

PREOXYGENATION REQUIREMENT PRIOR TO SL-2 STAND-UP EVA

STATEMENT OF PROBLEM

A stand-up EVA is being contemplated for SL-2. The question as to the requirement for prebreathing prior to EVA has been asked.

ASSUMPTIONS

1. The crew will denitrogenate for at least 3 hours prior to launch.
2. The CSM will be launched with a 60% oxygen/40% nitrogen atmosphere.
3. The decompression for EVA will be from approximately 5 psia to 3.5 psia pressure altitude.
4. The EVA may take place as early as 9 hours into the mission.
5. The EVA is expected to last up to 4 hours.
6. Activities will require moderate to heavy upper torso work.

SUMMARY OF EXPERIENCE

Condition - Three hours preoxygenation, 4 hours at 5 psia breathing 60% O₂ - 40% N₂ gas mixture followed by 2 hours breathing pure oxygen, at 3.5 psia

<u>Activity Level</u>	<u>No. of Exposures</u>	<u>Bends Reported</u>		
		<u>Grade I</u>	<u>Grade II</u>	<u>Grade III</u>
Light Exercise	29	5	2	0
Moderate (1200 BTU/hr.)	6	4	0	0
Heavy (1600 BTU/hr.)	19	4	2	0
Heavy (15 min. preoxygen)	19	1	2	1
Heavy (30 min. preoxygen)	15	1	2	0

DISCUSSION

In examining the results of the 88 manned decompression exposures, it can be seen that 27% of those exposed reported symptoms of decompression sickness; however, 20% of these were of a mild transient nature.

Bends risk

RECOMMENDATION

It is recommended that the crew be required to prebreathe for one hour prior to the SL-2 stand-up EVA.

ELMichel:abs 5/18/73