

program entailing a launch rate of six per year, a milestone of 1 year in orbit might be achieved about 1 year later than with continued use of the uprated Saturn I-Apollo system. DOD has no plans at this time to proceed with such a development for DOD purposes.

(b) The uprated MOL system would necessitate DOD and NASA nonrecurring costs for development and facilities modifications estimated at about \$480 million. Recurring costs would be higher for each 1-year mission than with the uprated Saturn I-Apollo system since a larger number of launches (six versus four) would be required. Achievement of the same number of man-days in orbit would require an even greater number of launches with the Titan IIIM-MOL system.

(c) Use of the uprated MOL system in lieu of the uprated Saturn I-Apollo system has several disadvantages, including: (1) the two-man-per-launch limitation on ferrying operations as compared to three with the possible increase to six men per launch with the Apollo; the 2-to-3-year delay and hiatus in low Earth orbital application of the technology being proven in the Apollo program; and (3) the lack of direct compatibility with Saturn V-launched systems which means that (a) the advantages of common use of S-IVB stages, including the spent stage "workshop," would be lost, and (b) there would be no economical capability to test in low earth orbit the same systems to be used with the Saturn V in high and synchronous orbits or out to the Moon or beyond.

Use of the uprated MOL system would have the advantages of (1) compatibility with the DOD Titan IIIM-MOL system, and (2) a capability for polar orbit from WTR launch facilities being built for the basic MOL.

In view of the above, it has been concluded in summary that:

1. A decision at this time to discontinue use of the uprated Saturn I-Apollo system and to introduce in its place either the Titan IIIM launch vehicle or the Titan IIIM-uprated MOL system for use in the nonmilitary post-Apollo Manned Space Flight program would not be technically desirable or clearly cost effective.

2. Use of the uprated Saturn I-Apollo system will take advantage of and maintain continuity with the Apollo program and avoid the prospect of a hiatus which might jeopardize the U.S. position in space.

3. Assuming success in the experimental program now planned, a capability for long-duration flight of 1 year or more could be available sooner and at less cost by proceeding in fiscal year 1968 and subsequent years with the uprated Saturn I-Apollo system.

4. If the experiments to be undertaken by NASA with the uprated Saturn I-Apollo system and by DOD with the MOL system indicate a requirement for a nonmilitary program involving a large number of missions within the capabilities of the MOL system, the use of the Titan IIIM-MOL or a modification thereof should receive careful consideration.