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HANDLE VIA TALENT-KEYHOLE CHANNELS ONLY

HANDLE VIA BYEMAN CONTROL SYSTEM

~~1S1~~ NATIONAL RECONNAISSANCE OFFICE

WASHINGTON, D.C.

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OFFICE OF THE DIRECTOR

May 24, 1966

MEMORANDUM FOR:

STATE	-	Amb. Johnson
DOD	-	Mr. McNaughton
ACDA	-	Mr. Fisher
CIA	-	Mr. Sheldon
WHITE HOUSE	-	Mr. Keeny
	-	Mr. Charles Johnson
NASC	-	Mr. Welsh
NASA	-	Dr. Seamans

SUBJECT: Political Aspects of Disclosure of Space Reconnaissance Capabilities

The attached NRO evaluation has been prepared in response to Ambassador Johnson's memorandum of May 6.

Alexander H. Flax

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Director

Attachment
NRO Evaluation

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EVALUATION OF THE IMPACT

OF THE

PROPOSED NASA EARTH RESOURCES SURVEY PROGRAM

ON THE

NATIONAL RECONNAISSANCE PROGRAM

1. BACKGROUND

a. During the past year the NASA has been rapidly accelerating the study and planning activities for its Earth Resources Survey Program to evaluate the feasibility and practicability of using satellite systems to observe, measure and analyze resources and changing natural and cultural conditions on earth. Although this program involves the use of many different types of earth sensors, by far the most important and widely applicable sensors in the proposed NASA program are photographic in nature. The photographic sensor capabilities required by NASA, at least in the long run, generally overlap the quality of sensors used in the NRP and would provide data of significant military and economic intelligence value. This had led to serious concern on the part of the DOD over the impact of the NASA program on the security and viability of the NRP.

b. At the May 6 meeting of the NSAM 156 Committee which was convened to consider these problems it was agreed that the "NRO would undertake to evaluate the risks and costs of partial disclosure of surveillance capabilities (not of the NRP per se), with particular focus on the implied surveillance

capability of NASA's desired programs and the security implications of release of space photographic products of high resolution, and on the security of technology of space surveillance."

2. RELATIONSHIP OF THE PROPOSED NASA PROGRAM TO THE NRP

a. Sensor Type and Quality:

(1) Photographic - NASA has defined as its minimal requirement for the initial phases of the orbital experimental program beginning in 1966 the following sensors:

Multi-spectral synoptical cameras - 30 meter resolution

Wide-range spectral scanner - 200 meter resolution

These sensors, if held to the minimum resolution requirement, would be of considerably lower quality than any optical systems in use in the NRP. The plans for 1971, however, contemplate meeting resolution requirements which will involve the best technology of that time period. Since the best technology in camera optics which is likely to be available in this period will be that which is employed in the NRP, there is implied a virtually complete declassification of NRP sensors or a parallel development of sensors of equal quality.

(2) Infrared and radar sensors - Such sensors are not currently in use from satellites in the NRP, although some

have been used in aircraft. This is because the available resolution from orbital altitude would generally provide data of limited value, although with respect to certain specific intelligence targets (such as a large underground installation) IR sensors would be useful. In general, the technologically available resolutions which are proposed by NASA are considerably poorer than the photographic requirements discussed above.

(3) Radar: A synthetic aperture radar of the type listed in the NASA instrumentation specifications has been flown in a satellite experimentally by the NRO; the radar was operated, however, only over the United States. Although it appears that certain useful results could be obtained over denied territory, the requirement for active electromagnetic illumination which is, at least in principle, detectable has inhibited any plans for operational use of this sensor.

50X1

(4) Non-image forming sensors: The NASA plans also include sensors such as magnetometers, radiometers and gravity gradiometers which have no counterpart in the NRP and generally do not provide information which is directly of

intelligence value but which may in some instances have applications of military value.

b. Orbits:

All of the NASA manned space flight programs up to this point (Mercury and Gemini) have been flown on orbits below 30 degrees inclination so that no overflight of the Soviet Union occurred, although China was overflown. The proposed NASA natural resources survey flights which are planned to begin in 1969 will involve orbital flight inclinations up to 48 degrees. These flights will cover only the most southern part of the Soviet Union, but this coverage will cover some of the most significant areas from an intelligence standpoint, namely, Tyura Tam, Kapustin Yar and Sary Shagan. It is further planned that later in the program polar orbital flights will be undertaken. These will completely correspond to the orbits used in the NRP and will provide global coverage of all denied territories.

c. NASA Program Phasing:

(1) Phase I: As defined by NASA, Part (a) of this phase, which includes analytical studies, laboratory experiments and development of aircraft flight experiments to define the signature characteristics of the phenomena involved and the

sensor characteristics required for remote observations does not directly relate to NRP activities as long as sensor considerations are limited to examination of desired characteristics rather than evaluation or design of specific sensor configurations to meet these requirements. Phase I (b) which contemplates examination of data to determine its applicability to stated requirements and methodology for its use raises the question of what data already in the NRP should be released for this purpose since essentially all the available high resolution photography from space is the product of the NRP and is subject to TALENT/KEYHOLE security controls.

(2) Phase II: In this phase, Part (b) which contemplates analytical studies and planning of space instrumentation systems to obtain and process the required data definitely involves close interactions with the NRP and raises questions concerning the release of highly classified equipment for unclassified NASA programs.

(3) Phase III: This phase involves principally flight tests of instrumentation systems over calibrated target areas. If such instrumentation systems are limited to those required to obtain the desired resolution from airplane altitudes, NRP satellite equipment will not be involved and the required instrumentation will, at most, be affected by classification

at the military "Secret" level.

(4) Phase IV: This is the orbital flight phase and its initiation will involve, in increasing degree as it progresses, overlap with NRP activities.

3. RISKS:

a. The assessment of risk is necessarily a subjective matter and the impact of the NASA program will depend on many factors which are not presently well defined. Probably the most important of these is the international environment from 1969 onward. For purposes of this assessment, however, it is assumed that the present environment will continue with no significant change. In this environment it appears that disclosure of U. S. capabilities and intentions for orbiting reconnaissance quality sensors could seriously jeopardize the security and reliability of the NRP. It is difficult to define a precise resolution at which point this problem becomes serious. However, it appears possible to define a threshold of resolution at which orbital data collection would provide information of military intelligence value over a broad spectrum of targets. (For certain specific targets of isolated nature such as a very large radar antenna or an airfield location even resolutions

poorer than this threshold value could provide some military information). For the broad spectrum of military intelligence targets, the threshold appears to be at a value of resolution between twenty and thirty meters. It is not clear whether this threshold for military target information relates closely to a threshold for political sensitivity.

b. It appears that the risks involved, particularly those affected by international political factors, must be faced whether the U. S. reconnaissance activities are identified as a NASA "peaceful" program or not.

c. The risks may be divided into three major categories as follows:

(1) International political: The stimulation of ill-timed discussion of space reconnaissance activities in the international arena could produce unfavorable reactions from neutral, hostile or even friendly nations and could confront the Soviet Union with a condition in which it would be forced to take a hard position on observation satellites. Among the actions which might be triggered are increased political pressure to hinder observation satellite activity by discrediting it, agitation for imposition of international controls on satellite

observation activities, or proposals to consolidate national satellite reconnaissance activities into a single internationally sponsored and controlled program. It is conceivable that the latter proposal would be coupled to a stipulation that photography in the international program would be limited to specific areas approved by the nation being overflown. In any event, the legality of the existing U. S. program could be called into question at the outset of any international discussion.

(2) Passive control measures: Public disclosure of the scope or quality of current U. S. satellite reconnaissance activities could lead to cover and camouflage responses from nations being overflown. While such activities would probably not be feasible or adequate to cover the larger installations, it might be very successful in denying us the kind of information

[redacted]

With the present KH-7 much effort is expended in analysis

of photography in an attempt to derive information of the type exemplified above. The KH-8 with its [redacted] improvement in resolution will make possible the derivation of even more information of this kind. However, as the resolution becomes finer and finer, it becomes easier and easier, particularly for technical intelligence targets, to camouflage or cover the fine detail, hard though it may be to cover the gross outlines of large objects. 50X1

(3) Active countermeasures: The Soviet Union has been developing a network of large surveillance radars (Dog House and Hen House) which will provide orbital search and track capabilities adequate for an anti-satellite system. This system is expected to become operational initially during 1966. Although there is no solid evidence of the existence of a Soviet anti-satellite interceptor system, it must be recognized that such an interceptor, based on a nuclear kill capability, can readily be developed by the Soviets through adaptation of MMRBM or IRBM vehicles. Such a development would parallel our own development of the 437 satellite interceptor and could be accomplished in a relatively short time. In the longer range, but certainly by 1970-75, a non-nuclear kill capability could be achieved utilizing a terminal homing interceptor. Based on

U. S. studies, it appears that development of such a terminal homing interceptor poses no particularly difficult technological problems and that such an interceptor system could be operated at a cost per interceptor considerably less than the cost of the reconnaissance satellite being destroyed.

d. The present security policies of the NRP, which have been formulated to meet the requirements of national policy (as expressed in NSC action 2454), essentially are intended to minimize these risks by tightly controlling all information as to the existence, the extent and the successes of the NRP. These controls cover, among other elements, the identity and scope of specific observational and developmental programs, the U. S. state-of-the-art in observation sensors and related activity and the quality and quantity of photography being obtained. The proposed NASA program would certainly disclose at least the state-of-the-art in observation sensors and would probably result in some further leakage of information concerning the existence and activities of the NRP. Such disclosure would be occurring well in advance of any projected flight dates through the media of NASA-sponsored symposia on earth-sensing, requests for proposals, and requests for program recommendations and endorsement which are widely distributed throughout the scientific community. These activities, which

are in most cases conducted prior to actual initiation of funded programs, have led to a series of proposed studies, designs and experimental activities involving the use of reconnaissance sensors in earth orbiting satellites. This has resulted in wide-spread discussion and publication of earth-sensing satellite potentials, as well as statements of needed and obtainable equipment capabilities. NRP contractors have been among those solicited, since they are the obvious sources for equipments of the kind desired.

e. Thus the risks to the security and viability of the NRP which are engendered by the NASA program actually begin in the planning stage and intensify through the process of unclassified hardware development on through to the flight phase, at which point the political sensitivity is probably at a maximum. It must also be recognized that the conduct of photographic activities from satellites implies, in at least some degree, an interest in denied territories, since it is apparent to those of even a modicum of technical information that, where overflight is not denied, many of the high resolution photographic objectives of the NASA program could be achieved earlier and probably at lower cost through the use of aircraft.

4. COSTS:

a. Since satellite reconnaissance is probably the most important single U. S. intelligence source, it is difficult to assess an overall national cost which would result from an international situation in which the U. S. no longer found it possible to continue the program in its present form. At the very best, there could result from international deliberations an "Open Skies" situation. At worst there could result a situation in which all satellite reconnaissance was subject to specific approval of photography by the nation overflown. Between these limits lies a wide spectrum of possibilities. In general, however, except for the establishment of an "Open Skies" doctrine, all possible consequences involve either greater difficulties on the international scene for the U. S. or greater difficulties and costs in providing cover and continuing viability for satellite reconnaissance activities.

b. The possibility that other nations will make increasing use of passive control measures such as cover and camouflage could significantly decrease the intelligence value of information obtained from satellite collection activities, especially for the resolutions expected to be obtained with the KH-8 this summer. This in effect would negate in part the effort and resources which have been expended in the development of the KH-8 system.

A similar but lesser effect would occur even for the products of the KH-7 system. It should be noted that, even if we assume that the Soviet Union is well aware of the quality of our present reconnaissance photography, Communist China and many smaller nations are less likely to have such information in spite of the speculation on such matters which appears from time to time in the press. In any event, the public dissemination of high resolution reconnaissance products contemplated in the NASA program would dispell all doubt.

c. The effect of active countermeasures which, for the near future, would probably be restricted to those undertaken by the Soviet Union, could be substantial. In order to apply vulnerability-reducing measures which have been under development by the NRO, a substantial reduction in other satellite payload must be accommodated. These vulnerability-reducing measures include [redacted] 50X1 The amount of payload degradation would depend on the intensity of the threat, but in general, the reduction of normal on-orbit payload equates to a reduction in number of days in orbit with a consequent reduction in total intelligence collected. In the event that the Soviets developed and employed a terminal homing

satellite interceptor with conventional warhead in the 1970-75 period, the U. S. could be involved in an expensive game of measure and countermeasure which could easily double or triple the cost of the present satellite reconnaissance program.

d. Specific cost levels cannot be related directly to levels of disclosure since even a partial disclosure might have the same effect in the international political arena as a full disclosure. Disclosure inevitably faces the overflown nations with pressures to react which can move them to take unfavorable positions to the U. S. Nevertheless, it appears that the conduct of NASA satellite reconnaissance activities at resolutions no better than thirty meters and in orbits below thirty degrees would pose a minimum risk, and would in any event involve minimum cost to the NRP with respect to possible active countermeasures since the Soviet Union would not be directly involved. Extension of NASA activities to include higher resolutions and orbits of higher inclinations would increase the risks and potential cost to the U. S. In the extreme case, the U. S. might be faced with the alternatives of either continuing the NRP and facing the disapprobation of world opinion or discontinuing the NRP.

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