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Capt. William Gay, Assistant Director
for Tests
Division of Military Application

With reference to the draft planning directive for Operation Bedrock we continue to have problems with the radiation exposure criteria used for weapons tests. The problems with the 3.9 R per year criteria were lessoned somewhat when this criterion was reworded in the context of an accident situation. Even in this context and considering the total body of experience at NTS, we believe the number is too high. There is also a problem in that this numerical guide is specified only for external exposures and there is no similar AEC guidance given in the planning directive for the potential problem with accidental release of radionuclides wherein the greatest exposure may come from internal emitters.

The Federal Radiation Council, FRC, has provided some guidance for internal emitters and accidents in their reports 5 and 7. At least the guidance in these reports should be referenced in the planning directive since this material is to be used by Federal agencies in planning those actions that are to be taken in responding to an emergency.

Even with use of this FRC material, there would still be one important question left unanswered. If the 3.9 R in one year defines the highest external whole body exposure offsite that is to be used for that day deliberations, what defines similar criteria for internal emitters?

From the point of view of using radiation criteria for offsite exposures for weapons tests that would be defenseable, we are in a very poor position with regard to use of both the 3.9 R in one year and the 10 R in any 10 years. The original intent was that the 10 R could be approached

incrementally over a period of time in those nearby communities where some exposure from atmospheric tests at NTS was expected and was almost inevitable. Again the problem comes from trying to use radiation exposure criteria developed for atmospheric tests in the conduct of underground tests. Now that the 3.9 R per year is in the context of an accidental release from underground tests (and hopefully there are to be no significant deliberate releases) this means that if the 10 R is approached at any nearby community, it will have been approached through a series of accidents or incidents. In our view such a string of events effecting the same community to the extent that an exposure like 10 R could be approached over a short time like 10 years would raise serious questions of the Commissions credibility. Delivery of each increment of exposure would begin to look more and more like a deliberate act to those getting exposed.

It is our current view that there is no justification and no reason why any individual or community near the NTS should be exposed to radiation levels as high as 3.9 R in a year from an underground test or repeatedly subjected to releases of radioactivity from underground tests such that exposures would be anywhere near 10 R in 10 years. We cannot accept the idea that such liberal criteria are actually needed in order to conduct the majority of tests.

The standard for long-term cumulative exposure of the general public that Federal agencies must use by Federal statute is 5 Rem in 30 years. This criteria is based on genetic considerations. Any agency using a higher criteria must have strong justification for it and be prepared to defend it. Further, in application, this exposure includes contribution from both external and internal emitters.

The standards for individuals and for population groups within the general public established by the FRC are as follows:

| Organ | Rem per year Individual | Group |
|---|---|---|
| Whole body | 0.5 | 0.17 |
| Bone Marrow | 0.5 | 0.17 |
| Bone | 1.5 | 0.5 |
| Thyroid | 1.5 | 0.5 |

In our view, these criteria, both the annual and 30-year values, should be met for any credible exposures associated with the Commission's normal and routine activities. Underground tests at NTS or at any other test location in our view do not qualify as an acception.

Unexpected or unplanned releases of radioactivity from underground tests that were designed for containment such as Baneberry have been labeled accidents by some, but this has not been a satisfactory description for others. On the basis of past experience at NTS, a rather high incidence prevails for a release of radioactivity like Baneberry. Considering past experience, massive venting can be expected in about one events. The risk of such a release may be higher or lower depending on who analyzes the data and there are those who will argue that things are improving. The only point we wish to make is that the risk is not like one in one million or so low as to be comfortable. Ventings have happened and will probably happen again. Thus, if a term is to be applied to venting of underground tests, it must describe a type of occurance within the range of possibilities that is unwanted but which has a fairly high probability of occurance. The same nearby offsite residents at NTS have been and are

being subjected repeatedly to the risk of this occurance throughout the years of testing. Because of the relatively high probability of a venting, we cannot agree with use of a significant exposure level for shot day decisions as would be the case if the risk were very low. We also cannot agree with a significant cumulative exposure criterion (like 10 R in 10 years) because there would be so many opportunities to keep the exposure much lower than this.

OS staff can no longer concur in use of the current blanket radiation exposure criteria covering all tests in a given series at NTS. We cannot agree that because a test is a weapons related nuclear test, that a shot day decision criterion of 3.9 R per year exposure to offsite residents is automatically justified. If a blanket criterion is needed, we recommend the annual values cited earlier from FRC. In applying the FRC values, the criterion for individuals could be used for farms, ranches, and towns small enough that determination of estimates of exposures of individual persons would be a practical task. For larger cities like Las Vegas, the criterion for population groups would be used. For cumulative exposures over a longer period, we suggest use of 4 Rem in 30 years. In all cases, determination of exposures would include consideration of all pathways, not just external exposure.

Should a situation develop where a higher exposure criterion than that cited above is needed, this should be considered on a case-by-case basis. The supporting laboratory should develop for Headquarters review, a justification for use of exposure criterion higher than that approved by FRC for use in protecting the general public, keyed to the purpose, benefits, etc., for the particular test.