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NRO REVIEW COMPLETED

COR 1273

Copy 3 of 3

22 AUG 1961

MEMORANDUM FOR: Acting Chief, DPD

SUBJECT: Evaluation of Present Satellite Programs

1. Attached is a paper entitled "Evaluation of Present Reconnaissance Satellite Program." It is the first of a series of articles planned on this subject. These articles will be submitted whenever an urgent need exists or at an interval of approximately every six months.

2. This series of papers, I believe, is needed to examine the progress the program has made to date and to enable us to extend our thinking beyond our present perimeters. In addition, they should act to solidify our aims and goals for the future.

3. The ideas for future operations expressed in these articles are written purely from an operational concept. Many of them, when examined by engineers and technicians, may have to be discarded for one reason or another. However, the mere fact that they were examined and discussed may produce ideas which will greatly improve our present capability. If this goal is achieved then the purpose which motivated these articles has also been achieved.

SIGNED

Chief, Special Projects Branch, DPD

Attachment - 1
As noted above

DPD/SPB/ (22 August 1961)

Distribution:

- #1 - Addee (w/att)
- #2 - DPD/SPB (w/att)
- #3 - DPD/RI (w/att)

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SECRET**EVALUATION OF PRESENT RECONNAISSANCE SATELLITE PROGRAM****I. INTRODUCTION:**

The present reconnaissance satellite program carries the code word CORONA. It is a program of high risk and rather high costs. Through 21 July 1961 the DISCOVERER program has supported sixteen CORONA missions. Eleven failed to launch, orbit, or re-enter with recovery. Four were recovered with useable photography. One was recovered with a film transport malfunction.

With each success proper evaluation of the results enables us to improve our procedures aimed at giving us more useable film in the areas of interest. This evaluation also points out the shortcomings and limitations built into the present program. The need for a follow-on program and modifications to the existing program also becomes apparent. The desire to improve our techniques and planning as well as to extend our thinking and examine our future needs are the motivating factors behind the writing of this article.

II. PRESENT METHOD OF OPERATIONS AND LIMITATIONS:

To place into orbit, whenever vehicle allocations permit, a reconnaissance satellite with the primary objective of obtaining photographic intelligence of the Soviet Union is the present method of operations for the CORONA program.

This program is limited to the ephemeris programmed for a launch from Vandenberg Air Force Base. Another limitation is the lense-film combination of the C prime camera. The use of the C tripple prime camera is now programmed and if this instrument lives up to its expectations photography of a much more desirable resolution will be produced. However, in this connection the CORONA program is experiencing growing pains in its ability to provide minimum sun angles for each type of film exposed under certain conditions. Much additional work is needed in this field before mission planners can increase the amount of useable product obtained during each mission.

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Limitations of obtaining desired orbital periods is another area that is weak in the operational phase of the mission. Once better accelerometer controls are available this weakness will be erased and as a result photography of more desirable scale will be obtained.

At present the intelligence input for each mission is limited to areas of interest within the USSR. This concept can very well overkill the area of interest and provide the intelligence community with more tasks than they can properly evaluate. A more realistic approach would be assigning priorities to areas of interest with additional priorities assigned to individual targets within each area. If this proposal were adopted the over programming capability could be used to a greater extent through the use of the pass selection capability.

The present pass selection capability provides us with the means of determining camera on-off decision after the commander takes into consideration the recommendations of weather and intelligence officers. For example, if there was just enough film available to use on one pass, which would be selected? On Pass A there are three targets. They are assigned target numbers of 3, 47, and 64. On Pass B the targets are assigned numbers of 11, 12, and 52. Here you can see why more detailed study of the targets must be taken into account rather than just assigning them numbers. But I will admit that assigning them numbers is better than using the present system of limiting targeting to outlining areas of interest.

As soon as the computer system, presently being installed at Offutt Air Force Base for use by Weather Central, is completed it is anticipated that more accurate and longer range forecasts will be available. At present long range forecasts are limited to a two day outlook. Even under the present method of operations this is considered inadequate. As the state-of-the-art advances the need for long range forecasts will become more critical.

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III. FUTURE CONCEPTS AND REQUIREMENTS:

Past history indicates that as long as covert intelligence photography is taken from reconnaissance satellites this Agency will want to maintain operational control of the vehicle. The advantages of obtaining pioneer coverage through the CORONA program are very apparent. Any area of the world can be brought under the lense whenever the need exists, without the great amount of coordination required to obtain political approval for piloted aircraft flights. The philosophy of "take any pictures you can and be grateful for any pictures you receive," should be phasing out as the CORONA program moves from the development into the operational stage. In addition, the pioneer coverage can be used for producing flight plans whenever the more detailed photography of manned vehicle is desired. With these ideas in mind the following ideas are advanced:

I. Establish a Need:

This does not refer to the normal missions scheduled to meet the availability of Thor and Agenas. Instead commitments should be made to review at regular intervals selected areas throughout the world, and more important is the idea of maintaining pre-cut mission tapes on the shelf to be used whenever the requirement exists. This requirement is in reality an established need.

To put this plan in operation the intelligence community must review the international situation and predict areas of the world that are most likely to develop into trouble areas. Areas which this country could benefit greatly from obtaining timely photographic intelligence. These areas could then be forwarded to the Operations Branch in the form of specific requirements.

After the Operations Branch receives the specifics, probable areas and dates, detailed flight plans could be produced. These plans would use the midtime for computing sun angles and recommending launch limits in agreement with established policies governing recovery operations and thermal limits.

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The west coast Detachment Commander would be notified of the plan through the use of an operations order and begin preparing standby directives; to provide the best launch, to obtain the most desirable orbital characteristics for the mission. Once the tapes are cut and the equipment made available launch should be effective within a six to eight day period after the mission approval is obtained.

2. Flexibility in Inclination Angle:

To obtain some of this new techniques and equipment will probably have to be developed. If we are to meet these requirements action must begin now because of the great amount of lead time required.

As the defense capability of the USSR improves or if the emphasis of importance shifts from the Soviet Union to China, it may be to our advantage to launch our vehicles on an inclination angle of 45-50 degrees. If this requirement is a valid one then launching from Cape Canaveral rather than Vandenberg Air Force Base will be necessary. Range safety problems created by launching towards heavily populated areas will not allow an eastward launch from Vandenberg Air Force Base. Thrust limitations required to overcome the forces of the earth's rotation prevent a westward launch. One solution would be to launch from a Florida site. Launching from this location will require a lot of planning and coordination and it should begin at once. In addition, this effort, whatever is required, will be worthwhile because many of the troubled areas in the world are located within the latitude band of 45 North to 45 South. It will also provide a launch capability throughout the year when sun angles, snow, and ice are a problem in the northern regions. The problem of location and composition of suitable recovery forces must be solved.

3. Flexibility in Launch Date:

The primary reason for delay would be the weather factors in the problem. As mentioned before the computer program should enable WECEN to supply us with better long range forecasts. It may also be necessary to delay launchings because of the presence of a solar flare. Much progress has been made in forecasting these

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phenomenon. Very accurate predictions should enable us to insure the recovery of payloads which previously would have been lost. However, detailed plans should be made with the other agencies to guarantee the availability of launch facilities to support priority satellite reconnaissance missions.

4. Flexibility in Lense-Film Combinations:

To be an operational vehicle with world-wide capabilities the requirement for greater latitudes in sun angles, cloud coverage, haze, industrial smoke, and camouflage must be met. Serious investigation into the advisability of employing color film and infra-red photography should be given immediate attention. Splicing various type of film for use over different areas of interest may provide the answer to part of this problem. Again the need for the development of a computer for use during an operation, that will help obtain better photography through the use of better sun angles and environmental conditions, should be given high priority. The need also exists to maintain in the inventory several different types of cameras and film which can be selected to provide the best photography at the least cost to fit the intelligence requirement.

5. Additional Operational Control:

To be fully operational more positive control of the camera must be made available to the commander. It is mandatory that an additional control station be completed in order that each pass can be individually controlled. In addition, it would be very advantageous to have in the system the option of selecting various portions of a pass rather than the pass in its entirety.

6. EWP:

As this program moves towards a completely operational capability the subject of satellite emergency war plan participation must be given more consideration. Here we have a means, perhaps the only means at this time, of obtaining photographic record of any international conflict which may engulf the world. In an atomic war perhaps this method will be denied us due to the high radiation levels in the atmosphere. But if this were the case, other reconnaissance vehicles will be similarly affected. This subject opens new avenues to the large problem of supporting and operating this program during periods of tension or during armed conflict.

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