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13 January 2016

It has recently come to our attention that there were discrepancies in the redactions to a document recently released to you and those found in prior released versions of the document entitled "Final Report: National Reconnaissance Program Task Force for the Director of Central Intelligence."

We apologize for this error, and have prepared a revised version that reflects the fullest release of material. We have enclosed the revised document for your records, and hope to post the document on our website at some point in the future.

Sincerely,

Patricia B. Cameresi
Chief, Information Review and
Release Group

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[redacted]

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NATIONAL RECONNAISSANCE PROGRAM TASK FORCE

Final Report: National Reconnaissance Program Task Force for the Director of Central Intelligence

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Final Report: National Reconnaissance Program Task Force for the Director of Central Intelligence

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Final Report: National Reconnaissance Program Task Force for the Director of Central Intelligence

Introduction

You have asked us to review and make recommendations to you regarding the overall direction of the National Reconnaissance Program (NRP) in time to be useful for your deliberations on the US fiscal year 1994 budget and five-year program. (The Terms of Reference are in Appendix A under separate cover.) In the six weeks available to us, we have done our best to evaluate the total system architecture for overhead imagery intelligence (IMINT), signals intelligence (SIGINT), measurement and signature intelligence (MASINT), and related communications as thoroughly as possible. We have outlined a strategy for overhead reconnaissance based on a reduced set of programs. Our assessment is that this reduced set will support the basic needs of the National Command Authorities (NCA), policy makers, and several sets of operational users, particularly including military commanders, with one important exception: broad area synoptic search. We recommend an addition to this set of programs to meet this need. Throughout, we have balanced the ways in which space-based and non-space-based collection could meet our intelligence needs, considering both effectiveness and economy of effort.

Much useful preparatory work had been completed, and more was under way as a result of other reviews that the National Security Council (NSC), you, and the Director of the National Reconnaissance Office (NRO) have initiated. We have drawn substantially from these efforts and have been aided by a series of briefings and discussions with the key participants.

We have begun from an understanding that intelligence needs are changing substantially as a result of the collapse of the Soviet Union and the momentous events of the last few years. The risk to the nation of failing to detect any single event will be less cataclysmic than would have been the case when our concern was focused on the USSR; most would agree that there is no single development today that would deserve the attention we once focused on potential Soviet strategic weapons breakthroughs. But this does not radically simplify the task of intelligence collection in general or of overhead collection in particular.

It does change the focus of overhead collection and the nature and use of some collection tools. As a result of these developments, some intelligence tasks are declining in importance, even nearly disappearing; examples are (b)(1)1.4c [redacted]. Other tasks are declining because of technical developments unrelated to the Soviet collapse— [redacted] (b)(1)1.4c [redacted] Therefore, some traditional collection tasks, for which we have heavily used overhead systems, will migrate to other methods of collection—for example, (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) PL 86 [redacted]

We want to stress that the uncertain nature of the world that is emerging from the end of the Cold War puts a heavy premium on the flexibility of intelligence collection methods. Flexibility is vital in order for us to be able to deal with unexpected developments that can be taken as seriously hostile to our national interests in a range of ways. Proliferation of weapons of mass destruction, narcotics production and smuggling, economic challenges, and other concerns are currently prominent. But the key point is that the focused and, in many cases, rather specific intelligence collection needs of the past [redacted] (b)(1)1.4c [redacted] are being replaced by issues and concerns with less specific

addresses—in geography and in frequency along the electromagnetic spectrum. We have thus been especially mindful of the importance of being able to focus upon different regions and on new sources of intelligence as unexpected needs arise. We must do this while still paying an appropriate degree of attention to the territory of the former Soviet Union because of the potential instability and large number of armaments there.

Another general concern has been to ensure that intelligence collection be useful to a wide range of consumers, from the President to the commanders of small military units in the field. This must be available across the full spectrum from peace, through tension and crisis, to the use of military force. One important development in recent years has been the increasing value and use of collection from NRP systems in the support of military operations.

(b)(1)1 4c

[redacted]

Our intelligence collection assets also need to be capable of dealing with more than one crisis at a time. (b)(1)1 4c

[redacted]

Throughout this review, we have felt acutely the need to be fiscally conservative in what we recommend. Yet the panel is of the view that, although it is unrealistic today to expect anything other than some decline in the resources devoted to intelligence collection, an excellent case can be made for that decline being substantially less than the decline in spending on national defense in general. The leverage that intelligence, properly disseminated and used, gives to the consumers of intelligence—especially as a force multiplier to the military—strongly suggests the increased utility of intelligence in the post-Cold War world. Although substantial reorientation is needed, it by no means suggests that there should be, overall, a proportional decline in intelligence resources. Quite the contrary.

We have tried to make recommendations, and we believe that we have succeeded, which will save intelligence collection resources compared with a program of proceeding with the NRP as most recently set out in the President's program. We have done so by recommending the excision of some collection tasks and even some entire types of existing and proposed collection systems. We believe that some of these tasks would be useful to perform and that these systems would also be useful; on balance, however, we believe these functions can be handled adequately in these new world circumstances with the alternate methods we recommend.

We would stress that the basic architecture we recommend, in our judgment, comprises the fewest number of both satellites and satellite types needed to respond adequately to the overhead collection component of the nation's intelligence needs for the foreseeable future.

Finally, we have devoted considerable attention to the industrial base for the NRP. In many ways, this industrial base is at the heart of a key aspect of this country's predominance in space—a predominance that we believe constitutes a unique strength for the nation. Further, predominance in space-based reconnaissance provides the United States with an extraordinary instrument in our relations with the rest of the world. We should strive to sustain this predominance in the actions we now take with respect to NRP investments. Although several other programs—such Air Force systems as MILSTAR, DSP (Defense Support Program), and others—also provide support for the industrial base, many of the technology and production techniques that have pushed the state of the art across a whole spectrum of unmanned space capabilities are generated by the

NRP. NASA's focus on manned space flight and one-time experimental programs in recent years has further moved the NRP front and center as far as the nation's industrial production base for unmanned space flight is concerned. A wise reduction in the NRP cannot be made without paying attention to this industrial base and to the critical functions that it must retain as it, too, shrinks. Our recommendations point toward a concentration in the NRP on only four principal satellite collector types—two to collect imagery and two to collect SIGINT. In such a reduced architecture, the remaining industrial structure must be carefully managed by the NRO in order to maintain efficiency and retain vital technical personnel and functions.

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6, (b)(3) PL 86-36, (b)(1)

We should point out four general complexities that we faced in making this assessment. First, there is a multitude of interrelationships between the different sources of intelligence. A clear and single line cannot be drawn between a collection system, acting alone, and an intelligence end product.

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6, (b)(3) PL 86-3

NRO has generally, over the years, had both the funds and the foresight to design collection systems (b)(1)1.4c

With some modification and modernization, we believe that it will be quite reasonable to use existing satellite systems even more flexibly to fulfill the new functions that are needed in the post-Cold War world. Ideal new designs would theoretically, in some cases, provide superior performance. The research and development (R&D) cost of wholly new satellite systems is so substantial, however, that we have chosen instead the path of steady evolution of a limited number of basic collection types. We thus present solutions that are less capable, but also less costly, than ideal systems. We have generally opted for elimination of some programs and for evolution and adaptation of the remaining ones to the new shape of collection needs, not for new starts. It is the very high nonrecurring development costs of new systems, not any lack of faith in the capacity of the NRO or industry to work their customary technical miracles, that have driven us in this direction.

Third, we have tried to consider the rest of the intelligence process downstream from collection. Although our principal focus has been on the NRP and hence on collection, we have done our best to consider the implications of inadequacies and required improvements in production and distribution of intelligence. To focus collection properly, it is clearly vital to consider the needs of the final users of intelligence, whether the President or a commander in the field, and to recommend directions in collection that can be most readily and usefully exploited.

Finally, we have studied, and our recommendations have been influenced by, the Intelligence Community's requirements process. But we have by no means simply taken the most recent outputs of that process and tried to recommend a way to satisfy all, or even some fixed share, of them. Much of the requirements process deals with operational requirements, or the tasking of existing collection systems. As such, these requirements indicate the proper direction for developing and acquiring future intelligence collection systems only very indirectly—to about the same extent that the Single Integrated Operational Plan (SIOP) indicates the proper direction for strategic force planning. Simple extrapolations from these current tasking requirements to future force requirements for a suite of collection systems is often not much more useful. It tends to produce a fiscally unmanageable wish list: a sky filled with satellites.

Consequently, we have sought to make judgments about the nature of future intelligence needs (a term we prefer to "requirements" to avoid the implication that we have become enmeshed in the process set out in the previous paragraph) based on our own assessments of a mixture of factors. We have begun with NSR-29, NSD-67, the *National Security Strategy of the United States: 1991-1992,* and your 10-year guidance. We have then tried, as best we could, to match those future needs with intelligence collection methods that may satisfy them, given all the uncertainties and vagaries described above.

We would not want to leave the impression that only difficulties and problems have dominated our deliberations. There are some exciting opportunities for using the remarkable assets developed and operated by the NRO to promote the goals and objectives of the United States in innovative and effective ways. We have thus made some suggestions about the extraordinary promise of the accelerating technological revolution in information processing and dissemination.

We have sought, in light of all these considerations, to make recommendations for the general direction of the NRP that would give us both the maximum return for the funds spent on intelligence collection within that program and the maximum leverage for us as a nation over those matters that affect our security.

Future Needs and Collection Methods

The intelligence apparatus exists to serve the national security interests of the United States. The most recent expression of this is the *National Security Strategy of the United States: 1991-1992*, as defined by the President. The challenge before us is to address directions in national security following the collapse of the USSR and world communism and the worldwide fallout from these developments. We realize that, more and more, the important dimensions of our national security will be set by economic and political factors in the future, as well as by military factors. In addition, it is clear that in the aftermath of the Cold War, the military factors themselves take on a considerably different cast. We also paid close attention to the intelligence needs associated with global issues such as the proliferation of weapons of mass destruction, narcotics, terrorism, and the environment. To assess the impact of all these concerns on intelligence needs, we reviewed and used the results of NSR-29. (The foundation upon which our approach is based is set out in more detail in Appendix B under separate cover.)

For purposes of this report, we grouped intelligence needs into three broad categories:

- Intelligence that provides indications and warning (I&W) of emerging threats to our security—both strategic and regional.
- Intelligence that supports policy makers in developing and executing plans and policies in several areas—economic, political, defense, and global issues.
- Intelligence that supports crisis management and the use of military force, nationally or in coalition arrangements.

After making our best assessment of the needs of the consumers of intelligence who deal with these national security matters, we have set forth our judgments about the future directions for overhead intelligence collection that stem from these needs. We are aware that some important types of intelligence are increasingly likely to come from sources other than overhead collection and that overhead systems are costly. We have also focused, however, on overhead collection's unique attributes.

These attributes are of substantial importance to the nation. Overhead collection of intelligence can provide *assured access to denied areas* that today include, for example, the test, production, and storage facilities of countries developing weapons of mass destruction. Overhead collection also plays a major role in effectively monitoring compliance with arms-reduction treaties and other international agreements that affect our security interests. It is *nonintrusive* and has the potential to be covert, thereby limiting the risk to human life and political embarrassment that can attend other types of collection. It provides *timely* intelligence on a *global scale* across the spectrum of political, economic, and military interests and has particular application for crisis management because it has the *flexibility* to provide *focused coverage on a frequent basis*. The collection of information from overhead assets provides a *highly credible* set of facts to policy makers and has often been the sole basis for influencing policy decisions or for altering strongly held positions. Perhaps most importantly, overhead collection provides both *broad area and distributed point coverage* that permit a wide range of assessment and analysis.

IMINT

From the days of the first U-2 flights over the Soviet Union and the first reconnaissance satellites, overhead imagery has been a major component of intelligence collection vital to the security of the United States. There are some salient questions about imagery today, however, in view of several developments: the decreasing importance of

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

(b)(1)1.4c

We believe that there is a clear and compelling need for (b)(1)1.4c, (b)(3) 10 USC 424, (b)(1)1.4e, (b)(1)1.4g

(b)(1)1.4c, (b)(3) 50 USC 403, Sec 6

After much discussion, it is clear to all of us that most of these needs—including search—can only be satisfied by relatively high-resolution imagery with frequent revisit. There is increasing pressure from intelligence analysts and consumers for higher quality imagery than previously available, and this pressure has substantial reasons behind it. The complexity of modern targets in many cases today necessitates

(b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6, (b)(1)1 4c, (b)(1)1

(b)(1)1 4c

(b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

(b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6, (b)(1)1 4c, (b)(1)1 4

(b)(1)1 4c, (b)(3) 50 USC 403, Sec 6

Technology in ground processing of imagery data is offering significant new capabilities. Computer-based image processing architectures offer substantial advantages in processing flexibility. Ongoing initiatives in both (b)(1)1 4c, (b)(3) 10 USC 424, (will add capacity, improve responsiveness, improve image quality and utility, and allow the production of

(b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

We applaud this effort. The ongoing NRO study to evaluate commonality in processing architectures shows great promise for significant cost reduction and performance improvement.

(b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6, (b)(1)1.4g

(b)(1)1.4c, (b)(1)1.4g, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6, (b)(1)1.4g

alternative would suggest, over the long run, a modest increase in vehicle production rate, recognizing the need for fiscal constraint, but would both ensure a high probability of (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC collection. This would result, ultimately, in a change (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

The flexibility that exists in (b)(1)1.4c, (b)(and the much greater flexibility that can be added to it suggests its continuation– (b)(1)1.4c, (b)(3) 10 USC 424 –as the principal overhead imagery system. The (b)(1)1.4 (b)(1)1.4c, (b)(capability will extend the performance of (b)(1)1.4c, (b)(3) 10 USC 424, (b) with the addition of an (b)(1)1.4c, (b)(3) 10 USC 42 The NRO has established an evolutionary path for the insertion of improved capabilities into these systems to improve substantially their performance in several important ways. We do not believe that the deployment of an alternative or wholly different satellite imagery system in addition to these (b)(1)1.4c, (b)(3) 10 USC 424, (b) would be desirable, much less worth the substantial added cost to develop and maintain a separate system. Our analysis of two-tiered imaging concepts revealed that there are some technically credible options for medium-NIIRS systems, but it is our strong view that the current and future imagery requirements for the United States are best served by the flexibility of the (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 4 systems. In imagery, we recommend concentrating on enhancements to current collection systems, not the introduction of new ones, in order to save development and infrastructure costs. We discuss below, however, some possible international applications of systems designed solely to collect lower-quality imagery.

Indications and Warning

We turn now to the utility of imagery in meeting the three broad categories of intelligence needs set out on page four. We have come to rely increasingly on imagery to provide I&W of threatening events, (b)(1)1.4c, (b)(3) 50 USC 403, Sec 6

(b)(1)1.4c, (b)(3) 10 U.S.C. 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6,

The use of imagery for I&W of all kinds comes at the cost of placing more demand on the imagery constellation for frequent coverage. (b)(1)1 4c

(b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6, (b)(1)1 4g

republics. This suggests the need for an option to add to revisit rates (see the above discussion of (b)(1)1 4c (b)(3) 10 USC 424 collection) and also to improve the capability for the (b)(1)1 4c (b)(3) 10 USC 2 system to contribute to I&W-(b)(1)1.4c, (b)(3) 10 USC 424

Policy Making and Planning: Imagery Intelligence

Defense Policy Making and Planning. In defense policy making and planning there are a number of important needs that can only be satisfied by overhead imagery. Among the most important is mapping. (b)(1)1 4c

The collection of large area source imagery to support map production, (b)(1)1 4c (b)(1)1 4c

It is necessary to accomplish this background mapping task prior to the height of a regional crisis so that, other than last-minute updating, the limited on-orbit resources do not have to be diverted to this task from other important missions within the region. The need for basic 1:250,000 scale maps could have become a ground "war stopper" in the Persian Gulf. The basic job of mapmaking had not been done for Iraq prior to Operation Desert Shield/Storm; substantial conflict between the mapping support and the priorities of other overhead imagery support to the Commander-in-Chief (CINC) was evident in the early months of the crisis. Currently, in the Bosnian crisis we need to be free to look for concentration camps as the crisis builds instead of collecting imagery for making the basic maps of Bosnia. The imagery constellation needs less of a surge capacity if the background mapping is systematically accomplished before the crisis.

LANDSAT has found a niche in the support of mapmaking through the application of overlays for intelligence preparation of the battlefield. These overlays have contributed to identifying the type of ground environment where field commanders will be operating. The low-resolution systems, however, have not proven useful in the preparation of 1:250,000 or 1:50,000 scale maps which are so vital to military operations. Enhancements to existing multispectral systems, which improve resolution from 30 to even 5 meters are still insufficient for this purpose. We do not recommend that NRP resources be used to pursue the use of the 5-meter LANDSAT-type systems to support the defense mapping mission.

Making maps for (b)(1)1 4c

the Defense Mapping Agency are instrumental (b)(1)1 4c

(b)(1)1.4c

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

In time, the increased use of digital mapping products will help us substantially improve efficiency by replacing tons of maps with data that can be efficiently disseminated digitally in softcopy.

Another important defense planning mission, closely akin to mapping, is the accumulation of a (b)(1)1.4c Many intelligence and operational analysis tasks are substantially enhanced if we have a (b)(1)1.4c The detailed demands placed on imagery for understanding (b)(1)1.4c (b)(1)1.4c, (b)(3) PL 86-36, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i)

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6 imagery, and (b)(1)1.4c, (b)(3) 10 USC imagery are all instrumental in the construction of this data base.

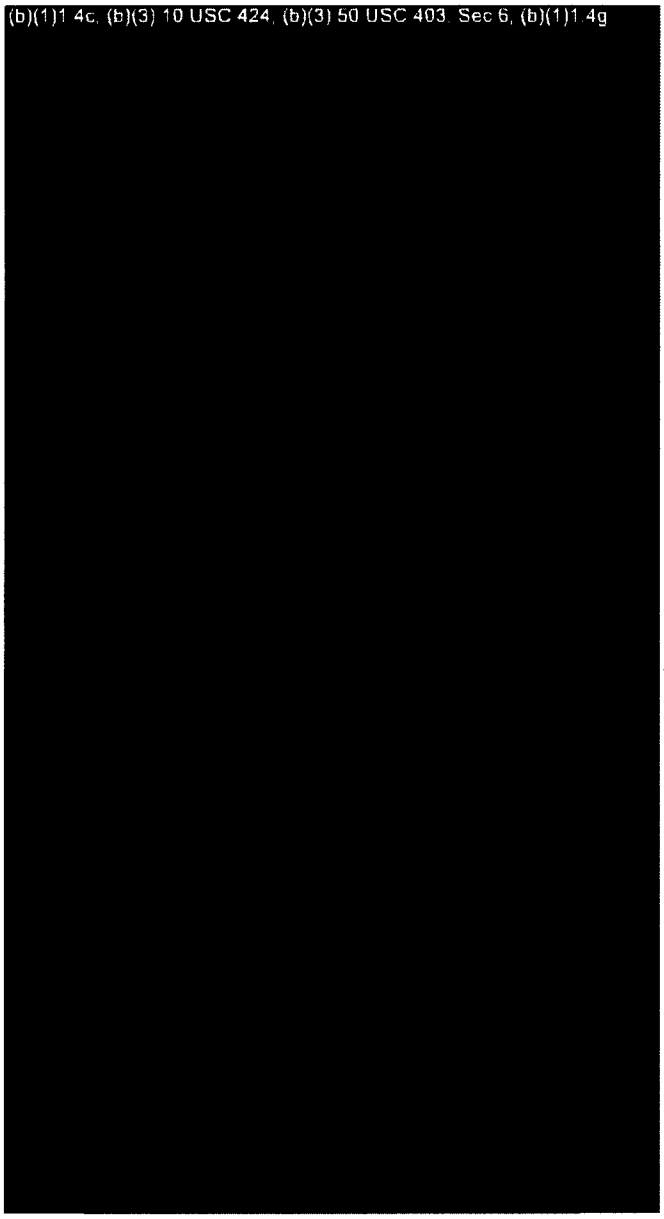
(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

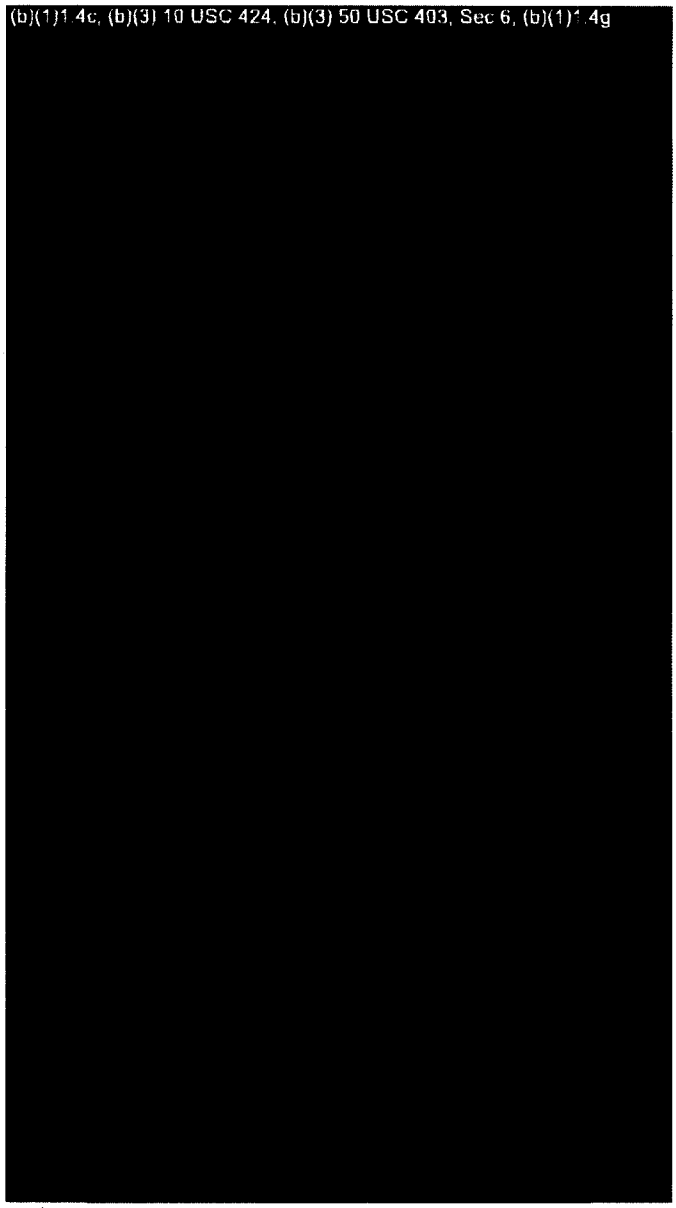
For example (b)(1)1.4c, (b)(coverage, if combined with frequent revisit, can be used to assess the rate

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

assisted by the (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Se

(b)(1)1.4c, (b)(3) 50 USC 403, Sec 6





Global Issues. Imagery is also increasingly needed by government planners and policy makers to assess certain global developments that are of national security concern. The amount of imagery required here is moderate and generally of lower NIIRS resolution. Most coverage is not time-sensitive. One example, however, of such collection

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

basis.

In general, these collection needs can be dealt with handily within the framework of an imagery collection program that is designed and sized adequately for I&W, defense planning and policy, and support for military operations. These global intelligence needs do not point to a different type of imagery collection but they do support the rationale for the planned constellation. (b)(1)1.4c

Foreign Policy. The same general observation would apply to imagery support for foreign policy management. Moreover, those who manage foreign affairs sometimes need releasable imagery.

Economic Policy. Overhead imagery has some utility in helping address economic affairs and trade issues—for example, the monitoring of (b)(1)1.4c, (b)(3) 1

It is not expected that the volume of these needs will increase, and these target types fit easily within the proposed collection program capacities.

Crisis Management and Support for Military Operations

Overhead imagery is at the forefront of meeting intelligence needs for crisis management and support for military operations. (b)(1)1.4c

In the Balkans, the number of imaging operations has increased from about (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403 in August 1992. The imagery has been used to give policy makers a daily update of military movements in Bosnia, to support humanitarian relief missions, to make assessments of fighting in Sarajevo, and to support military planning. In addition, imagery has been used to monitor (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 US

The trend is likely to continue upward if French or other forces deploy to the area.

(b)(1)1.4c

Theater commanders asked for frequent coverage with varying look-angles of specific targets to support military planning. (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3)

Imagery is clearly of great importance for many aspects of both crisis management and support for military operations. Yet its contribution has been far from perfect, as viewed from the perspective of the infantry battalion commander or the pilot in the cockpit. Many comparisons have been drawn between the quick responsiveness to combat

(b)(1)1.4c

from SIGINT collection and the fact that many such commanders went into battle without imagery that they believed they needed. A second major issue has arisen because almost all observers agree that there would have been great

(b)(1)1.4c

These issues have dominated much of the recent debate about imagery and, indeed, about the NRP as a whole. Some observers have even suggested that the

(b)(1)1.4c

(b)(1)1.4c

(b)(1)1.4c

(b)(1)1.4c

The establishment of the Central Imagery Office (CIO), which has the charter to establish dissemination standards in conjunction with the NRO's system architecture work, is beginning to help solve this problem. (b)(1)1.4c

The panel was pleased to see some substantial planning for (b)(1)1.4c the continued (b)(1)1.4c We are convinced that this (b)(1)1.4c (b)(1)1.4c

The evolution of new weapons and military operational concepts (b)(1)1.4c

(b)(1)1.4c

through preestablished dissemination profiles. Users should be able to have (b)(1)1.4c data base for identifying their areas of interest and, (b)(1)1.4c for example—(b)(1)1.4c A system designed to satisfy automatically a user's needs by letting him or her pull what is needed from a data base (b)(1)1.4c

(b)(1)1.4c

Broad Area Synoptic Coverage

(b)(1)1.4c

There are two candidate solutions currently under evaluation: the evolution of (b)(1)1.4c, (b)(3) beyond the (b)(1) local plane previously described (b)(1)1.4c

required to meet the majority of needs for this sort of coverage is between (b)(1)1.4c for example, (b)(3) 50 USC 403, Sec 6, (b)(1)1.4c

(b)(1)1 4c

particularly in support of military operations involving the commitment of troops at high risk.

(b)(1)1 4c

(b)(1)1 4c, (b)(3 (with its programmed enhanced sensor, the (b)(1) ocal plane) will also be a very capable area collector, (b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403

This latter figure is an area greater than Bosnia. It is just under 40 percent of the area of the KTO

(b)(1)1 4c

Developing a fair comparison between (b)(1)1 4c, (b)(3) 50 USC 403, Sec 6 is difficult and depends on the set of assumptions that one must make to resolve the differences. The panel recognizes that a decision about the importance of this broad area synoptic search mission and the method, if any, of meeting it needs to be made soon in order to focus the NRP's limited resources.

(b)(1)1 4c

(b)(1)1 4c

- (b)(1)1 4c

system in sufficient cases to justify its potential cost. (b)(1)1 4c

- Further, we feel that (b)(1)1 4c

(b)(1)1 4c, (b)(1)1 4e, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

Over the next decade, with yet an additional

(b)(1)1 4c, (b)(1)1 4e, (b)(1)1 4g, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec

(b)(1)1.4c, (b)(1)1.4e, (b)(1)1.4g, (b)(3) 10 USC 424, (b)(3) 50 USC 40

Such improvements to (b)(1)1.4c, (b)(3) 10 USC 424, (b)(

requirements with an aircraft, on the other hand, (b)(1)1.4c

We feel the broad area requirement is so important that you should invest in the solution with the best chance of being sustained to completion. (b)(1)1.4c

Lastly, as we prepare this report, principals in (b)(1)1.4c

This is an indicator of the worldwide (b)(1)1.4c

IMINT Summary

For the reasons set out above, we see little, if any, decrease in the nation's dependence on imagery systems. Within the (b)(1)1.4c see an increasing need (b)(1)1.4c (b)(1)1.4c We would especially emphasize t (b)(1)1.4c, (b)(3) 50 USC 403, Sec 6, (b)(3) 10 USC 424

- (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6
  - Structure the procurement in such a way as to make possible the capability to operate a (b)(1)1.4c, (b)(3) 10 USC 4 (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6
    This would permit the occasional operation of a (b)(1)1.4c, (b)(3) 50 USC 403, Sec 6, (b)(3)
- Continue the deployment of (b)(1)1.4c at the (b)(1)1.4c, (b)(3) 50 USC with residuals to assure a (b)(1)1.4c The planned activity to (b)(1)1.4c
- The (b)(1)1.4c, (b)(program should be funded to move, by the early 21st century, toward having an area capability significantly beyond that of the current program. This (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6
- (b)(1)1.4c
- (b)(1)1.4c

(b)(1)1 4c

SIGINT

In addressing the SIGINT elements of the NRP, some basic issues must be assessed in order to define an architecture to serve the nation into the 21st century. This basic assessment must both take into account the changes in the world around us and, given certain changes in technology, identify what collection in the future can best be accomplished by overhead SIGINT platforms.

(b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6

As we look at the world evolving after the Cold War and at the rapid evolution of technology, we find that some of the underlying missions for overhead SIGINT are in flux.

The Soviet Union no longer exists. Its ICBM missile test ranges are today nearly inactive. The United States has made major efforts to deal with the changing nuclear and strategic threat, ranging from international efforts to constrain weapons proliferation to the Global Protection Against Limited Strike program under the aegis of the Strategic Defense Initiative Organization. Our interest in these types of issues is shifting, but it has not vanished. (b)(1)1 4c, (b)(3) 50 USC 403, Sec 6, (b)(1)1 4g, (b)(

Lacking the sharp, simplifying focus of the past, intelligence about threats related to weapons of mass destruction and other advanced weapons must be derived from data collected from both the former USSR and from activities within and among many different states about which we now know very little. We must characterize indigenous Third World weapons developments, monitor the acquisition and deployment of weapons from external sources, and generally track the traffic in advanced weaponry. Without such information, our attempts to be prepared to defend against these systems and to respond effectively to weapons proliferation cannot succeed. (b)(1)1 4c, (b)(3) PL 86-36, (b)(3) 18 USC 798, (b)(3) 50 U

(b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6, (

At the same time, Third World adventurism is no longer contained by a bipolar world order and ethnic conflicts are on the rise. These conflicts will involve combatants using weapons of all kinds from many sources. Monitoring new sources of conflict will involve keeping pace with new modes of communication: high-capacity communications in many countries are moving from simple high-powered analog systems to advanced low power digital pulse code modulation (PCM) technology and

from microwave transmission systems to land-based cable and fiber optic networks.

(b)(1)1 4c, (b)(3) 50 USC 403, Sec 6

(b)(1)1 4c, (b)(3) 10 U S C 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6, (

Given these evolving geographic concerns, we also need to identify what types of signals we are trying to collect.

Significant work on SIGINT architectures has been accomplished by the SIGINT Community and the NRO over the last two years. Numerous SIGINT mission utility studies and two detailed system design studies have been conducted. The Low-altitude Integrated SIGINT Architecture (LISA) study is complete and the first phase of the High-Altitude SIGINT Architecture (HASA) study is due to be completed in December 1992. This work formed the foundation for our evaluation. These ongoing efforts to consolidate the overhead SIGINT architecture allowed our panel to evaluate the different elements of the architecture far more efficiently than would have otherwise been the case. The Community and the NRO together have developed a refined understanding of matching system capabilities to intelligence needs. This process was instrumental in allowing us to gain a sense of priorities and to help us understand the key elements of the architecture, particularly data integration across the SIGINT disciplines. The process was also useful in helping us assess cost. Discussions with senior managers of the National Security Agency helped us characterize the importance of overhead satellite-based SIGINT in NSA's strategic plans.

Indications and Warning

Warning intelligence has focused on the Warsaw Pact threat and on the Soviet Union strategic nuclear attack threat for the last four decades. SIGINT, both overhead and ground based,

has been a major contributor to the national intelligence posture, which has given us high confidence in the timely acquisition of this strategic warning. Our military strategy, to a large degree, was structured on the belief that timely and credible warning of a Warsaw Pact mobilization would be provided.

(b)(1)1.4c, (b)(3) PL 86-36, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i)

As our national focus moves away from the former Warsaw Pact countries, positive steps must be taken to refocus overhead resources on the regions of the world where warning is most important to us.

(b)(1)1.4c, (b)(3) 10 U S C 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6,

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6,

The newfound visibility and utility of the United Nations and the willingness of nations, including the United States, to deploy forces under its aegis make it vital to have timely and accurate intelligence to support an expanded set of users. Now, for example, early indications that countries are moving to violate sanctions, economic or otherwise, is critical intelligence to policy makers.

(b)(1)1.4c, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6, (b)(1)1.4g, (b)(3) 10

(b)(1)1 4c, (b)(3) PL 86-36, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i)

(b)(1)1 4c, (b)(3) PL 86-36, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i)

(b)(1)1 4c, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6, (b)(3) 10 USC 424, (b)

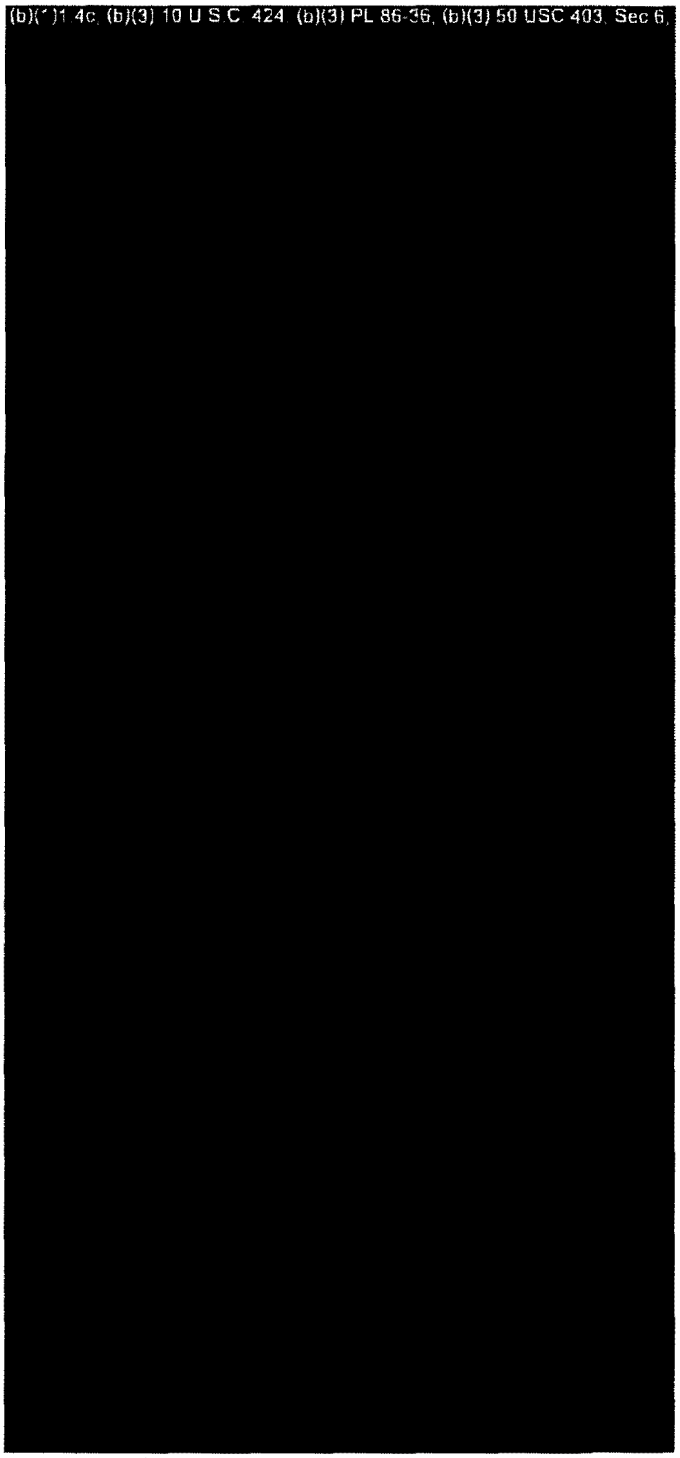
Policy Making and Planning: Signals Intelligence

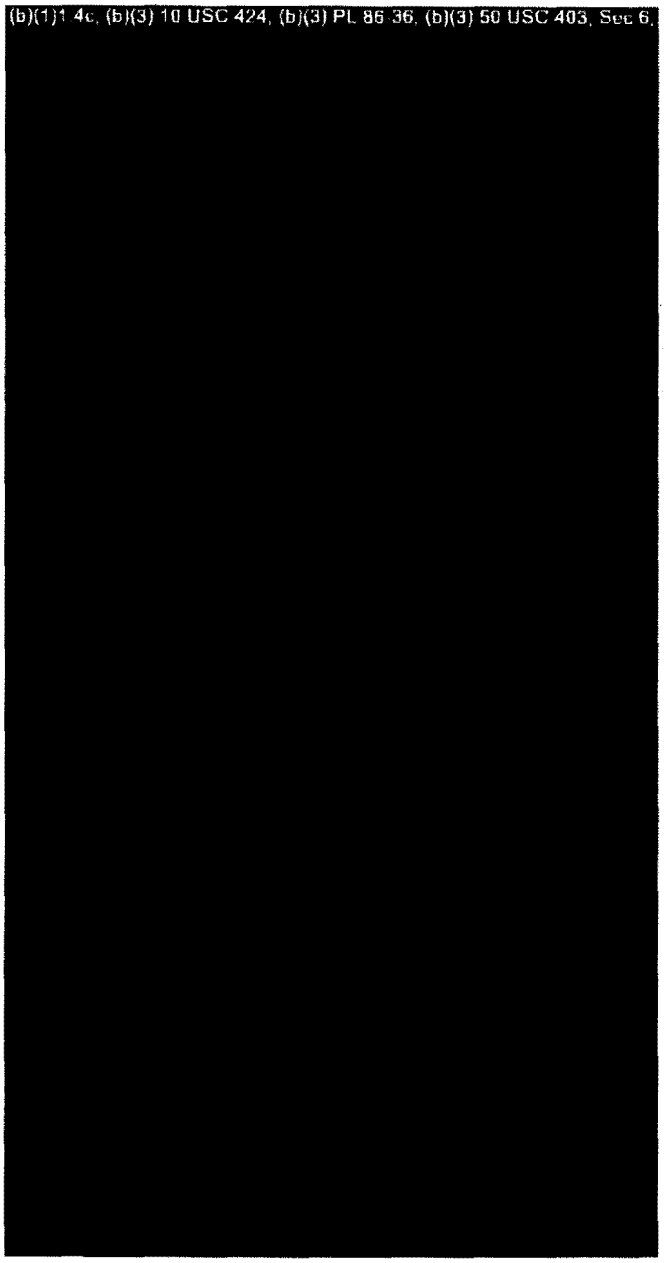
Defense Policy Making and Planning. The context within which defense policy is made and planning is done is undergoing a major change. A new national military strategy has been adopted, based on the recognition that planning for a major global war is no longer required. Regional military plans and capabilities need to be grounded on the understanding that US global interests and assets will be challenged and put at risk in an uncertain, unstable, and rapidly changing world. This new regional strategy is based on four elements: strategic deterrence and defense, forward presence, crisis response, and reconstitution. While elements of the former Soviet Union, particularly the nuclear CIS nations, remain a major focus, the strategy is fundamentally a global one to promote regional stability.

(b)(1)1 4c, (b)(3) 10 U S C 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6, (

Global Issues. Both the *National Security Strategy of the United States: 1991-1992* and NSD-67 address new global issues that cross the traditional boundaries of political affairs, economic affairs, and defense. These issues include global energy, global environment, world health and population, international terrorism, and narcotics trafficking. They are already major national concerns, but their importance to our national security in the future will likely be relatively greater, and the list will grow. Intelligence needs associated with these issues will become more significant in the future as our policies on these complex questions become more comprehensive. In several instances, as in the case of environmental issues, the intelligence needs are little understood today since the threats and the international relationships and responsibilities are only now unfolding.

(b)(1)1 4c, (b)(3) PL 86-36, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i)





Crisis Management and Support to Military Operations

Responding to crises and to regional conflicts are major aspects of our new regional military

strategy. The essential criterion is to be able to respond to any crisis with a range of options. Options should be preplanned, encompassing all the instruments of national leverage: diplomatic, political, economic, and military. Within the nation's military responses, the options will range from a single surgical strike to the deployment of national or multinational forces that are sufficient for a quick, decisive victory. The strategy therefore spans conditions of peace, crisis, and war.

The demand for extensive overhead SIGINT collection in response to crises and support for military operations will be a continuing national priority. There are fundamental differences between these new needs and those associated with the traditional operations plans for a global conflict.

Planning for future conflicts includes the following assumptions:

- Conflicts can occur at almost any place in the world and in varying environments; strategic lift will likely be required from both forward deployed sites and from CONUS (continental United States).

- The operational objectives and size of employed forces can vary greatly from conflict to conflict (support to UN forces, humanitarian operations requiring a show of force, and so forth) and will be scaled according to our strategic interest in a particular nation or region.

SIGINT collection needs for regional crises and conflicts will require architecture changes as well as a broad set of overhead collection system capabilities. Tasking flexibility and precise data, although historically needed for many military applications, will be imperative for future conflicts in regions and against adversaries for which we will have little time to plan.

Overhead COMINT will continue to be important for force posture changes, deployments and employments, military C3 systems and configurations, targeting, battle damage assessment, and coalition operations. OPELINT will also continue to be of high value for all of these needs. Additionally, TECH ELINT and signal searches will be needed for quick reaction counters to enemy modifications to red, blue, and gray weapons that may first be disclosed on the battlefield. TECH ELINT and signal search intelligence form the kernel of a performing OPELINT system.

In terms of establishing overhead SIGINT capabilities, crisis management and support for military operations will be the dominant needs. These extend far beyond sensor system performance. The end-to-end architecture needs, including terminal dissemination, should be addressed.

SIGINT Dissemination

The intelligence derived from SIGINT overhead collection has, from the inception of the program, been disseminated as part of the overall SIGINT distribution system operated by NSA. For many years this system employed a dedicated communications network designed to move SIGINT data among intercept stations and production centers, and between them and a large array of customer headquarters, including the full range of principal military commands worldwide. More recently, these arrangements have been expanded to include the use of tactical communications networks to afford rapid transmission to additional tactical commanders in the field.

During Operation Desert Shield/Storm this system performed well, delivering useful and timely SIGINT results to military customers in the theater of operations. The overall system, moreover, is enhanced by the on-scene presence at major military commands of SIGINT support units that assist in manipulating the overall SIGINT system to satisfy the commanders' needs. In general, the SIGINT dissemination system is adequate to support its customers.

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(b)(1)1 4c, (b)(3) 10 USC 424

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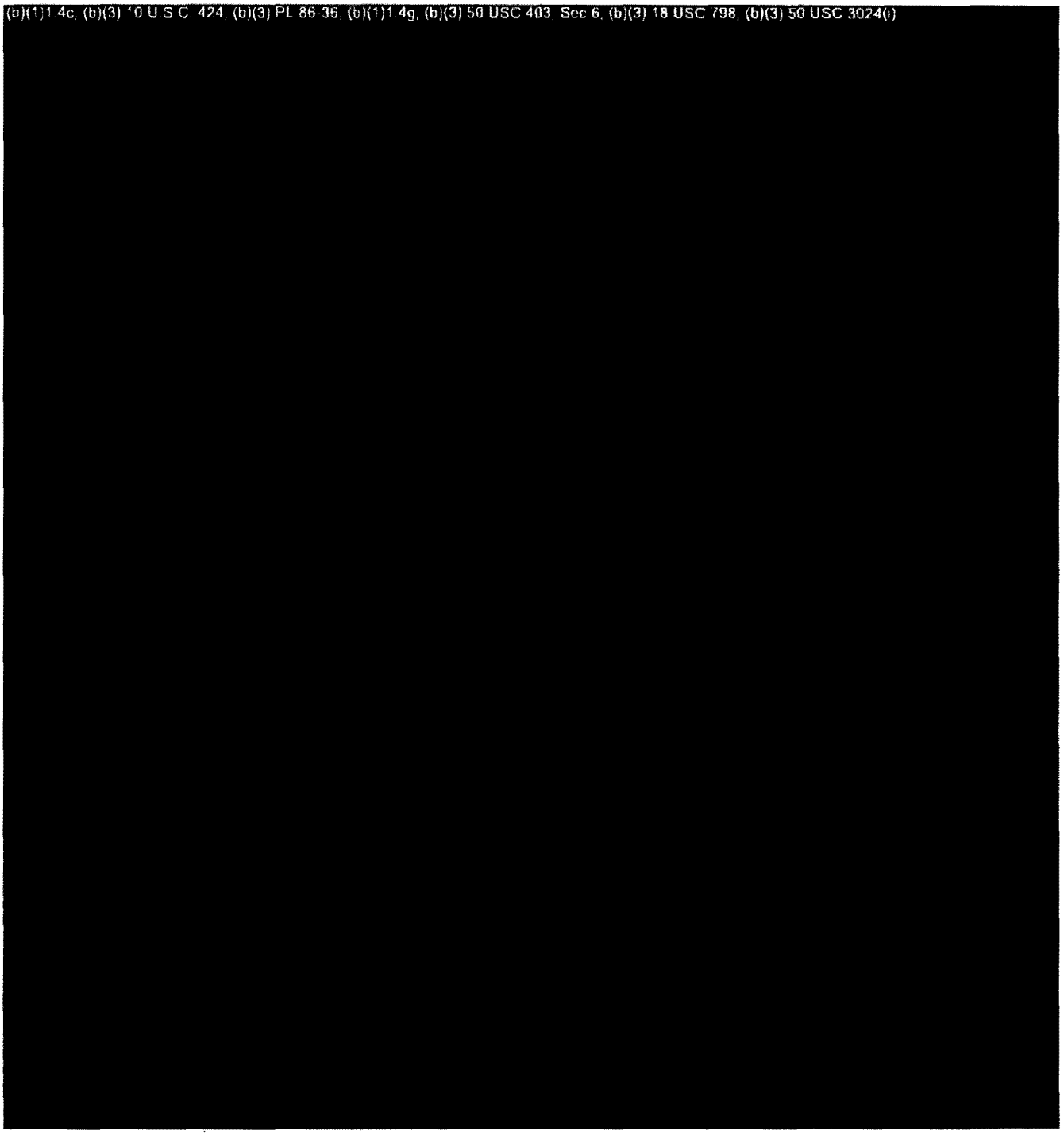
(b)(1)1 4c, (b)(3) 10 U.S.C. 424, (b)(3) PL 86-36, (b)(1)1 4g, (b)(3) 50 USC 403, Sec 6, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i)



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(b)(1)1 4c, (b)(3) 10 USC 424

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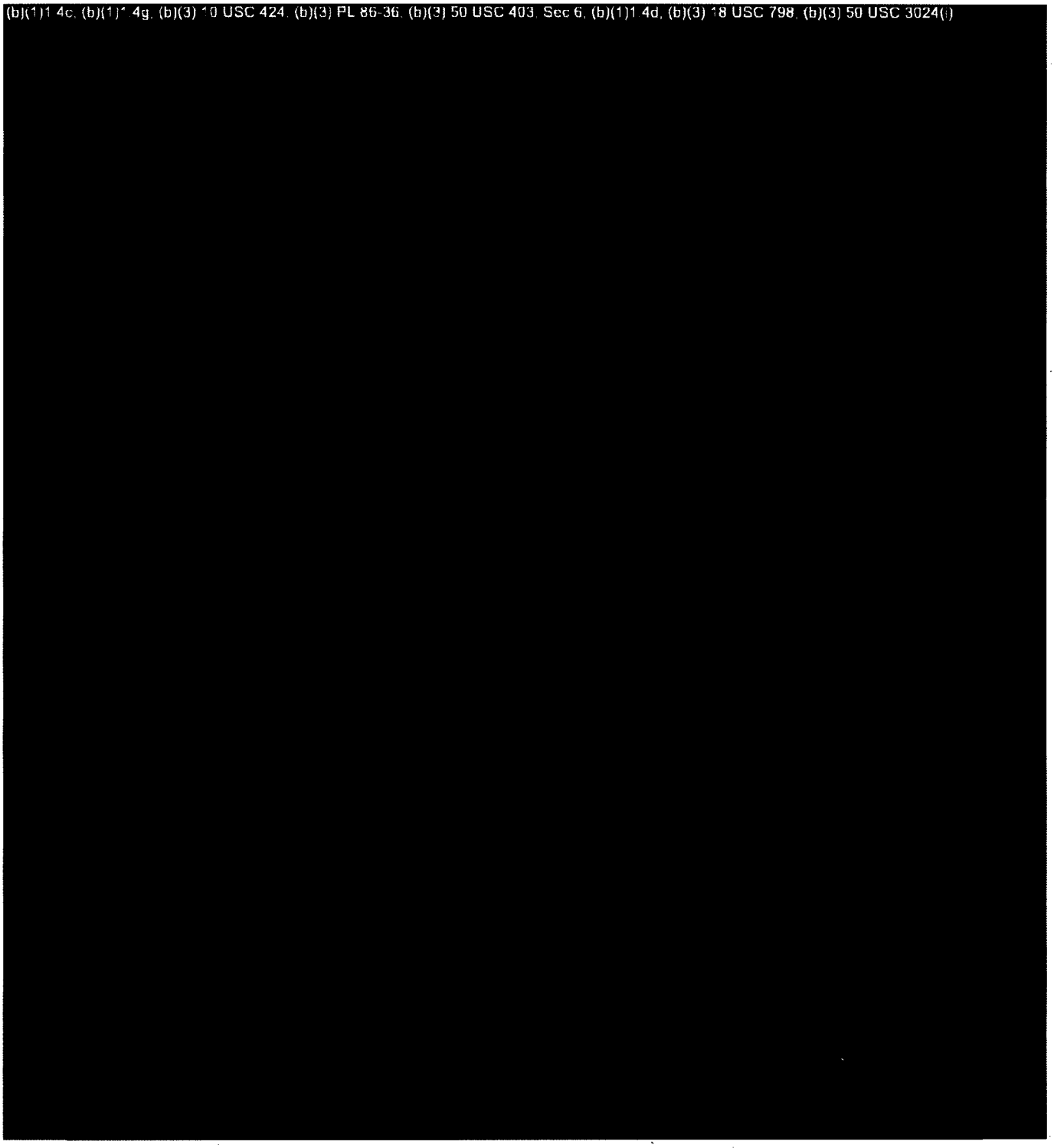
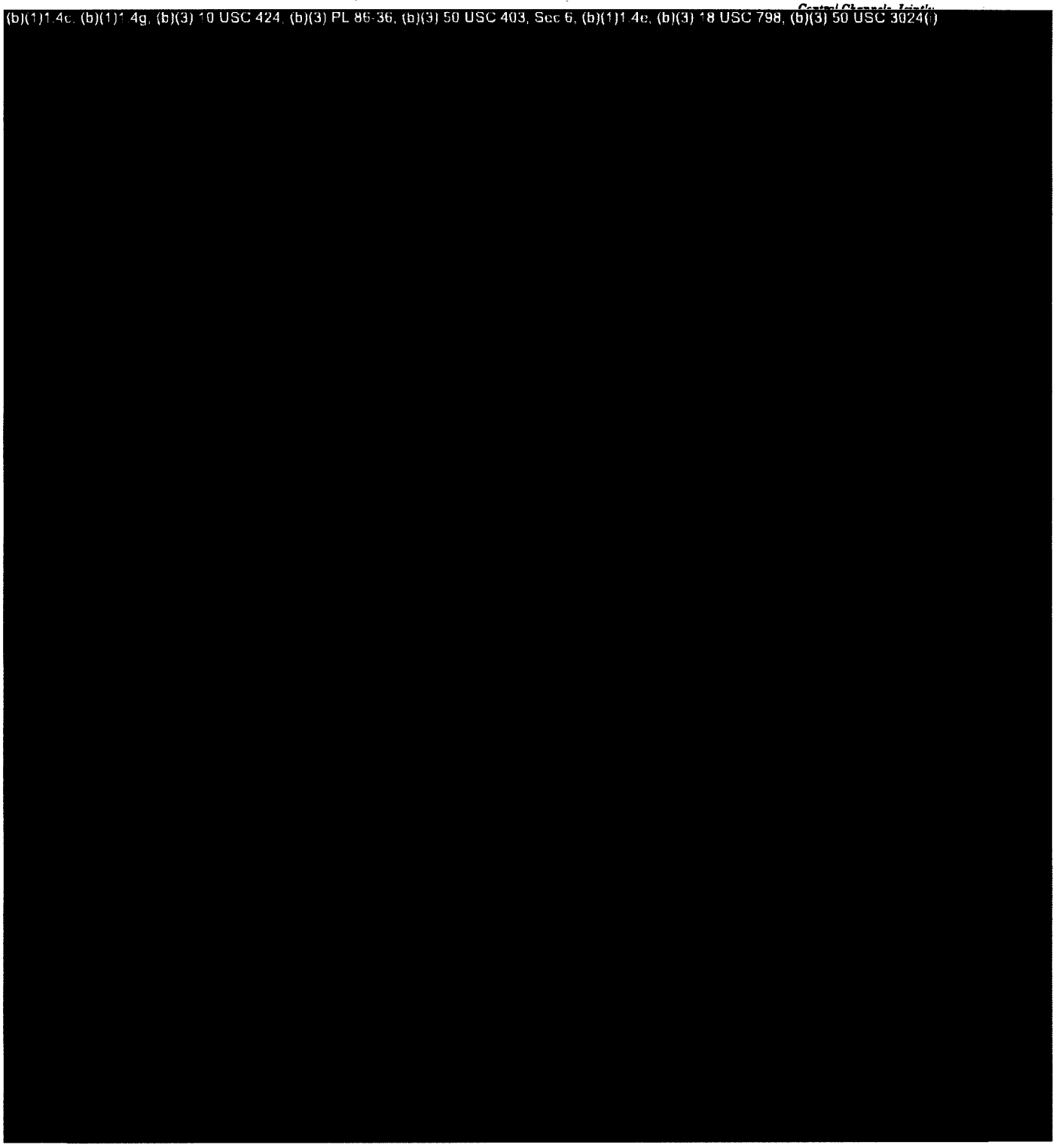


(b)(1)1 4c, (b)(1)1 4g, (b)(3) 10 USC 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i)



(b)(1)1 4c, (b)(3) 10 U.S.C. 424, (b)(3) PL 86-36, (b)(3) 50 US

Communications

We have reviewed the NRO overhead communications architecture. The NRO must relay mission data from the collectors to a mission ground station in the United States.

(b)(1)1 4c, (b)(3) 50 USC 403, Sec 6, (b)(3) 10 USC 424

(b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

(b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

approach is sound. Because of its marginal utility, we recommend against the procurement of a satellite for the (b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6 is not required until it is needed to support the second plane of (b)(1)1 4c, (b)(3) in June 2000.

The dissemination o (b)(1)1 4c, (b)(3) data via a (b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sc is critical to (b)(1)1 4c, (b)(3) 10 success in meeting its users' needs. The addition of communication transponders to (b)(1)1 4c, (b)(to support this requirement is appropriate.

(b)(1)1 4c, (b)(3) 50 USC 403, Sec 6, (b)(3) 10 USC 424

is required to permit the modification of (b)(1)1 4c, (b)(3) 10 USC 424, (b)(1)1 4e, (b)(1)1 4g,

MASINT

Measurement and signature intelligence (MASINT) is an auxiliary product of overhead collection.

The (b)(1)1 4c program has included research and development to derive information from (b)(1)1 4c, (b)(3)

Although this process is computationally intensive, the algorithms developed to date show extraordinary promise of making additional intelligence contributions.

The (b)(1)1.4c, (b)(program has the capability to

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(1)1.4e, (b)(1)1.4g, (b)(3) 50 USC 403, S

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6, (b)(1)1.4g, (b)(1)1

Industrial Base Considerations

The future overhead collection architecture is heavily dependent on the capabilities of the US aerospace industry. The effects of reducing the industrial base must be considered in any recommendations the panel makes.

Even the current program would require a reduced industrial base in order for production to take place at efficient rates. A reduced program, such as we set out here, requires such reductions to an even greater degree. To ensure as comprehensive a look at the problem as time would allow, the panel formed the Industrial Advisory Commission, composed of four senior aerospace executives. The Commission solicited responses from that portion of the aerospace industry that serves the NRP and developed concepts for addressing industry's concerns. Their report to the panel is in Appendix C under separate cover.

We are convinced that it is absolutely essential that an aggressive industrial policy be developed to ensure that the critical resources and unique capabilities of industry are sustained as reductions occur. Without an aggressive approach to this problem, the industry is in significant danger of falling below critical mass in several key areas within the next 18 months. Strong companies must be sustained in order to supply innovative engineering, cost-effective manufacturing, and sound system management. Without guidance to industry, the declining budget will result in spreading too few dollars across the existing industrial base, thereby reducing the strength of all companies in the process. The time has come for the government to take steps to avoid such a result and to establish policy and guidelines for reducing the NRP's industrial base in such a way that the proper mix of capabilities is maintained. The panel recommends that the Director of the NRO establish this policy within the next six months to address the following considerations:

- **Low Production Rate Facilities:** There is a significant overcapacity in NRO-dedicated buildings and staff. The NRO should establish a process to identify, systematically, the facilities and capabilities that are unique to the NRO, and a comprehensive planning process should be developed to address production rates and capabilities to be mothballed. The realities of the resource environment will demand a streamlined approach in order for us to be able to maintain the critical capabilities while facilities are being scaled back or eliminated. Enhanced training and video documentation of critical assembly processes must be incorporated to ensure the possibility of reestablishing production if resources permit and requirements dictate. Critical engineering

skills and the continuation of a skilled workforce should be maintained by directed cross-assignment to ongoing activities, such as operations and maintenance contracts.

- **Industry Redefinition:** This industrial policy should develop industrial centers of excellence to ensure that scarce resources are optimally focused on key subjects of specialization. Government and industry should jointly develop reduction plans that utilize such tools as enduring joint ventures with managed competition, accelerated depreciation of capital equipment, and methods to overcome exit barriers for facilities that are no longer required. Regulatory changes should be identified and implemented to encourage efficient consolidation and disposition of excess capacity. Useful levels of competition should be maintained by selective, focused R&D and appropriate dual-sourcing. Industry prime contractors should work with the government to identify unique component suppliers. This data should be used to develop a methodology to preserve, integrate, nurture, or mothball these suppliers' capabilities.

- **Methodology to Sustain Unique Industrial Capabilities:** The NRO should reevaluate its R&D process to ensure that it systematically addresses long-run needs for innovation. The R&D should be targeted at critical technologies that are unique to the NRO's needs. The NRO should evaluate the utility of increased R&D's being coordinated by the prime contractors, serving as centers of excellence. In the reduced aerospace funding environment, the panel believes that the NRO's R&D funding must be increased if the United States is to maintain its superiority in innovative engineering in unmanned space flight. As production rates are reduced, it is imperative to protect the systems engineers and component engineers who serve the NRO's unique needs and design the next generation of modifications, improvements, and systems.

- **Industry and Government Efficiency Improvements:** A substantial number of changes have occurred since the establishment of the NRO in the 1960s. Many procedures and management practices should be reevaluated in light of the need to reduce unnecessary overhead and promote efficiency. The inefficiencies caused by programs being stretched for budgetary reasons are severe. Procedures should be established between the Administration and Congress to minimize the disruption caused by such stretch-outs.

- **Industrial Security:** The security procedures used by NRO development activities are excessive. The current security system should be thoroughly examined and overhauled. Some of the current regulations appear to be based on absolute worst-case assumptions and may no longer have logical justification. There is little justification for some of the technologies currently in use by the NRO to remain classified. The degree of classification currently used is a heavy administrative burden, and it significantly reduces dual use of the technologies by other government agencies. Much of the compartmentation between individual NRO programs today also seems to have a small degree of utility to justify its substantial expense. After deployment, most—if not all—of the basic characteristics of the majority of collection systems are typically available, outside of the compartment, in user (product) security channels. The panel believes that a generic "development" security channel is warranted in order to reduce development overhead and promote efficiency and technology sharing between programs and that the reduction in protection of data would be minimal. In the context of such an overhaul, the establishment of several exclusive compartments for particularly sensitive data should be considered.

- **Launch Infrastructure:** The launch infrastructure is a significant contributor to

system cost. The NRO should continue aggressive planning to ensure the optimum use of launch systems and facilities. Efforts should be undertaken to reduce the number of unique interfaces between satellites and launch systems and the amount of time required between stack and launch.

Procurement Policy Considerations

The procurement procedures of the NRO continue to be among the most efficient processes in government today. Nevertheless, the panel recommends that these procedures be reviewed and further streamlined to reduce unnecessary work. Both industry and government incur substantial costs in preparing and evaluating competitive proposals. While it is appealing to have numerous qualified sources for each procurement, this results in replication of capabilities—a luxury we can ill afford in today's environment. A thorough review and simplification of the acquisition regulations could allow significant cost reduction. The percentage of program costs expended for documentation appears to have increased dramatically over the last 20 years. It is not clear that this has been accompanied by reduced risk, improved visibility, or enhanced efficiency.

Although further simplification is needed, we were impressed by the relatively streamlined management within the NRO compared with DoD procurement methods. The development of very sophisticated national collection systems is challenging enough without the additional overhead of bureaucracy outside of the NRO. We strongly urge that you and the Secretary of Defense help to ensure that the NRO continues to be protected from unnecessary and burdensome external bureaucratic controls. The NRO's cradle-to-grave development methodology and its acquisition management system are far more streamlined than those of the DoD; these allow the NRO to field systems faster and more effectively than is the case for most DoD systems.

We believe that sufficient oversight exists to ensure that the NRO is compliant with the relevant requirements of the Federal Acquisition Regulations.

International Industrial Issues

Thirty years of research, development, and application of space technology has given the United States preeminence in space-based reconnaissance systems. The establishment of this capability, while begun under the auspices of the government, has placed the United States and its aerospace firms in a unique position. The aerospace industry is now finding itself facing both reduced government spending and numerous inquiries from foreign governments for proposals for space-based surveillance systems. These countries, either through a lack of indigenous technology, motivation, or money are finding it attractive to approach US companies instead of undertaking their own long-term space system development.

The interest in space reconnaissance systems will grow as more countries are exposed to products from these systems or become aware of their value. We have seen extensive procurement of SPOT-type imagery by foreign governments. Over the next decade more countries will request overhead technology and systems or request that the United States share overhead intelligence with them.

From a broad national perspective, the interests of the United States would be best served if our dominant position in the realm of space reconnaissance were not to become eroded by foreign competition. While there are some aspects of space reconnaissance technology that are unique and thus worthy of protection, the United States enjoys its largest advantage in systems integration, processing, exploitation, dissemination, and the total breadth of its capabilities. We believe that the country would be best served by a policy that allows for the involvement of some aspects of US expertise in space in foreign ventures in such a way as to help retain this dominance.

The panel feels that you should take the lead in an interagency effort to construct a national strategy, with US dominance being its objective, for dealing with requests for the sale of US space expertise or the sharing of overhead products.

(b)(1)1.4c, (b)(3) 10 U.S.C. 424, (b)(3) PL 86-36, (b)(3) 50 USC 40

Transition Considerations

We have recommended an architecture for the future of a consolidated NRP (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec b

(b)(1)1.4c, (b)(3) 10 U.S.C. 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Se

The planning for a transition from today's constellation is complex. With many factors to consider, we have only had time to undertake a summary review of this area. In our judgment, a balanced approach would be as follows:

(b)(1)1.4c, (b)(3) 10 U.S.C. 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec

Concluding Note

Our review of the NRP has allowed us to gain an understanding of the individual programs, the operations, and the people. Our discussions with a broad spectrum of the NRO's customers have permitted us to appreciate how each of these organizations use and depend on the NRO's products. It is clear to us that the intelligence gained from overhead reconnaissance has a vital place in the country's national security, and that it is being obtained with remarkable technology and by talented people. Although we see some shifts in priority, we believe that, in general, space reconnaissance will continue to make a unique contribution to the country's intelligence needs for the foreseeable future.

We took a long-term view of the program. Our approach was to design a program to meet the needs of the country in the next decade and beyond, while attempting to balance the substantial and unavoidable uncertainties. We constructed a recommended program around the (b)(1)1.4c

These core systems will allow the NRO to continue the consolidation of multiple programs into these (b)(1)1.4c, (b)(3) 1 systems. We believe this will result in savings below the current program. Unfortunately, the complexity of this transition and the need to be fiscally conservative through the transition process will not generate substantial savings in percentage terms in the next few years. It

is our judgment, however, that the approach we recommend could be executed after this period of transition, beginning in the year 2000, at a level approximately 10 percent below the level of the President's recommended program in fiscal year 1993. We think the transition process outlined above allows an evolutionary approach, over the next decade, to protect necessary capabilities and allow a transition to a lower-cost program. We think the plan outlined in this report will allow us to achieve an efficient program as quickly as possible. The reduced program does lower the total expenditures of the NRP by just under (b)(1)1 4c, (b) over the 1994 through 1999 budgets.

Even with such savings, the reduced program includes significant enhancements to the nation's overhead collection capabilities. The key aspect of our reduced program is the establishment of an architecture that responds to the pressures of a changing geopolitical world and to budgetary constraints. (b)(1)1 4c, (b)(1)1 4g, (b)(3) 50 USC 403, Sec 6, (b)(3) [redacted] These enhancements would further provide a modest increase in the NRP's R&D program to promote innovation in critical technologies, and they would include a quick reaction capability.

Beyond these enhancements included in our reduced program, (b)(1)1 4c [redacted]

Imagery dissemination is clearly now receiving increased emphasis. We believe that this emphasis will allow the development of an integrated dissemination architecture that will permit evolutionary growth.

(b)(1)1 4c [redacted]

(b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6 [redacted]

We recommend that coverage beyond that available from (b)(1)1 4c, (b)(3) 10 [redacted] be pursued, using the savings from the reduced program. Over the years into the early part of the next decade, this would involve the development of improved optics (b)(1)1 4c, (b)(1)1 4 (b)(1)1 4c, (b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) 50 U [redacted] or both. This would provide a worldwide, responsive capability by that time.

In summary, the NRO continues to deliver innovative solutions to this country's national security problems. We are convinced that the program recommended by this panel, if implemented, will provide a capable and flexible way to meet the challenges of the early 21st century.

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Appendixes A, B, and C to the Final Report: National Reconnaissance Program Task Force for the Director of Central Intelligence

Information contained in this report is classified and controlled within BYEMAN and COMINT channels jointly.

This set of appendixes supplements the *Final Report: National Reconnaissance Program Task Force for the Director of Central Intelligence,* BYE-184423/92.

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BYE-184424/92
SSS-019/92
September 1992

APPENDIX A. TERMS OF REFERENCE FOR DDCI NATIONAL RECONNAISSANCE PROGRAM (NRP) TASK FORCE

Background

In a period of major world change and dramatically decreasing budget environment for Defense and Intelligence Programs, there is a need to review and validate the future direction of all aspects of the National Reconnaissance Program. NSR-29/NSD-67 validated a new set of national intelligence needs which is far broader than the previous Cold War priorities. DCI management and programs must focus on achieving intelligence economies and efficiencies, as well as managing required reductions while preserving essential flexible, adaptable, and capable reconnaissance and reconnaissance support systems. A special focus will remain on the conduct of reconnaissance operations targeted in support of national intelligence needs and to support the wide range of military operations tasks.

The baseline point of departure for this Task Force effort will be the current overhead reconnaissance programs as previously approved and related existing or ongoing NRO/NSA and other relevant studies and analysis. The Task Force should consider the wide range of extant and ongoing NRO architectural efforts and studies including, but not limited to:

- MUS
- OSAS
- LISA
- HASA
- IAS

Basic Task

Under the broad supervision of the DDCI, a National Reconnaissance Review Task Force will be chaired by Mr. R. James Woolsey to perform the tasks enumerated below.

Task Force Structure

The Task Force will consist of staff support to Mr. Woolsey; a steering group of eminent individuals with technical, intelligence, policy, and military backgrounds from government and industry; a series of professional task groups which will gather data, process and present ideas and options, and conduct such tasks as defined by the Chairman. At least two areas of task group focus will apply to needs and technology. The Task Force will take outside testimony to seek perspectives on how to improve the cost-effectiveness of the national reconnaissance architecture in a changing world.

Scope

The Task Force should consider end-to-end aspects of current and potential satellite technology programs for Imagery, SIGINT (ELINT/COMINT/FIS), MASINT, and communications relay support, utilized for intelligence and mapping. All aspects of the national reconnaissance program will be considered for review for potential streamlining, consolidation, and reductions or enhancements. This will include but not be limited to:

(b)(1)1 4c, (b)(3) 10 USC 424

[redacted]

Product

The focus of this study will be on cost and performance framed against current and future priority intelligence needs which can be uniquely satisfied by national reconnaissance means. Non-satellite collection capabilities should be audited only as they represent alternatives to spaceborne collection. Specific tasks are as follows:

a. Consider the intelligence needs that should be fulfilled with satellite systems in the context of NSD-67 and recommend areas where needs no longer exist or are of low priority as well as areas of new needs. Utilizing existing overhead programs and ongoing NRO architectural planning as the point of departure, develop recommendations for a minimum baseline NRP with prioritized enhancements. Identify any intelligence shortfalls which may accrue from a minimized baseline.

b. Recommend new directions that would streamline and improve the capabilities of the NRP. Consideration should be given to highly innovative or radically reoriented approaches which are deemed feasible and affordable. These two tasks should take into account and record the extent of redundancy or duplication that exists within the overhead programs and determine if this level of efficiency is proper. Additionally, the Task Force should specifically consider whether trade-offs between SIGINT and Imagery programs, or between space-based and land-based programs, can be made which allow greater economy of effort and minimal loss of needed intelligence.

Timing

The DCI has requested that the Task Force complete its work in time to affect the FY 1994 budget. A target completion date of 31 August 1992 is therefore established, and the Task Force should be mindful that its recommendations will influence budgets over the FYDP and beyond. A two-month Task Force effort provides minimal time to achieve this complex objective. Pace, organization, focus, and subjective criteria must necessarily be the hallmarks of this review.

APPENDIX B: FUTURE OVERHEAD COLLECTION CAPABILITY NEEDS

The Fundamental Criteria for the National Reconnaissance Program

The major challenge the panel confronted at the outset of our task to recommend a new, baseline national reconnaissance program (NRP) was the question of what criteria should be used to establish national intelligence needs for overhead collection required in the future. Guidance provided by the Deputy Director of Central Intelligence made it clear that our recommendation was to be an austere NRP. Therefore, a restrictive approach for identifying future intelligence needs was called for, rather than an inclusive one. The challenge was to identify core national intelligence needs that will be enduring in the future and to account for new needs that are now unpredictable—and to confine the answer to essentials. We began with the proposition that overhead collection will remain a national priority to maintain intelligence capabilities sufficient for the effective management of the national security of the nation in an uncertain future world. The scope of future intelligence needs for national security affairs was adopted as the basis for future overhead collection. The panel also felt strongly that it was important to develop a strategic-level understanding of future intelligence needs rather than to attempt to cope with the enormous, detailed, future intelligence-requirement data base developed by the Intelligence Community. We adopted a "top-down" approach for identifying future overhead collection capability needs that stem from essential intelligence needs required by all of the principal players involved in national security affairs policy development and execution. Therefore, our results must be viewed in the context of a baseline set of overhead collection capability needs—a floor-set of needs for the security of the nation.

The White House release of the *National Security Strategy of the United States: 1991-1992* was our initial reference for developing the dimensions of national security management in the future. This National Security Council (NSC)-developed strategy was designed to address the changing direction of our national security policies following the collapse of world communism, the transformations occurring in eastern Europe and in the former Soviet Union, the world's increased access to sophisticated technologies, and the worldwide fallout of such developments. The strategy recognizes that our national security interest in the future will be broader—including a political, economic, and defense agenda. Further, select global issues are also recognized as emerging possible threats to our security. The broadening scope of our national security affairs was further viewed in light of NSR-29 materials and NSD-67. While some of the specific policies and intelligence requirements cited in these documents will be transitory, these references collectively are a credible basis for identifying enduring national intelligence needs for supporting a comprehensive national security strategy in the changing world.

National Security Strategy Intelligence Needs

Intelligence needs that stem from national security affairs can be categorized as:

- Intelligence that provides indications and warnings (I&W) of emerging threats to the security interest of our nation
- Intelligence that supports the development and execution of political, economic, and defense policies and plans
- Intelligence that supports crisis management and the use of military force.

This breakout provides a useful structure for assessing the intelligence needs for the diversity of intelligence consumers with national security affairs responsibilities. The *DCI Decision Memorandum on Improving Intelligence Warning* was reviewed for future warning intelligence needs and the *National Military Strategy of the United States* was reviewed for future military intelligence needs. Additionally, data calls were made and responses received from: STATE/INR, on intelligence needs associated with the conduct of foreign affairs; CIA, on intelligence needs associated with economic affairs and global issues; and DIA, on intelligence needs for defense policy/planning and military operations. What we requested and received were not detailed needs but rather, collectively, the major applications of intelligence for all dimensions of national security management.

Associated Overhead Collection Capability Needs

The final step in our top-down approach to needs was to resolve collection capability that stems from the national security consumer's essential intelligence needs. The objective was to develop guidelines for associating specific, functional, collection capabilities and performance regimes with intelligence applications of national security affairs consumers. The approach developed allows such associations.

We considered two sets of factors in the process of determining the overhead collection capability subset of the compiled overall intelligence needs. They were: 1) the relevance of the unique attributes of overhead collection to the intelligence need and 2) the relative contribution a collection system will offer for a particular intelligence need in the future. These assessments were done on the basis of expert judgments, not by extensive simulations. In some cases, more detailed assessments may be appropriate. The unique attributes that are associated with overhead collection are presented in Table B-1.

Table B-1. Overhead Collection Attributes

- Assured unique access an a global scale
  - Impervious to area denial
- Nonintrusive collection
  - No risk to human Life
  - No risk of political embarrassment
- Near real-time intelligence on a global scale
  - Vital for the conduct of military operations
  - Vital for crisis management
- Frequent/continuous coverage on a global scale
  - Stays abreast of dynamic situations
  - Minimizes surprises
  - Monitors norms of activity on a worldwide basis
- Provides highly credible intelligence
  - Often the sole basis for a major national policy decision
  - Often the sole basis for influencing a foreign nation
- Broad area/distributed locations synoptic intelligence
  - Permits accountability of distributed mobile units
  - Permits nationwide posture assessments
  - Permits posture assessments of two or more engaged nations

Indications and Warning Intelligence Trends

Warning intelligence has traditionally been a priority mission of national intelligence agencies and will remain so. Moreover, the DCI recently launched a comprehensive strategic plan for the Intelligence Community for the purpose of increasing the effectiveness of warning intelligence. He directed that warning intelligence transition from the primary focus of a strategic attack to include identifying and forecasting events that could cause the engagement of US military forces (from the scale of embassy evacuations to larger military activities) and events that would have a sudden deleterious effect on US foreign policy and security (for example, coups, third-party wars, refugee surges, and so forth).

The DCI's objective is to enhance the warning intelligence process—from one of simply informing policymakers or increasing their understanding of an issue or development to something much more useful: "sound an alarm, give notice, give admonishing advice to policymakers." With this in mind, several structure and policy changes are to occur within the Intelligence Community: the NIO/Warning is assigned to be the primary agent responsible for substantive warning and the warning process; all major elements in the Community will establish dedicated warning intelligence staffs; warning intelligence products will be coordinated with the National Foreign Intelligence Board principals on a fast-track basis, will be brought immediately to the attention of the DCI and the DDCI, and will be the basis of a tailored collection plan for enhanced monitoring of the warning event.

The DCI's increased emphasis and change of direction concerning warning intelligence will have a direct effect on future collection needs. The target sets will be global rather than highly focused on former Warsaw Pact nations and more dynamic in that regional issues will be more of a concern. The impact of this change in the scope of warning intelligence upon future collection needs is that warning collection sets will not be as structured and constant as they were for the Warsaw Pact and Soviet strategic attack problems. They will need to be tailored constantly to changing regional situations. (b)(3) 50 USC 403, Sec 6 [redacted] The specific implications for overhead collection needs are presented in Table B-2.

Foreign Affairs Intelligence Trends

NSD-67 is particularly informative on intelligence needs to support policy and planning for foreign affairs, economic affairs, and defense. It documents the fact that intelligence needs for foreign affairs management is a substantial requirement that includes many elements of our government. NSR-29 identified these departments as having critical needs: STATE, NSC, OSD, JCS, ACDA, JUSTICE, DOC, DOE, DOT, AID, FEMA, and Congress. The following are observations on foreign affairs intelligence needs:

(b)(1)1.4c

- [redacted]
- [redacted]
- [redacted]
- [redacted]

(b)(1) 1.4c

Table B-2. Indications and Warning Intelligence: Overhead Collection Capability Needs

(b)(1) 1.4c, (b)(3) 50 USC 403, Sec 6

In addition to broadening sets of of intelligence consumers for foreign affairs management, there are important changing trends in the use of intelligence by senior policymakers. (b)(1) 1.4c

(b)(1)1.4c

Overhead architectures must be designed as balanced end-to-end systems, from system tasking to final product dissemination.

(b)(1)1.4c

But there is an increasing need to share intelligence in the context of multinational arrangements and, frequently, to make the intelligence public. More flexibility in intelligence-sharing practices and policies are needed for increased disclosure of sensitive intelligence and often for its release. (b)(1)1.4

Table B-3. Foreign Affairs Policy Management: Overhead Collection Capability Needs

(b)(1)1.4c, (b)(1)1.4g, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i)

Economic Affairs Intelligence Trends

NSD-67 clearly identifies that economic intelligence is a major need for many consumers. Consumers include Treasury, DOC, STATE, USTR, DOT, OSD, JUSTICE, FEMA, AID, DOE, and USDA. Traditionally, economic intelligence focused on the Warsaw Pact's defense budget; economic intelligence is now a global topic and includes a wide variety of subject matter. (b)(1)1.4c, (b)(3) 50 USC 403, Sec 6 [redacted]

Economic intelligence intersects with defense and political intelligence in several important priority intelligence needs. For instance, technology transfer and even weapons proliferation activities are often national initiatives taken for economic motives as much as for political motives. (b)(1)1.4c, (b)(3) 50 USC 403, Sec 6 [redacted]

Economic intelligence is likely to be a growth industry for national intelligence. Even though NSD-67 uncovered an enormous need for economic intelligence, many consumers are still at an early stage of appreciating the potential contribution of national intelligence to economic policy development, which itself will likely remain in flux for some time. (b)(1)1.4c, (b)(3) 50 USC 403, Sec 6, (b)(1)1.4g, (b)(3) 10 USC 424, (b)(3) 18 USC 798, (b)(3) [redacted]

Table B-4. Economic Affairs Policy Management: Overhead Collection Capability Needs

(b)(1)1.4c, (b)(3) 10 U S C 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6, (b)(3) 18 USC 798, (b)(3) [redacted]

Defense Policy/Planning Intelligence Trends

DoD needs for foreign political intelligence are almost as extensive as the Department of State's needs for policy and planning for alliance management, military assistance programs, treaty negotiations, technology-transfer control, joint exercises, and the development of regional defense policies. The new national military strategy emphasizes peacetime operational missions of forward-presence forces in western Europe, East Asia/Pacific, and in the Persian Gulf. Thus, defense policy and planning will remain a global problem. Peacetime intelligence needs for this new strategy include:

- Warning intelligence on political and military instabilities
- Improved estimates that provide insightful assessments of the motives and intentions of the political actors in each region
- Accurate assessments of relevant regional military forces and weapons systems capabilities, including enhancements obtained through arms transfers
- A minimum essential infrastructure data base for the rest of the world, including host-nation support capabilities and targeting reference materials for traditional as well as advanced weapons
- In-place coalition intelligence support and sharing arrangements.

Defense intelligence needs for weapons system development and acquisition are also becoming global. Future threat assessments, a major driver in weapons acquisition decisions, are no longer strictly a red threat but also include blue and gray weapons systems. Table B-5 presents defense affairs policy and planning overhead collection capability needs.

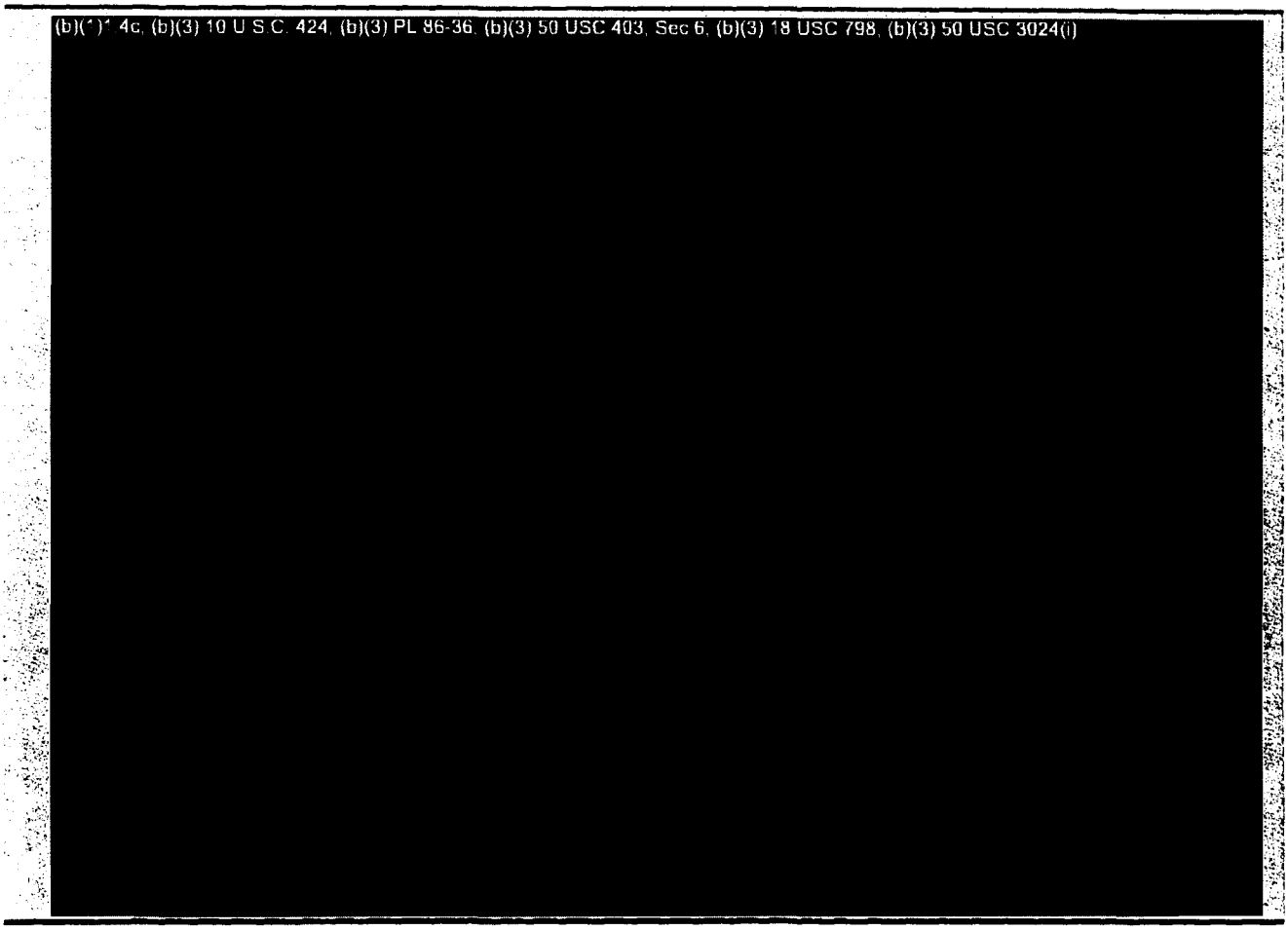
Global Issues Intelligence Trends

Both the *National Security Strategy of the United States: 1991-1992* and NSD-67 address global issues that cross the traditional boundaries of political affairs, economic affairs, and defense. These issues include global energy, global environment, world health and population, international terrorism, and narcotics trafficking. They are already priority national concerns but their importance to our national security in the future will likely be greater, and the list will grow. Associated intelligence needs will become more significant in the future as our policies on these complex issues become more comprehensive. In several cases (for example, the environment), the intelligence needs are little understood today since the threat and international relationships and responsibilities are now unfolding. Table B-6 presents the overhead collection needs associated with global issues.

Crisis Management and Support to Military Operations Intelligence Trends

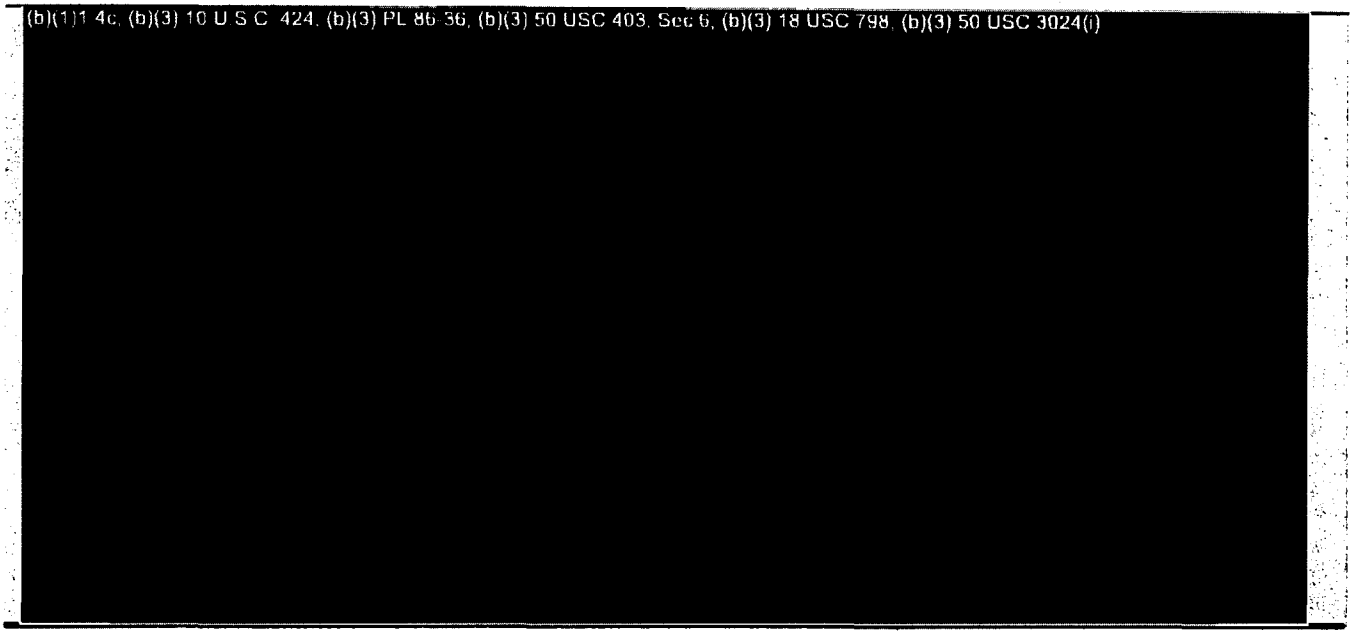
The new national military strategy of the United States clearly recognizes that planning for a major nuclear war on a global scale is no longer required. It states that military plans and capabilities now need to be structured on the reality that US global interests and assets will inherently be challenged and put at risk in the uncertainty and instability of a rapidly changing world. Crisis response is therefore a major thrust of the new strategy. The essence of the regional crisis response strategy is the capability to be able to respond to any

Table B-5. Defense Affairs Policy/Planning: Overhead Collection Capability Needs



crisis with a range of options. These options are to be preplanned, encompassing all the instruments of national power (diplomatic, political, economic, and military). Within the military response regime, the options will range from a single surgical strike to the deployment of multinational forces, sufficient for a quick, decisive victory. For high-level crisis response options, the strategy recognizes that the introduction of ground forces remains the most compelling signal of national resolve. If the crisis turns into conflict, air superiority and sea control are also fundamental tenets of the strategy. The central planning factors set forth in the new strategy are the tailoring of force structures for joint task force operations and maintaining a peacetime reserve posture for come-as-you-are deployments.

Table B-6. Global Issues Policy Management: Overhead Collection Capability Needs



The above short review of the new military strategy of the United States sets the framework for the new intelligence capabilities that will be required in the future for support to military operations. The implications for overhead collection capabilities are clear, in terms of guiding principles:

- Global access and frequent coverage must be maintained; regional focusing is to be achieved with short response times.
- Targeting flexibility from overhead systems must be readily achieved in terms of requirements tasking and system performance.
- Cross-cueing among systems will be more important as the target sets become less predictable.,
- Near-real-time reporting will be increasingly important for both policymakers and military commanders.
- High accuracy geopositioning and high resolution target definitions will be vital requirements for the employment of advanced weapons.
- Collection system architectures and military intelligence and operator architectures must be not only interoperable but balanced in terms of capacity, and designed for very high data rates.

Specific implications for overhead collection capability needs for crisis management and for support for military operations in the future are presented in Table B-7.

Table B-7. Crisis Management and Support to Military Operations: Overhead Collection Capability Needs

- IMINT

(b)(1)1 4c

- COMINT

(b)(1)1 4c, (b)(3) 50 USC 403, Sec 6

(b)(1)1 4c, (b)(3) 10 U S C 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i)

Summary Observations

The preceding strategic-level review of the changing and broadening aspects of our national security interest proved to be of value for understanding the scope of intelligence required to support the diversity of government departments charged with national security responsibilities. The review of intelligence trends that stem from changing national security interests was also valuable, in the context of indicating what intelligence needs are lessening, identifying new needs, and understanding what intelligence process changes are required for more consumer support. This work provided the foundation for understanding future overhead collection capability needs that must be maintained as an essential national capability. Several fundamental conclusions follow from this review of national intelligence needs for overhead collection that are held to be pertinent to the task of the panel:

- The use and value of overhead-derived intelligence is expanding throughout the Executive Department, as well as in the Legislative Branch. As our national security interest broadens in scope with the changing world, the baseline need for overhead-derived intelligence for national security management will remain substantial for the foreseeable future.

- No aspect of national security management is supported predominantly by a single or even a few overhead collection systems. To varying degrees, all principal consumers require a combination of collection capabilities; thus some degree of all current types of capabilities must be maintained.

- Changing requirements, the changing world, and the globalization of select technologies, are having the consequence that some aspects, principally in SIGINT, of overhead-derived intelligence are becoming less effective to pursue by overhead systems than by alternative means.

- The nature and scope of the defense intelligence needs are radically changing. The need for blanket coverage of a monolithic threat is giving way to the need for intelligence in support of adaptive planning for a variety of contingency operations on a global scale. Overhead collection systems and architectures need to be optimized for targeting flexibility and tasking adaptability.

- The value of overhead-derived intelligence for support to military operations will increase. Factors that contribute to its increased value are smaller forces, less predictable operational requirements, increased use of advanced weapons for surgical strikes, short crisis-to-conflict warning times, and defense policies that call for decisive victories with minimum casualties and collateral damage.

- Intelligence consumers involved in practically all aspects of national security management have increasing needs for rapid (often in near-real-time) intelligence; overhead collection architectures must be designed on an end-to-end basis for this objective. Table B-8 presents a summary evaluation of the relative contributions overhead collection is expected to make in the future to national security intelligence needs.

Table B-8. National Security Intelligence Needs: Relative Overhead Collection Contributions

(b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

APPENDIX C. INDUSTRIAL ADVISORY COMMITTEE REPORT TO THE WOOLSEY PANEL SUMMER 1992

HUGHES

Subsidiary of GM Hughes Electronics

A. J. IORILLO, President
Telecommunications and Space Sector

31 August 1992

The Honorable R. James Woolsey
Shea and Gardner
1800 Massachusetts Avenue, N.W.
Suite 800
Washington, DC 20036

Dear Jim:

Attached is the final report of the Committee on Industrial Impacts. I hope that it will be useful to your Panel's deliberations. As you requested, I have limited dissemination of the report to you and the Committee members. My colleagues and I are grateful for the opportunity to express our views on these important issues.

Sincerely,

Anthony J. Iorillo

Attachment
Classified and
under seperate cover

Office of the Chairman
Corporate Offices
P.O. Box [illegible]
Los Angeles, CA [illegible]
(310) [illegible]

APPENDIX C. INDUSTRIAL ADVISORY COMMITTEE REPORT TO THE WOOLSEY PANEL SUMMER 1992

Foreword

The Woolsey panel established the Industrial Advisory Committee to undertake a study of the industrial base issues arising from the significant decline in NRO program funding. The committee was asked to develop concepts which might be incorporated into an industrial policy that would improve and streamline the government's development and procurement process.

The committee members were Tony Iorillo, Sam Araki, Mike Henshaw and Bob Kohler. The committee and a number of consultants met over a three week period to develop the material contained in this report. Information and opinions were solicited from all companies in the current industrial base. Responses were factored into the study.

Introduction

In the last twenty years, the government has developed a very capable and robust overhead collection system comprising (b)(1)' 4c, (b)(3) 10 USC In the last decade, the government has inventoried (b)(1)1 4c, (b)(3) 10 U replacement satellites which have even greater capability. The current constellation plus the replacement set should serve the government well into the next decade and the government might wait some considerable period before it acquires any new systems. In other times, industry would turn its resources to other programs until the government was ready to reorder.

However, today there simply is no other available market large enough to sustain the industry on any sort of stable path. NASA, with its focus on shuttle and space station projects, has not been a reliable source of support for the satellite industry. The DoD has been a source of support through its C³I programs, but such support is declining rapidly. The commercial satellite industry is currently active, but the technology involved does not span the entire set required by the NRO.

The fact is that the major industrial suppliers to the NRO have already suffered major reductions in force. Within a year and a half, with the work on the last of the replacement satellites nearing completion, these companies will necessarily dismantle their unique development and production capabilities unless some steps are taken. Given our current view of the government's requirements for satellites in the future, the industry size required will be less than half of what it is today. It is our opinion that two of the top five suppliers will probably be forced to withdraw entirely from the satellite business.

In view of the industrial situation we described, the committee attempted to answer some related questions for the panel's consideration.

1) How might the government alter its current SIGINT procurement strategy to help promote as orderly a transition as possible?

2) What are the critical technologies, supplies and skills which warrant special attention?

3) What might the government do to help sustain these resources?

4) What can the government do to support the industrial downsizing?

5) What might the government do to streamline its programs?

6) What might the government do to improve the launch vehicle situation?

Discussion and recommendations related to each question are presented in sections which follow.

Assumptions and the Challenge

Figure C-1 shows the assumptions this Committee made concerning past and future NRO budgets. We believe the numbers, though rough, are approximately correct. (Both then-year and constant 1992 dollars are shown). The budget reduction from 1986 (peak year) to 1994 in constant '92 dollars is approximately 55%. The industrial impact will be an approximately 60% reduction in work force at the contractor level by 1993-94. This rapid downturn results from concurrent phasing-down and -out, of all of the current NRO system production programs, including imaging, SIGINT and Titan IV.

Figure C-1. Assumed Budget

The country needs to maintain operational capabilities during this downsizing and to provide for capabilities in the future. The Industrial Commission has made the following operating assumptions:

- (b)(1)1 4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6
- [redacted]
- [redacted]
- [redacted]
- [redacted]

(b)(1)1 4c, (b)(3) 10 U S C 424, (b)(3) PL 86-36, (b)(1)1 4e, (b)(3) 50 USC 403, Sec 6, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i)
[redacted] We expect the current Low and High architectures being derived individually by separate program offices to yield a program which will not fit the available budget. An integrated High/Low architecture which the addresses the missions cooperatively will lead to costs within the funding profile.

Threats to a Viable NRO Program

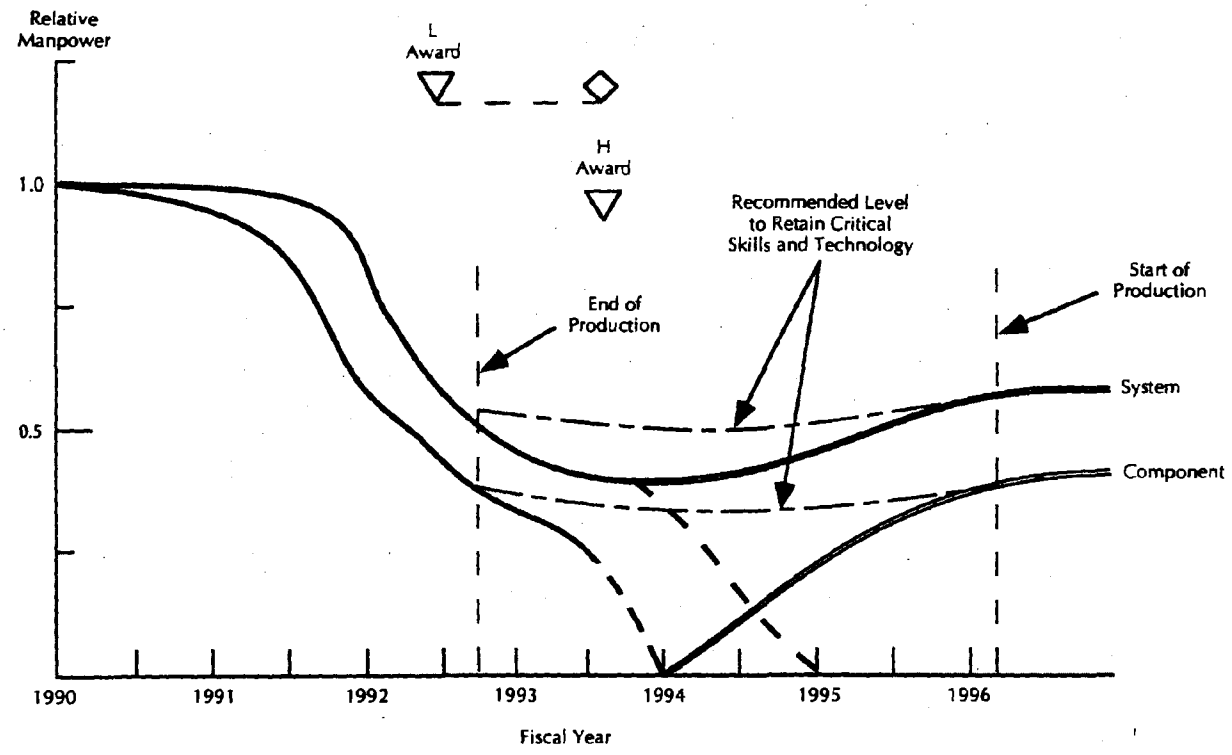
The declining budget and downsizing of NRO Programs pose serious threats to maintaining a viable program and its associated industrial base. If the required downsizing is not accomplished in an orderly, well planned manner the nation could easily lose critical technologies, skills and industrial facilities necessary to accomplish the NRO Program. (b)(1)1 4c, (b)(3) 10 U S C 424, (b)(3) PL 86-36, (b)(1)1 4g, (b)(3) 50 USC 403, Sec 6, (b)(3) 18 USC 798, (
[redacted]

Plans must be implemented to retain the critical skills and technologies during the multi-year gap. The same applies to the (b)(1)1 4c and Titan IV elements of the NRO, since they (b)(1)1 4g, (b)(3) 50 USC 403, Sec 6
(b)(1)1 4g, (b)(3) 50 USC 403, Sec 6, (b)(3) 10 USC 424 prior to start of any new development. Figure C-2 shows the effect of the current plan (heavy lines) on the entire industry involved in the NRO. The upper line ("system") is for the whole industry: the lower line is for the lower tier "component" or subsystem suppliers. The dashed lines show the estimated minimum levels for each necessary to retain the critical skills and technology.

The "gap" between plan and need in FY '93 through FY '95 is dramatic and equates t (b)(1)1 4c, (b)(3) 10 USC critical skills personnel. The following sections of this report discuss the nature of these skills and technologies and recommend methods for retaining them. To illustrate how important it is to put in place some retention program we need only remember the example of the impacts due to the shutdown and restart after two years of the U. S. expendable launch vehicle industry when all launches moved to the Shuttle.

Following the gap and the resulting loss of key technical and production expertise: (1) the production cost and non-conformance/re-work items jumped by a factor of 3; (2) the launch failure rate jumped dramatically (e.g., 3 Titan - 34D failures in the next 15 launches) with attendant loss of high-value payloads. During this period, Delta and Atlas failures were also experienced.

Figure C-2. Industry Impact

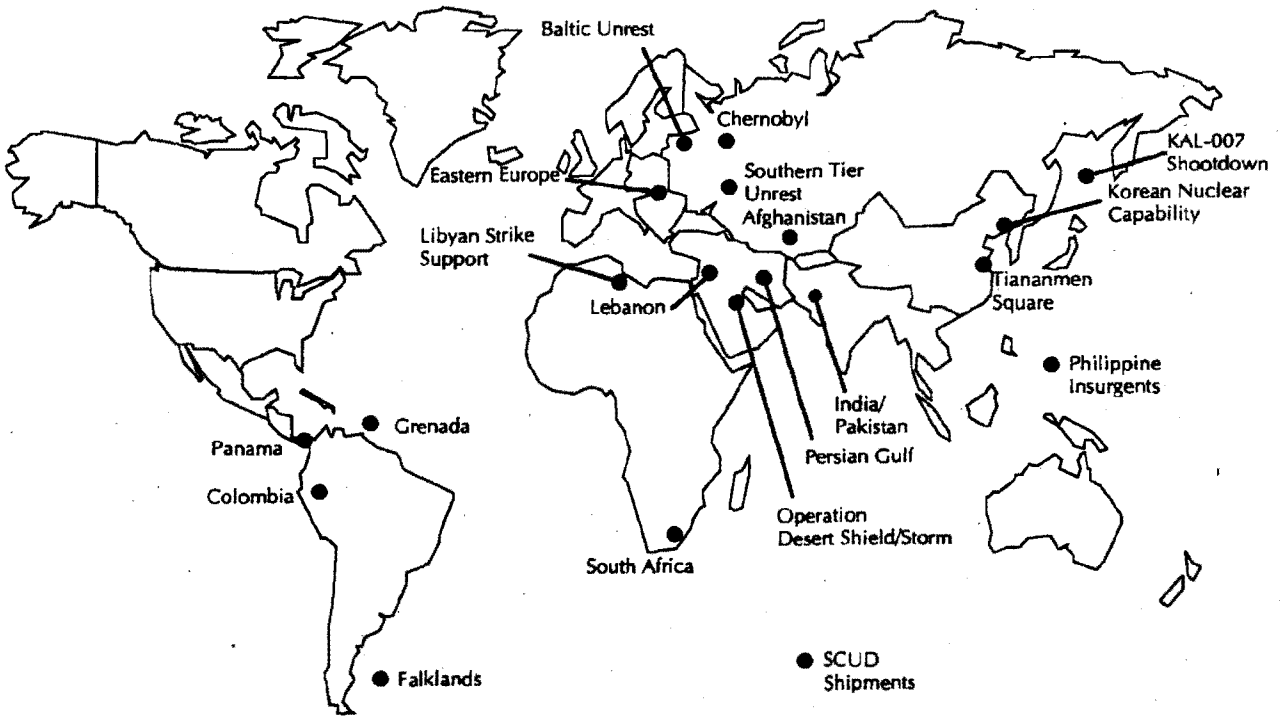


Recommendation I: Confirm Customer Needs and Act on Realistic Plan

1. Immediately establish a clear, integrated, affordable SIGINT operational concept ("design to budget") consolidate programs into a single architecture, restructure RFPs as needed.

The shift from a Bi-Polar world to a Multi-Polar world has resulted in a series of crises occurring worldwide. In the future, America's friends and enemies will be worldwide, crisis locations less predictable, and crises more frequent and varied. These crises require the overhead system to be more flexible and responsive to changing threats and to provide more global coverage, as indicated in Figure C-3. In response, this demands an integrated SIGINT operations concept with cooperative High/Low geopositioning, mutual tipoff, and other cooperative and integrated features. The resulting single architecture needs to be reflected in the procurement process.

Figure C-3. Worldwide Crises



2. Realign customer's procurement strategy to reflect integrated architectural approach.

Since the budget drives the desired outcome, it is recommended that the funding profile available for the Integrated SIGINT System (Space, Ground and Booster) be defined and specified with the RFPs.) The competing contractor teams should be required to prepare an integrated system configuration and system specification. The contractors should be required to develop launch and build rates based on the replenishment rate of the current high and low system constellations using actual operational life mean mission duration. The build rate should consider the continuity of workforce and integrated use of facilities to establish maximum efficiency; and the system specification and build rate must be compatible with the funding profile.

3. Maintain current procurement schedule (1993 contract start) for integrated architecture.

Maintaining the 1993 contract start date for the single integrated architecture procurement(s) is critical to the maintenance of the industrial base. It is recommended the NRO shift its procurement strategy now such that the resulting integrated RFPs be specified to the current RFP schedule.

Recommendation II: Identify and Sustain Critical Capabilities

Problem Statement

Budget reduction and consolidation and re-competition of current NRO programs has led to a significant downsizing of development activity. Since the new programs will not start before FY 1994 at the earliest, a major downsizing of the in-place work force will have occurred in 1992 and 1993, as illustrated by the solid line on Figure C-2. This loss of personnel with skills and experience in critical technologies will make it difficult, to produce systems cost-effectively with the mission performance needed for the next decade.

The country's ability to sustain NRO programs rests on a kernel of specialized capabilities: technologies, suppliers, facilities, skilled manpower. Some of this kernel will be at risk in the near future because customers other than the NRO are unlikely to support them.

Timing is important to sustain this base. If the NRO would selectively start new efforts in early FY 1993 aimed at a few unique technology fields, several benefits would follow. First, the loss of personnel with critical skills and experience would be lessened (as shown in the dashed line of Figure C-2). Second, by having much of the technology on-the-shelf by FY 1994, the development risk of the new systems would be greatly reduced. Third, there would be fewer startup or re-start problems and associated costs with the development of new systems because the learning curve would not be lost. Fourth, the final total cost of these systems would be less because of the insertion of production and O&M labor saving technology.

Discussion

1. What are the critical technologies for the future?

In responding to this question we have emphasized those technologies which are unique to NRO programs and are unlikely to receive funding from non-NRO sources.

A list of such critical technologies is attached as in Table C-1. We have selected three from that list to discuss as examples. They are: 1) large deployable structures, 2) stabilization and control of large, agile spacecraft, and 3) large lightweight optics.

Table C-1. Critical Technologies for the Future

- Large Deployable Structures
- Stabilization and Control of Agile Spacecraft
- Large, Lightweight Optics
- Precisions Pointing of [redacted]
- Faster Focal Planes
- [redacted] Focal Planes
- Data Compression Algorithms
- [redacted] Processing Algorithms
- SIGINT Processing Algorithms

A. Large Deployable Structures. NRO requirements drive the need for space systems which stow compactly within a launch vehicle shroud, yet deploy on-orbit to a very large size. These include SIGINT antennas, masts, feeds and solar arrays. Deployable antennas have many unique features. They are extremely large, must deploy and maintain their shape very accurately in space. Deployment mechanisms contain many hinges and cables which must work autonomously and reliably in the space environment.

[redacted]

C. Large, Lightweight Optics. Space imaging optics have many unique features: they must be polished to an accuracy of a small fraction of a wavelength of light over their entire surface, they must not distort in the widely varying thermal environment during an orbit, and their cost must be acceptable in low volume production.

2. Critical Suppliers for the Future

In responding to this question we attempted to concentrate only on suppliers with product lines unique to NRO programs. We excluded suppliers of subsystems where the prime contractors have established or could

establish a capability. (b)(1)1.4c

(b)(1)1.4c, (b)(3)10 USC 424, (b)(3) 50 USC 403, Sec 6

(b)(1)1.4c, (b)(3)10 USC 424, (b)(3) 50 USC 403, Sec 6 These companies supply the precision (b)(1)1.4c, (b)(3) 10 USC 42 focal planes used on imaging spacecraft. Other suppliers manufacture focal planes, but not with the unique combination of sensitivity, pixel size and uniformity required for NRO applications.

(b)(1)1.4c

(b)(1)1.4c We understand that (b)(1) intends to continue to operate this business, but would likely be more expensive. (b)(1)1.4c The large space optics industry is an example of a business that has had over-capacity and poor earnings for many years. Left to its own, it could randomly disintegrate.

(b)(1)1.4c is the only U. S. supplier of large mirror blanks required to make large imaging optics.

(b)(1)1.4c, (b)(3)10 U.S.C. 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i)

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, This company makes phased array antennas and transmit-receive modules, has many years of R&D investments and experience on aircraft systems and is fluent in VHSIC and MMIC technology.

3. What are the facilities which are unique or dedicated to these programs for which we have no other application?

When considering the BYEMAN Industrial Facilities involved in these programs and for which there has been significant investment, the buildings involved fall into three general categories:

A) (b)(1)1.4c, (b)(3)10 USC 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6

B) Secure facilities (TEMPEST spaces and clean rooms) which currently support highly classified programs but could with some large amount of funding be converted for other use, either classified or unclassified.

C) A third category of facilities are those currently used for restricted work which can be considered excess. These represent buildings which were secured but no longer are required. The cost for these facilities could either be paid for by the Government and held for future Government or contractor use or sold.

Large optics fabrication, polishing and testing facilities are considered specific to the NRO. (b)(1)1 4c, (b)(3) [redacted] as well, fall into this category although all of these capabilities are probably not needed.

4. Critical skills for the future

We believe ground and space engineering skills, (e.g., thermal, structural, power, software, etc.) could and will be supported by ongoing DoD, commercial and NASA programs. A frequent revisit to ongoing non-NRO programs will be necessary to ensure certain skills and technologies are maintained outside the BYEMAN world. Only specific skills related to the NRO are listed. These include specific systems engineering skills, cleared development engineers, manufacturing, and integration and test personnel (See Table C-2 for a full list of critical skills required). (b)(1)1 4c, (b)(3) PL 86 36, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i) [redacted]

Table C-2. Critical Skills for the Future

- Specific Systems Engineering Skills
  - System Concept Definition
  - Systems Development
  - Operations Concept
  - Mission Definition/Assessment
  - Data Analysis/Understanding
  - Architectural Configuration Development
  - Space, Ground Algorithm Design (especially SIGINT Processing)
  - SIGINT/EO Systems Definition
- Cleared Development Engineers
  - Precise Pointing and Control of Large Spacecraft
  - Mechanical Design of Deployable Structures
  - Antenna and Feed Design
  - SIGINT/EO Payload Designers and Developers
  - Signal Processing
- Manufacturing Integration and Test Personnel
  - Optics
  - Large Antennas

(b)(1) 1.4c

[redacted]

The impact of near term layoffs must also be considered. If new programs do not start before FY 1994, a major downsizing of the work force will have occurred in FY 1993. The implications of draw-downs and schedule slips for the various programs are dramatic by any measure. Program cancellations have resulted in sharp drop-offs in all the manpower loading profiles for the NRO platforms. A sampling of three major contractors (b)(1) 1.4c, (b)(3) 10 USC 424 show a peak of three or four thousand people per company working on these programs dropping to less than 500 per company by the end of 1993.

In summary, the recommendations to sustain the unique industry capabilities are:

1. Sustain critical skills and technologies through targeted use of contract R&D; change the current practice of spreading R&D too widely to peripheral suppliers; focus R&D through prime contractors.

2. Identify unique, low rate production facilities and capabilities to be mothballed; prepare need planning and documentation.

3. Establish written and video documentation of critical processes and skills (e.g., bonded storage information package).

4. Maintain critical systems engineering and analysis skills through directed manning at ground stations and factory based O&M contracts.

5. Direct primes to identify unique suppliers at all levels in "industry food chain" and determine best way to preserve, integrate, nurture or mothball. Periodically update unique supplier list.

Recommendation III: Support Greater Efficiency

1. Set realistic program schedules then assure adherence and timely completion through stabilized funding.

Broad, but well-thought-out, government requirements, followed by clearly articulated general specifications which can be used by industry, are the first step in promoting increased efficiency. These specifications, with a firm design-to-cost funding profile provided, allow industry to develop strong, detailed systems specifications and design criterion.

The Industrial Committee believes that substantial resources are wasted by both government and industry when ill-defined, ever-changing and ever-growing, detailed specifications are issued to industry for

the competitive design and build of programs. This waste of time and resources is further enlarged when sudden shifts in funding, and therefore schedules, occur. Usually these shifts are caused by ill-defined strategic plans and architectures, which lead to a poorly defended and advocated program on the Hill.

Program stability (funding, strategy, schedule) is needed now more than ever because industry has downsized to the point of losing critical skills for a technological excellence and high quality response to new programs.

2. Permit broader security compartments and encourage dual-use technologies and greater sharing with DoD and NASA.

No one argues that adequate, reasonable program security is warranted. But the Committee concludes that several positive steps can be taken which would not jeopardize security.

a. To the maximum extent possible, develop, manufacture and test unclassified subsystems and components of a classified system in an unclassified area (controlled if warranted). This reduces program clearance expense, facility expense, etc.

b. Combine multiple program material buys for efficiency. The buy of parts for Program 2 could be documented as extra parts for Program 1, for example.

c. Aggressively promote cross-clearance of engineers and technicians who possess critical skills. Achieve further savings by requiring cross-program use of development, production and test facilities, key skills and marching armies.

d. Facilitate cross-utilization of technology with other government users to spread program costs over a wider base.

e. Aggressively allow products developed in classified areas to "pass through" to unclassified programs.

f. Immediately begin to limit and disassemble unneeded and marginal multiple compartments.

3. Downsize customer's internal costs (e.g., O&M, review procedures, SETA) to fit new budget scenario and assure proper balance between overhead costs and new procurements.

This is an area in which both industry and government can improve. The Committee concludes that too many government (and therefore industry) people are attending too many meetings where too little is happening, there is too much unneeded paper produced and required, and too much useless, non-value-added work performed. It is not unusual for there to be a meeting where there are 100 government and 100 industry people in attendance.

4. Develop updated policies and practices on international trade.

Freedom to sell surveillance systems and components abroad may help ease the economic transition for some companies, but it is not likely to lead to sales large enough to ease the problems of the industry as a whole.

There is a potential overseas market:

- Demonstration of US capabilities has generated demand for systems in other countries.
- In addition to overhead assets there is interest in ground stations, processing, and related equipment.
- Meeting these demands could help maintain employment levels in some suppliers.

The committee had a difference of opinion on the likely size of the international market, but agreed that regulations forbidding US firms' selling to other customers should be lifted. In addition to easing the downsizing, such a move could help sustain US technological leadership and discourage technical development in other countries.

5. Resolve national launch needs through balanced investments in current and future launch systems.

There are several improvements which must be made to the current launch vehicle fleet and infrastructure as the nation debates and prepares for the new National Launch System envisioned for 2005-2010:

a. Modernized AGE for reduced manpower at the launch site.

b. Solid-state avionics, laser-initiated ordnance, electromechanical actuators.

c. Reduced specialized payload/booster interface requirements. Develop very few interface specifications and mandate payload and booster compliance.

d. Develop payloads robust enough for factory assembly and shipping. This would allow minimum pad time and quick launch turn-around, as well as reducing the "standing army" awaiting launch.

e. Invest in "clean pad" launch infrastructure where the payload is encapsulated in parallel with booster integration and "crawled" to the pad together for launch.

f. Prove-out NLS technology on existing ELVs. This will reduce risk for the eventual NLS.

g. With increased/stabilized launch rates as a result of minimum pad time (payload encapsulation, etc.) open-up launch infrastructure for multiple, diverse users.

h. Most importantly, however, sustain minimum production of this nation's expendable launch services through NLS design, development, test and operational status. Avoid dark factories (prime, 2nd- and 3rd-tier subs) associated with ELV production gaps.

Recommendation IV: Encourage Essential Industry Evolution

Shifting customer needs and the current budget outlook create significant challenges for our industry base. Significant over capacity is already evident and will grow substantially worse. Without appropriate actions this excess supply of talented people, dedicated facilities, and competitive teams will create an unacceptable drag on the overall productivity and affordability of the industrial base. These problems are only aggravated by the current, dramatic downsizing now reshaping the entire aerospace industry. Re-deployment of essential people and facilities is no longer a realistic option. Initial estimates suggest that the one-time cost of restructuring the industry to eliminate this excess of people and specialized facilities could exceed (b)(1)1.4c, (b)(1)1.4c, (b) Furthermore, some traditional regulatory assumptions and constraints may need to be reexamined in light of the clear need for consolidation and for new and more affordable forms of competition. Failure to accomplish this needed restructuring rapidly and successfully threatens unaffordable overhead rates throughout the industry.

In this context, several recommendations would help accomplish evolution of the industrial capacity. These are summarized below:

1. **Accommodate the inevitable trend toward greater contractor specialization or centers of excellence, through more targeted funding, directed teaming, and concentration of scarce resources.**

Greater specialization by major suppliers will help consolidate and protect essential capabilities while reducing overall customer costs. Redundant or duplicate facilities, people, bidding expenses, research, and overhead structures can be minimized by appropriate specialization. This, in turn, will require clear customer recognition of the critical role that a few suppliers must play as centers of excellence. Needed specialization can result as funding is channeled to key suppliers, R&D funds are focused on only the most critical areas and credible suppliers, and the costs of duplication and broad competition are clearly balanced against the potential benefits of competition. Inevitably contractor selections by the customer will need to be made sooner and from a more limited list of fully qualified suppliers. Often directed teaming or other actions to foster and sustain a viable center of excellence may be required.

2. **Maintain competition (despite specialization) through dual sourcing, R&D support of key technologies and other proven methods.**

Greater specialization need not eliminate the benefits of productive competition. In many segments of the aerospace industry, techniques have been developed to gain many of the benefits of competition despite significant concentration. Dual sourcing may still be economically sound in some program or technical areas. R&D funding can be used to sustain an alternative, competitive concept. Greater customer involvement in selected research and prototyping activities may be warranted. New contracting terms and incentives may be required. In this new industrial environment, key customer and industry leaders will need to formulate a new, affordable, and appropriate basis for competition.

3. **Support regulatory changes essential to encourage efficient consolidation and disposition of excess assets and personnel.**

The industry must take prompt actions to adjust to the new demand scenario. Slow, cautious, incremental cuts will only waste resources, raise total costs, and frustrate customer needs. However, prompt

action may require relief from traditional constraints on teaming, joint ventures, sharing of information, and customer involvement in key contract decisions. All branches of government need to recognize these extraordinary times and the need to re-examine any traditional rulings, regulations, or practices that impede appropriate and prompt industry restructuring.

4. Support recovery of extraordinary costs (e.g., facilities disposition, personnel severance) through modified directives on terminated contracts.

Essential restructuring actions will create extraordinary costs to sell or mothball facilities and terminate excess personnel. Initial estimates suggest that these costs are large enough to discourage some suppliers from acting promptly, yet slow response will only waste scarce customer resources. Therefore there may need to be adjustments to current directives so that contracts termination costs are properly reflected and shared.

The NRO and the defense/Intelligence Community are able to play only minor roles in supporting legislative, regulatory, and tax changes. To the extent that they can, however, we would encourage them to support tax credits or other legislation to partially recognize the extraordinary restructuring costs being incurred by the entire aerospace industry.

NATIONAL RECONNAISSANCE OFFICE
14675 Lee Road
Chantilly, VA 20151-1715

30 October 2015

This is in response to your letter dated 18 February 2012, received in the National Reconnaissance Office (NRO) on 23 February 2012. Pursuant to the Freedom of Information Act (FOIA), you are requesting a copy of "The Report associated with the 1992 National Reconnaissance Program Task Force for the DCI, Commissioned by the DDCI in September 1992 and conducted by the R. James Woolsey Panel."

Your request has been processed in accordance with the FOIA, 5 U.S.C. § 552, as amended. After a thorough search of our records and databases, we located one document (65 pages) responsive to your request. The document is being released to you in part.

Material withheld from release is denied pursuant to FOIA exemption (b)(1), as properly classified information under Executive Order 13526, Sections 1.4(c), 1.4(d), 1.4(e), and 1.4(g); and exemption (b)(3), which applies to information exempt from disclosure by statute. The relevant withholding statutes in this case are:

10 U.S.C. § 424, which provides (except as required by the President or for information provided to Congress), that no provision of law shall be construed to require the disclosure of the organization or any function of the NRO; the number of persons employed by or assigned or detailed to the NRO; or the name or official title, occupational series, grade, or salary of any such person;

The Central Intelligence Agency Act of 1949, 50 U.S.C. § 403, as amended, e.g., Section 6, which exempts the disclosure of information pertaining to the organization and functions of the Central Intelligence Agency;

Public Law 86-36, The National Security Agency Act of 1959, 50 U.S.C. 3605, which exempts from disclosure information pertaining to the organization, activities and functions of the National Security Agency;

50 U.S.C. 3024i, which protects intelligence sources and methods, and;

18 U.S.C. 798, which allows for protection of information relating to communications intelligence.

You have the right to appeal this determination by addressing your appeal to the NRO Appeal Authority, 14675 Lee Road, Chantilly, VA 20151-1715 within 60 days of the date of this letter. Should you decide to do so, please explain the basis of your appeal.

If you have any questions, please call the Requester Service Center at (703) 227-9326 and reference case number F12-0054.

Sincerely,

Patricia B. Cameresi
Chief, Information Review and Release Group

Enclosure: Final Report - National Reconnaissance Program Task Force for the Director of Central Intelligence

Top Secret

[redacted]

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NATIONAL RECONNAISSANCE PROGRAM TASK FORCE

Final Report: National Reconnaissance Program Task Force for the Director of Central Intelligence

Top Secret

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Final Report: National Reconnaissance Program Task Force for the Director of Central Intelligence

Information contained in this report is classified and controlled within BYEMAN and COMINT channels jointly.

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Panel Membership

R. James Woolsey, Chairman
(b)(1)1.4c, (b)(3) 50 USC 403, Sec 6
Adm. Leon A. Edney (USN, Ret.)
Gen. Paul F. Gorman (USA, Ret.)
Jeffrey K. Harris
The Honorable Richard Helms
Robert J. Hermann, Ph.D.
Eli Jacobs
Gordon Negus
Condoleezza Rice, Ph.D.
Robert E. Rich
Gen. William Y. Smith (USAF, Ret.)
Sayre Stevens, Ph.D.

Final Report: National Reconnaissance Program Task Force for the Director of Central Intelligence

Introduction

You have asked us to review and make recommendations to you regarding the overall direction of the National Reconnaissance Program (NRP) in time to be useful for your deliberations on the US fiscal year 1994 budget and five-year program. (The Terms of Reference are in Appendix A under separate cover.) In the six weeks available to us, we have done our best to evaluate the total system architecture for overhead imagery intelligence (IMINT), signals intelligence (SIGINT), measurement and signature intelligence (MASINT), and related communications as thoroughly as possible. We have outlined a strategy for overhead reconnaissance based on a reduced set of programs. Our assessment is that this reduced set will support the basic needs of the National Command Authorities (NCA), policy makers, and several sets of operational users, particularly including military commanders, with one important exception: broad area synoptic search. We recommend an addition to this set of programs to meet this need. Throughout, we have balanced the ways in which space-based and non-space-based collection could meet our intelligence needs, considering both effectiveness and economy of effort.

Much useful preparatory work had been completed, and more was under way as a result of other reviews that the National Security Council (NSC), you, and the Director of the National Reconnaissance Office (NRO) have initiated. We have drawn substantially from these efforts and have been aided by a series of briefings and discussions with the key participants.

We have begun from an understanding that intelligence needs are changing substantially as a result of the collapse of the Soviet Union and the momentous events of the last few years. The risk to the nation of failing to detect any single event will be less cataclysmic than would have been the case when our concern was focused on the USSR; most would agree that there is no single development today that would deserve the attention we once focused on potential Soviet strategic weapons breakthroughs. But this does not radically simplify the task of intelligence collection in general or of overhead collection in particular.

It does change the focus of overhead collection and the nature and use of some collection tools. As a result of these developments, some intelligence tasks are declining in importance, [redacted]. Other tasks are declining because of technical developments [redacted]

(b)(1)1.4c. (b)(3) 10 USC 424. (b)(3) PL 86-36. (b)(3) 50 USC 403. Sec 6.

We want to stress that the uncertain nature of the world that is emerging from the end of the Cold War puts a heavy premium on the flexibility of intelligence collection methods. Flexibility is vital in order for us to be able to deal with unexpected developments that can be taken as seriously hostile to our national interests in a range of ways. Proliferation of weapons of mass destruction, narcotics production and smuggling, economic challenges, and other concerns are currently prominent. But the key point is that the focused and, in many cases, rather specific intelligence collection needs of the past [redacted] are being replaced by issues and concerns with less specific

addresses—in geography and in frequency along the electromagnetic spectrum. We have thus been especially mindful of the importance of being able to focus upon different regions and on new sources of intelligence as unexpected needs arise. We must do this while still paying an appropriate degree of attention to the territory of the former Soviet Union because of the potential instability and large number of armaments there.

Another general concern has been to ensure that intelligence collection be useful to a wide range of consumers, from the President to the commanders of small military units in the field. This must be available across the full spectrum from peace, through tension and crisis, (b)(1)1.4c
(b)(1)1.4c

[redacted]

Throughout this review, we have felt acutely the need to be fiscally conservative in what we recommend. Yet the panel is of the view that, although it is unrealistic today to expect anything other than some decline in the resources devoted to intelligence collection, an excellent case can be made for that decline being substantially less than the decline in spending on national defense in general. The leverage that intelligence, properly disseminated and used, gives to the consumers of intelligence—especially as a force multiplier to the military—strongly suggests the increased utility of intelligence in the post-Cold War world. Although substantial reorientation is needed, it by no means suggests that there should be, overall, a proportional decline in intelligence resources. Quite the contrary.

We have tried to make recommendations, and we believe that we have succeeded, which will save intelligence collection resources compared with a program of proceeding with the NRP as most recently set out in the President's program. We have done so by recommending the excision of some collection tasks and even some entire types of existing and proposed collection systems. We believe that some of these tasks would be useful to perform and that these systems would also be useful; on balance, however, we believe these functions can be handled adequately in these new world circumstances with the alternate methods we recommend.

We would stress that the basic architecture we recommend, in our judgment, comprises the fewest number of both satellites and satellite types needed to respond adequately to the overhead collection component of the nation's intelligence needs for the foreseeable future.

Finally, we have devoted considerable attention to the industrial base for the NRP. In many ways, this industrial base is at the heart of a key aspect of this country's predominance in space—a predominance that we believe constitutes a unique strength for the nation. Further, predominance in space-based reconnaissance provides the United States with an extraordinary instrument in our relations with the rest of the world. We should strive to sustain this predominance in the actions we now take with respect to NRP investments. Although several other programs—such Air Force systems as MILSTAR, DSP (Defense Support Program), and others—also provide support for the industrial base, many of the technology and production techniques that have pushed the state of the art across a whole spectrum of unmanned space capabilities are generated by the

NRP. NASA's focus on manned space flight and one-time experimental programs in recent years has further moved the NRP front and center as far as the nation's industrial production base for unmanned space flight is concerned. A wise reduction in the NRP cannot be made without paying attention to this industrial base and to the critical functions that it must retain as it, too, shrinks. Our recommendations point toward a concentration in the NRP on only four principal satellite collector types—two to collect imagery and two to collect SIGINT. In such a reduced architecture, the remaining industrial structure must be carefully managed by the NRO in order to maintain efficiency and retain vital technical personnel and functions.

We should point out four general complexities that we faced in making this assessment. First, there is a multitude of interrelationships between the different sources of intelligence. A clear and single line cannot be drawn between a collection system, acting alone, and an intelligence end product.

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6, (b)(3) PL 86-3

NRO has generally, over the years, had both the funds and the foresight to design collection systems (b)(1)1.4c

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6, (b)(3) PL 86-36, (b)(1)

With some modification and modernization, we believe that it will be quite reasonable to use existing satellite systems even more flexibly to fulfill the new functions that are needed in the post-Cold War world. Ideal new designs would theoretically, in some cases, provide superior performance. The research and development (R&D) cost of wholly new satellite systems is so substantial, however, that we have chosen instead the path of steady evolution of a limited number of basic collection types. We thus present solutions that are less capable, but also less costly, than ideal systems. We have generally opted for elimination of some programs and for evolution and adaptation of the remaining ones to the new shape of collection needs, not for new starts. It is the very high nonrecurring development costs of new systems, not any lack of faith in the capacity of the NRO or industry to work their customary technical miracles, that have driven us in this direction.

Third, we have tried to consider the rest of the intelligence process downstream from collection. Although our principal focus has been on the NRP and hence on collection, we have done our best to consider the implications of inadequacies and required improvements in production and distribution of intelligence. To focus collection properly, it is clearly vital to consider the needs of the final users of intelligence, whether the President or a commander in the field, and to recommend directions in collection that can be most readily and usefully exploited.

Finally, we have studied, and our recommendations have been influenced by, the Intelligence Community's requirements process. But we have by no means simply taken the most recent outputs of that process and tried to recommend a way to satisfy all, or even some fixed share, of them. Much of the requirements process deals with operational requirements, or the tasking of existing collection systems. As such, these requirements indicate the proper direction for developing and acquiring future intelligence collection systems only very indirectly—to about the same extent that the Single Integrated Operational Plan (SIOP) indicates the proper direction for strategic force planning. Simple extrapolations from these current tasking requirements to future force requirements for a suite of collection systems is often not much more useful. It tends to produce a fiscally unmanageable wish list: a sky filled with satellites.

Consequently, we have sought to make judgments about the nature of future intelligence needs (a term we prefer to "requirements" to avoid the implication that we have become enmeshed in the process set out in the previous paragraph) based on our own assessments of a mixture of factors. We have begun with NSR-29, NSD-67, the *National Security Strategy of the United States: 1991-1992,* and your 10-year guidance. We have then tried, as best we could, to match those future needs with intelligence collection methods that may satisfy them, given all the uncertainties and vagaries described above.

We would not want to leave the impression that only difficulties and problems have dominated our deliberations. There are some exciting opportunities for using the remarkable assets developed and operated by the NRO to promote the goals and objectives of the United States in innovative and effective ways. We have thus made some suggestions about the extraordinary promise of the accelerating technological revolution in information processing and dissemination.

We have sought, in light of all these considerations, to make recommendations for the general direction of the NRP that would give us both the maximum return for the funds spent on intelligence collection within that program and the maximum leverage for us as a nation over those matters that affect our security.

Future Needs and Collection Methods

The intelligence apparatus exists to serve the national security interests of the United States. The most recent expression of this is the *National Security Strategy of the United States: 1991-1992*, as defined by the President. The challenge before us is to address directions in national security following the collapse of the USSR and world communism and the worldwide fallout from these developments. We realize that, more and more, the important dimensions of our national security will be set by economic and political factors in the future, as well as by military factors. In addition, it is clear that in the aftermath of the Cold War, the military factors themselves take on a considerably different cast. We also paid close attention to the intelligence needs associated with global issues such as the proliferation of weapons of mass destruction, narcotics, terrorism, and the environment. To assess the impact of all these concerns on intelligence needs, we reviewed and used the results of NSR-29. (The foundation upon which our approach is based is set out in more detail in Appendix B under separate cover.)

For purposes of this report, we grouped intelligence needs into three broad categories:

- Intelligence that provides indications and warning (I&W) of emerging threats to our security—both strategic and regional.
- Intelligence that supports policy makers in developing and executing plans and policies in several areas—economic, political, defense, and global issues.
- Intelligence that supports crisis management and the use of military force, nationally or in coalition arrangements.

After making our best assessment of the needs of the consumers of intelligence who deal with these national security matters, we have set forth our judgments about the future directions for overhead intelligence collection that stem from these needs. We are aware that some important types of intelligence are increasingly likely to come from sources other than overhead collection and that overhead systems are costly. We have also focused, however, on overhead collection's unique attributes.

These attributes are of substantial importance to the nation. Overhead collection of intelligence can provide *assured access to denied areas* that today include, for example, the test, production, and storage facilities of countries developing weapons of mass destruction. Overhead collection also plays a major role in effectively monitoring compliance with arms-reduction treaties and other international agreements that affect our security interests. It is *nonintrusive* and has the potential to be covert, thereby limiting the risk to human life and political embarrassment that can attend other types of collection. It provides *timely* intelligence on a *global scale* across the spectrum of political, economic, and military interests and has particular application for crisis management because it has the *flexibility* to provide *focused coverage on a frequent basis*. The collection of information from overhead assets provides a *highly credible* set of facts to policy makers and has often been the sole basis for influencing policy decisions or for altering strongly held positions. Perhaps most importantly, overhead collection provides both *broad area and distributed point coverage* that permit a wide range of assessment and analysis.

IMINT

From the days of the first U-2 flights over the Soviet Union and the first reconnaissance satellites, overhead imagery has been a major component of intelligence collection vital to the security of the United States. There are some salient questions about imagery today, however, in view of several developments: the decreasing importance of

(b)(1)1.4c (b)(3) 10 USC 424 (b)(3) 50 USC 403, Sec 6

[redacted]

(b)(1)1.4c

[redacted]

We believe that there is a clear and compelling need for (b)(1)1.4c (b)(3) 10 USC 424 (b)(1)1.4e (b)(1)1.4g

(b)(1)1.4c (b)(3) 50 USC 403, Sec 6

[redacted]

After much discussion, it is clear to all of us that most of these needs—including search—can only be satisfied by relatively high-resolution imagery with frequent revisit. There is increasing pressure from intelligence analysts and consumers for higher quality imagery than previously available, and this pressure has substantial reasons behind it. The complexity of modern targets in many cases today necessitates

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6, (b)(1)1.4e, (b)(1)1

(b)(1)1.4c

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6, (b)(1)1.4e, (b)(1)1.4

(b)(1)1.4c, (b)(3) 50 USC 403, Sec 6

Technology in ground processing of imagery data is offering significant new capabilities. Computer-based image processing architectures offer substantial advantages in processing flexibility. Ongoing initiatives in both (b)(1)1.4c, (b)(3) 10 USC 424, I will add capacity, improve responsiveness, improve image quality and utility, and allow the production of

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

We applaud this effort. The ongoing NRO study to evaluate commonality in processing architectures shows great promise for significant cost reduction and performance improvement.

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

(b)(1)1.4c. (b)(3) 10 USC 424. (b)(3) 50 USC 403. Sec 6. (b)(1)1.4g

(b)(1)1.4c. (b)(1)1.4g. (b)(3) 10 USC 424. (b)(3) 50 USC 403. Sec 6

(b)(1)1.4c. (b)(3) 10 USC 424. (b)(3) 50 USC 403. Sec 6. (b)(1)1.4g

alternative would suggest, over the long run, a modest increase in vehicle production rate, recognizing the need for fiscal constraint, but would both ensure a high probability o(b)(1)1.4c. (b)(3) 10 USC 424. (b)(3) 50 USC 4

collection. This would result, ultimately, in a change (b)(1)1.4c. (b)(3) 10 USC 424. (b)(3) 50 USC 403. Sec 6

The flexibility that exists in(b)(1)1.4c. (b)(and the much greater flexibility that can be added to it suggests its continuation–(b)(1)1.4c. (b)(3) 10 USC 424 –as the principal overhead imagery system. The(b)(1)1.4 (b)(1)1.4c. (b)(capability will extend the performance of (b)(1)1.4c. (b)(3) 10 USC 424. (b) with the addition of an (b)(1)1.4c. (b)(3) 10 USC 42The NRO has established an evolutionary path for the insertion of improved capabilities into these systems to improve substantially their performance in several important ways. We do not believe that the deployment of an alternative or wholly different satellite imagery system in addition to these(b)(1)1.4c. (b)(3) 10 USC 424. (b would be desirable, much less worth the substantial added cost to develop and maintain a separate system. Our analysis of two-tiered imaging concepts revealed that there are some technically credible options for medium-NIIRS systems, but it is our strong view that the current and future imagery requirements for the United States are best served by the flexibility of the(b)(1)1.4c. (b)(3) 10 USC 424. (b)(3) 50 USC 4 systems. In imagery, we recommend concentrating on enhancements to current collection systems, not the introduction of new ones, in order to save development and infrastructure costs. We discuss below, however, some possible international applications of systems designed solely to collect lower-quality imagery.

Indications and Warning

We turn now to the utility of imagery in meeting the three broad categories of intelligence needs set out on page four. We have come to rely increasingly on imagery to provide I&W of threatening events,(b)(1)1.4c. (b)(3) 50 USC 403. Sec 6

(b)(1)1.4c. (b)(3) 10 U.S.C. 424. (b)(3) PL 86-36. (b)(3) 50 USC 403. Sec 6.

The use of imagery for I&W of all kinds comes at the cost of placing more demand on the imagery constellation for frequent coverage. (b)(1)1.4c

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6, (b)(1)1.4g

republics. This suggests the need for an option to add to revisit rates (see the above discussion of (b)(1)1.4c, (b)(3) 10 USC 424 collection) and also to improve the capability for the (b)(1)1.4c, (b)(3) 10 USC 4 system to contribute to I&W. (b)(1)1.4c, (b)(3) 10 USC 424

Policy Making and Planning: Imagery Intelligence

Defense Policy Making and Planning. In defense policy making and planning there are a number of important needs that can only be satisfied by overhead imagery. Among the most important is mapping. (b)(1)1.4c

The collection of large area source imagery to support map production. (b)(1)1.4c (b)(1)1.4c

It is necessary to accomplish this background mapping task prior to the height of a regional crisis so that, other than last-minute updating, the limited on-orbit resources do not have to be diverted to this task from other important missions within the region. The need for basic 1:250,000 scale maps could have become a ground "war stopper" in the Persian Gulf. The basic job of mapmaking had not been done for Iraq prior to Operation Desert Shield/Storm; substantial conflict between the mapping support and the priorities of other overhead imagery support to the Commander-in-Chief (CINC) was evident in the early months of the crisis. Currently, in the Bosnian crisis we need to be free to look for concentration camps as the crisis builds instead of collecting imagery for making the basic maps of Bosnia. The imagery constellation needs less of a surge capacity if the background mapping is systematically accomplished before the crisis.

LANDSAT has found a niche in the support of mapmaking through the application of overlays for intelligence preparation of the battlefield. These overlays have contributed to identifying the type of ground environment where field commanders will be operating. The low-resolution systems, however, have not proven useful in the preparation of 1:250,000 or 1:50,000 scale maps which are so vital to military operations. Enhancements to existing multispectral systems, which improve resolution from 30 to even 5 meters are still insufficient for this purpose. We do not recommend that NRP resources be used to pursue the use of the 5-meter LANDSAT-type systems to support the defense mapping mission.

Making maps for (b)(1)1.4c the Defense Mapping Agency are instrumental (b)(1)1.4c

(b)(1)1.4c

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

In time, the increased use of digital mapping products will help us substantially improve efficiency by replacing tons of maps with data that can be efficiently disseminated digitally in softcopy.

Another important defense planning mission, closely akin to mapping, is the accumulation of a (b)(1)1.4c Many intelligence and operational analysis tasks are substantially enhanced if we have a (b)(1)1.4c The detailed demands placed on imagery for understanding (b)(1)1.4c

(b)(1)1.4c, (b)(3) PL 86-36, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i)

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

imagery, and (b)(1)1.4c, (b)(3) 10 USC imagery are all instrumental in the construction of this data base.

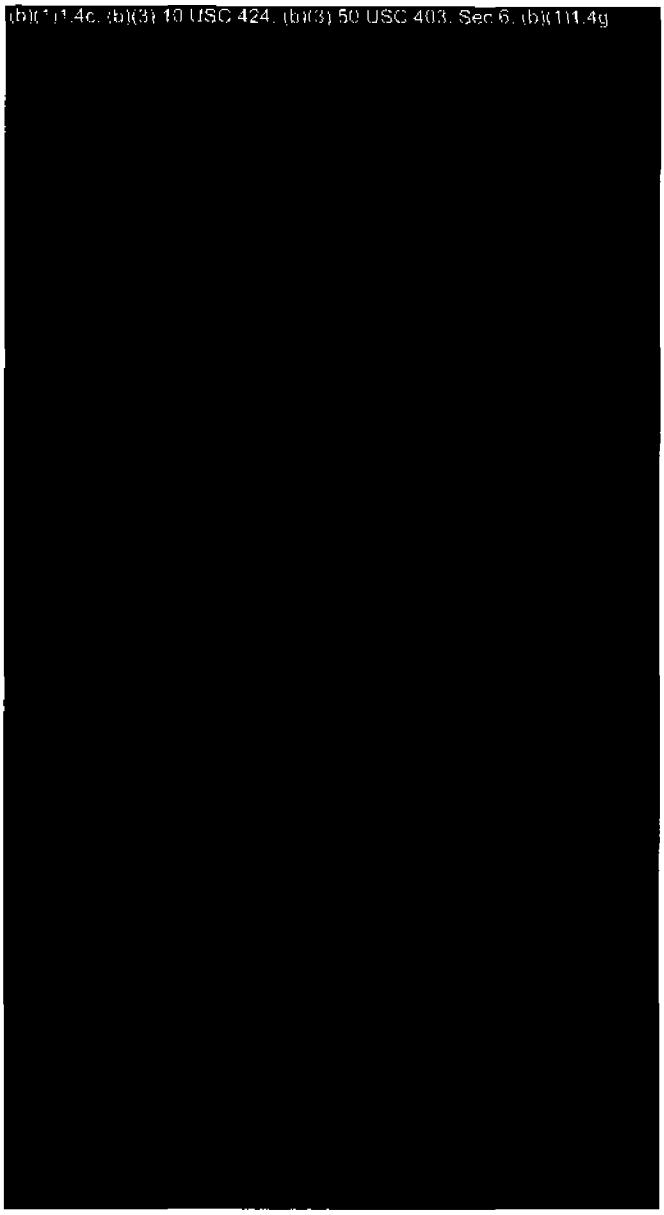
(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

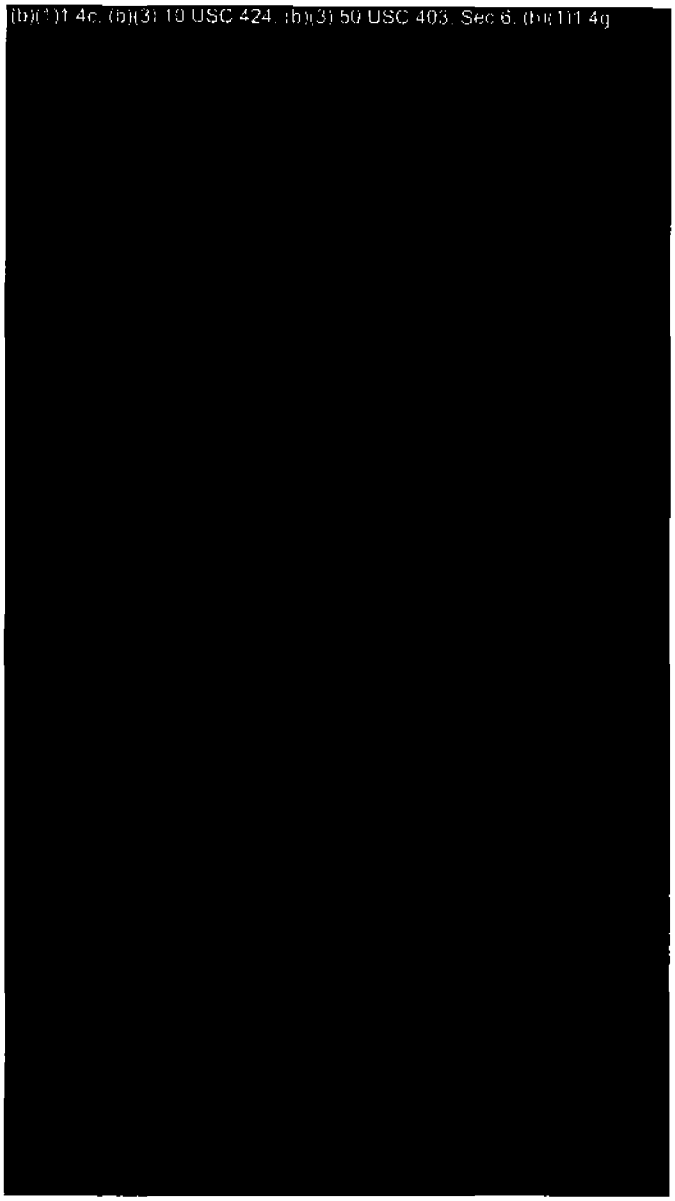
For example (b)(1)1.4c, (b)(coverage, if combined with frequent revisit, can be used to assess the rate

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

assisted by the (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Se

(b)(1)1.4c, (b)(3) 50 USC 403, Sec 6





Global Issues. **Imagery is also increasingly needed by government planners and policy makers to assess certain global developments that are of national security concern. The amount of imagery required here is moderate and generally of lower NIIRS resolution. Most coverage is not time-sensitive. One example, however, of such collection**

(b)(1)1.4c. (b)(3) 10 USC 424. (b)(3) 50 USC 403. Sec 6

basis.

In general, these collection needs can be dealt with handily within the framework of an imagery collection program that is designed and sized adequately for I&W, defense planning and policy, and support for military operations. These global intelligence needs do not point to a different type of imagery collection but they do support the rationale for the planned constellation. (b)(1)1.4c

Foreign Policy. The same general observation would apply to imagery support for foreign policy management. Moreover, those who manage foreign affairs sometimes need releasable imagery.

Economic Policy. Overhead imagery has some utility in helping address economic affairs and trade issues—for example, the monitoring of (b)(1)1.4c. (b)(3) 1

It is not expected that the volume of these needs will increase, and these target types fit easily within the proposed collection program capacities.

Crisis Management and Support for Military Operations

Overhead imagery is at the forefront of meeting intelligence needs for crisis management and support for military operations. (b)(1)1.4c

In the Balkans, the number of imaging operations has increased from about (b)(1)1.4c. (b)(3) 10 USC 424. (b)(3) 50 USC 403. in August 1992. The imagery has been used to give policy makers a daily update of military movements in Bosnia, to support humanitarian relief missions, to make assessments of fighting in Sarajevo, and to support military planning. In addition, imagery has been used to monitor (b)(1)1.4c. (b)(3) 10 USC 424. (b)(3) 50 US

The trend is likely to continue upward if French or other forces deploy to the area.

(b)(1)1.4c

Theater commanders asked for frequent coverage with varying look-angles of specific targets to support military planning. (b)(1)1.4c. (b)(3) 10 USC 424. (b)(3) 5

Imagery is clearly of great importance for many aspects of both crisis management and support for military operations. Yet its contribution has been far from perfect, as viewed from the perspective of the infantry battalion commander or the pilot in the cockpit. Many comparisons have been drawn between the quick responsiveness to combat

(b)(1)1.4c from SIGINT collection and the fact that many such commanders went into battle without imagery that they believed they needed. A second major issue has arisen because almost all observers agree that there would have been great (b)(1)1.4c

These issues have dominated much of the recent debate about imagery and, indeed, about the NRP as a whole. Some observers have even suggested that the (b)(1)1.4c

(b)(1)1.4c

(b)(1)1.4c

(b)(1)1.4c

The establishment of the Central Imagery Office (CIO), which has the charter to establish dissemination standards in conjunction with the NRO's system architecture work, is beginning to help solve this problem. (b)(1)1.4c

The panel was pleased to see some substantial planning for (b)(1)1.4c the continued (b)(1)1.4c We are convinced that this (b)(1)1.4c (b)(1)1.4c The evolution of new weapons and military operational concepts (b)(1)1.4c

(b)(1)1.4c

through preestablished dissemination profiles. Users should be able to have (b)(1)1.4c data base for identifying their areas of interest and, (b)(1)1.4c for example– (b)(1)1.4c A system designed to satisfy automatically a user's needs by letting him or her pull what is needed from a data base (b)(1)1.4c

(b)(1)1.4c

Broad Area Synoptic Coverage

(b)(1)1.4c

There are two candidate solutions currently under evaluation: the evolution of (b)(1)1.4c, (b)(3) beyond the (b)(1) focal plane previously described (b)(1)1.4c

required to meet the majority of needs for this sort of coverage is between (b)(1)1.4c for example (b)(3) 50 USC 403, Sec 6, (b)(1)1.4c

(b)(1)1.4c

particularly in support of military operations involving the commitment of troops at high risk.

(b)(1)1.4c

(b)(1)1.4c, (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

This latter figure is an area greater than Bosnia. It is just under 40 percent of the area of the KTO

(b)(1)1.4c

Developing a fair comparison between (b)(1)1.4c, (b)(3) 50 USC 403, Sec 6 is difficult and depends on the set of assumptions that one must make to resolve the differences. The panel recognizes that a decision about the importance of this broad area synoptic search mission and the method, if any, of meeting it needs to be made soon in order to focus the NRP's limited resources.

(b)(1)1.4c

(b)(1)1.4c

- (b)(1)1.4c

system in sufficient cases to justify its potential cost. (b)(1)1.4c

- Further, we feel that (b)(1)1.4c

(b)(1)1.4c, (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

Over the next decade, with yet an additional

(b)(1)1.4c, (b)(1)1.4e, (b)(1)1.4g, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec

(b)(1)1.4c, (b)(1)1.4e, (b)(1)1.4g, (b)(3) 10 USC 424, (b)(3) 50 USC 40

Such improvements to (b)(1)1.4c, (b)(3) 10 USC 424, (b)(

requirements with an aircraft, on the other hand, (b)(1)1.4c We feel the broad area requirement is so important that you should invest in the solution with the best chance of being sustained to completion. (b)(1)1.4c

Lastly, as we prepare this report, principals in (b)(1)1.4c This is an indicator of the worldwide (b)(1)1.4c

IMINT Summary

For the reasons set out above, we see little, if any, decrease in the nation's dependence on imagery systems. Within the (b)(1)1.4c **see an increasing need** (b)(1)1.4c (b)(1)1.4c **We would especially emphasize** (b)(1)1.4c, (b)(3) 50 USC 403, Sec 6, (b)(3) 10 USC 424

- (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6
  - **Structure the procurement in such a way as to make possible the capability to operate a** (b)(1)1.4c, (b)(3) 10 USC 4
    (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6
    This would permit the occasional operation of a (b)(1)1.4c, (b)(3) 50 USC 403, Sec 6, (b)(3)
- **Continue the deployment of** (b)(1)1.4c **at the** (b)(1)1.4c, (b)(3) 50 USC **with residuals to assure a** (b)(1)1.4c **The planned activity to** (b)(1)1.4c
- **The** (b)(1)1.4c, (b)(**program should be funded to move, by the early 21st century, toward having an area capability significantly beyond that of the current program. This** (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6
- (b)(1)1.4c
- (b)(1)1.4c

(b)(1)1.4c

SIGINT

In addressing the SIGINT elements of the NRP, some basic issues must be assessed in order to define an architecture to serve the nation into the 21st century. This basic assessment must both take into account the changes in the world around us and, given certain changes in technology, identify what collection in the future can best be accomplished by overhead SIGINT platforms.

(b)(1)1.4c (b)(3) 10 USC 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6

As we look at the world evolving after the Cold War and at the rapid evolution of technology, we find that some of the underlying missions for overhead SIGINT are in flux.

The Soviet Union no longer exists. Its ICBM missile test ranges are today nearly inactive. The United States has made major efforts to deal with the changing nuclear and strategic threat, ranging from international efforts to constrain weapons proliferation to the Global Protection Against Limited Strike program under the aegis of the Strategic Defense Initiative Organization. Our interest in these types of issues is shifting, but it has not vanished. (b)(1)1.4c (b)(3) 50 USC 403, Sec 6, (b)(1)1.4c, (b)(

Lacking the sharp, simplifying focus of the past, intelligence about threats related to weapons of mass destruction and other advanced weapons must be derived from data collected from both the former USSR and from activities within and among many different states about which we now know very little. We must characterize indigenous Third World weapons developments, monitor the acquisition and deployment of weapons from external sources, and generally track the traffic in advanced weaponry. Without such information, our attempts to be prepared to defend against these systems and to respond effectively to weapons proliferation cannot succeed. (b)(1)1.4c, (b)(3) PL 86-36, (b)(3) 18 USC 798, (b)(3) 50 US

(b)(1)1.4c (b)(3) 10 USC 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6, (

At the same time, Third World adventurism is no longer contained by a bipolar world order and ethnic conflicts are on the rise. These conflicts will involve combatants using weapons of all kinds from many sources. Monitoring new sources of conflict will involve keeping pace with new modes of communication: high-capacity communications in many countries are moving from simple high-powered analog systems to advanced low power digital pulse code modulation (PCM) technology and

from microwave transmission systems to land-based cable and fiber optic networks.

(b)(1)1.4c (b)(3) 10 U.S.C. 424 (b)(3) PL 86-36 (b)(3) 50 USC 403 Sec 6

(b)(1)1.4c (b)(3) 50 USC 403 Sec 6

Given these evolving geographic concerns, we also need to identify what types of signals we are trying to collect.

Significant work on SIGINT architectures has been accomplished by the SIGINT Community and the NRO over the last two years. Numerous SIGINT mission utility studies and two detailed system design studies have been conducted. The Low-altitude Integrated SIGINT Architecture (LISA) study is complete and the first phase of the High-Altitude SIGINT Architecture (HASA) study is due to be completed in December 1992. This work formed the foundation for our evaluation. These ongoing efforts to consolidate the overhead SIGINT architecture allowed our panel to evaluate the different elements of the architecture far more efficiently than would have otherwise been the case. The Community and the NRO together have developed a refined understanding of matching system capabilities to intelligence needs. This process was instrumental in allowing us to gain a sense of priorities and to help us understand the key elements of the architecture, particularly data integration across the SIGINT disciplines. The process was also useful in helping us assess cost. Discussions with senior managers of the National Security Agency helped us characterize the importance of overhead satellite-based SIGINT in NSA's strategic plans.

Indications and Warning

Warning intelligence has focused on the Warsaw Pact threat and on the Soviet Union strategic nuclear attack threat for the last four decades. SIGINT, both overhead and ground based,

has been a major contributor to the national intelligence posture, which has given us high confidence in the timely acquisition of this strategic warning. Our military strategy, to a large degree, was structured on the belief that timely and credible warning of a Warsaw Pact mobilization would be provided.

(b)(1)1.4c, (b)(3) PL 86-36, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i)

As our national focus moves away from the former Warsaw Pact countries, positive steps must be taken to refocus overhead resources on the regions of the world where warning is most important to us.

(b)(1)1.4c, (b)(3) 10 U.S.C. 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6,

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6

The newfound visibility and utility of the United Nations and the willingness of nations, including the United States, to deploy forces under its aegis make it vital to have timely and accurate intelligence to support an expanded set of users. Now, for example, early indications that countries are moving to violate sanctions, economic or otherwise, is critical intelligence to policy makers.

(b)(1)1.4c, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6, (b)(1)1.4g, (b)(3) 10

(b)(1)1.4c, (b)(3) PL 86-36, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i)

(b)(1)1.4c, (b)(3) PL 86-36, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i)

(b)(1)1.4c, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6, (b)(3) 10 USC 424, (b)

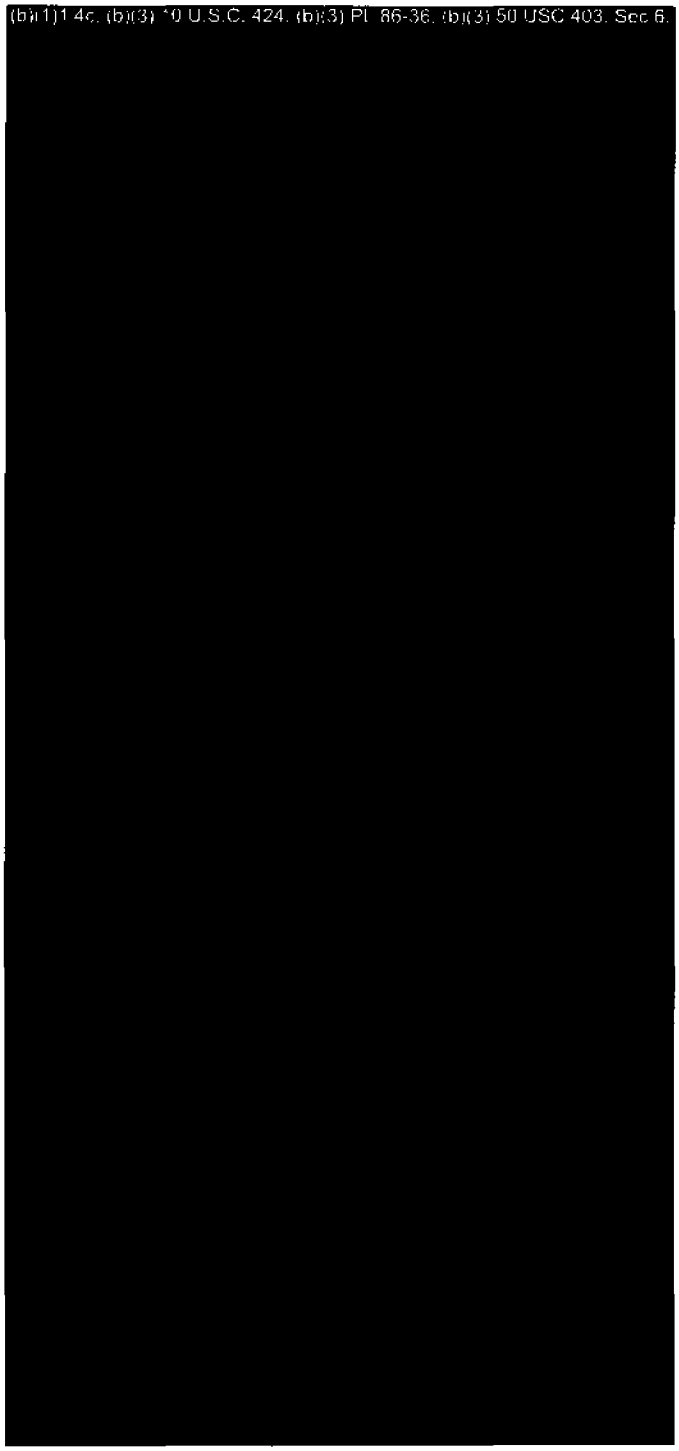
Policy Making and Planning: Signals Intelligence

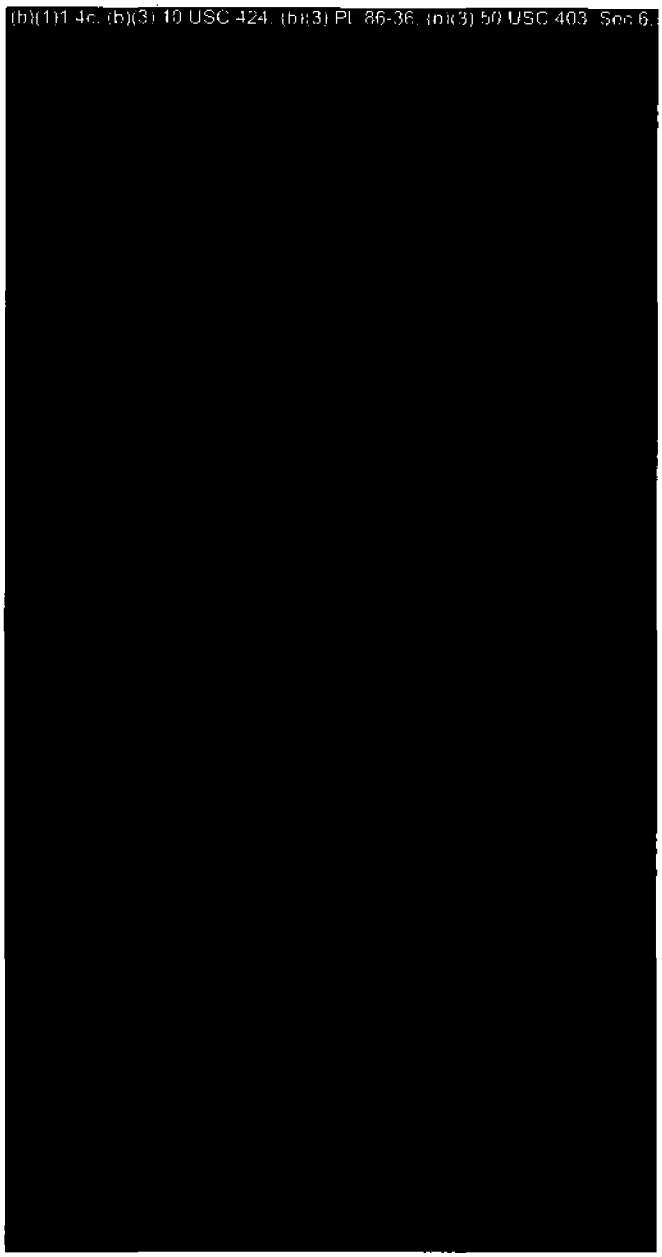
Defense Policy Making and Planning. The context within which defense policy is made and planning is done is undergoing a major change. A new national military strategy has been adopted, based on the recognition that planning for a major global war is no longer required. Regional military plans and capabilities need to be grounded on the understanding that US global interests and assets will be challenged and put at risk in an uncertain, unstable, and rapidly changing world. This new regional strategy is based on four elements: strategic deterrence and defense, forward presence, crisis response, and reconstitution. While elements of the former Soviet Union, particularly the nuclear CIS nations, remain a major focus, the strategy is fundamentally a global one to promote regional stability.

(b)(1)1.4c, (b)(3) 10 U.S.C. 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec 6, (

Global Issues. Both the *National Security Strategy of the United States: 1991-1992* and NSD-67 address new global issues that cross the traditional boundaries of political affairs, economic affairs, and defense. These issues include global energy, global environment, world health and population, international terrorism, and narcotics trafficking. They are already major national concerns, but their importance to our national security in the future will likely be relatively greater, and the list will grow. Intelligence needs associated with these issues will become more significant in the future as our policies on these complex questions become more comprehensive. In several instances, as in the case of environmental issues, the intelligence needs are little understood today since the threats and the international relationships and responsibilities are only now unfolding.

(b)(1)1.4c, (b)(3) PL 86-36, (b)(3) 18 USC 798, (b)(3) 50 USC 3024(i)





Crisis Management and Support to Military Operations

Responding to crises and to regional conflicts are major aspects of our new regional military

strategy. The essential criterion is to be able to respond to any crisis with a range of options. Options should be preplanned, encompassing all the instruments of national leverage: diplomatic, political, economic, and military. Within the nation's military responses, the options will range from a single surgical strike to the deployment of national or multinational forces that are sufficient for a quick, decisive victory. The strategy therefore spans conditions of peace, crisis, and war.

The demand for extensive overhead SIGINT collection in response to crises and support for military operations will be a continuing national priority. There are fundamental differences between these new needs and those associated with the traditional operations plans for a global conflict.

Planning for future conflicts includes the following assumptions:

- Conflicts can occur at almost any place in the world and in varying environments; strategic lift will likely be required from both forward deployed sites and from CONUS (continental United States).

- The operational objectives and size of employed forces can vary greatly from conflict to conflict (support to UN forces, humanitarian operations requiring a show of force, and so forth) and will be scaled according to our strategic interest in a particular nation or region.

SIGINT collection needs for regional crises and conflicts will require architecture changes as well as a broad set of overhead collection system capabilities. Tasking flexibility and precise data, although historically needed for many military applications, will be imperative for future conflicts in regions and against adversaries for which we will have little time to plan.

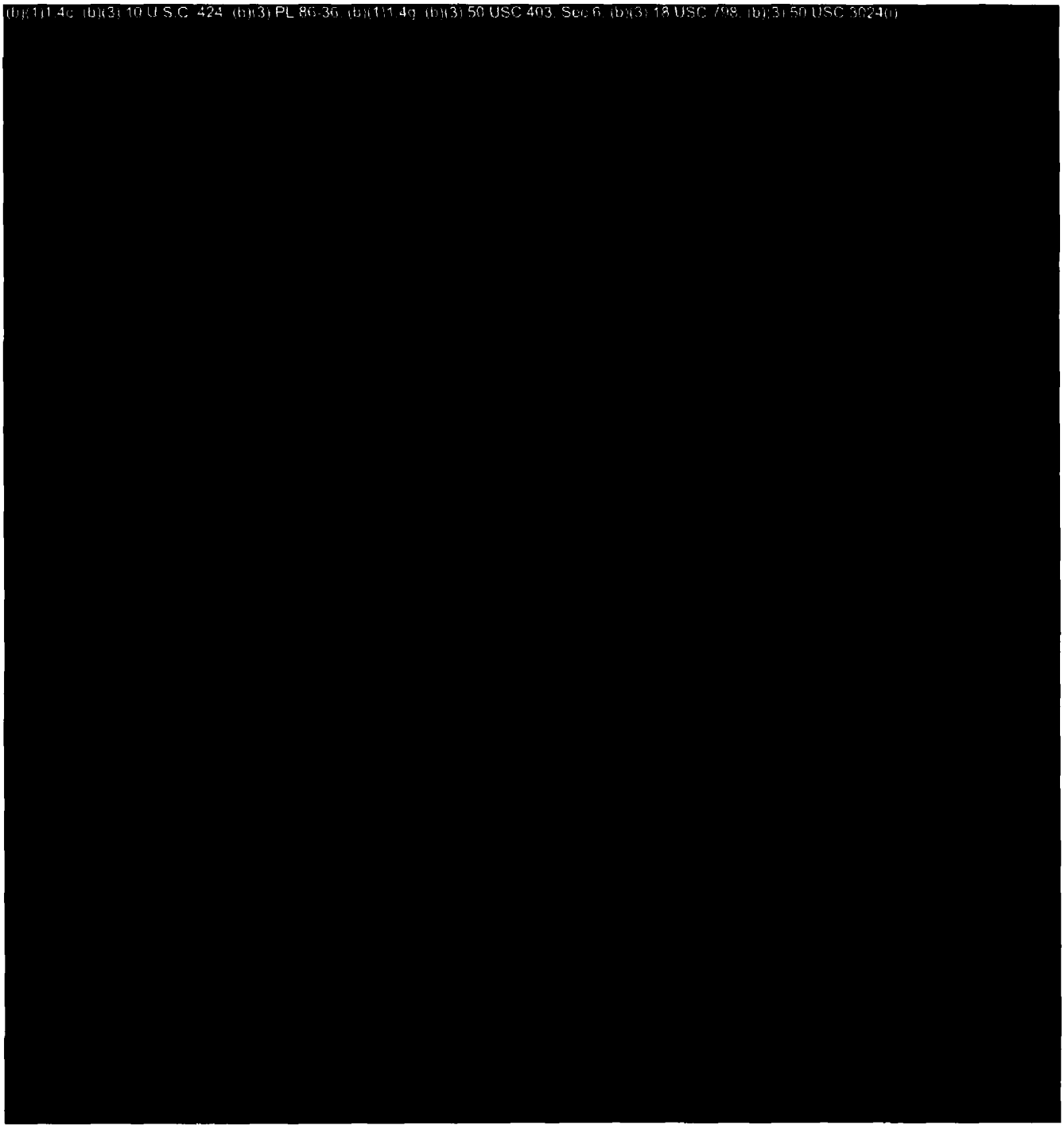
Overhead COMINT will continue to be important for force posture changes, deployments and employments, military C3 systems and configurations, targeting, battle damage assessment, and coalition operations. OPELINT will also continue to be of high value for all of these needs. Additionally, TECH ELINT and signal searches will be needed for quick reaction counters to enemy modifications to red, blue, and gray weapons that may first be disclosed on the battlefield. TECH ELINT and signal search intelligence form the kernel of a performing OPELINT system.

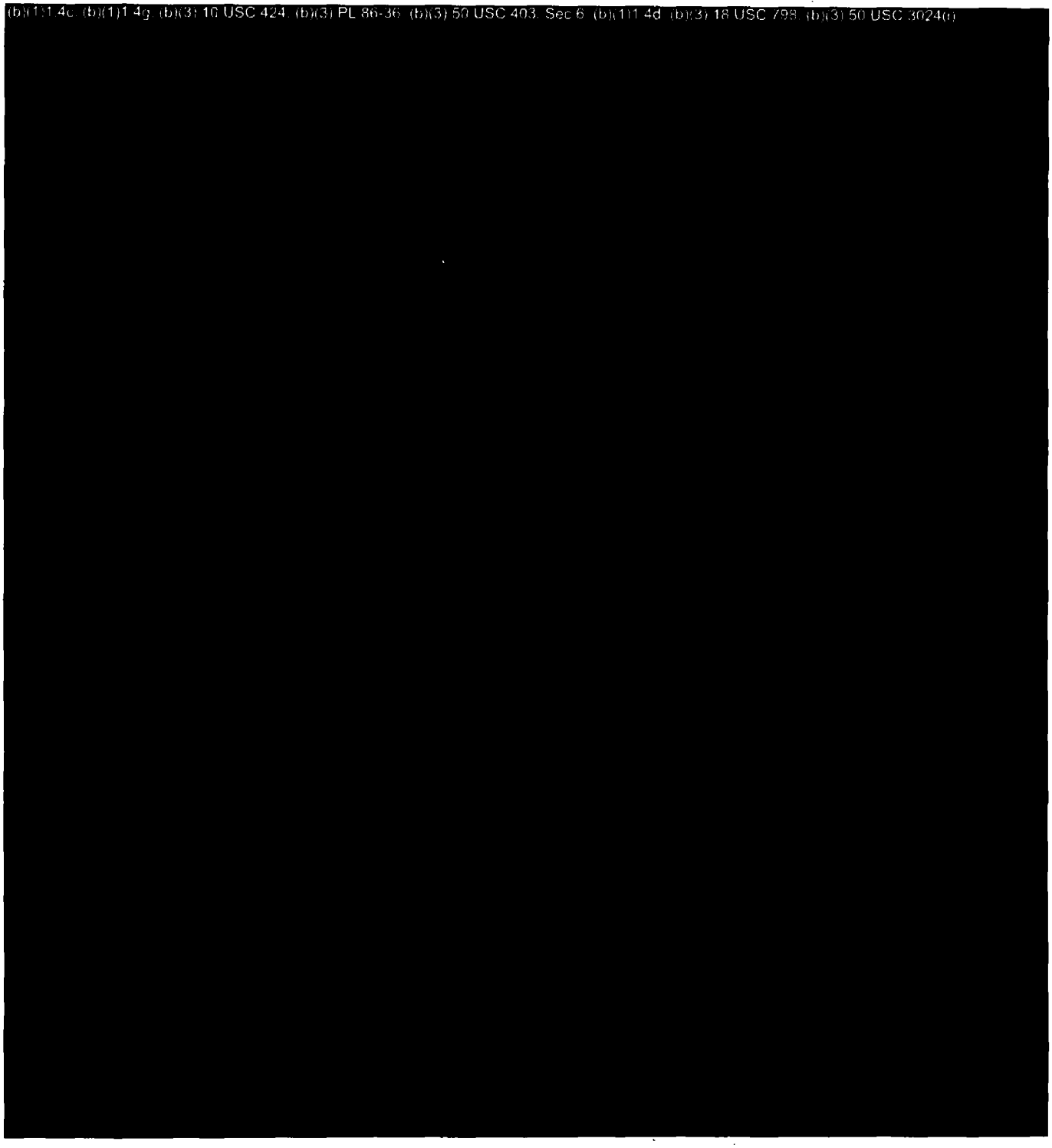
In terms of establishing overhead SIGINT capabilities, crisis management and support for military operations will be the dominant needs. These extend far beyond sensor system performance. The end-to-end architecture needs, including terminal dissemination, should be addressed.

SIGINT Dissemination

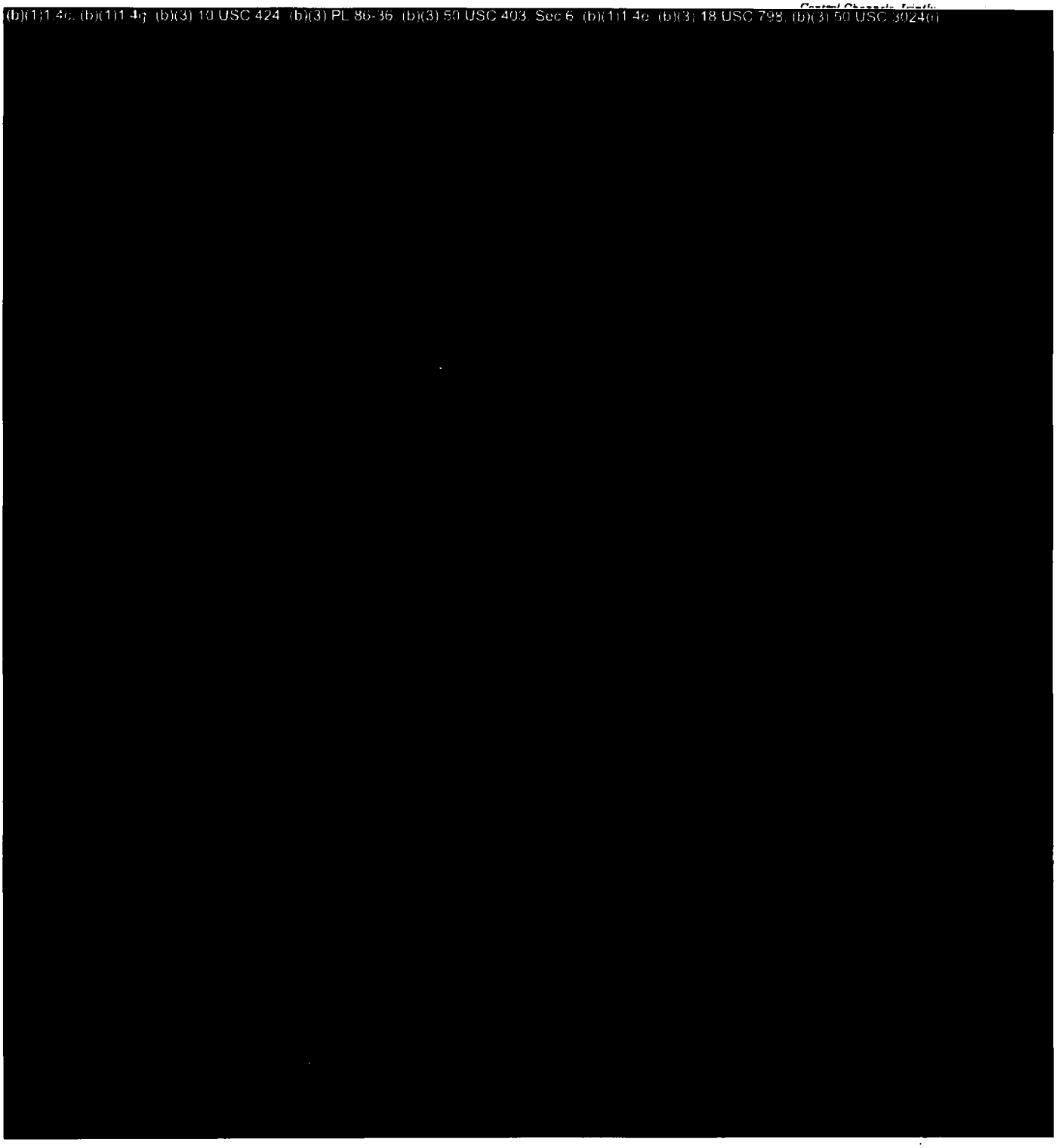
The intelligence derived from SIGINT overhead collection has, from the inception of the program, been disseminated as part of the overall SIGINT distribution system operated by NSA. For many years this system employed a dedicated communications network designed to move SIGINT data among intercept stations and production centers, and between them and a large array of customer headquarters, including the full range of principal military commands worldwide. More recently, these arrangements have been expanded to include the use of tactical communications networks to afford rapid transmission to additional tactical commanders in the field.

During Operation Desert Shield/Storm this system performed well, delivering useful and timely SIGINT results to military customers in the theater of operations. The overall system, moreover, is enhanced by the on-scene presence at major military commands of SIGINT support units that assist in manipulating the overall SIGINT system to satisfy the commanders' needs. In general, the SIGINT dissemination system is adequate to support its customers.





(b)(1)1.4c (b)(1)1.4g (b)(3) 10 USC 424 (b)(3) PL 86-36 (b)(3) 50 USC 403, Sec 6 (b)(3) 18 USC 798 (b)(3) 50 USC 3024(i)



(b)(1)1.4c, (b)(3) 10 U.S.C. 424, (b)(3) PL 86-36, (b)(3) 50 US

approach is sound. Because of its marginal utility, we recommend against the procurement of a satellite for the (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6 is not required until it is needed to support the second plane of (b)(1)1.4c, (b)(3) in June 2000.

Communications

We have reviewed the NRO overhead communications architecture. The NRO must relay mission data from the collectors to a mission ground station in the United States.

(b)(1)1.4c, (b)(3) 50 USC 403, Sec 6, (b)(3) 10 USC 424

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

The dissemination of (b)(1)1.4c, (b)(3) data via a (b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6 is critical to (b)(1)1.4c, (b)(3) 10 success in meeting its users' needs. The addition of communication transponders to (b)(1)1.4c, (b)(to support this requirement is appropriate.

(b)(1)1.4c, (b)(3) 50 USC 403, Sec 6, (b)(3) 10 USC 424

is required to permit the modification of (b)(1)1.4c, (b)(3) 10 USC 424, (b)(1)1.4c, (b)(1)1.4g,

MASINT

Measurement and signature intelligence (MASINT) is an auxiliary product of overhead collection.

The (b)(1)1.4c program has included research and development to derive information from (b)(1)1.4c, (b)(3)

Although this process is computationally intensive, the algorithms developed to date show extraordinary promise of making additional intelligence contributions.

The (b)(1)1.4c, (b)(program has the capability to
(b)(1)1.4c, (b)(1)1.4g, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6
(b)(1)1.4c, (b)(3) 10 USC 424, (b)(1)1.4e, (b)(1)1.4g, (b)(3) 50 USC 403, S
(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6, (b)(1)1.4g, (b)(1)1

formed the Industrial Advisory Commission, composed of four senior aerospace executives. The Commission solicited responses from that portion of the aerospace industry that serves the NRP and developed concepts for addressing industry's concerns. Their report to the panel is in Appendix C under separate cover.

We are convinced that it is absolutely essential that an aggressive industrial policy be developed to ensure that the critical resources and unique capabilities of industry are sustained as reductions occur. Without an aggressive approach to this problem, the industry is in significant danger of falling below critical mass in several key areas within the next 18 months. Strong companies must be sustained in order to supply innovative engineering, cost-effective manufacturing, and sound system management. Without guidance to industry, the declining budget will result in spreading too few dollars across the existing industrial base, thereby reducing the strength of all companies in the process. The time has come for the government to take steps to avoid such a result and to establish policy and guidelines for reducing the NRP's industrial base in such a way that the proper mix of capabilities is maintained. The panel recommends that the Director of the NRO establish this policy within the next six months to address the following considerations:

- **Low Production Rate Facilities:** There is a significant overcapacity in NRO-dedicated buildings and staff. The NRO should establish a process to identify, systematically, the facilities and capabilities that are unique to the NRO, and a comprehensive planning process should be developed to address production rates and capabilities to be mothballed. The realities of the resource environment will demand a streamlined approach in order for us to be able to maintain the critical capabilities while facilities are being scaled back or eliminated. Enhanced training and video documentation of critical assembly processes must be incorporated to ensure the possibility of reestablishing production if resources permit and requirements dictate. Critical engineering

Industrial Base Considerations

The future overhead collection architecture is heavily dependent on the capabilities of the US aerospace industry. The effects of reducing the industrial base must be considered in any recommendations the panel makes.

Even the current program would require a reduced industrial base in order for production to take place at efficient rates. A reduced program, such as we set out here, requires such reductions to an even greater degree. To ensure as comprehensive a look at the problem as time would allow, the panel

skills and the continuation of a skilled workforce should be maintained by directed cross-assignment to ongoing activities, such as operations and maintenance contracts.

- **Industry Redefinition:** This industrial policy should develop industrial centers of excellence to ensure that scarce resources are optimally focused on key subjects of specialization. Government and industry should jointly develop reduction plans that utilize such tools as enduring joint ventures with managed competition, accelerated depreciation of capital equipment, and methods to overcome exit barriers for facilities that are no longer required. Regulatory changes should be identified and implemented to encourage efficient consolidation and disposition of excess capacity. Useful levels of competition should be maintained by selective, focused R&D and appropriate dual-sourcing. Industry prime contractors should work with the government to identify unique component suppliers. This data should be used to develop a methodology to preserve, integrate, nurture, or mothball these suppliers' capabilities.

- **Methodology to Sustain Unique Industrial Capabilities:** The NRO should reevaluate its R&D process to ensure that it systematically addresses long-run needs for innovation. The R&D should be targeted at critical technologies that are unique to the NRO's needs. The NRO should evaluate the utility of increased R&D's being coordinated by the prime contractors, serving as centers of excellence. In the reduced aerospace funding environment, the panel believes that the NRO's R&D funding must be increased if the United States is to maintain its superiority in innovative engineering in unmanned space flight. As production rates are reduced, it is imperative to protect the systems engineers and component engineers who serve the NRO's unique needs and design the next generation of modifications, improvements, and systems.

- **Industry and Government Efficiency Improvements:** A substantial number of changes have occurred since the establishment of the NRO in the 1960s. Many procedures and management practices should be reevaluated in light of the need to reduce unnecessary overhead and promote efficiency. The inefficiencies caused by programs being stretched for budgetary reasons are severe. Procedures should be established between the Administration and Congress to minimize the disruption caused by such stretch-outs.

- **Industrial Security:** The security procedures used by NRO development activities are excessive. The current security system should be thoroughly examined and overhauled. Some of the current regulations appear to be based on absolute worst-case assumptions and may no longer have logical justification. There is little justification for some of the technologies currently in use by the NRO to remain classified. The degree of classification currently used is a heavy administrative burden, and it significantly reduces dual use of the technologies by other government agencies. Much of the compartmentation between individual NRO programs today also seems to have a small degree of utility to justify its substantial expense. After deployment, most—if not all—of the basic characteristics of the majority of collection systems are typically available, outside of the compartment, in user (product) security channels. The panel believes that a generic "development" security channel is warranted in order to reduce development overhead and promote efficiency and technology sharing between programs and that the reduction in protection of data would be minimal. In the context of such an overhaul, the establishment of several exclusive compartments for particularly sensitive data should be considered.

- **Launch Infrastructure:** The launch infrastructure is a significant contributor to

system cost. The NRO should continue aggressive planning to ensure the optimum use of launch systems and facilities. Efforts should be undertaken to reduce the number of unique interfaces between satellites and launch systems and the amount of time required between stack and launch.

Procurement Policy Considerations

The procurement procedures of the NRO continue to be among the most efficient processes in government today. Nevertheless, the panel recommends that these procedures be reviewed and further streamlined to reduce unnecessary work. Both industry and government incur substantial costs in preparing and evaluating competitive proposals. While it is appealing to have numerous qualified sources for each procurement, this results in replication of capabilities—a luxury we can ill afford in today's environment. A thorough review and simplification of the acquisition regulations could allow significant cost reduction. The percentage of program costs expended for documentation appears to have increased dramatically over the last 20 years. It is not clear that this has been accompanied by reduced risk, improved visibility, or enhanced efficiency.

Although further simplification is needed, we were impressed by the relatively streamlined management within the NRO compared with DoD procurement methods. The development of very sophisticated national collection systems is challenging enough without the additional overhead of bureaucracy outside of the NRO. We strongly urge that you and the Secretary of Defense help to ensure that the NRO continues to be protected from unnecessary and burdensome external bureaucratic controls. The NRO's cradle-to-grave development methodology and its acquisition management system are far more streamlined than those of the DoD; these allow the NRO to field systems faster and more effectively than is the case for most DoD systems.

We believe that sufficient oversight exists to ensure that the NRO is compliant with the relevant requirements of the Federal Acquisition Regulations.

International Industrial Issues

Thirty years of research, development, and application of space technology has given the United States preeminence in space-based reconnaissance systems. The establishment of this capability, while begun under the auspices of the government, has placed the United States and its aerospace firms in a unique position. The aerospace industry is now finding itself facing both reduced government spending and numerous inquiries from foreign governments for proposals for space-based surveillance systems. These countries, either through a lack of indigenous technology, motivation, or money are finding it attractive to approach US companies instead of undertaking their own long-term space system development.

The interest in space reconnaissance systems will grow as more countries are exposed to products from these systems or become aware of their value. We have seen extensive procurement of SPOT-type imagery by foreign governments. Over the next decade more countries will request overhead technology and systems or request that the United States share overhead intelligence with them.

From a broad national perspective, the interests of the United States would be best served if our dominant position in the realm of space reconnaissance were not to become eroded by foreign competition. While there are some aspects of space reconnaissance technology that are unique and thus worthy of protection, the United States enjoys its largest advantage in systems integration, processing, exploitation, dissemination, and the total breadth of its capabilities. We believe that the country would be best served by a policy that allows for the involvement of some aspects of US expertise in space in foreign ventures in such a way as to help retain this dominance.

The panel feels that you should take the lead in an interagency effort to construct a national strategy, with US dominance being its objective, for dealing with requests for the sale of US space expertise or the sharing of overhead products.

(b)(1)1.4c, (b)(3) 10 U.S.C. 424, (b)(3) PL 86-36, (b)(3) 50 USC 40

Transition Considerations

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

(b)(1)1.4c, (b)(3) 10 U.S.C. 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Se

The planning for a transition from today's constellation is complex. With many factors to consider, we have only had time to undertake a summary review of this area. In our judgment, a balanced approach would be as follows:

(b)(1)1.4c, (b)(3) 10 U.S.C. 424, (b)(3) PL 86-36, (b)(3) 50 USC 403, Sec

Concluding Note

Our review of the NRP has allowed us to gain an understanding of the individual programs, the operations, and the people. Our discussions with a broad spectrum of the NRO's customers have permitted us to appreciate how each of these organizations use and depend on the NRO's products. It is clear to us that the intelligence gained from overhead reconnaissance has a vital place in the country's national security, and that it is being obtained with remarkable technology and by talented people. Although we see some shifts in priority, we believe that, in general, space reconnaissance will continue to make a unique contribution to the country's intelligence needs for the foreseeable future.

We took a long-term view of the program. Our approach was to design a program to meet the needs of the country in the next decade and beyond, while attempting to balance the substantial and unavoidable uncertainties. We constructed a recommended program around the (b)(1)1.4c

These core systems will allow the NRO to continue the consolidation of multiple programs into these (b)(1)1.4c, (b)(3) 10 systems. We believe this will result in savings below the current program. Unfortunately, the complexity of this transition and the need to be fiscally conservative through the transition process will not generate substantial savings in percentage terms in the next few years. It

is our judgment, however, that the approach we recommend could be executed after this period of transition, beginning in the year 2000, at a level approximately 10 percent below the level of the President's recommended program in fiscal year 1993. We think the transition process outlined above allows an evolutionary approach, over the next decade, to protect necessary capabilities and allow a transition to a lower-cost program. We think the plan outlined in this report will allow us to achieve an efficient program as quickly as possible. The reduced program does lower the total expenditures of the NRP by just under (b)(1)1.4c, (b) over the 1994 through 1999 budgets.

Even with such savings, the reduced program includes significant enhancements to the nation's overhead collection capabilities. The key aspect of our reduced program is the establishment of an architecture that responds to the pressures of a changing geopolitical world and to budgetary constraints. (b)(1)1.4c, (b)(1)1.4g, (b)(3) 50 USC 403, Sec 6, (b)(3) [redacted] These enhancements would further provide a modest increase in the NRP's R&D program to promote innovation in critical technologies, and they would include a quick reaction capability.

Beyond these enhancments included in our reduced program, (b)(1)1.4c [redacted]

Imagery dissemination is clearly now receiving increased emphasis. We believe that this emphasis will allow the development of an integrated dissemination architecture that will permit evolutionary growth.

(b)(1)1.4c [redacted]

(b)(1)1.4c, (b)(3) 10 USC 424, (b)(3) 50 USC 403, Sec 6

We recommend that coverage beyond that available from (b)(1)1.4c, (b)(3) 10 be pursued, using the savings from the reduced program. Over the years into the early part of the next decade, this would involve the development of improved optics (b)(1)1.4c, (b)(1)1.4 (b)(1)1.4c, (b)(1)1.4e, (b)(3) 10 USC 424, (b)(3) 50 U [redacted] or both. This would provide a worldwide, responsive capability by that time.

In summary, the NRO continues to deliver innovative solutions to this country's national security problems. We are convinced that the program recommended by this panel, if implemented, will provide a capable and flexible way to meet the challenges of the early 21st century.

Appendixes A, B, and C to the Final Report: National Reconnaissance Program Task Force for the Director of Central Intelligence

Information contained in this report is classified and controlled within BYEMAN and COMINT channels jointly.

This set of appendixes supplements the *Final Report: National Reconnaissance Program Task Force for the Director of Central Intelligence,* BYE-184423/92.

APPENDIX A. TERMS OF REFERENCE FOR DDCI NATIONAL RECONNAISSANCE PROGRAM (NRP) TASK FORCE

Background

In a period of major world change and dramatically decreasing budget environment for Defense and Intelligence Programs, there is a need to review and validate the future direction of all aspects of the National Reconnaissance Program. NSR-29/NSD-67 validated a new set of national intelligence needs which is far broader than the previous Cold War priorities. DCI management and programs must focus on achieving intelligence economies and efficiencies, as well as managing required reductions while preserving essential flexible, adaptable, and capable reconnaissance and reconnaissance support systems. A special focus will remain on the conduct of reconnaissance operations targeted in support of national intelligence needs and to support the wide range of military operations tasks.

The baseline point of departure for this Task Force effort will be the current overhead reconnaissance programs as previously approved and related existing or ongoing NRO/NSA and other relevant studies and analysis. The Task Force should consider the wide range of extant and ongoing NRO architectural efforts and studies including, but not limited to:

- MUS
- OSAS
- LISA
- HASA
- IAS

Basic Task

Under the broad supervision of the DDCI, a National Reconnaissance Review Task Force will be chaired by Mr. R. James Woolsey to perform the tasks enumerated below.

Task Force Structure

The Task Force will consist of staff support to Mr. Woolsey; a steering group of eminent individuals with technical, intelligence, policy, and military backgrounds from government and industry; a series of professional task groups which will gather data, process and present ideas and options, and conduct such tasks as defined by the Chairman. At least two areas of task group focus will apply to needs and technology. The Task Force will take outside testimony to seek perspectives on how to improve the cost-effectiveness of the national reconnaissance architecture in a changing world.

Scope

The Task Force should consider end-to-end aspects of current and potential satellite technology programs for Imagery, SIGINT (ELINT/COMINT/FIS), MASINT, and communications relay support, utilized for intelligence and mapping. All aspects of the national reconnaissance program will be considered for review for potential streamlining, consolidation, and reductions or enhancements. (b)(1) 1.4c (b)(3) 10 USC 424

[redacted]

Product

The focus of this study will be on cost and performance framed against current and future priority intelligence needs which can be uniquely satisfied by national reconnaissance means. Non-satellite collection capabilities should be audited only as they represent alternatives to spaceborne collection. Specific tasks are as follows:

a. Consider the intelligence needs that should be fulfilled with satellite systems in the context of NSD-67 and recommend areas where needs no longer exist or are of low priority as well as areas of new needs. Utilizing existing overhead programs and ongoing NRO architectural planning as the point of departure, develop recommendations for a minimum baseline NRP with prioritized enhancements. Identify any intelligence shortfalls which may accrue from a minimized baseline.

b. Recommend new directions that would streamline and improve the capabilities of the NRP. Consideration should be given to highly innovative or radically reoriented approaches which are deemed feasible and affordable. These two tasks should take into account and record the extent of redundancy or duplication that exists within the overhead programs and determine if this level of efficiency is proper.

(b)(1) 1.4c

[redacted]

Timing

The DCI has requested that the Task Force complete its work in time to affect the FY 1994 budget. A target completion date of 31 August 1992 is therefore established, and the Task Force should be mindful that its recommendations will influence budgets over the FYDP and beyond. A two-month Task Force effort provides minimal time to achieve this complex objective. Pace, organization, focus, and subjective criteria must necessarily be the hallmarks of this review.

APPENDIX B: FUTURE OVERHEAD COLLECTION CAPABILITY NEEDS

The Fundamental Criteria for the National Reconnaissance Program

The major challenge the panel confronted at the outset of our task to recommend a new, baseline national reconnaissance program (NRP) was the question of what criteria should be used to establish national intelligence needs for overhead collection required in the future. Guidance provided by the Deputy Director of Central Intelligence made it clear that our recommendation was to be an austere NRP. Therefore, a restrictive approach for identifying future intelligence needs was called for, rather than an inclusive one. The challenge was to identify core national intelligence needs that will be enduring in the future and to account for new needs that are now unpredictable—and to confine the answer to essentials. We began with the proposition that overhead collection will remain a national priority to maintain intelligence capabilities sufficient for the effective management of the national security of the nation in an uncertain future world. The scope of future intelligence needs for national security affairs was adopted as the basis for future overhead collection. The panel also felt strongly that it was important to develop a strategic-level understanding of future intelligence needs rather than to attempt to cope with the enormous, detailed, future intelligence-requirement data base developed by the Intelligence Community. We adopted a "top-down" approach for identifying future overhead collection capability needs that stem from essential intelligence needs required by all of the principal players involved in national security affairs policy development and execution. Therefore, our results must be viewed in the context of a baseline set of overhead collection capability needs—a floor-set of needs for the security of the nation.

The White House release of the *National Security Strategy of the United States: 1991-1992* was our initial reference for developing the dimensions of national security management in the future. This National Security Council (NSC)-developed strategy was designed to address the changing direction of our national security policies following the collapse of world communism, the transformations occurring in eastern Europe and in the former Soviet Union, the world's increased access to sophisticated technologies, and the worldwide fallout of such developments. The strategy recognizes that our national security interest in the future will be broader—including a political, economic, and defense agenda. Further, select global issues are also recognized as emerging possible threats to our security. The broadening scope of our national security affairs was further viewed in light of NSR-29 materials and NSD-67. While some of the specific policies and intelligence requirements cited in these documents will be transitory, these references collectively are a credible basis for identifying enduring national intelligence needs for supporting a comprehensive national security strategy in the changing world.

National Security Strategy Intelligence Needs

Intelligence needs that stem from national security affairs can be categorized as:

- Intelligence that provides indications and warnings (I&W) of emerging threats to the security interest of our nation
- Intelligence that supports the development and execution of political, economic, and defense policies and plans
- Intelligence that supports crisis management and the use of military force.

This breakout provides a useful structure for assessing the intelligence needs for the diversity of intelligence consumers with national security affairs responsibilities. The *DCI Decision Memorandum on Improving Intelligence Warning* was reviewed for future warning intelligence needs and the *National Military Strategy of the United States* was reviewed for future military intelligence needs. Additionally, data calls were made and responses received from: STATE/INR, on intelligence needs associated with the conduct of foreign affairs; CIA, on intelligence needs associated with economic affairs and global issues; and DIA, on intelligence needs for defense policy/planning and military operations. What we requested and received were not detailed needs but rather, collectively, the major applications of intelligence for all dimensions of national security management.

Associated Overhead Collection Capability Needs

The final step in our top-down approach to needs was to resolve collection capability that stems from the national security consumer's essential intelligence needs. The objective was to develop guidelines for associating specific, functional, collection capabilities and performance regimes with intelligence applications of national security affairs consumers. The approach developed allows such associations.

We considered two sets of factors in the process of determining the overhead collection capability subset of the compiled overall intelligence needs. They were: 1) the relevance of the unique attributes of overhead collection to the intelligence need and 2) the relative contribution a collection system will offer for a particular intelligence need in the future. These assessments were done on the basis of expert judgments, not by extensive simulations. In some cases, more detailed assessments may be appropriate. The unique attributes that are associated with overhead collection are presented in Table B-1.

Table B-1. Overhead Collection Attributes

- Assured unique access an a global scale
  - Impervious to area denial
- Nonintrusive collection
  - No risk to human Life
  - No risk of political embarrassment
- Near real-time intelligence on a global scale
  - Vital for the conduct of military operations
  - Vital for crisis management
- Frequent/continuous coverage on a global scale
  - Stays abreast of dynamic situations
  - Minimizes surprises
  - Monitors norms of activity on a worldwide basis
- Provides highly credible intelligence
  - Often the sole basis for a major national policy decision
  - Often the sole basis for influencing a foreign nation
- Broad area/distributed locations synoptic intelligence
  - Permits accountability of distributed mobile units
  - Permits nationwide posture assessments
  - Permits posture assessments of two or more engaged nations

Indications and Warning Intelligence Trends

Warning intelligence has traditionally been a priority mission of national intelligence agencies and will remain so. Moreover, the DCI recently launched a comprehensive strategic plan for the Intelligence Community for the purpose of increasing the effectiveness of warning intelligence. He directed that warning intelligence transition from the primary focus of a strategic attack to include identifying and forecasting events that could cause the engagement of US military forces (from the scale of embassy evacuations to larger military activities) and events that would have a sudden deleterious effect on US foreign policy and security (for example, coups, third-party wars, refugee surges, and so forth).

The DCI's objective is to enhance the warning intelligence process—from one of simply informing policymakers or increasing their understanding of an issue or development to something much more useful:

(b)(1) 1.4c

[redacted]

The DCI's increased emphasis and change of direction concerning warning intelligence will have a direct effect on future collection needs.

(b)(1) 1.4c (b)(3) 50 USC 403, Sec 6

(b)(3) 50 USC 403, Sec 6

[redacted]

Foreign Affairs Intelligence Trends

NSD-67 is particularly informative on intelligence needs to support policy and planning for foreign affairs, economic affairs, and defense. It documents the fact that intelligence needs for foreign affairs management is a substantial requirement that includes many elements of our government. NSR-29 identified these departments as having critical needs: STATE, NSC, OSD, JCS, ACDA, JUSTICE, DOC, DOE, DOT, AID, FEMA, and Congress. The following are observations on foreign affairs intelligence needs:

(b)(1) 1.4c

[redacted]

(b)(1) 1.4c

[redacted]

Table B-2. Indications and Warning Intelligence: Overhead Collection Capability Needs

(b)(1) 1.4c (b)(3) 50 USC 403 Sec 6

[redacted]

In addition to broadening sets of of intelligence consumers for foreign affairs management, there are important changing trends in the use of intelligence by senior policymakers. (b)(1) 1.4c

[redacted]

(b)(1)1.4c [redacted] Overhead architectures must be designed as balanced end-to-end systems, from system tasking to final product dissemination.

(b)(1)1.4c [redacted] But there is an increasing need to share intelligence in the context of multinational arrangements and, frequently, to make the intelligence public. More flexibility in intelligence-sharing practices and policies are needed for increased disclosure of sensitive intelligence and often for its release. (b)(1)1.4 [redacted]

(b)(1)1.4c [redacted]

(b)(1)1.4c (b)(1)1.4g (b)(3) PL 86-36 (b)(3) 50 USC 403 Sec 6 (b)(3) 18 USC 798 (b)(3) 50 USC 3024(i) [redacted]

Economic Affairs Intelligence Trends

NSD-67 clearly identifies that economic intelligence is a major need for many consumers [redacted]

Economic intelligence intersects with defense and political intelligence in several important priority intelligence needs. For instance, technology transfer and even weapons proliferation activities are often national initiatives taken for economic motives as much as for political motives. [redacted]

Economic intelligence is likely to be a growth industry for national intelligence. [redacted]

Table B-4. Economic Affairs Policy Management: Overhead Collection Capability Needs

[redacted]

Defense Policy/Planning Intelligence Trends

DoD needs for foreign political intelligence are almost as extensive as the Department of State's needs for policy and planning for alliance management, military assistance programs, treaty negotiations, technology-transfer control, joint exercises, and the development of regional defense policies. The new national military strategy emphasizes peacetime operational missions of forward-presence forces in western Europe, East Asia/Pacific, and in the Persian Gulf. Thus, defense policy and planning will remain a global problem. Peacetime intelligence needs for this new strategy include:

- Warning intelligence on political and military instabilities
- Improved estimates that provide insightful assessments of the motives and intentions of the political actors in each region
- Accurate assessments of relevant regional military forces and weapons systems capabilities, including enhancements obtained through arms transfers
- A minimum essential infrastructure data base for the rest of the world, including host-nation support capabilities and targeting reference materials for traditional as well as advanced weapons
- In-place coalition intelligence support and sharing arrangements.

Defense intelligence needs for weapons system development and acquisition are also becoming global. Future threat assessments, a major driver in weapons acquisition decisions, are no longer strictly a red threat but also include blue and gray weapons systems. Table B-5 presents defense affairs policy and planning overhead collection capability needs.

Global Issues Intelligence Trends

Both the *National Security Strategy of the United States: 1991-1992* and NSD-67 address global issues that cross the traditional boundaries of political affairs, economic affairs, and defense. These issues include global energy, global environment, world health and population, international terrorism, and narcotics trafficking. They are already priority national concerns but their importance to our national security in the future will likely be greater, and the list will grow. (b)(1) 1.4c

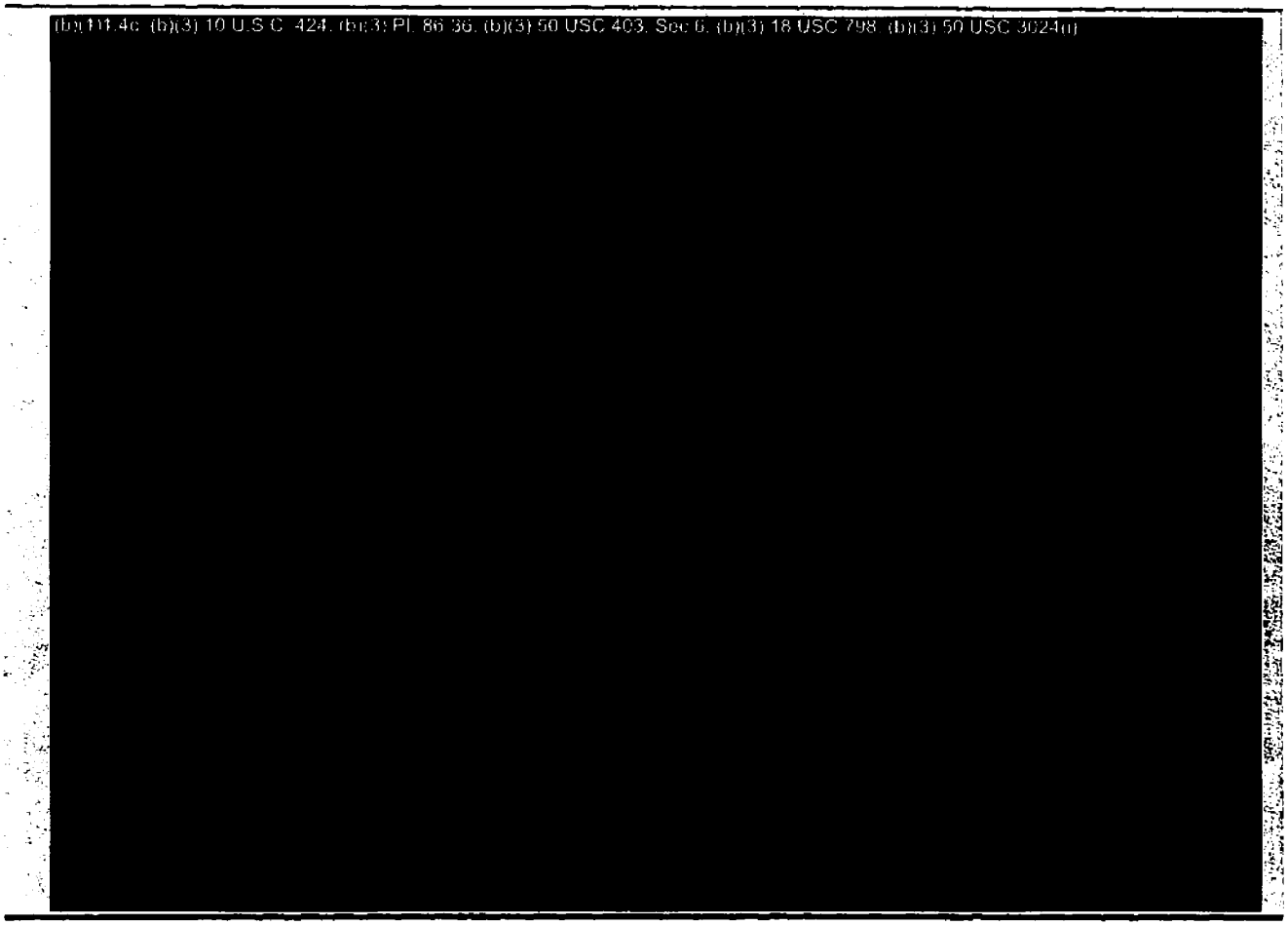
[redacted]

Crisis Management and Support to Military Operations Intelligence Trends

(b)(1) 1.4c

[redacted] Crisis response is therefore a major thrust of the new strategy. The essence of the regional crisis response strategy is the capability to be able to respond to any

Table B-5. Defense Affairs Policy/Planning: Overhead Collection Capability Needs



crisis with a range of options. These options are to be preplanned, encompassing all the instruments of national power (diplomatic, political, economic, and military). Within the military response regime, the options will range from a single surgical strike to the deployment of multinational forces, sufficient for a quick, decisive victory. For high-level crisis response options, the strategy recognizes that the introduction of ground forces remains the most compelling signal of national resolve. If the crisis turns into conflict, air superiority and sea control are also fundamental tenets of the strategy. The central planning factors set forth in the new strategy are the tailoring of force structures for joint task force operations and maintaining a peacetime reserve posture for come-as-you-are deployments.

Table B-6. Global Issues Policy Management: Overhead Collection Capability Needs

The above short review of the new military strategy of the United States sets the framework for the new intelligence capabilities that will be required in the future for support to military operations. The implications for overhead collection capabilities are clear, in terms of guiding principles:

- Global access and frequent coverage must be maintained; regional focusing is to be achieved with short response times.
- Targeting flexibility from overhead systems must be readily achieved in terms of requirements tasking and system performance.
- Cross-cueing among systems will be more important as the target sets become less predictable.
- Near-real-time reporting will be increasingly important for both policymakers and military commanders.
- High accuracy geopositioning and high resolution target definitions will be vital requirements for the employment of advanced weapons.
- Collection system architectures and military intelligence and operator architectures must be not only interoperable but balanced in terms of capacity, and designed for very high data rates.

Specific implications for overhead collection capability needs for crisis management and for support for military operations in the future are presented in Table B-7.

Table B-7. Crisis Management and Support to Military Operations: Overhead Collection Capability Needs

- IMINT

[redacted]

- COMINT

[redacted]

[redacted]

Summary Observations

The preceding strategic-level review of the changing and broadening aspects of our national security interest proved to be of value for understanding the scope of intelligence required to support the diversity of government departments charged with national security responsibilities. The review of intelligence trends that stem from changing national security interests was also valuable, in the context of indicating what intelligence needs are lessening, identifying new needs, and understanding what intelligence process changes are required for more consumer support. This work provided the foundation for understanding future overhead collection capability needs that must be maintained as an essential national capability. Several fundamental conclusions follow from this review of national intelligence needs for overhead collection that are held to be pertinent to the task of the panel:

- The use and value of overhead-derived intelligence is expanding throughout the Executive Department, as well as in the Legislative Branch. As our national security interest broadens in scope with the changing world, the baseline need for overhead-derived intelligence for national security management will remain substantial for the foreseeable future.

- No aspect of national security management is supported predominantly by a single or even a few overhead collection systems. To varying degrees, all principal consumers require a combination of collection capabilities; thus some degree of all current types of capabilities must be maintained.

- Changing requirements, the changing world, and the globalization of select technologies, are having the consequence that some aspects, principally in SIGINT, of overhead-derived intelligence are becoming less effective to pursue by overhead systems than by alternative means.

- The nature and scope of the defense intelligence needs are radically changing. The need for blanket coverage of a monolithic threat is giving way to the need for intelligence in support of adaptive planning for a variety of contingency operations on a global scale. Overhead collection systems and architectures need to be optimized for targeting flexibility and tasking adaptability.

- The value of overhead-derived intelligence for support to military operations will increase. Factors that contribute to its increased value are smaller forces, less predictable operational requirements, increased use of advanced weapons for surgical strikes, short crisis-to-conflict warning times, and defense policies that call for decisive victories with minimum casualties and collateral damage.

- Intelligence consumers involved in practically all aspects of national security management have increasing needs for rapid (often in near-real-time) intelligence; overhead collection architectures must be designed on an end-to-end basis for this objective. Table B-8 presents a summary evaluation of the relative contributions overhead collection is expected to make in the future to national security intelligence needs.

(b)(1) 4c (b)(3) 10 USC 424 (b)(3) 50 USC 403 Sec 6

APPENDIX C. INDUSTRIAL ADVISORY COMMITTEE REPORT TO THE WOOLSEY PANEL SUMMER 1992

HUGHES

Subsidiary of GM Hughes Electronics

A. J. IORILLO, President
Telecommunications and Space Sector

31 August 1992

The Honorable R. James Woolsey
Shea and Gardner
1800 Massachusetts Avenue, N.W.
Suite 800
Washington, DC 20036

Dear Jim:

Attached is the final report of the Committee on Industrial Impacts. I hope that it will be useful to your Panel's deliberations. As you requested, I have limited dissemination of the report to you and the Committee members. My colleagues and I are grateful for the opportunity to express our views on these important issues.

Sincerely,

Anthony J. Iorillo

Attachment
Classified and
under seperate cover

Office of the Chairman
Corporate Offices
P.O. Box 80028
Los Angeles, CA 90080-0028
(310) 568-7400

APPENDIX C. INDUSTRIAL ADVISORY COMMITTEE REPORT TO THE WOOLSEY PANEL SUMMER 1992

Foreword

The Woolsey panel established the Industrial Advisory Committee to undertake a study of the industrial base issues arising from the significant decline in NRO program funding. The committee was asked to develop concepts which might be incorporated into an industrial policy that would improve and streamline the government's development and procurement process.

The committee members were Tony Iorillo, Sam Araki, Mike Henshaw and Bob Kohler. The committee and a number of consultants met over a three week period to develop the material contained in this report. Information and opinions were solicited from all companies in the current industrial base. Responses were factored into the study.

Introduction

In the last twenty years, the government has developed a very capable and robust overhead collection system comprising (b)(1)1.4c, (b)(3) 10 USC In the last decade, the government has inventoried (b)(1)1.4c, (b)(3) 10 U replacement satellites which have even greater capability. The current constellation plus the replacement set should serve the government well into the next decade and the government might wait some considerable period before it acquires any new systems. In other times, industry would turn its resources to other programs until the government was ready to reorder.

However, today there simply is no other available market large enough to sustain the industry on any sort of stable path. NASA, with its focus on shuttle and space station projects, has not been a reliable source of support for the satellite industry. The DoD has been a source of support through its C³I programs, but such support is declining rapidly. The commercial satellite industry is currently active, but the technology involved does not span the entire set required by the NRO.

The fact is that the major industrial suppliers to the NRO have already suffered major reductions in force. Within a year and a half, with the work on the last of the replacement satellites nearing completion, these companies will necessarily dismantle their unique development and production capabilities unless some steps are taken. Given our current view of the government's requirements for satellites in the future, the industry size required will be less than half of what it is today. It is our opinion that two of the top five suppliers will probably be forced to withdraw entirely from the satellite business.

In view of the industrial situation we described, the committee attempted to answer some related questions for the panel's consideration.

1) How might the government alter its current SIGINT procurement strategy to help promote as orderly a transition as possible?

2) What are the critical technologies, supplies and skills which warrant special attention?

3) What might the government do to help sustain these resources?

4) What can the government do to support the industrial downsizing?

5) What might the government do to streamline its programs?

6) What might the government do to improve the launch vehicle situation?

Discussion and recommendations related to each question are presented in sections which follow.

Assumptions and the Challenge

Figure C-1 shows the assumptions this Committee made concerning past and future NRO budgets. We believe the numbers, though rough, are approximately correct. (Both then-year and constant 1992 dollars are shown). The budget reduction from 1986 (peak year) to 1994 in constant '92 dollars is approximately 55%. The industrial impact will be an approximately 60% reduction in work force at the contractor level by 1993-94. This rapid downturn results from concurrent phasing-down and -out, of all of the current NRO system production programs, including imaging, SIGINT and Titan IV.

Figure C-1. Assumed Budget

The country needs to maintain operational capabilities during this downsizing and to provide for capabilities in the future. The Industrial Commission has made the following operating assumptions:

- (b)(1)1.4c. (b)(3) 10 USC 424. (b)(3) 50 USC 403. Sec 6
- [redacted]
- [redacted]
- [redacted]
- [redacted]

(b)(1)1.4c. (b)(3) 10 U.S.C. 424. (b)(3) PL 86-36. (b)(1)1.4e. (b)(3) 50 USC 403, Sec 6. (b)(3) 18 USC 798. (b)(3) 50 USC 3024(i) [redacted] We expect the current Low and High architectures being derived individually by separate program offices to yield a program which will not fit the available budget. An integrated High/Low architecture which the addresses the missions cooperatively will lead to costs within the funding profile.

Threats to a Viable NRO Program

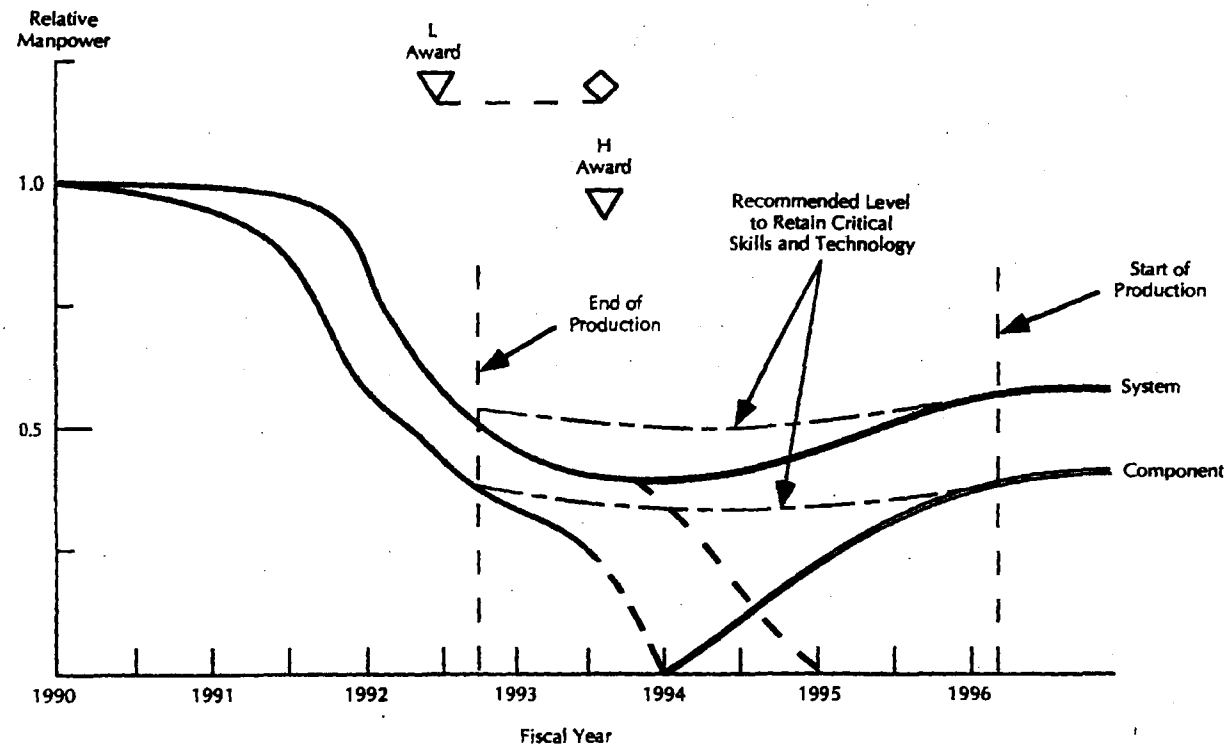
The declining budget and downsizing of NRO Programs pose serious threats to maintaining a viable program and its associated industrial base. If the required downsizing is not accomplished in an orderly, well planned manner the nation could easily lose critical technologies, skills and industrial facilities necessary to accomplish the NRO Program. (b)(1)1.4c. (b)(3) 10 U.S.C. 424. (b)(3) PL 86-36. (b)(1)1.4g. (b)(3) 50 USC 403. Sec 6. (b)(3) 18 USC 798. [redacted]

Plans must be implemented to retain the critical skills and technologies during the multi-year gap. The same applies to the (b)(1)1.4c [redacted] and Titan IV elements of the NRO, since they (b)(1)1.4g. (b)(3) 50 USC 403. Sec 6. (b)(1)1.4g. (b)(3) 50 USC 403. Sec 6. (b)(3) 10 USC 424 [redacted] prior to start of any new development. Figure C-2 shows the effect of the current plan (heavy lines) on the entire industry involved in the NRO. The upper line ("system") is for the whole industry: the lower line is for the lower tier "component" or subsystem suppliers. The dashed lines show the estimated minimum levels for each necessary to retain the critical skills and technology.

The "gap" between plan and need in FY '93 through FY '95 is dramatic and equates to (b)(1)1.4c. (b)(3) 10 USC [redacted] critical skills personnel. The following sections of this report discuss the nature of these skills and technologies and recommend methods for retaining them. To illustrate how important it is to put in place some retention program we need only remember the example of the impacts due to the shutdown and restart after two years of the U. S. expendable launch vehicle industry when all launches moved to the Shuttle.

Following the gap and the resulting loss of key technical and production expertise: (1) the production cost and non-conformance/re-work items jumped by a factor of 3; (2) the launch failure rate jumped dramatically (e.g., 3 Titan - 34D failures in the next 15 launches) with attendant loss of high-value payloads. During this period, Delta and Atlas failures were also experienced.

Figure C-2. Industry Impact

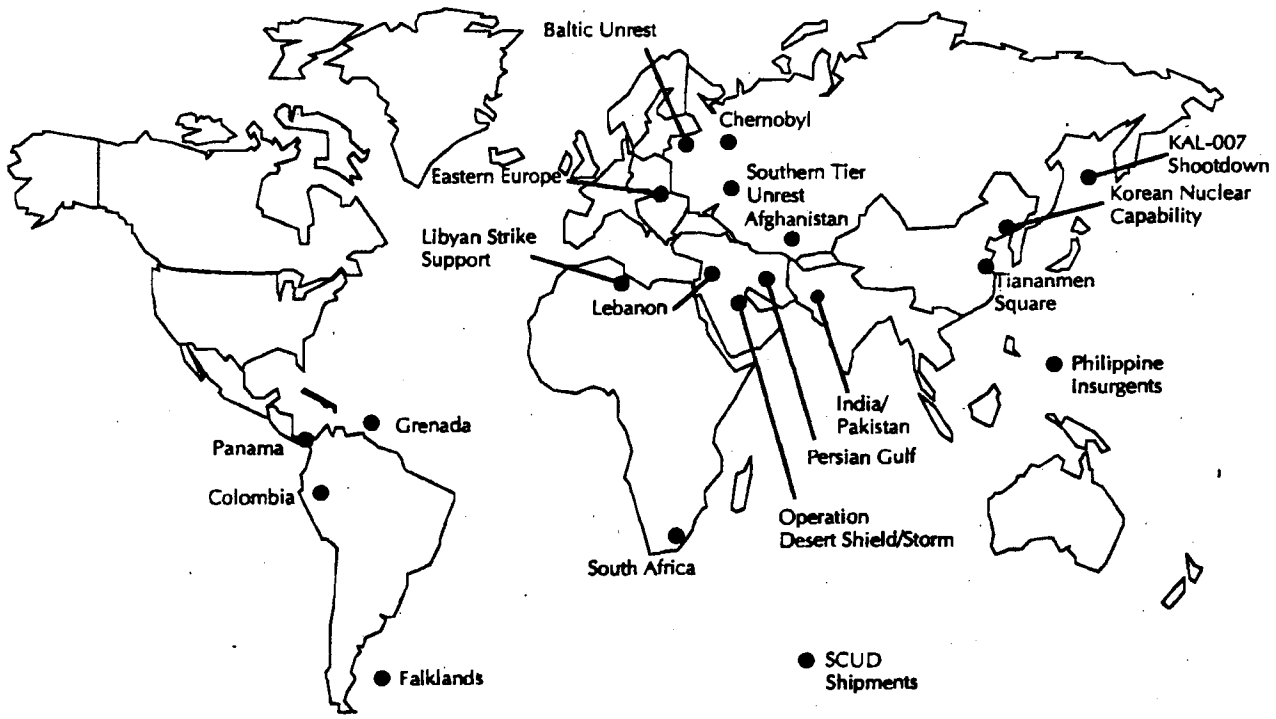


Recommendation I: Confirm Customer Needs and Act on Realistic Plan

1. Immediately establish a clear, integrated, affordable SIGINT operational concept ("design to budget") consolidate programs into a single architecture, restructure RFPs as needed.

The shift from a Bi-Polar world to a Multi-Polar world has resulted in a series of crises occurring world-wide. In the future, America's friends and enemies will be worldwide, crisis locations less predictable, and crises more frequent and varied. These crises require the overhead system to be more flexible and responsive to changing threats and to provide more global coverage, as indicated in Figure C-3. In response, this demands an integrated SIGINT operations concept with cooperative High/Low geopositioning, mutual tipoff, and other cooperative and integrated features. The resulting single architecture needs to be reflected in the procurement process.

Figure C-3. Worldwide Crises



2. Realign customer's procurement strategy to reflect integrated architectural approach.

Since the budget drives the desired outcome, it is recommended that the funding profile available for the Integrated SIGINT System (Space, Ground and Booster) be defined and specified with the RFPs.) The competing contractor teams should be required to prepare an integrated system configuration and system specification. The contractors should be required to develop launch and build rates based on the replenishment rate of the current high and low system constellations using actual operational life mean mission duration. The build rate should consider the continuity of workforce and integrated use of facilities to establish maximum efficiency; and the system specification and build rate must be compatible with the funding profile.

3. Maintain current procurement schedule (1993 contract start) for integrated architecture.

Maintaining the 1993 contract start date for the single integrated architecture procurement(s) is critical to the maintenance of the industrial base. It is recommended the NRO shift its procurement strategy now such that the resulting integrated RFPs be specified to the current RFP schedule.

Recommendation II: Identify and Sustain Critical Capabilities

Problem Statement

Budget reduction and consolidation and re-competition of current NRO programs has led to a significant downsizing of development activity. Since the new programs will not start before FY 1994 at the earliest, a major downsizing of the in-place work force will have occurred in 1992 and 1993, as illustrated by the solid line on Figure C-2. This loss of personnel with skills and experience in critical technologies will make it difficult, to produce systems cost-effectively with the mission performance needed for the next decade.

The country's ability to sustain NRO programs rests on a kernel of specialized capabilities: technologies, suppliers, facilities, skilled manpower. Some of this kernel will be at risk in the near future because customers other than the NRO are unlikely to support them.

Timing is important to sustain this base. If the NRO would selectively start new efforts in early FY 1993 aimed at a few unique technology fields, several benefits would follow. First, the loss of personnel with critical skills and experience would be lessened (as shown in the dashed line of Figure C-2). Second, by having much of the technology on-the-shelf by FY 1994, the development risk of the new systems would be greatly reduced. Third, there would be fewer startup or re-start problems and associated costs with the development of new systems because the learning curve would not be lost. Fourth, the final total cost of these systems would be less because of the insertion of production and O&M labor saving technology.

Discussion

1. What are the critical technologies for the future?

In responding to this question we have emphasized those technologies which are unique to NRO programs and are unlikely to receive funding from non-NRO sources.

A list of such critical technologies is attached as in Table C-1. We have selected three from that list to discuss as examples. They are: 1) large deployable structures, 2) stabilization and control of large, agile spacecraft, and 3) large lightweight optics.

Table C-1. Critical Technologies for the Future

- Large Deployable Structures
- Stabilization and Control of Agile Spacecraft
- Large, Lightweight Optics
- Precisions Pointing of [redacted]
- Faster Focal Planes
- [redacted] Focal Planes
- Data Compression Algorithms
- [redacted] Processing Algorithms
- SIGINT Processing Algorithms

A. Large Deployable Structures. NRO requirements drive the need for space systems which stow compactly within a launch vehicle shroud, yet deploy on-orbit to a very large size. These include SIGINT antennas, masts, feeds and solar arrays. Deployable antennas have many unique features. They are extremely large, must deploy and maintain their shape very accurately in space. Deployment mechanisms contain many hinges and cables which must work autonomously and reliably in the space environment.

[redacted]

C. Large, Lightweight Optics. Space imaging optics have many unique features: they must be polished to an accuracy of a small fraction of a wavelength of light over their entire surface, they must not distort in the widely varying thermal environment during an orbit, and their cost must be acceptable in low volume production.

2. Critical Suppliers for the Future

In responding to this question we attempted to concentrate only on suppliers with product lines unique to NRO programs. We excluded suppliers of subsystems where the prime contractors have established or could

establish a capability. [redacted]

[redacted]

[redacted] These companies supply the precision [redacted] focal planes used on imaging spacecraft. Other suppliers manufacture focal planes, but not with the unique combination of sensitivity, pixel size and uniformity required for NRO applications.

[redacted]

We understand that [redacted] intends to continue to operate this business, [redacted] but would likely be more expensive. [redacted] The large space optics industry is an example of a business that has had over-capacity and poor earnings for many years. Left to its own, it could randomly disintegrate.

[redacted] is the only U. S. supplier of large mirror blanks required to make large imaging optics.

[redacted]

[redacted] This company makes phased array antennas and transmit-receive modules, has many years of R&D investments and experience on aircraft systems and is fluent in VHSIC and MMIC technology.

3. What are the facilities which are unique or dedicated to these programs for which we have no other application?

When considering the BYEMAN Industrial Facilities involved in these programs and for which there has been significant investment, the buildings involved fall into three general categories:

A) [redacted]

B) Secure facilities (TEMPEST spaces and clean rooms) which currently support highly classified programs but could with some large amount of funding be converted for other use, either classified or unclassified.

C) A third category of facilities are those currently used for restricted work which can be considered excess. These represent buildings which were secured but no longer are required. The cost for these facilities could either be paid for by the Government and held for future Government or contractor use or sold.

Large optics fabrication, polishing and testing facilities are considered specific to the NRO. (b)(1)1.4c (b)(3) [redacted] as well, fall into this category although all of these capabilities are probably not needed.

4. Critical skills for the future

We believe ground and space engineering skills, (e.g., thermal, structural, power, software, etc.) could and will be supported by ongoing DoD, commercial and NASA programs. A frequent revisit to ongoing non-NRO programs will be necessary to ensure certain skills and technologies are maintained outside the BYEMAN world. Only specific skills related to the NRO are listed. These include specific systems engineering skills, cleared development engineers, manufacturing, and integration and test personnel (See Table C-2 for a full list of critical skills required). (b)(1)1.4c (b)(3) PL 86-36 (b)(3) 18 USC 798 (b)(3) 50 USC 3024(i) [redacted]

Table C-2. Critical Skills for the Future

- Specific Systems Engineering Skills
  - System Concept Definition
  - Systems Development
  - Operations Concept
  - Mission Definition/Assessment
  - Data Analysis/Understanding
  - Architectural Configuration Development
  - Space, Ground Algorithm Design (especially SIGINT Processing)
  - SIGINT/EO Systems Definition
- Cleared Development Engineers
  - Precise Pointing and Control of Large Spacecraft
  - Mechanical Design of Deployable Structures
  - Antenna and Feed Design
  - SIGINT/EO Payload Designers and Developers
  - Signal Processing
- Manufacturing Integration and Test Personnel
  - Optics
  - Large Antennas

[redacted]

The impact of near term layoffs must also be considered. If new programs do not start before FY 1994, a major downsizing of the work force will have occurred in FY 1993. The implications of draw-downs and schedule slips for the various programs are dramatic by any measure. Program cancellations have resulted in sharp drop-offs in all the manpower loading profiles for the NRO platforms. A sampling of three major contractors [redacted] show a peak of three or four thousand people per company working on these programs dropping to less than 500 per company by the end of 1993.

In summary, the recommendations to sustain the unique industry capabilities are:

1. Sustain critical skills and technologies through targeted use of contract R&D; change the current practice of spreading R&D too widely to peripheral suppliers; focus R&D through prime contractors.

2. Identify unique, low rate production facilities and capabilities to be mothballed; prepare need planning and documentation.

3. Establish written and video documentation of critical processes and skills (e.g., bonded storage information package).

4. Maintain critical systems engineering and analysis skills through directed manning at ground stations and factory based O&M contracts.

5. Direct primes to identify unique suppliers at all levels in "industry food chain" and determine best way to preserve, integrate, nurture or mothball. Periodically update unique supplier list.

Recommendation III: Support Greater Efficiency

1. Set realistic program schedules then assure adherence and timely completion through stabilized funding.

Broad, but well-thought-out, government requirements, followed by clearly articulated general specifications which can be used by industry, are the first step in promoting increased efficiency. These specifications, with a firm design-to-cost funding profile provided, allow industry to develop strong, detailed systems specifications and design criterion.

The Industrial Committee believes that substantial resources are wasted by both government and industry when ill-defined, ever-changing and ever-growing, detailed specifications are issued to industry for

the competitive design and build of programs. This waste of time and resources is further enlarged when sudden shifts in funding, and therefore schedules, occur. Usually these shifts are caused by ill-defined strategic plans and architectures, which lead to a poorly defended and advocated program on the Hill.

Program stability (funding, strategy, schedule) is needed now more than ever because industry has downsized to the point of losing critical skills for a technological excellence and high quality response to new programs.

2. Permit broader security compartments and encourage dual-use technologies and greater sharing with DoD and NASA.

No one argues that adequate, reasonable program security is warranted. But the Committee concludes that several positive steps can be taken which would not jeopardize security.

a. To the maximum extent possible, develop, manufacture and test unclassified subsystems and components of a classified system in an unclassified area (controlled if warranted). This reduces program clearance expense, facility expense, etc.

b. Combine multiple program material buys for efficiency. The buy of parts for Program 2 could be documented as extra parts for Program 1, for example.

c. Aggressively promote cross-clearance of engineers and technicians who possess critical skills. Achieve further savings by requiring cross-program use of development, production and test facilities, key skills and marching armies.

d. Facilitate cross-utilization of technology with other government users to spread program costs over a wider base.

e. Aggressively allow products developed in classified areas to "pass through" to unclassified programs.

f. Immediately begin to limit and disassemble unneeded and marginal multiple compartments.

3. Downsize customer's internal costs (e.g., O&M, review procedures, SETA) to fit new budget scenario and assure proper balance between overhead costs and new procurements.

This is an area in which both industry and government can improve. The Committee concludes that too many government (and therefore industry) people are attending too many meetings where too little is happening, there is too much unneeded paper produced and required, and too much useless, non-value-added work performed. It is not unusual for there to be a meeting where there are 100 government and 100 industry people in attendance.

4. Develop updated policies and practices on international trade.

Freedom to sell surveillance systems and components abroad may help ease the economic transition for some companies, but it is not likely to lead to sales large enough to ease the problems of the industry as a whole.

There is a potential overseas market:

- Demonstration of US capabilities has generated demand for systems in other countries.
- In addition to overhead assets there is interest in ground stations, processing, and related equipment.
- Meeting these demands could help maintain employment levels in some suppliers.

The committee had a difference of opinion on the likely size of the international market, but agreed that regulations forbidding US firms' selling to other customers should be lifted. In addition to easing the downsizing, such a move could help sustain US technological leadership and discourage technical development in other countries.

5. Resolve national launch needs through balanced investments in current and future launch systems.

There are several improvements which must be made to the current launch vehicle fleet and infrastructure as the nation debates and prepares for the new National Launch System envisioned for 2005-2010:

a. Modernized AGE for reduced manpower at the launch site.

b. Solid-state avionics, laser-initiated ordnance, electromechanical actuators.

c. Reduced specialized payload/booster interface requirements. Develop very few interface specifications and mandate payload and booster compliance.

d. Develop payloads robust enough for factory assembly and shipping. This would allow minimum pad time and quick launch turn-around, as well as reducing the "standing army" awaiting launch.

e. Invest in "clean pad" launch infrastructure where the payload is encapsulated in parallel with booster integration and "crawled" to the pad together for launch.

f. Prove-out NLS technology on existing ELVs. This will reduce risk for the eventual NLS.

g. With increased/stabilized launch rates as a result of minimum pad time (payload encapsulation, etc.) open-up launch infrastructure for multiple, diverse users.

h. Most importantly, however, sustain minimum production of this nation's expendable launch services through NLS design, development, test and operational status. Avoid dark factories (prime, 2nd- and 3rd-tier subs) associated with ELV production gaps.

Recommendation IV: Encourage Essential Industry Evolution

Shifting customer needs and the current budget outlook create significant challenges for our industry base. Significant over capacity is already evident and will grow substantially worse. Without appropriate actions this excess supply of talented people, dedicated facilities, and competitive teams will create an unacceptable drag on the overall productivity and affordability of the industrial base. These problems are only aggravated by the current, dramatic downsizing now reshaping the entire aerospace industry. Re-deployment of essential people and facilities is no longer a realistic option. Initial estimates suggest that the one-time cost of restructuring the industry to eliminate this excess of people and specialized facilities could exceed [redacted] Furthermore, some traditional regulatory assumptions and constraints may need to be reexamined in light of the clear need for consolidation and for new and more affordable forms of competition. Failure to accomplish this needed restructuring rapidly and successfully threatens unaffordable overhead rates throughout the industry.

In this context, several recommendations would help accomplish evolution of the industrial capacity. These are summarized below:

1. **Accommodate the inevitable trend toward greater contractor specialization or centers of excellence, through more targeted funding, directed teaming, and concentration of scarce resources.**

Greater specialization by major suppliers will help consolidate and protect essential capabilities while reducing overall customer costs. Redundant or duplicate facilities, people, bidding expenses, research, and overhead structures can be minimized by appropriate specialization. This, in turn, will require clear customer recognition of the critical role that a few suppliers must play as centers of excellence. Needed specialization can result as funding is channeled to key suppliers, R&D funds are focused on only the most critical areas and credible suppliers, and the costs of duplication and broad competition are clearly balanced against the potential benefits of competition. Inevitably contractor selections by the customer will need to be made sooner and from a more limited list of fully qualified suppliers. Often directed teaming or other actions to foster and sustain a viable center of excellence may be required.

2. **Maintain competition (despite specialization) through dual sourcing, R&D support of key technologies and other proven methods.**

Greater specialization need not eliminate the benefits of productive competition. In many segments of the aerospace industry, techniques have been developed to gain many of the benefits of competition despite significant concentration. Dual sourcing may still be economically sound in some program or technical areas. R&D funding can be used to sustain an alternative, competitive concept. Greater customer involvement in selected research and prototyping activities may be warranted. New contracting terms and incentives may be required. In this new industrial environment, key customer and industry leaders will need to formulate a new, affordable, and appropriate basis for competition.

3. **Support regulatory changes essential to encourage efficient consolidation and disposition of excess assets and personnel.**

The industry must take prompt actions to adjust to the new demand scenario. Slow, cautious, incremental cuts will only waste resources, raise total costs, and frustrate customer needs. However, prompt

action may require relief from traditional constraints on teaming, joint ventures, sharing of information, and customer involvement in key contract decisions. All branches of government need to recognize these extraordinary times and the need to re-examine any traditional rulings, regulations, or practices that impede appropriate and prompt industry restructuring.

4. Support recovery of extraordinary costs (e.g., facilities disposition, personnel severance) through modified directives on terminated contracts.

Essential restructuring actions will create extraordinary costs to sell or mothball facilities and terminate excess personnel. Initial estimates suggest that these costs are large enough to discourage some suppliers from acting promptly, yet slow response will only waste scarce customer resources. Therefore there may need to be adjustments to current directives so that contracts termination costs are properly reflected and shared.

The NRO and the defense/Intelligence Community are able to play only minor roles in supporting legislative, regulatory, and tax changes. To the extent that they can, however, we would encourage them to support tax credits or other legislation to partially recognize the extraordinary restructuring costs being incurred by the entire aerospace industry.