20 Jan.
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~~SECRET~~ [redacted] ~~CONFIDENTIAL~~

QUESTIONNAIRE - WS 117L

1. How does the WS 117L Program today compare with that of a year ago?

a. In the past year the WS 117L Program has undergone a series of important changes. In general, all of these changes have been additive to the program in that the scope and size of the program has been definitely increased. In addition to the expansion of the program, a marked acceleration has been achieved. The expansion and acceleration of the WS 117L Program began in late January of last year with the addition of ten Thor boosted flights. Subsequently, nine more Thor boosted flights were added to the program bringing the total Thor boosted flights to nineteen. To accomplish the acceleration a total of $106M was added to the program. The first of the Thor flights was scheduled for firing in late December 1958 or early January 1959. Effectively, the addition of the Thor Program moved the first firing date for the WS 117L Program six months ahead of previously planned schedules.

b. As an additional technical requirement, a Biomedical Recovery Capsule Program was added as an objective for the Thor boosted flights. This addition added the requirement to organize, train and deploy an airborne recovery force. This force, consisting of nine C-119 aircraft with crews, supported by EC-121 early warning radar aircraft of the Air Defense Command for tracking of the Biomedical Recovery Capsule, and Navy destroyers, has been organized, trained and deployed to Hawaii.

c. Additional tracking stations have been added to the program principally to support the recovery operations and secondly to provide additional tracking information. These stations, located at Annette Island, Alaska; Chiniak, Alaska; Kaena Point, Hawaii, have been planned, constructed and made ready for operation during this time period.

d. As a result of increased on-orbit payload requirements, work has been undertaken to modify the satellite vehicle engine to use a more powerful fuel combination. The rocket engine is being converted to use unsymmetrical dimethylhydrazine (UDMH) in lieu of JP4 jet fuel. This program has proceeded very satisfactorily and we hope that we will be able to use the improved engines early in the Thor-boosted Discoverer Program.

e. Another important step in the WS 117L Program has been the work leading to the technical determination of a potential Infrared ICBM Warning System. Through this work it has been determined that anti-ICBM Infrared Satellite Warning System (MIDAS) is possible and feasible. We are proposing and are prepared to undertake (if adequate funds are made available) an expanded Infrared Program which will consist of three phases.

The first two phases are concerned with the development of a satellite-borne detection system which will be capable of detecting the launching of ballistic missiles any place on the face of the earth and relaying this information back to control agencies in this country instantaneously. The third phase of the program will be to place on orbit a sufficient number of satellites with the developed sensory equipment aboard to provide adequate coverage of the earth's surface. This will require some twenty active satellites on orbit at one time.

f. Another recent change to the WS 117L Program is the addition of a recovery capsule to the satellite vehicle that will use the Atlas as the first stage booster. Additionally, a mapping capability is being incorporated into the program. Technically this change does not present a serious problem. The system was designed with payload flexibility in mind and the mapping capability can be achieved quite economically by the addition of appropriate camera systems.

g. In the last year, while not representing a program change, one area in which significant progress has been made is in the delivery of system hardware. Some examples are:

(1) Five complete tracking and acquisition stations with equipment installed, checked out and available for operation.

(2) Two completed satellite vehicles with thirteen additional vehicles in various stages of manufacture.

(3) Complete ground support equipment complex to support satellite launches.

(4) A launch complex.

(5) Developed Biomedical Recovery Capsules.

(6) Modified downrange telemetry ship (Pvt. Joe E. Mann).

2. What have you done in the past year to accelerate WS 117L?

The WS 117L Program is an accelerated program. It has undergone changes described above which have contributed to an increased pace of accomplishment. The important thing is that the program during FY 1959 receives the adequate financial support to maintain its rate of progress. A loss of momentum through inadequate funding at this crucial time would seriously delay future work.

3. Is further acceleration possible? How?

It is our opinion that the WS 117L Program is proceeding about as rapidly as it can from a technical viewpoint. The thing that will insure that the present rate of accomplishment is maintained is program stability and adequate funding at the accelerated level.

4. Could you use more money in WS 117L? For what? How much?

a. Yes. At the present we are facing a serious funding shortage particularly with respectto FY 1960. In our programming documents we forecast a requirement for approximately $300M to continue the WS 117L Program at the accelerated rate. In our opinion this requirement is still completely valid.

b. As you know, the WS 117L Program was placed under the Advanced Research Projects Agency in June 1958. This change resulted in a fund ceiling being placed on the program for FY 1959 and FY 1960. The reason for this ceiling was the result of ARPA fund limitations. In FY 1959 the difference between the fund ceiling and our requirements was relatively small; however, in FY 1960 available ARPA funds represent approximately half of the money required to continue the program at an accelerated pace. In this instance the ARPA fund ceiling is $160M compared with our requirement of almost $300M for continuation of the program at the proposed level in FY 1960.

c. At the present time the only relief in sight which will serve to partially solve our problem is to acquire some additional funds from Air Force operational agencies to support, out of their own funds, those portions of the program which are pointed toward an operational capability. This solution does not in any way relieve the need for the additional research and development funds required.

5. Has money for WS 117L been held back? How much? By whom?

a. With regard to the FY 1959 funding, money has not been held back to date; however, we have been incrementally funded almost on a month to month basis during this fiscal year. Frequently, delays in the incremental funding have caused considerable difficulty and contractor dissatisfaction. Further, delays in funding are a serious problem in the financial management of these contracts. The difficulty is twofold; e.g., increments are provided in a "spoon-feeding" process which is both uneconomical and time consuming; and further, this condition is aggravated by "last minute" funding of these increments.

b. Good financial management requires that funds be made available on a programmed basis, but in any event not less than quarterly. In actual practice funds are made available usually in monthly increments, and in some cases even shorter periods of time. This type of funding has far-reaching economical consequences to the Program. The Lockheed contracts are approximately fifty percent subcontracted, and these subcontractors in turn have a great many second-tier subcontractors. Most of these subcontractors are funded in the same manner as the prime contractor. Contractors faced with fund uncertainties on a month-to-month basis are prevented from ordering materials in the most economical quantities and hesitate to make other commitments required by good business practice. This difficulty in ordering materials will also have an adverse effect on delivery of items toward the most advantageous schedules to the over-all program.

c. The above described "spoon-feeding" process has been further aggravated by the fact that even these small increments of funds are not made available until the Contractor is completely out of funds, for commitment purposes. This problem can best be illustrated by the current situation. The contract funds were fully committed 15 January 1959. On 14 January an amount to tide the Contractor over for five days was received by the Contracting Officer and applied to the contract. Funds beyond that five day point are not available at this headquarters. This withholding of funds to the last day gives no recognition to the fact that there is a certain amount of procurement processing time, with respect to the prime contract, and with the many subcontracts which must also be funded in the same way. During the period between receipt by this headquarters of obligation authority, and processing of the contractual document to apply the funds, the Contractor is forced to make necessary commitments at his own risk. In fact, it has been regrettably necessary for this headquarters to send urgent TWXs and telephone calls to The Pentagon to advise of a possible stoppage of the program if funds are not available.

d. This program is, for the most part, funded by ARPA; and the delays in receipt of obligation authority are occasioned at that headquarters. It is considered essential that the funding of WS 117L contracts be expedited in a manner to avoid the undesirable conditions described above. This can be accomplished by ARPA, through the establishment of a procedure to provide funds on a programmed basis, but not less than a quarterly basis. And, further, it is absolutely essential that, regardless of the basis used, funds must be received at least thirty days prior to the date when the existing funds will have been committed.

6. <u>Have decision lags delayed the program? Where?</u>

a. Decision lags or decisions inadequate to meet the requirements of particular problems have produced situations that may cause serious future program delays. Our operation has certainly been made more expensive and a great deal more difficult than necessary by poor decision making processes. During the calendar year 1958 we have had the continued problem of changing objectives in the accelerated program. These changes have been directly the outgrowth of ARPA directives and orders and ARPA changes in the program. Failure on the part of the ARPA to either approve or disapprove the [redacted] Program has delayed the contractor in establishing an adequate organization for the conduct of the Infrared work. The [redacted] Program has been funded incrementally in such a fashion as to prohibit program stability and continuity.

b. A development plan was submitted to the ARPA in September 1958 for the conduct of the program under their direction. No approval or disapproval of this development plan was received. In December 1958, the ARPA directed a reorientation of the entire WS 117L Program to include an ARPA photographic recovery capsule and eliminated a photographic readout program already in existence.

c. One notable example of a case wherein a decision lag may eventually cause a delay in future firing schedules is associated with the WS 117L missile assembly building. In this instance the ARPA deferred decision as to whether or not the missile assembly building would be located at Pt. Arguello which is part of the Naval Air Missile Test Center, or at Vandenberg Air Force Base. The ARPA withheld a decision until approximately two months after the originally scheduled initiation of construction. This in turn will delay completion of the facility by a similar amount of time. Unfortunately, the requirement for this facility was time-scheduled to coincide with an increased firing schedule requirement.

7. What has ARPA contributed to the program?

a. The ARPA has provided funds for the nine additional Thor flights bringing the total to nineteen.

b. One of the most difficult problems associated with ARPA management has been the need to rejustify the engineering approach and re-explain the WS 117L Program to the ARPA. For example, a considerable amount of effort was involved in defending the use of the WS 117L approach to the satellite tracking and command problem in preference to using the Azusa tracking system at ARPA direction. The continued necessity of being required to justify oneself and defend the technical approach to the WS 117L Program has created a particularly unfavorable situation with regard to program stability both within the Air Force and associated WS 117L contractors.

c. As noted previously, the incremental funding of this program has added unnecessarily to our difficulties and those of the contractors. It would appear that the ARPA feels that by "spoon-feeding" available funds they can maintain closer control of the technical work in progress. Since the technical efforts and level of expenditure is established contractually for a given period of time, the "spoon-feeding" action by ARPA serves no useful purpose.

d. The following is a summary list of ARPA orders associated with the WS 117L Program:

(1) ARPA Order No. 9-58: WS 117L Program placed under ARPA

(2) ARPA Order No. 38-59: MIDAS

(3) ARPA Order No. 41-59: Sentry Launch Complex, Pt. Arguello

(4) ARPA Order No. 48-59: Discoverer-Thor Project