A, (2), (a), (b), (c), and (d) cannot fairly be used without stating the circumstances (a) under which fallout occurred, (b) under which the radioactive levels were measured, and (c) which were assumed in calculating the ultimate exposure such levels would transmit to humans.

In cases A, (2), (a), (b), and (d) above, fallout occurred in a narrow, concentrated path extending roughly east of the Diving Ground within 6-7 hours after shot time. This was followed by a strong wind which, because of the peculiar area of fallout, blew the particles only away from the area. This reduced the concentration which was later measured since there was no contamination elsewhere to be blown back in. It also removed any airborne particles which might otherwise have been present. In other words, measurements on the ground were low by this amount of weathering. Since measurements at Lincoln Mine were taken before the wind, no reduction of readings took place due to weathering in that case.

Calculations of what the quarterly and lifetime dose would be, using the readings obtained in fallout areas, were based as usual on three assumptions:

- (a) Persons receiving the dose stay in contaminated area continuously during the period involved.

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(b) There is no weathering of the fallout.

(c) No attenuation due to walls of buildings, etc.,
i.e., persons stay outside.

These rather extreme general assertions necessarily do not reflect actual conditions or individual behaviours. If persons were to stay indoors, for example, during about half the 24 hour day as is usual, this would reduce overall exposures about 25%. On the other hand, having early morning shots means fallout on the near horizon blowing toward us more chiefly during the daylight hours immediately following so the reduction above is not effective. Also, weathering effects are often very prominent.

(2) Effect on the Population:

There are so many unknowns about the biological effects of radiation no one can really say what the effects of this radiation are. Dr. Miller, member of the sub-committee on External exposure of the National Committee on Radiation Protection, and one of our best authorities, is publishing a book which says .3 R per week (1.9 R/quarter) exposure is acceptable, and that this must be reduced by a factor of 10 for children. This is because of the effect of radiation on bone and tissue formation which is going on so rapidly during a child's growth. On the other hand, the Army is allowing a maximum dose of 10 R per month for personnel in Desert Rock. Their basis probably is that the danger of injury from radiation even at this level can be compared as less than danger of injury from more orthodox causes faced during maneuver and combat.

(3) Effect on Future tests:

The level of radiation here is such that, if fallout occurred in a populated area immediately adjacent to the proving ground, both sides must be alerted. This would be a serious situation indeed since these burns cause hair to fall out and skin to ulcerate to some extent. This would probably arouse immediate public clamor for the closing of the Proving Ground.

Fallout in a corridor or a such as Las Vegas is quite possible.
Winds for that is, it drifted 30° to the south from predicted
azimuth. Another 15° would have caused the fallout to hit Las
Vegas.

High levels of radioactivity seems to occur only in connection
with flame jets fired on the ground, probably because of the large
number of dust particles picked up by afterwinds as well as
particles of the tower material. These provide nuclei around
which the volatilized fission products and fragments condense
to form radioactive pellets which fall out rapidly while still
very active. If the high-pitch jets are fired as air bursts,
this effect is greatly reduced because of lack of dust and
tower particles. In fact, no important contamination has even
been detected offsite after an aircraft.

It is apparent from the above that the Test Organization should
consider seriously the upper limit of size of tower jets with
a view to permits jet size below some maximum, for-
ness of it. The alternatives will otherwise almost certainly be
either over-exposure of nearby populations and conceivably
the enforced closure of the Nevada Proving Ground.

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