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OCT 6 1967

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MEMORANDUM FOR RECORD

SUBJECT: September 29, 1967, MOL Program Review Council Meeting

The September 29, 1967, meeting of the MOL Program Review Council convened in Room 5D-227, Pentagon, at 8:30 A.M. Principals in attendance were:

Dr. Flax
General Ferguson
Major General Stewart
Major General Bleymaier

Brigadier General Berg
Brigadier General Martin
Dr. Yarymovych
Dr. Leonard

DEPUTY DIRECTOR'S REPORT

Funding Status

General Bleymaier reviewed briefly the evolution of MOL Program costs between August 1965 and June 1967. He noted that performance and money are the foundation of the MOL Program, and while he has confidence that the technical objectives are clearly stated and attainable, he believes that the financial requirements need shoring up. In particular, the program funding does not provide for contingencies, and the financial requirement growth history suggests that it may be very difficult to accomplish the program within the planned \$2.35 billion budget. Of immediate concern is the difference of \$40 million between FY 68 program requirements for \$480 million and the approved NOA of \$440 million. This problem will be vigorously pursued during early October. Dr. Flax also stated that the FY DP should be adjusted without delay to bring the FY 70 and beyond financial plan up to program requirements.

(Program Office Action)

Actions being taken by the Systems Office to reduce contractor requirements in FY 68 were discussed. These consist of:

- Letters to the contractors reaffirming the need to stay within established individual bogeys.
- Tighter financial control.
- Assignment of financial management officers to each system segment.
- Tighter change control.

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- Scrubbing down of contractor manpower phasing and requirements.
- Putting a current level ceiling on contractor test operations personnel, and using SAC "blue-suiters" for the VAFB SLC-6 acceptance check.

Dr. Flax concurred with these actions.

General Bleymaier said he thought \$40 million or \$50 million of "risk" would have to be assumed by the contractors over and above what they would receive in a \$480 million budget. Dr. Flax stated that a complete assessment of the contractors actual performance and program fund status should be presented to Dr. Brown about December 1.*

As a result of the Apollo safety studies, various safety changes will be incorporated in MOL which will affect program costs. The parallel development of IVS, possible incorporation of C/SPCS as prescribed in Annex 4 of AFSCM 70-5, and technical changes on Flights 1 and 2 were identified as other sources of potential cost increases.

The master summary and test flow schedules were reviewed briefly. Flight Vehicle #1 is 8.4 weeks behind schedule due to a Mission Module structural failure. The failure was caused by a change in the production milling procedure, and has been corrected. Flight Vehicle #2 is 13 weeks behind schedule, and Flight #3 9 weeks. All of these are considered to be transient negative slacks.

Weight and power requirements were discussed, and the point was made that power continues to be a more critical problem than weight.

General Bleymaier recommended that the PRC consider adopting the Carousel System as the Titan IIIM guidance subsystem. This guidance system is lighter and cheaper and can be derived from an existing production base. The presently planned Titan IIIM guidance system production line, on the other hand, will have been down for 3 years and will require reactivation to meet MOL schedule requirements. Dr. Flax noted that there were other considerations. For example, the production Carousel System is not subjected to the stringent testing required for MOL application. Dr. Leonard noted that time was critical, and a decision needed in the next few weeks. Dr. Flax observed that because there would be a great deal of Congressional and GAO interest if we change the ACED

*Note: A subsequent discussion I had with Dr. Brown indicated, in view of overall FY 68 financial difficulties, that this assessment should take place by October 31.

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contract, the Systems Office should set down the pros and cons for changing the guidance system. There is also some question about the legal propriety of changing guidance systems while retaining the same sole source supplier. Dr. Flax and General Stewart will discuss this matter with the General Counsel.

(Systems Office Action)

SLC-6 construction progress was reviewed briefly. It appears that although \$3.9 million additional MCP money is required for SLC-6, the Corps of Engineers wants MOL to state a requirement for \$9.0 million. Dr. Flax wants clarification of why this overstatement of the requirement is necessary.

(Systems Office Action)

Systems Office Reorganization

General Bleymaier reviewed the new organization of the Systems Office and discussed the realigned functions and responsibilities of the various organizational elements.

Cost/Schedule Planning and Control Specification

General Bleymaier recommended that C/SPCS as prescribed in Annex 4 not be required for MOL contracts. General Stewart stated that MOL would have to include some acceptable C/SPCS as part of its contracts. It was agreed that no further action would be taken until after the Douglas C/SPCS validation is conducted in October.

AEROSPACE TECHNICAL REPORT - DR. LEONARD

PSAC Meeting Follow-Up Actions

During the August 29 presentations to the PSAC, the Air Force was asked to investigate and report on:

Zero "G" test techniques

IVS Resolution

Image Intensification

Three Zero "G" test techniques have been considered, i.e., Drop Tests, Suspension Support and Oscillation. After careful study, none of these techniques was judged to be satisfactory. There will be continuing study by Aerospace on this subject.

With respect to the IVS Resolution, as a result of the PSAC discussions and subsequent analysis, an equation had been offered to

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describe the amount of smear related to IVS resolution. Subsequent study yielded the conclusion that the suggested equation is inapplicable because accepted definitions of resolution do not apply to IVS, since the sensor responds to a broad spectrum of spatial frequencies relating to the view it senses in terms of light and content.

On the subject of image intensification, Dr. Land had suggested using an electron tube or some other device for improving contrast when viewing through the acquisition and tracking scope. Further studies suggest that use of a low light level image orthicon may be a better approach, but further assessment is required to determine its impact on the baseline photographic system.

A written summary on these subjects is to be prepared for the PSAC by the end of October.

(Systems Office Action)

Support Module 60-Day Capability

This agenda item was a direct result of Secretary McNamara's concern with whether the MOL Program baseline development would provide a 60-day capability on Flights 6 and 7. In response to Dr. Flax's specific question, it was reaffirmed that the baseline program provides the space, weight and power provisions to accommodate a 60-day capability.

As part of the discussion, it was pointed out that more efficient use of film, such as by effective cloud sensing with the IVS, and the ability to use UTB type film are conditions to a 60 day mission capability with not more than 8 buckets. The 8 bucket constraint is one of space and weight. This configuration is compatible with 80/186 nm altitudes and 90° inclination.

Contractor responsibilities for the support module are:

McDonnell Douglas - Structure

EKC - Film assembly

GE - DRV

McDonnell Douglas is planned as the integrating contractor, but Dr. Flax suggested it might be worthwhile to consider GE for the integration task. He expressed agreement with the support module schedule for definition, design and development. The Systems Office is to provide Dr. Flax, NLT December 1, with firm cost estimates and updated reliability information for the 60 day capability.

(Systems Office Action)

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Re-entry Vehicle Alternatives

Dr. Leonard presented a discussion on the possible application in MOL of a new re-entry vehicle now under development consideration for another program. Overall characteristics, configuration, and various mixes of multiple re-entry vehicles were described. Included as one option was the use of one Mark 5 and three new re-entry vehicles. It was shown that four of the new RVs weigh essentially the same as the eight RVs currently planned for MOL. It was also shown that two new RVs would have adequate film capacity to return the total unmanned DORIAN film supply. It was pointed out that a configuration employing three of the new RVs appears to be very attractive from an engineering and weight standpoint, but use of four new RVs would very probably extend the length of the vehicle to a point where stability problems could become a concern. The question of the use of the NASA Bio-satellite RV was raised, and the view was expressed that the bio-satellite RV was new, had no weight advantage, would have limited use by other programs, with resulting engineering sustaining costs, and had therefore been dropped from further consideration.

The number of RVs in the unmanned configuration was addressed from the viewpoint of the requirement for frequency of data return. It was noted that the intelligence community has indicated a desire for a ten day interval between recoveries. The view was expressed that the use of the proposed new RVs in either the three or four RV configuration limited MOL operational flexibility. Further, the contract for the new RV has not been awarded and therefore the configuration, internal and external, is not completely determined. Thus the presumption of commonality between the new RV as designed for the parent program and its application in MOL is premature. A further complication on a decision to use the new RV in MOL is that this decision will have to be made before the RV is flown in the parent program.

It was concluded that RV trade-off studies should be continued by the Systems Office. Dr. Flax's guidance on this subject was that consideration should be given to total program costs with regard to the number of RVs selected for use in the initial flights as compared to the number in subsequent flights. The approach must avoid, for example, solutions which require a major expenditure to go from six RVs in the first two unmanned flights to eight RVs in follow-on flights. Further, the question of six RVs vs eight must consider RV capacity using UTB film. Dr. Flax directed that the RV trade-off studies continue on the six vs eight option at this time, postponing, for the present, examination of the new proposed RV.

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Dr. Flax directed that the 60-day unmanned studies and design continue with a reporting target date of o/a 1 December. No fabrication or qualification is approved. (Systems Office Action)

The following is a summary of the direction issued in regard to the proposed Support Module Phase 1A.

1. Flight Objectives of Vehicles 6 and 7 are to:
 - a. Demonstrate on-orbit operation to the limiting capability of on board expendables established for the baseline configuration, with the objective of extending the flight profile as far beyond 30 days as is useful.
 - b. Demonstrate the operational life of subsystems beyond 30 days to subsystem failure or test conclusion with the view of obtaining maximum subsystem performance information leading to a 60-day capability. Limited operational capabilities are acceptable beyond 30 days.
 - c. Employ on-orbit test results to identify those subsystems requiring further improvement to insure reliable 60-day on-orbit operation.
2. Conduct a trade-off study between the 6 and 8 RU configurations using UTB as program baseline. Examine the implications of EK UTB design for film drive and platen(s). These results should be compared with a consideration of the use of TB film on early manned and automatic flights (3 thru 7) with the view of determining the most beneficial approach for the program.
3. Proceed with 60-day design. Fabrication and qualification are not approved. Extension of Flights 6 and 7 to 60-day operation will be examined, but the option must be preserved to fly these vehicles with present baseline expendables.
4. Define and describe test program for flights 6 and 7:
 - a. Baseline expendables.
 - b. 60-day design.
5. Define additional changes to the baseline test program and the block change requirement necessary for the follow-on program if the present baseline expendables design approach is used for flights 6 and 7.

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6. Develop ROM costs for each of the following cases and compare their effect on total program costs including follow-on.
 - a. Baseline expendables for Flights 6 and 7.
 - b. Extension of baseline to 60-day capability.
7. Develop a rationale for 60-day design as a reasonable objective, from a reliability standpoint, to be realized early.
8. Recommend the best approach to Flights 6 and 7 assuming a follow-on program that includes the most cost effective configuration.

FOCUS SENSOR

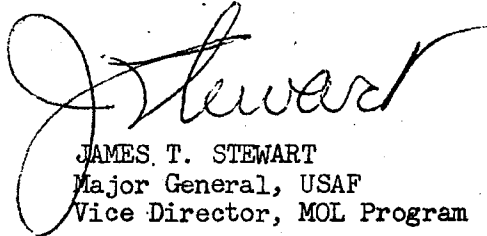
MOL focus sensor development was reviewed and deficiencies in the EK baseline sensor identified. This discussion concluded with the recommendation that, in addition to the present EK work, additional parallel work using ITEK and Hycon focus sensor designs should be undertaken on a subcontract basis to EK.

(Systems Office Action)

EXECUTIVE SESSION

General Martin reported that the 500' F/L balloon-borne camera experiment has produced good results. The photos are being evaluated at the AF Special Projects Processing Laboratory at this time. Parallel ground observations made at three locations during the experiment classed seeing conditions as poor. The results of this experiment should prove of great interest.

A final discussion of the program financial situation for FY 68 took place, and Dr. Flax expressed his willingness to go forward with General Stewart as soon as adequate data become available to reaffirm the FY 68 NOA requirement.



JAMES T. STEWART
Major General, USAF
Vice Director, MOL Program

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