DEPARTMENT OF THE AIR FORCE
USAF SCHOOL OF AEROSPACE MEDICINE (AFSC)
BROOKS AIR FORCE BASE, TEXAS 78235

REPLY TO ATTN OF: SMBRH

15 Apr 66

SUBJECT: MOL Information

TO: SMBR

1. The following information was obtained via telcon with Mr. Bob Pruett of the Aerospace Corporation on 14 April 1966:

a. The Space Physics Laboratory of the Aerospace Corporation has the responsibility of defining the MOL space radiation environment. The primary personnel responsible for this task are Dr. Freden and Mr. Pruett.

b. Based on the orbital parameters which they have been furnished, they are assuming that radiation contributions from the Van Allen Belts will be negligible. At the present time they are disregarding any possibility of nuclear detonations but do intend to treat this situation "down stream". Therefore they are assuming that solar flare protons represent the only significant radiation hazard at present.

c. Although optical observations of the sun's activity have been made for a number of years, proton flare data is only available from the 19th solar cycle, therefore it has been assumed that the 20th solar cycle will be similar to the 19th. Primarily, the November 12, 1960 and July 14-15, 1959 solar events are being used as the guide in assessing the radiation environment. Data from these events published in the Solar Proton Manual is in some disrepute with a factor of about 7 disagreement depending upon whose interpretation you use. Integrating the protons with energies greater than 30 Mev, the upper limit is 9×10^9 protons/cm^2 and the lower limit is 1.3×10^9.

d. In regard to the MOL shielding, Douglas has furnished an estimate of 2 gms/cm^2 averaging over 4 pi. They have further stated that the "rest" or "sleep" area may be about 1.5 gm/cm^2. They are making an effort to disperse the many "black boxes" around the MOL to help optimize the shielding, recognizing that there are certain limitations such as astronauts convenience in performing assigned tasks, etc.

e. Taking the worst case flare data (11/12/60) and attenuating

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this through 2 gms/cm^2 the upper limit estimate is 360 rads incident on the chest (skin). Using the same incident flux and attenuating through 1 gm/cm^2 increases this dose by a factor of 1.5 to 2. It was my understanding that some spectral data is available and is being used to calculate doses under different conditions.

2. All of the above information was given as unofficial and is subject to change. It was also pointed out by Mr. Pruett that he does not have the authority to release this type of information to anyone outside of SSD at the present time. In this regard, it is recommended we forward an official request through channels to be placed on the distribution list for the following type of information and subsequent refinements as they are generated:

a. The probability of flare occurrence as a function of intensity and mission duration.

b. The calculated dose and proton energy spectrum incident on the astronauts with shielding tradeoffs ranging from 0.5 gm/cm^2 to about 3 gm/cm^2.

c. MOL capsule configuration showing the "sleep" or "rest" area and assigned work stations with approximate estimation of how long the astronauts will be in each area.

d. Any other parameters which would affect the proton energy and flux incident on the body of the astronauts (such as dust streaming problems, etc.)

3. An official point of contact for us within the Space Physics Laboratory of the Aerospace Corporation would also be most beneficial to our MOL work.

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