~~TOP SECRET~~

HANDLE VIA [redacted]
CONTROL SYSTEM

~~(S)~~ NATIONAL RECONNAISSANCE OFFICE
WASHINGTON, D.C.

THE NRO STAFF

17 August 1977

NOTE FOR DR. MARK

While I realize that you did not ask for arguments against an overt treaty verification satellite, I believe this paper contains enough food for thought possibly to be of use to you. In the interest of time I am forwarding it, so there will be a few hours to respond to further information you may want for your Friday discussions.

[redacted]
WILLIAM L. SHIELDS, JR.
Brigadier General, USAF
Director

HANDLE VIA [redacted]
CONTROL SYSTEM

CLASSIFIED [redacted] EXEMPT FROM GENERAL [redacted] SCHEDULE OF EXECUTIVE ORDER 11652 EXEMPTION CATEGORY 5B2 DECLASSIFY ON NRP DET.

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WASHINGTON, D.C.

THE NRO STAFF

17 August 1977

MEMORANDUM FOR DR. MARK

SUBJECT: Unclassified Arms Control Satellite (UACS)

The NRO Staff, with input from Programs A, B, and C, has reviewed the concept of "Open Skies" and a potential "Unclassified Arms Control Satellite" and finds them not in the best interest of the United States. While technologically feasible, at some substantial cost, the development of a UACS, either unilaterally or jointly with the Soviets, could threaten the ability of this government to continue collecting useful intelligence from space.

The technical parameters for a UACS can generally be gleaned from a recent DCI Memorandum[1] entitled "Imaging System Matrices" which outlines requirements for SAL and MBFR treaty monitoring as follows:

AGREEMENT	QUALITY AVG NIIRS (BEST)	TIMELINESS	FREQUENCY OF VISIT	VOLUME OF IMAG	TYPE OF COVERAGE
SAL	4-6 (7)[2]	Weeks-Months	Periodic	Large	Area + Targets
MBFR	4-6 (7)	Days-Months	Daily to Periodic	Limited	Area + Targets

A further design inhibition is the desire to minimize the amount of [redacted] technology/capability that might be compromised t[redacted]evelopment of a UACS.

Operating under these constraints, several NRP systems or derivatives present themselves as candidate UACSs:

1 Memorandum for PRC(I) [redacted]270-77, 4 Aug 1977
2 Memo states that SAL also requires precise mensuration

[redacted] CORONA QUILL

[redacted]

[redacted]

d. CORONA Revival: "Resurrecting portions of the CORONA program, while expensive, would provide five to seven feet resolution from an 82 mile orbit. The PINTO concept, a CORONA system with six or eight recovery buckets, has been studied in the past. Similarly parts and pieces of the old SAMOS technology is available at NRP contractors.

[redacted]

An alternate approach would be to develop the UACS from NASA activities, decoupling it entirely from the NRO or the NRP. This would insulate [redacted] technology and experience somewhat; people would clearly have to appreciate that the UACS was not a reconnaissance system but

rather a remote sensing observation satellite. NASA could develop and launch the UACS for ADCA using its work on meteorological satellites for NOAA as a model. Candidate options for a NASA-developed UACS include:

a. LANDSAT D: The multispectral scanner (MSS) is projected to provide visual images in five bands at 80 meters spatial resolution. A thematic mapper (TM) is planned to provide six bands of 30 meter spatial resolution. While these capabilities appear unacceptable for treaty verification purposes, a decision to pursue UACS could lead to greater performance.

b. SEASAT B: In cooperation with the Tracking and Data Relay Satellite (TDRS), SEASAT B could provide radar images with 25 meter spatial resolution. The 25 meter limit is a procedural constraint; ten meters is the technical limit. Although currently designed for ocean use, SEASAT could and will be used equally well over land.

c. Space Telescope Program (STP): NASA's newly awarded STP could be modified to point toward earth. The STP's 94 inch diameter mirror is theoretically capable of three to five inch ground resolution if flown in a 145 mile orbit. Using the TDRS, the STP as a UACS could provide near real-time verification.

d. Shuttle Imaging Radar (SIR): Using STS as a platform, joint US-USSR crews could provide verification services in a manned-UACS concept. The currently planned SIR could be coupled with the 15 meter camera used on SKYLAB to provide a multispectral approach to the problem.

A final approach to the treaty verification problem would be to specifically delimit the mission and function of a given UACS. Consider, for example, a potential arms limitation agreement for the Indian Ocean. The key provisions in such an agreement would be concerned with limiting the presence of US and Soviet surface combatants in the treaty area.

A jointly developed and operated "radar Indian Ocean surveillance satellite system" could be an acceptable monitoring tool. Such a jointly developed space system could be launched by either the US, probably on the shuttle, or the Soviet Union, or by both if a multiple spacecraft

operation is envisioned. Readout might be to US and Soviet ground stations. If the littoral states are involved in an Indian Ocean arms limitation agreement (at least as interested third parties), one or more ground stations for readout only (not for spacecraft control) might be deployed in key littoral countries. The ocean surveillance radar could be based on state-of-the-art technology of low security sensitivity: Performance could be gated to be sufficient to reliably detect only destroyer escort-sized and larger surface combatants. Applicable technology is already incorporated in the Soviet RORSAT. Features which might be added to such a scheme encompass ship unique transponders which all US and Soviet combatants in the Indian Ocean would have to carry. Such transponders would, upon being illuminated by the orbiting radar, identify the radar return uniquely. This information could be encoded if desirable, so that this ship unique identifier would be only available to the US and USSR (not the PRC, for example). An obvious weakness, however, would be the ease with which a ship could turn off its transponder and change positions, later claiming innocently that it was BOFM (e.g., Beacon Off For Maintenance).

In summary, there seem to be several technically feasible methods of achieving a reasonably usable UACS without having to reveal the latest [redacted] technology in the process.

More important than mere technical issues, however, are the substantial non-quantifiable risks that can be foreseen with an Open Skies or UACS proposal.

The verification of arms control agreements may be said to have three distinct purposes:[3]

First, verification serves to detect violations of an agreement (or to provide evidence that violations may have occurred), and hence to furnish, as far as is possible, timely warning of any threat to the nation's security arising under a treaty regime.

Second, by increasing the risk of detection complicating any scheme of evasion, verification helps to deter violations of an agreement. The deterrent value of verification depends to a considerable extent on a potential violator being ignorant of the exact capability of the

3 "Arms Control Report", US Arms Control and Disarmament Agency, Pub 89, July 1976, p 55.

intelligence techniques used to monitor his compliance with an agreement--a fact which helps to explain the importance of secrecy regarding many of these techniques.

Third, verification serves to build domestic and international confidence in the viability of an arms control agreement. By providing evidence that the parties to an agreement are in fact fulfilling the obligations they have assumed, verification contributes to mutual trust among the parties and helps to create a political environment necessary for further progress in arms control. At the same time, it provides an important safeguard against wishful illusions and against possible manipulations of an atmosphere of trust in the pursuit of unilateral advantage.

An unclassified arms control satellite (UACS) would not serve the first purpose because its capabilities would be known to the Soviets, might marginally contribute to the second, and could serve to a limited extent the purpose of general confidence building implicit in the third purpose.

These potential benefits, however, are overshadowed by the serious costs surrounding a UACS. Financially, UACS concepts have been estimated at between [redacted] to procure and deploy. Continued operational (recurring) costs could also be large.

However substantial, "financial costs" represent only a small part of the picture. A UACS might significantly impact the current foundation of verification by national technical means (NTM). There are two major areas of concern: first, the process of defining and negotiating a "verification satellite" could lead rapidly to the Soviet position that identifiable and limited performance criteria can and must be associated with specific treaty provisions, and that better performance is not required for verification and, hence, is spying. For example, the assertion might be made that the detection and counting of ICBM silos can be satisfied with 5 foot GRD and any resolution better than that is clearly for the purpose of intelligence gathering, not for treaty verification. Second, the existence of UACS would appear to undercut the protection afforded to NTMS by noninterference treaty language. Any noninterference assurance would likely be narrowed to apply only to assets for verification (i.e., UACS). Thus, the consequences of ACDA's having its own verification satellite may be that the United States has no other.

Regardless of which UACS concept was advocated, there would continue to be a requirement for other [redacted] satellite systems to resolve ambiguities, verify violations and insure treaty compliance. US experience with compliance issues demonstrates that they frequently involve ambiguous practices that cannot be clarified by photography alone. Higher resolution photographs and possibly SIGINT and COMINT will be needed by both sides. Neither the Soviets nor the US will believe that the UACS is sufficient in and of itself. Without the implied protection of an ambiguous NTM definition these satellites might be even more vulnerable to interference than is currently the case.

Touting an unclassified verification satellite could lead to a public misconception that UACS is the US means of verification, particularly if we continue to protect the existence and status of the other systems being used for verification. In effect the UACS, as a symbolic satellite, could eventually be construed as a mass deception to the US public and the world by the Government of the United States.

Finally, a detailed knowledge of the capabilities and limitations of the UACS would allow the Soviets to develop an optimized camouflage, concealment and deception program. A unilateral US UACS would bound the Soviet cheating threshold allowing them to better expend their CCD resources. It would also reveal to them our perception of politically important targets in their country and allow them to tighten up the facilities or disperse their functions.

For these reasons a unilateral UACS seems ill-fated. A recent interagency intelligence memorandum[4] declared: "It is our judgment that unless the US worked with the Soviet Union to jointly create an open-skies type of photoreconnaissance system, the Soviets would consider such a move to be both strategically threatening and politically embarrassing. Under such circumstances, there is a high likelihood that they would take aggressive actions to aggressively disrupt the system operation. The Soviet Union could claim its actions were taken on behalf of the many, or it could simply assert that it must protect itself from illegal intrusions. The exact form of the Soviets' reactions could vary from political harassment to overt interference depending on how they read world opinion."

4. IIM: Possible Soviet Reactions to US Space Systems and Policies in Peacetime (draft), TCS-889180-77/3, pages 76-78

An alternative to the unilateral UACS would be a joint US-USSR UACS program. While the Soviets will still learn our targeting priorities and may, from close association, compro- [redacted] in film, optical system, [redacted] as a "team player" they would be unlikely to castigate [redacted] some way harm the UACS concept. If a skillful program or blatancy avoidance was followed it might be possible to achieve a joint UACS without offending the sensibilities of conservative Americans, the Soviet citizenry and third party nations.

More likely, the establishment of a publicly-acknowledged superpower photo satellite cartel could be politically unacceptable as countries and their political leaders sought to protect their sovereign rights and proprietary interests. This could increase the scope and fervor of the international debate about unauthorized data gathering already in process in the UN with respect to earth resources imaging satellites, as much negotiation is based on one country not being totally aware of crop failures, national disasters, mineral resources, [redacted] compelled to react to official acknowledgement of overflights by US and USSR espionage satellites.

If, for example, the UACS imaged areas other than the US-USSR and released photography or radar images of one country committing an aggressive act against another nation it is conceivable that such photography would be far superior to that which both aggressive and defending nations might be able to collect with their own resources. Therefore, the possession of such photography by the aggressive nation would constitute an excellent BDA tool and could result in even more accurate and effective aggressive acts. We, therefore, could become an unwitting collaborator to the aggressive act and might have to share the burden of guilt for the damage inflicted on the defending nation.

Satellite photography (and radar imagery more so) is both ambiguous and controversial. "Interpretation" of such photography/images could emerge as a source of controversy so large as to overshadow any real or imagined benefit from UACS. It is not clear that public disclosure of UACS products would substatially change the overall public confidence in the US

As we discussed yesterday, one can conceive also of a secret bilateral arrangement (NOFORN except USSR)

intelligence collection process. Both the public and our allies appreciate that NTM is a euphemism for sophisticated satellite reconnaissance vehicles. The Soviets, however, have never had to formally acknowledge that their prime rival is overflying their homeland. (Neither have we had to explain to our populace why we can do nothing about espionage satellites which spend their time ferreting information from high above the atmosphere over Davenport, Iowa.) Non-judicious, unclassified release of UACS data could lead to spurious amateur assessments by the public and maybe even panic should an overzealous press conclude an attack was imminent. The Soviets have never accepted on-site inspection either, yet a jointly manned UACS station or perhaps a UACS ground site in the Soviet Union would amount to the same thing.

The likelihood of the Soviets agreeing to a joint UACS program appears remote. The IIM[5] draft states: "We seriously doubt that the Soviets would agree to the idea of a joint open-skies program. Their very serious activities in the UN regarding both the ground resolution problem on earth resources systems and the requirement for prior consent before distributing remotely sensed data both indicate a strong national desire to protect themselves from worldwide observation. Official and public discussions of this topic could lead to UN activities, perhaps coupled to the Landsat issues, raising the prospect of an international restrictions on sensing from space of another nation's territory or limiting dissemination of the derived data. Both the US and the Soviet Union would suffer from such activity."

In our judgment, therefore, the concept of a UACS should not be pursued. The identified substantial costs--both quantifiable and unquantifiable--far outweigh the potential benefits.

WILLIAM L. SHIELDS, JR.
Brigadier General, USAF
Director

5. Ibid. p 78