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MEMORANDUM FOR: Deputy Director for Science and Technology

SUBJECT : The NASA Earth Resources Survey Program (NERSP)

REFERENCE : Report of the NSAM 156 Committee on "Political and Security Aspects of Non-Military Applications of Satellite Earth-Sensing"

1. The Office of Special Projects (OSP) has conducted a review of the agreements and studies relating to the DOD/NASA coordination of the Earth Resources Program (NERSP).

2. Several years of study work has gone into the agreements. In addition to the NSAM 156 Committee, USIB, COMOR, the NRO, and a group known as the Survey Applications Coordinating Committee (SACC) have contributed memoranda on the subject of cooperation on DOD and NASA space activities.

3. Most of the studies relating to the use of KH photography or KH systems in the NASA Earth Resources Program have been written with the primary attention on security and, therefore, tend to be negative. The NSAM 156 Committee has recognized the potential benefits from a national standpoint and recommended further action on the part of the DCI.

4. The major objections to the use of KH satellite photography in the NASA Earth Resources Program have been:

a. Protection of intelligence sources and methods;

b. Cost and complexity associated with downgrading of TKH materials;

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c. Political problems emanating from officially acknowledged U. S. satellite reconnaissance.

5. The political issue in most cases has been interwoven with security matters, and hence a clear-cut U. S. Government position is not directly available. The NSAM 156 Committee report takes cognizance of the fact that the NASA-Gemini program and the weather satellites have both produced photography of large portions of the earth's surface. Although not covered in the report, it is noteworthy that the distribution of these photographs has been handled on a purely unclassified basis. It appears, therefore, that open satellite photography can be carried out without political repercussion under the proper circumstances. This is one of the underlying themes in the NSAM 156 Committee report. Our analysis of the problem has shown us that among necessary criteria are:

a. Scientific or humanitarian goals for the program and research rather than resolution objectives in the selection of the type of photography;

b. Large area coverages rather than point targeting. Camera programming, of course, is necessary since it would be undesirable to photograph areas of no scientific interest. It is clear, however, that for most research purposes a panoramic camera or framing camera is better suited than a strip or spotting type camera;

c. Coverage only of U. S. areas or foreign areas where cooperative research objectives exist and production and distribution of useful reports from the program.

6. From the criteria outlined, we have concluded that the TKH materials presently available would have only limited value in the Earth Resources Program. The photography is largely of the Sino-Soviet Bloc or of military targets in the non-Bloc areas. It has been taken for intelligence purposes and is black and white coverage repeated

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each mission in the same spectral band. It would appear, therefore, that the question of downgrading TKH material should be dropped, and that NASA should collect new coverages specifically selected for the earth resources analysis. This would vastly simplify security problems associated with the TKH control system, would avoid disclosure of targeting used on past TKH mission, would eliminate the cost aspects associated with the downgrading, and would allow from the outset an unclassified scientific atmosphere to the NASA program.

7. Because of its flexibility in handling multiple film types, and in producing multispectral black and white photography, the KH-4B system appears best suited of all existing or planned reconnaissance payloads for the earth resources tasking. This brings us to the difficult question; can the KH-4B system be used by NASA without loss of effectiveness for the intelligence programs?

8. The KH-4B system, although greatly improved in flexibility and reliability over the basic KH-4, is nevertheless viewed within the NRP and the intelligence community as a gap filler for the [redacted] The focal length of [redacted] limits the maximum attainable resolution of the KH-4B to approximately five feet from its minimum design altitude of 80 nm. Resolutions are degraded operationally by:

a. Altitude;

b. Scan angle;

c. Lens performance;

d. Weather;

e. Type film selected;

f. Spectral band selected.

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9. In the Earth Resources Program it seems certain that NASA would wish to make use of a combination of black and white, color, and the infrared color reversal films. Samples of earth resources applications using these film types are presented in the attached booklet. This work was accomplished on the EKIT Program conducted by OSP during the KH-4B development. The EKIT reports examined use of the alternate film types in intelligence applications. OSP has done a limited amount of work in spectral band separation and plans further work in this area during the KH-4B flight/test program. No spectral separation work is included, however, in the booklet. When used from altitudes of 100 nm or greater in an earth resources role, the system resolution of the KH-4B (with operational degradations) should be within the guideline set down in Recommendation 4 of the reference.

10. The NSAM 156 Committee outlined in their report a number of goals, suggestions and/or recommendations relative to satellite earth-sensing and the use of KH systems. A reasonable approach for cooperation between the NRO, CIA, and NASA on earth resources consistent with the national goals could be developed along the following lines:

a. CIA/DD/S&T/OSP could provide briefings for cleared NASA personnel on the EKIT Program and the applications of the KH-4B system to earth resources.

b. With NRO/COMOR support, the NASA interests in U. S. areas could be factored into the KH-4B photographic coverages. For an example, on Mission 1044, KH-4 photography was programmed to assist in assessment of flood devastation in Texas, to survey gold resources in Alaska, and to survey the area associated with a U. S. Army Corp of Engineers canal project proposed in the Great Lakes region. Stateside materials can be made available to selected NASA personnel at a Top Secret classification without requirements for TKH storage and control. Stateside engineering coverages are provided to selected contractor personnel at the present time under similar security arrangements.

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c. Unclassified coverages of U. S. areas of interest could be collected from aircraft and used by NASA personnel in developing the photo interpretation techniques necessary to carry out the earth resources analysis. The EKIT coverages shown in the attached booklet provide examples of such techniques.

d. By testing these techniques in satellite application on the stateside KH-4B materials, NASA could develop, on a classified basis, a realistic, organized, and tested plan for worldwide satellite earth resources photography. The plan would be directed toward independent and unclassified NASA flights beginning in 1970. The timing for public announcement of the program can be decided after the detailed plan is available.

e. CIA can procure, test, and deliver to NASA in 1970 several KH-4B payload systems. Cost of a KH-4B payload is approximately [redacted]. The payloads could be launched by NASA from the NASA Thor pads at Vandenberg as recommended by the NSAM 156 Committee. Air Force support could be provided in the area of tracking and recovery. NASA/Air Force recovery cooperation on an unclassified basis has already been accomplished on NASA's Biosatellite Program. As indicated in the referenced report, a cover story similar to the one used for the [redacted] cameras on the NASA lunar reconnaissance program could be developed for the payload. A DoD/NASA unclassified agreement would remove CIA participation from possible disclosure.

11. In 1970, the [redacted] and [redacted] systems will represent the state of the art in U. S. intelligence reconnaissance programs. Although the KH-4 system will continue in limited operational use, Soviet knowledge on its capability should not affect the reconnaissance efforts. Any of the KH-4B multispectral applications which may prove to have a uniquely valuable military application can be avoided in the NASA flight tests.

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12. A cooperative plan will result in not only substantial cost savings to the U. S. Government, but in savings of time and technical manpower. By allowing NASA to further the multispectral work already accomplished by the intelligence community, rather than begin from scratch with their own efforts, the intelligence community will realize reciprocal benefits.

13. The [redacted] can provide the necessary support to the DD/S&T in the coordination and conduct of the planning.

[redacted]

Attachment:
Booklet a/s

cc: ADD/S&T w/o att

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DAT: 6-4

Office of the DD/S&T

TO: D/OSP

SUBJECT: NASA Earth Resources Survey Program

ACTION

REMARKS:

I am returning the attached, with request that you hold it in your files for possible future use. As you know, I have had a number of recent meetings with NASA personnel, [redacted] and NRO on this subject. Our willingness to discuss proposals for use of existing hardware in future earth resource programs is well known. In fact, the Itek report you attached is a good example. I sent a copy of this report to [redacted] before he left offering any further briefing or details he might desire. I heard nothing more. Bob [redacted] attampted to brief some NASA types on crop photography and other related projects but they showed no interest. I think the facts are clear. NASA first and foremost is looking for reasons to develop new satellites and any thought of using something already developed runs counter to their whole scheme. With new players in the act this attitude may change but I doubt it.

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Office of the DD/S&T

TO:

SUBJECT:

ACTION

REMARKS:

Since I don't think it appropriate for us to shove anything down their throats, I think we should sit back and watch for a while.

My detailed briefing to [redacted] gave him ample opportunity to follow up and I think it is clear now thats their nickel.

DD/S&T

DUE DATE: _____

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