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THE NRO STAFF

October 2, 1969

NOTE FOR DR. MC LUCAS

Attached, for your signature, is a proposed memorandum for the Executive Committee. The paper addresses the subject of guidelines for NASA earth-sensing activity, discussed briefly in your September 16 meeting with the Executive Committee.

William R. Yost
Colonel, USAF

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OFFICE OF THE DIRECTOR

MEMORANDUM FOR MR. PACKARD
MR. HELMS
DR. DuBRIDGE

SUBJECT: Guidelines for NASA Earth-Sensing Activity

At the Semptember 16 meeting of the Executive Committee, we discussed the current guidelines for NASA activity in earth sensing. The question arose as a result of recent inquiries by NASA concerning possible experiments with the MOL/DORIAN Acquisition and Tracking System (ATS) and the possible role of NRP developed capabilities--technology and facilities--in NASA's development and testing of large optics.

I have described in the paragraphs which follow, the basis for these guidelines, their current format, our practical experience in the review of NASA effort in this area and some recent action I have taken in this regard.

The current guidelines for NASA satellite-borne earth-sensing activity are based on an agreement of August 24, 1965 between Dr. McMillan (then DNRO) and Dr. Seamans (then Associate Administrator of NASA).

This agreement defined those NASA activities which would be subject to a review by the Director, NRO Staff and a small committee within NASA reporting to Dr. Seamans. The definitions agreed to were these:

> An activity is defined as the expenditure of NASA research and development money with a university or industry, or the transfer of NASA money to another government agency for spending in this way. The activities to be brought to NRO attention are those involving

the study, design, development, fabrication, or test of reconnaissance-like sensors, or significant components thereof, for use in orbital systems, or studies of the use of such sensors in orbital systems.

A reconnaissance-like sensor is defined to be an image forming sensor having an angular resolution of 0.1 milliradian or finer, or an optical or infra red image forming system with a physical aperture greater than 30 cm. and an optical figure controlled to better than 1/4 wave length.

Other possible activities of technical interest to the NRP included the development or test of pointing, tracking, and stabilizing techniques, or systems to be used with satellites bearing high resolution sensors, in which the pointing accuracy was better than 20 microradians or the unstabilized rate was less than 20 microradians per second. NASA activities in this area were also to be brought to the attention of the DNRO.

As a result of a growing interest in NASA investigations of the potential for earth sensing from satellites and the possible application of these techniques, the NSAM 156 Committee was asked to meet, in April 1966, to review the national security problems raised by NASA's proposed earth-sensing program. The Committee reported its recommendations to the President on July 11, 1966. Key among the recommendations were these:

1. The NRP should be protected by continuing to consider carefully the political and security effects of proposed unclassified earth-sensing activities prior to their authorization.

2. At present, and for the next several years, from the standpoint of political and security considerations there is no objection to NASA proceeding with its tentatively planned experimental program, complying with the limitation previously established between NASA and the NRO.

3. In discussion of the use of observation satellites for natural resources purposes, NASA should, for the next five years--subject to future review and possible revision of guidelines--restrict its discussion of future systems to those involving ground resolution of 10-15 feet.

Recognizing the necessity for conducting its Earth Resources Survey Program in such a manner as to continue to avoid placing the NRO in jeopardy, NASA proposed that its program go forward under a special NASA-DOD coordinating and monitoring mechanism, governed by the specific guidelines, criteria and ground rules established in the McMillan-Seamans agreement of August 1965 and endorsed by the NSAM 156 Committee in July 1966. A review mechanism was formally established as a NASA-DOD committee and designated the Survey Applications Coordinating Committee (SACC), to report directly to the Manned Space Flight Policy Committee whose functions were expanded to include the responsibility for top policy determination on matters concerning mutual participation in and support of the programs of DOD and NASA.

The NASA-DOD SACC was to provide a detailed and continuing review, coordination, monitoring and control of NASA activities that related to the NRP.

NASA activity in the earth-sensing area has been reviewed continuously since early 1966 by this Committee within these general guidelines. The somewhat unrealistic restrictions imposed previously on astronomical experiments have, for practical review purposes, been removed. Astronomical experiments have been recognized as intrinsically non-provocative to other nations and have been reviewed for some time in this context.

As a matter of practicality, the SACC has for some time used a ground resolution of 20 meters (from any altitude) rather than the previously defined angular resolution, as a criterion for defining reconnaissance-like sensor performance.

Pursuant to the NSAM 156 Committee recommendations of July 1966, the SACC has, in reviewing plans based on NASA documented needs for future earth sensing systems, used a 5 meter ground

resolution (from any altitude) as the criterion for sensitive imagery.

NASA activity in the earth-sensing area has proceeded, virtually uninhibited, within this interpretation and application of the established guidelines.

In early May of this year, I proposed to the SACC a formal revision to the existing guidelines which I felt would allow a more realistic and practical approach to controlling NASA effort in this area. I consider the revised guidelines to be in complete accord with both the established national policy objectives and the security policy guidance of the DCI. Moreover, they afford the advantage of an essential early SACC involvement in the continuing review of NASA activity to insure the protection of the NRP, yet facilitate NASA's efforts in this area.

Essentially, the proposal would:

1. exempt from SACC review NASA astronomical experiments as non-earth-looking efforts,

2. define the limitation of product quality in current NASA programs in terms of ground resolution (20 meters from any altitude) rather than angular resolution,

3. confirm a 5 meter ground resolution (from any altitude) criterion for sensitive imagery for NASA planning of future earth-sensing systems,

4. remove the limitation on optical and image-forming systems with a physical aperture greater than 30 centimeters or sensors with an optical figure controlled to better than 1/4 wave length.

These revised guidelines have been reviewed by the NASA-DOD Survey Applications Coordinating Committee and are being submitted to the MSFPC for review. I anticipate no difficulty in obtaining MSFPC approval of the revised guidelines and expect their implementation within the next few weeks.

The current guidelines do not impede NASA's immediate plan to study the applicability of the ATS and associated hardware to the Earth Resources Survey Program. We have agreed that NASA should proceed with these studies. Should NASA find it desirable to make use of the ATS, it will be necessary to re-address a number of policy questions.

NASA's planned effort in very large optics for astronomy can, of course, proceed within the current guidelines.

John L. McLucas