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Assessing the Future Role and Conduct of the Army Space Exploitation Demonstration Program (ASEDP)

John R. Hiland, Gaylord K. Huth
Susan J. Pond

Arroyo Center

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John R. Hiland, Gaylord K. Huth
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Prepared for the
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PREFACE

The Army Space Exploitation Demonstration Program (ASEDP) has been conducted for the past seven years as an important part of the Army's overall efforts to effectively utilize and integrate space assets and capabilities into its operations and other activities. This annotated briefing presents the results of an effort to review the current process used to select candidate space demonstrations, as well as the emerging interfaces with other new internal Army program initiatives that will shape the future context for this program. Improvements to the current selection process are suggested, and alternative future program directions are assessed. The document also presents some viewpoints, gleaned from a series of interviews with 16 key Army people, on the ASEDP and Army space efforts in general.

This research was conducted under the Force Development and Technology Program of RAND's Arroyo Center, a federally funded research and development center sponsored by the United States Army. The results should be of interest to agencies and organizations involved in the Army's overall space efforts and other related activities, such as Louisiana Maneuvers (LAM), the Battle Labs, Battlefield Operating Systems, and the Army Digitization Office. The House Armed Services Committee and Department of Defense may also find the results useful to their efforts to enhance joint space support to all warfighters.

CONTENTS

Preface iii

Summary vii

Abbreviations ix

1. INTRODUCTION 1

2. HOW SHOULD THE ASEDP DEMO SELECTION PROCESS BE IMPROVED TO MAKE IT MORE USEFUL TO THE ARMY? 6

3. INTERVIEWS: WHAT DO KEY ARMY PEOPLE THINK ABOUT THE PAST/PRESENT PERFORMANCE OF THE ASEDP? 13

4. INTERVIEWS: WHAT DO KEY ARMY PEOPLE THINK ABOUT THE ARMY'S EFFORTS TO INTEGRATE SPACE INTO ITS OPERATIONS? 22

5. WHAT FUTURE DIRECTION SHOULD THE ASEDP TAKE? 29

6. RECOMMENDATIONS FOR POSSIBLE ARMY ACTION RELATIVE TO THE ASEDP 38

7. RECOMMENDATIONS FOR POSSIBLE ARMY ACTION RELATIVE TO ARMY SPACE 41

Appendix 45

SUMMARY

This documented briefing examines the Army Space Exploitation Demonstration Program (ASEDP) and its role within the Army. There are three broad reasons why now is an opportune time to review the program: the Army has not yet achieved a complete and effective incorporation of space into all its operations; the program has several areas that are recognizably in need of improvement; and the world has changed greatly in the past few years, and the Army has changed as well.

The study's objectives were to review the ASEDP demonstration selection process and its interfaces and to make recommendations about the program's future role and conduct. This briefing is structured around three primary research questions: (1) How can you improve the demo selection process? (2) What do key Army people think about the program and Army space efforts in general? and (3) What future direction should the ASEDP take? Each question is considered briefly in turn below.

The Army made substantial improvements to the ASEDP demo selection process between its FY94 and FY95 cycles. For example, Army needs are now better identified and communicated, and the selection criteria for demonstrations were made more explicit. Moreover, warfighters are more involved in ASEDP conferences, and there is better coordination between the ASEDP, Battle Labs, and LAM. There is also an increased emphasis on a Force XXI orientation to the ASEDP. The Arroyo Center believes that only further refinements to these and other improvements are warranted at this time.

In exploring what key Army people think about the past and present performance of the ASEDP, Arroyo Center researchers found broad agreement on the program's value and the need to continue it. The consensus view seems to be that ASEDP is an "Army bargain" that has produced many notable successes and fulfilled important functions at a low cost. Other comments lauded its educational value and its role in keeping the Army current in the field. Some needed improvements were noted: avoid duplication of other demos, and provide sufficient clarification and justification where differences between demos are small. Moreover, ASEDP technology demos have not done well when transitioned into Advanced Technology Demonstrations in the tech-base arena. The Army people interviewed offered a number of ideas for improving this performance.

The key Army people were also asked about the Army's overall efforts to integrate space into its operations. There was general agreement that space has great value for future Army operations and that it is important for the Army to pursue an aggressive strategy for space implementation, both internally and in the formulation of joint space policy.

Based on its assessment of various alternatives and information gained through the interviews, the Arroyo Center believes that the ASEDP should continue as it is currently structured for the near term, but with continuing emphasis in specific areas, namely, attention to warfighter needs; close working relationship with the Battle Labs/LAM/ATDs; better-defined demo transition options; innovative space ideas; direct link between COTS technology/products and Army applications; and coordination with the Force XXI and Digitization of the Battlefield efforts.

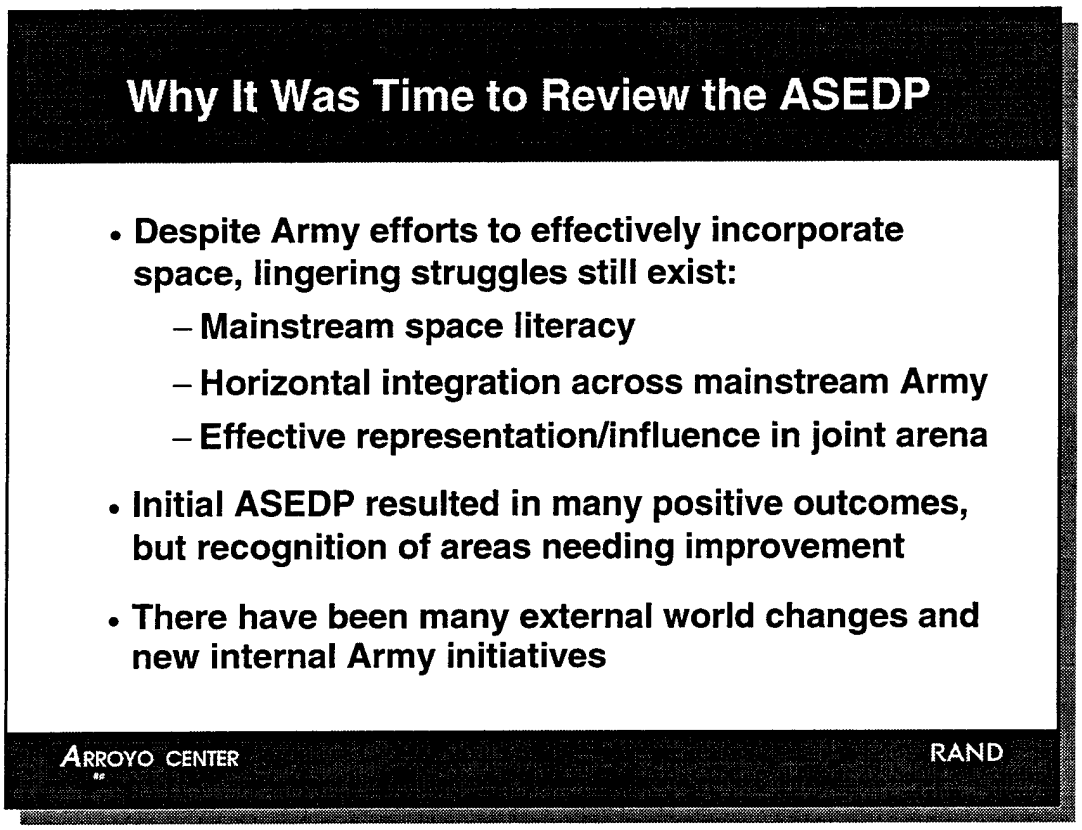
The briefing ends with recommendations for possible Army action relative to the ASEDP and relative to Army space efforts in general. The former set of recommendations are: incorporate the recommended refinements to the demo selection process; leave ASEDP under ARSPACE leadership; clarify ARSPACE roles in the transitioning of demos to fielded capabilities, establish requirements, etc.; explore options to incorporate some materiel development capability; consider a higher level of TRADOC involvement in the ASEDP process; and obtain a signed Memorandum of Understanding between ARSPACE and TRADOC. Recommendations for Army action regarding its space efforts in general are: intensify efforts to integrate space education at all levels in Army schools and centers; pursue a top-level mandate to consider space options in trade-off analyses with other space and nonspace options; intensify efforts to integrate space into simulations and exercises; initiate efforts to devise "payoff measures" for space that compare to, or directly translate into, "killing things"; assign resident space expertise to Battle Labs, LAM issues, ATDs; and work toward a horizontal integration of space throughout the Army. The Army is improving the space efforts with the creation of the Space Battle Center.

ABBREVIATIONS

ACTDs	Advanced Concepts and Technology Demonstrations
ACTII	Advanced Concepts and Technology II
ARSPACE	Army Space Command
ASARDA	Assistant Secretary of the Army for Research, Development and Acquisition
ASDP	Army Space Demonstration Program
ASEDP	Army Space Exploitation Demonstration Program
ASEWG	Army Space Executive Working Group
ASI	Army Space Institute
ASPO	Army Space Program Office
ASTRO	Army Space Technology Research Organization
ATDs	Advanced Technology Demonstrations
AWEs	Advanced Warfighting Experiments
BCBL	Battle Command Battle Lab
CINC	Commander-in-Chief
COTS	Commercial off-the-shelf
CONUS	Continental United States
DCSOPS	Deputy Chief of Staff, Operations and Plans
ECBRS	Enhanced Concept-Based Requirements System[1]
FY	Fiscal Year
GPS	Global Positioning System
JTAGS	Joint Tactical Ground Station
LAM	Louisiana Maneuvers
NIH	Not Invented Here

[1]TRADOC has recently gone back to referring to ECBRS as CBRS, without the "Enhanced."

OCRs	Operational Capability Requirements
ODS	Operation Desert Shield/Desert Storm
OSD	Office of the Secretary of Defense
SDC	Strategic Defense Command
SLGR	Small Lightweight GPS Receiver
SSDC	Space and Strategic Defense Command
TENCAP	Tactical Exploitation of National Capabilities
TRADOC	Training and Doctrine
VCSA	Vice Chief of Staff, Army



1. INTRODUCTION

Before addressing the results of this effort, we will briefly recap some of the considerations that prompted Army Space Command (ARSPACE) to request the study in early 1993.

First, since the rebirth of interest in space capabilities in 1985, the Army has made considerable progress in incorporating space into its operations. However, there are still some problems, principally in the areas of (1) mainstream space literacy, (2) horizontal integration of space throughout the mainstream Army, and (3) effective representation and influence in the joint space arena.

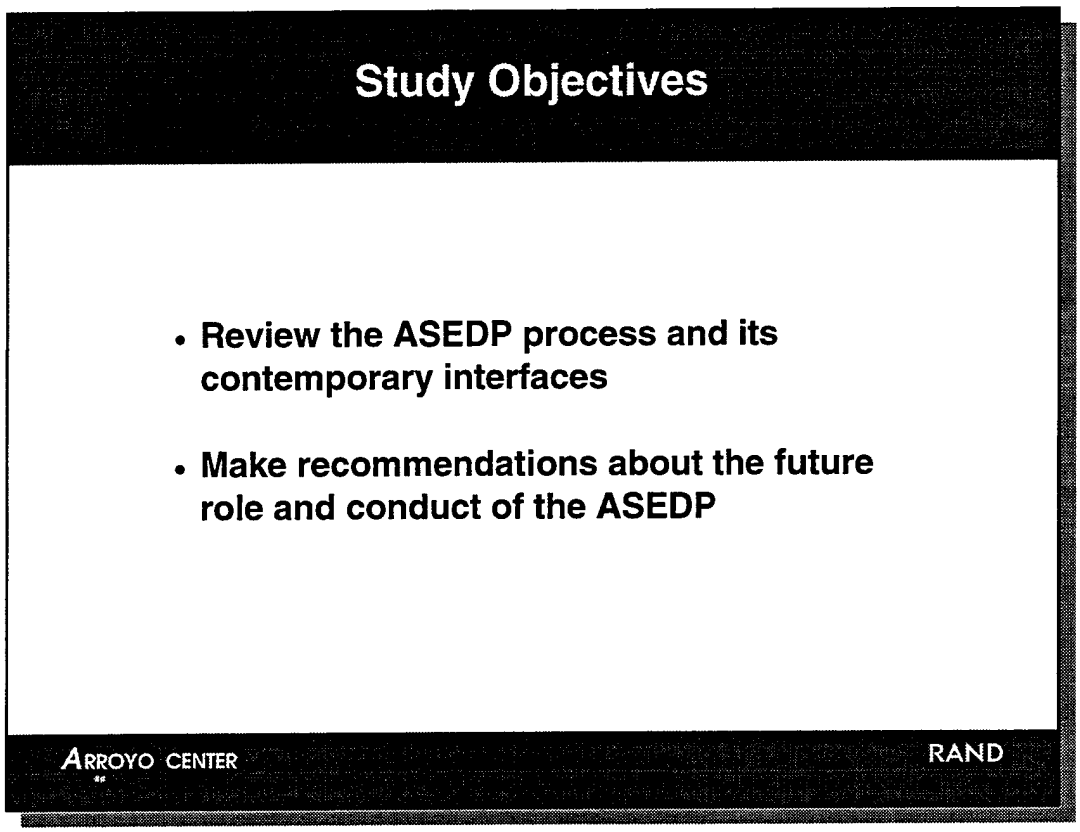
Second, the Army Space Exploitation Demonstration program (started in 1986–87 under a slightly different name[2]) has substantively contributed to

[2]The Army Space Institute (ASI) originally had the Army's lead role in the Army Space Demonstration Program (ASDP), as it was then called; but upon that organization's downsizing in 1990–91, combined with the emergence and maturation of ARSPACE, leadership of the ASDP mission was transferred to ARSPACE and the program became known as the ASEDP.

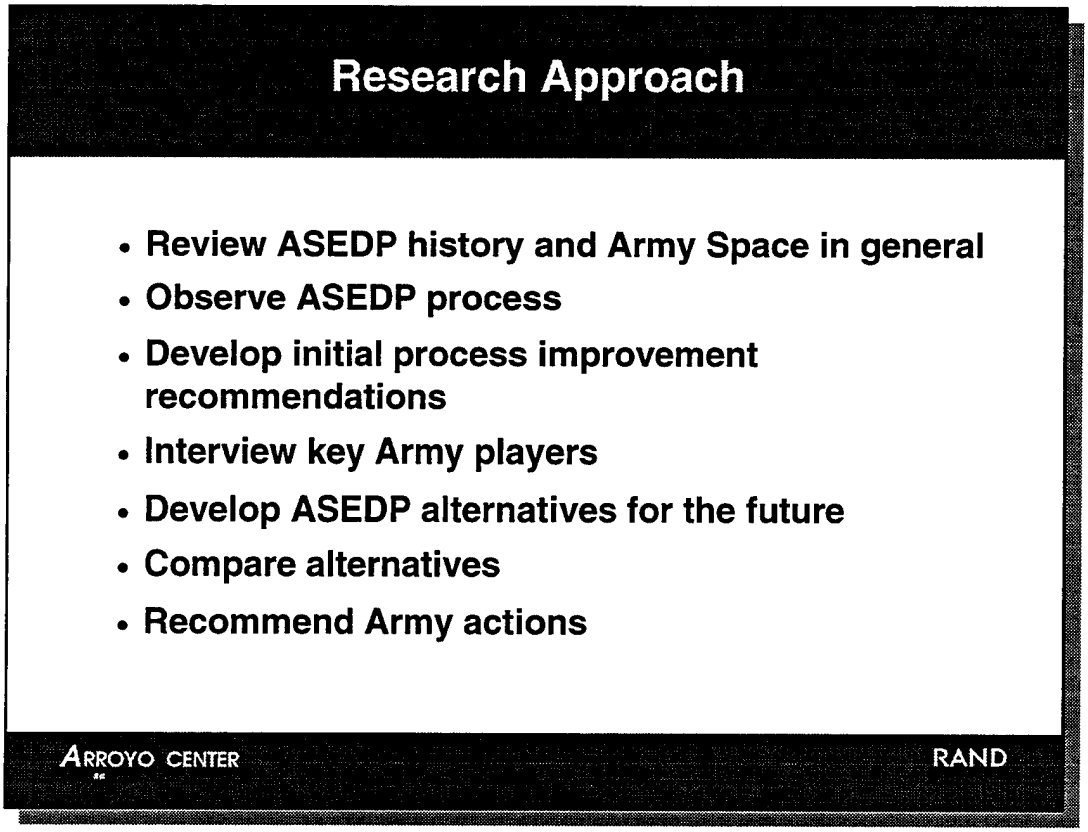
this overall progress by producing many positive outcomes, although of course there has been recognition along the way of program areas needing improvement.

Finally, there have been several significant external world changes which, among other things, have led to a transition from predeployed to Continental United States (CONUS)-based projection forces, and some new internal Army initiatives, e.g., the Battle Labs and Louisiana Maneuvers (LAM), new demo programs in the Battle Labs and at the joint OSD level, and the recent merger of SDC and ARSPACE to form the Army's Space and Strategic Defense Command (SSDC), under three-star leadership, to better focus space efforts.

Accordingly, ARSPACE deemed it prudent and timely to review the ASEDP.



The RAND study was initiated with these objectives: to review the demo selection process and the new interfaces that shape the future program context, and to make some recommendations, not only about the internal conduct of the program, but about its future role.



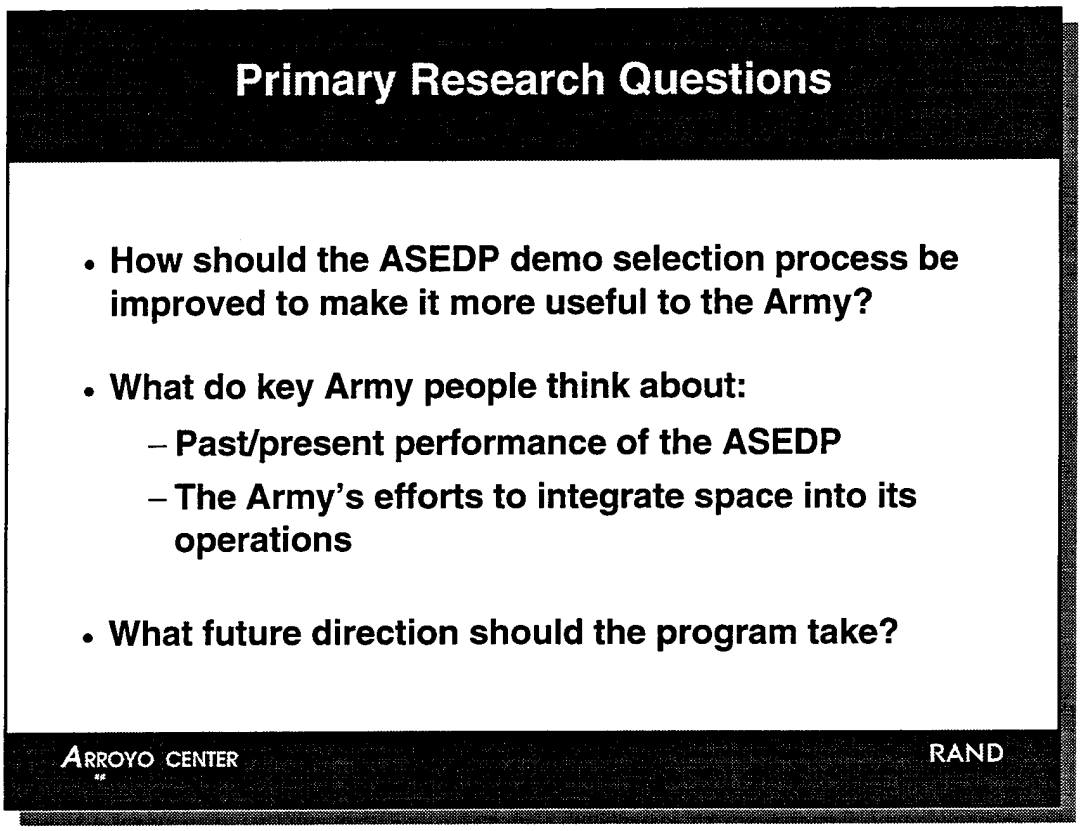
We began with a brief review of the history of the ASEDP and Army space in general. The Arroyo Center came to RAND in 1985 and has, in various ways, been involved in the Army's interest in space since that time.

We had the opportunity to observe two cycles of the demo selection process: for FY94 and for FY95.

Some initial process improvement suggestions were offered as part of this study's Interim Progress Report in October 1993, and many of those ideas, along with other ARSPACE initiatives, were incorporated into the FY95 demonstration selection process.

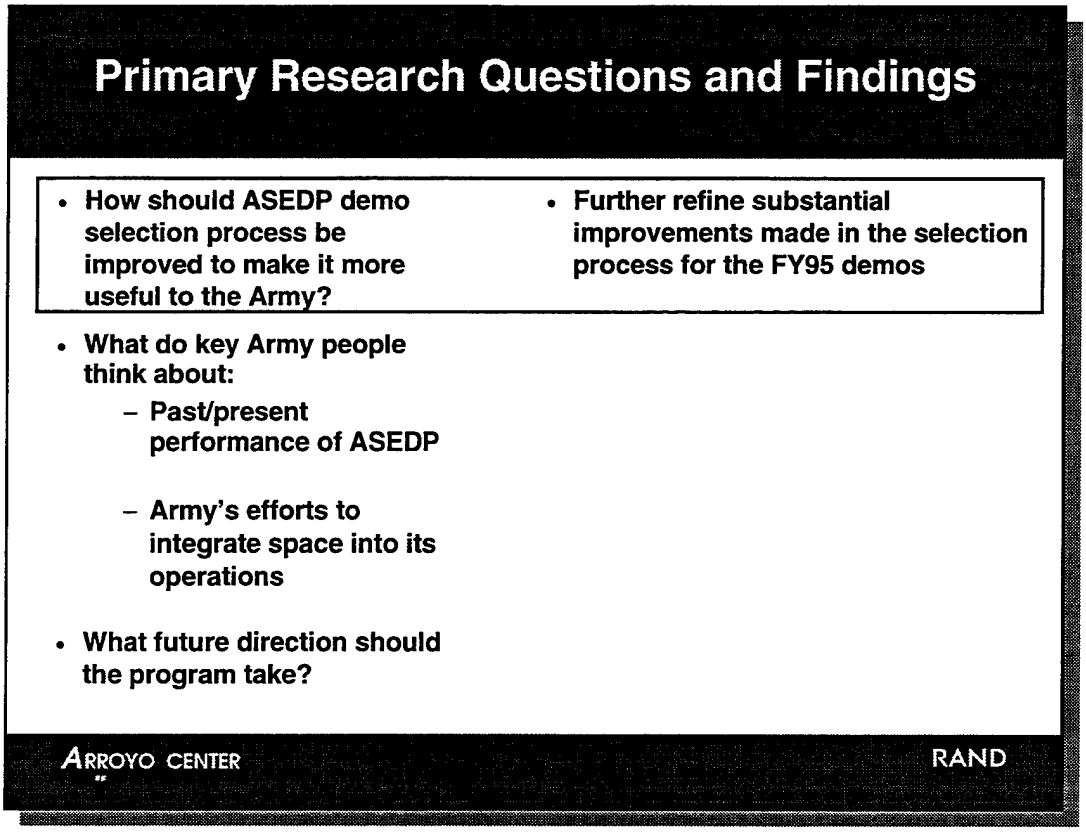
Another major part of our effort was to interview 16 key Army people from the Vice Chief of Staff on down (see pages 13–14), in order to get their views on the space demonstration program and on Army space progress in general.

Finally, we looked at some future program alternatives and will make some recommendations for possible Army action.



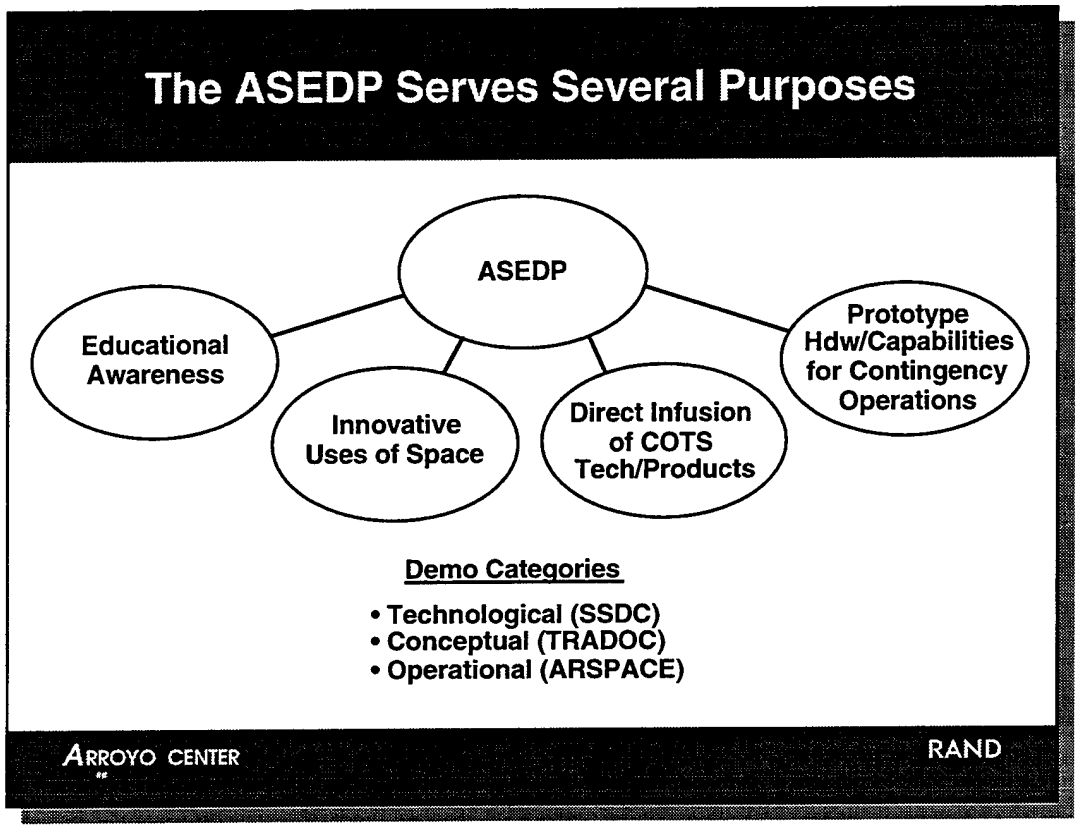
The presentation is structured around three primary research questions: (1) How can you improve the demo selection process? (2) What do key Army people think about the demo program and Army space efforts in general? and (3) What future direction should the ASEDP take?

In addressing each question, we will first give a short answer summarizing our findings, followed by more detail to hopefully substantiate that answer.



2. HOW SHOULD THE ASEDP DEMO SELECTION PROCESS BE IMPROVED TO MAKE IT MORE USEFUL TO THE ARMY?

Our short answer to the first question, "How do you improve the process?" is that there *were* substantial program improvements made between the FY94 and FY95 selection cycles, and we believe, until proven otherwise, that only further refinements to those changes are warranted at this time. We briefly review and assess the recent improvements and offer suggestions for further "fine tuning."



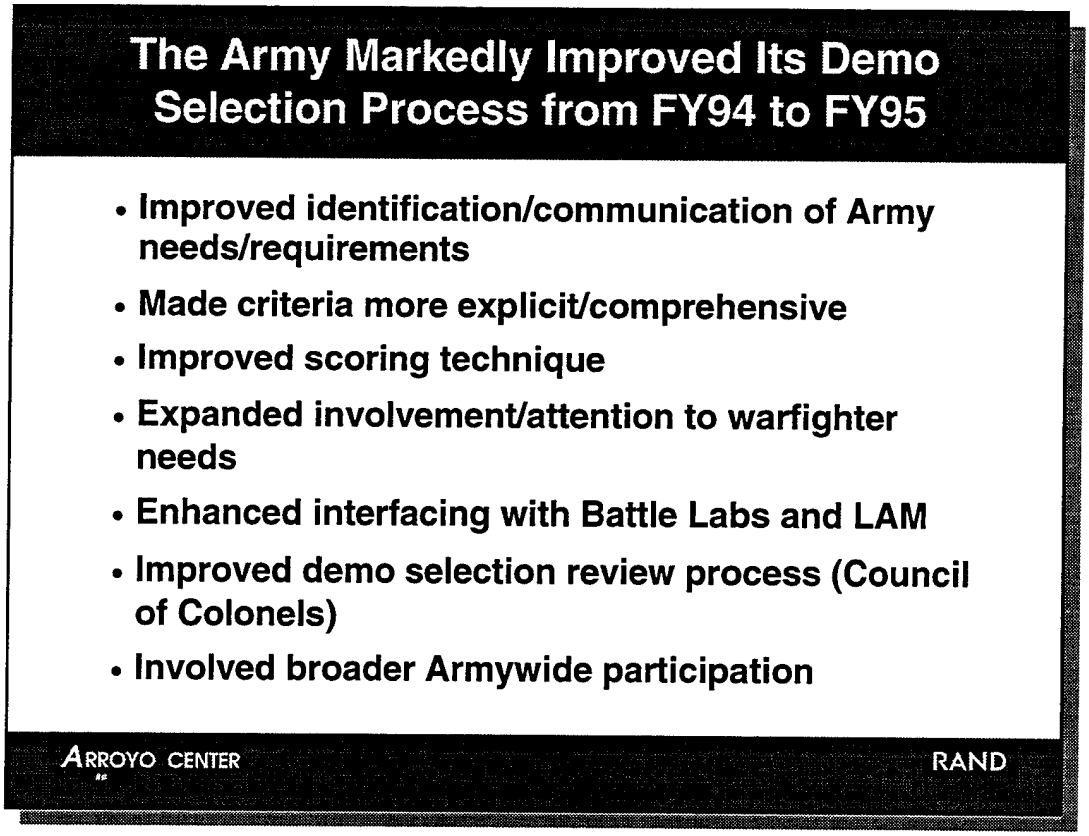
In thinking about how to improve a program, it is well to keep in mind what purposes the program has served. The first one, educational awareness, was one of then Army Vice Chief of Staff (VCSA) General Thurman's primary motivations in sanctioning the initial program.

The program captures and exposes innovative uses of space and serves as a mechanism to infuse commercial off-the-shelf (COTS) technology and products directly into Army programs, as opposed to the more lengthy and formal introduction process.

It can produce, and in fact has produced, prototype space-related hardware/software and new capabilities for use in contingency operations.

The program comprises three types of space demonstrations—technological, conceptual, and operational—and the agencies responsible for monitoring and executing[3] each type are noted above. The demonstration categories are briefly described in the Appendix.

[3]In actual practice, various Army organizations are typically involved in executing the different types of ASEDP demos.



The Army markedly improved the selection process for the FY95 cycle.[4] There is now better identification and communication of Army needs and requirements to guide demo selection. This has been one of the past criticisms of the program, i.e., that the demos were too often not sufficiently tied to requirements. The Planning Conference now serves as an effective forum for broad, cross-sectional sharing of requirements, activities, and concerns among various Army agencies.

From FY94 to FY95 the selection criteria were made more explicit and comprehensive. Some of the FY94 criteria were combined, eliminated, or replaced; an important additional criterion was added to test a demo candidate against the Battle Labs' Operational Capability Requirements (OCRs).[5]

There has also been expanded involvement of warfighters in the ASEDP conferences and increased attention to their needs during demo candidate evaluations.

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[4]The demo selection process and criteria are outlined in the Appendix.

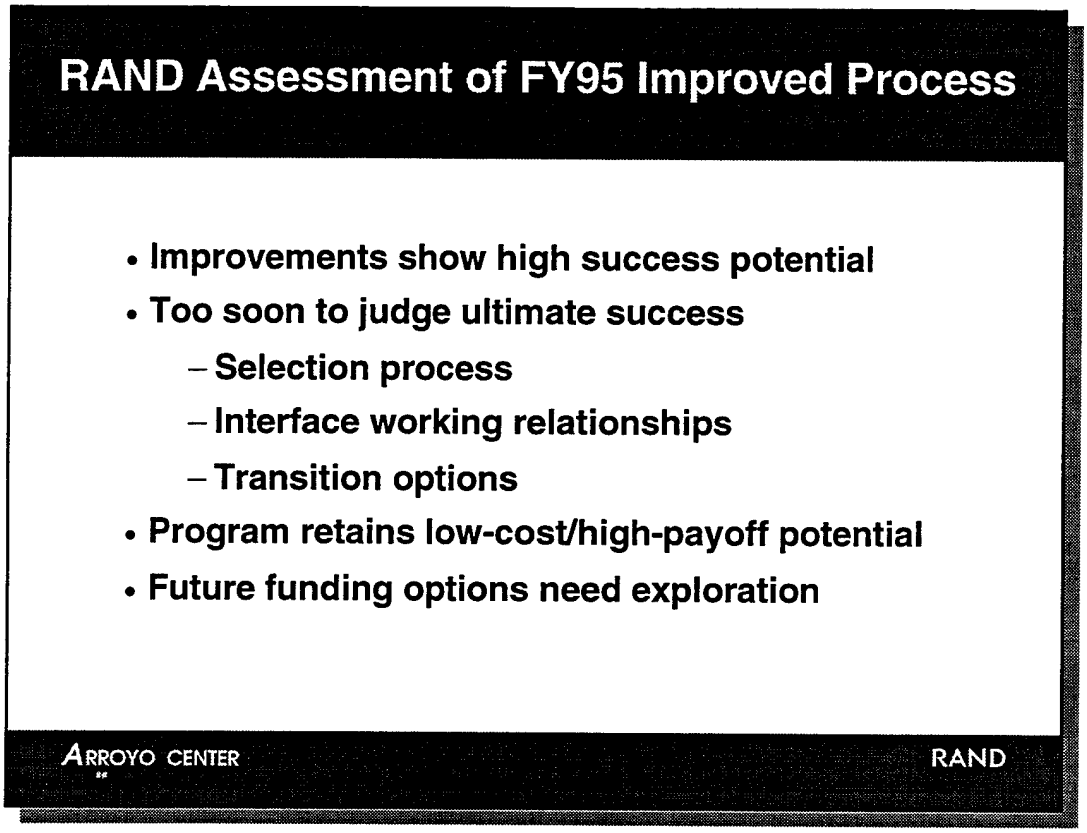
[5]Originally, the Battle Lab's top priorities were called "Battle Dynamic Concepts."

Coordination between the ASEDP, Battle Labs, and LAM is now an ongoing process. An inaugural "ARSPACE Support to the Battle Labs Conference" was held in March 1993, and a draft Memorandum of Understanding between ARSPACE and TRADOC has been written to further promote such coordination.

ARSPACE/ASEDP personnel are lending space support to various LAM issues.[6] The LAM Task Force is represented on a new Council of Colonels review board that was added to the FY95 ASEDP Planning Conference in order to strengthen the demo-selection review process before selected candidates are forwarded to the Army Space Executive Working Group for review and subsequent approval by the Commanding General (CG), SSDC.

Armywide participation in general was broadened for the FY95 selection process.

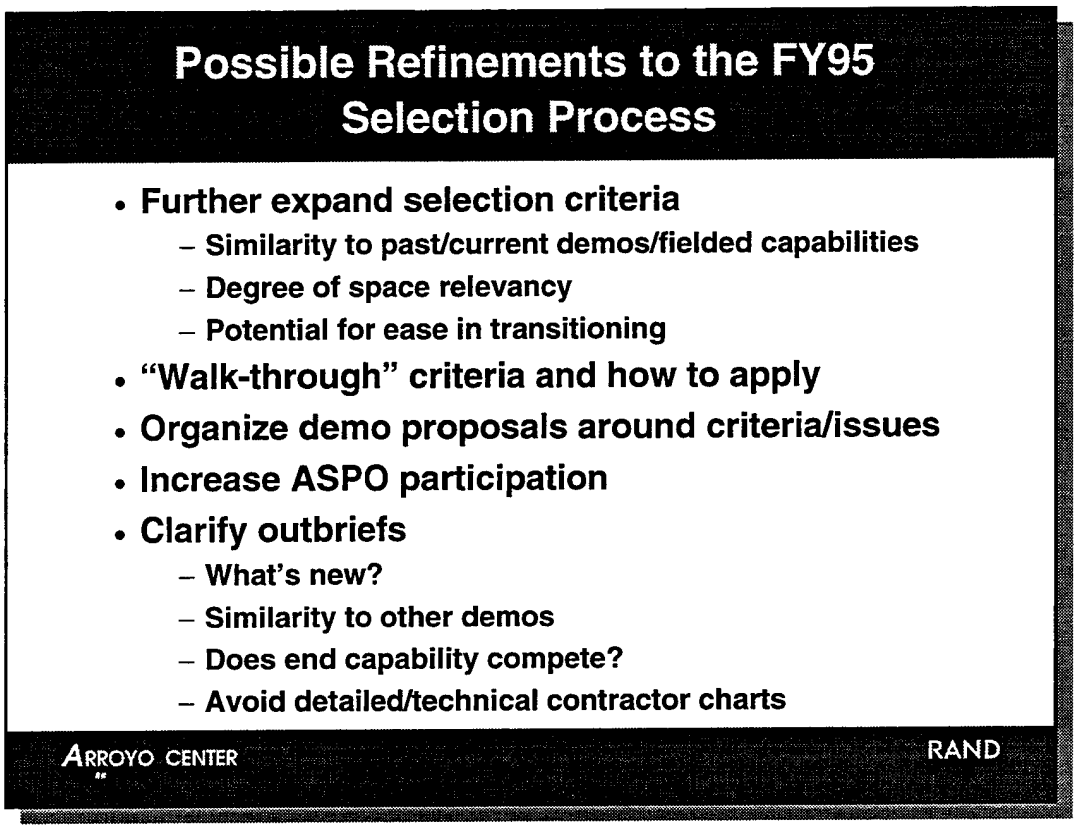
[6]Primary support has been to the FY94 LAM "Space" issues and the FY93 "C^4I/Space" issue, where the Battle Command Battle Lab (BCBL) developed the Commercial Space Package.



In assessing our observations of the FY95 selection process, the recent improvements appear to suggest a high success potential, although it is too soon to judge their ultimate effect since (1) the FY95 demos have only recently been selected and have not yet been conducted, (2) working relationships are still solidifying, and (3) transition options are still being explored by ARSPACE and others. None of the newer transition paths have been adequately tested.

We think the program continues to retain its low-cost/high-payoff potential, and the latter aspect may even be improved.

The final bullet is included only as an incidental comment; i.e., assessment and exploration of program funding and options were not part of our study, but as we proceeded we were reminded that past ASEDP funding has been somewhat ad hoc and informal. The question is whether it should remain so. Moreover, only recently, the House Armed Services Committee has mentioned this program, among others, pursuant to its interest in combining space training and education programs at the joint level and, in general, in enhancing space joint support to all warfighters. So we simply note this area as one that might warrant further consideration.



Given the program improvements currently in place, we now offer some further possible refinements to the selection process for future consideration, based on our FY95 review.

While there is some uncertainty about how far to go in establishing explicit demo selection criteria, we note that some seemingly important "dimensions" are still missing from the current list (shown in the Appendix). Since duplication has been a past criticism of the program, it might be helpful to add a "test" for how similar a demo candidate is to one that was conducted in the past or to one currently being conducted in another program; likewise for the implied end-capability. The "degree of space relevancy" would address the appropriateness of conducting a candidate demo in the ASEDP versus another, less-space-oriented, demo program when the contribution of space to the function being demonstrated is somewhat moot. The "relative potential for ease in transitioning" may, or may not, be appropriate for the selection process but is included for completeness in further criteria considerations. Incorporation of "meeting warfighter needs" into the current "requirements" criterion might be another minor improvement.

We think it would be worthwhile at both the Industry and Planning Conferences to conduct a brief, preliminary "walkthrough" of the criteria for the audience charged with rating the demos, in order to facilitate a more uniform interpretation of what is meant (by ARSPACE) in each criterion, and then present a few specific examples of how to apply them.

Proposers of demo candidates should be encouraged to organize their proposals more around the criteria and the implied issues.

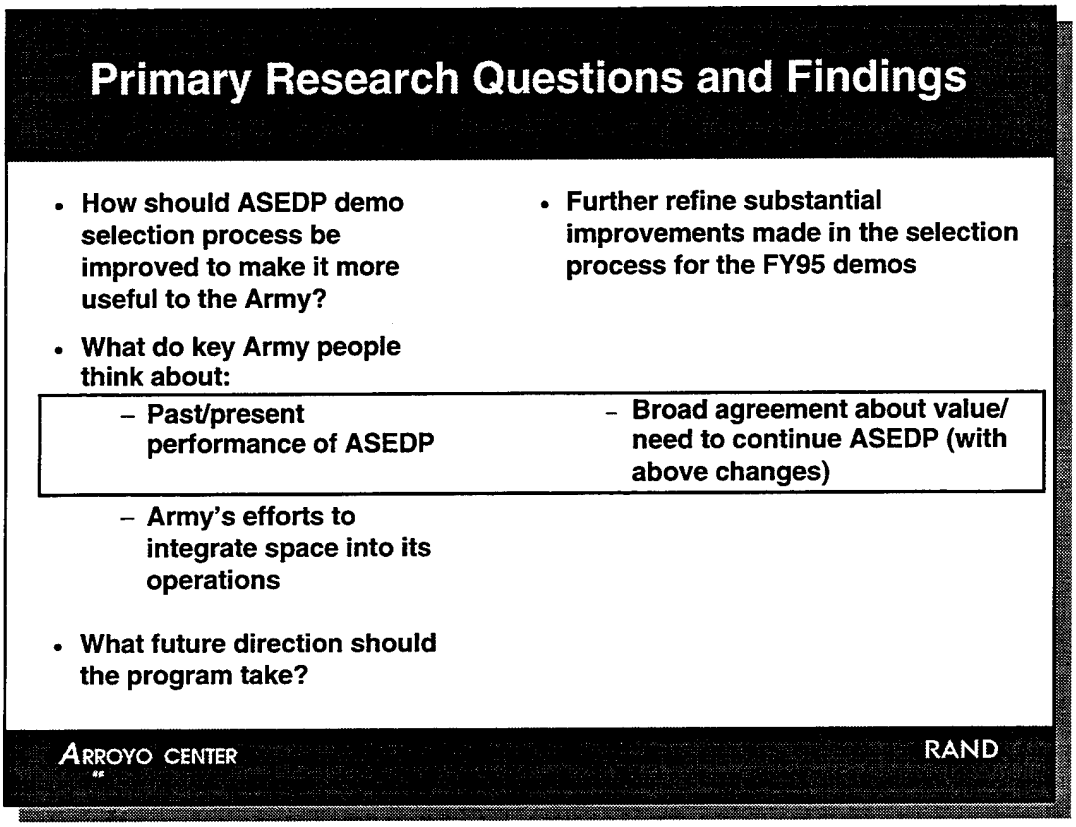
We were aware of one ASPO participant on the FY95 Planning Conference Council of Colonels review board, but are uncertain of his involvement in the demo evaluation panels. Since there are six functional area panels that concurrently evaluate candidate demos, increased ASPO participation might help avoid duplication of black world versus white world space demos and also facilitate (due to the broad cross-section of panel participants) a better transition of TENCAP capabilities and equipment from the black world to the white.

Some further clarification in the six panel outbriefs to the review board seems warranted to minimize the ambiguities, questions, and concerns expressed over the following issues. When a demo is proposed for carry-over from one year to the next, it is not always clear in the outbrief what is new this year, and the significance of that difference. Moreover, when a candidate appears very similar to another known past or ongoing demo in another program, the outbrief should make the payoff of the differences more explicit. And, if the implied end-capability of a demo candidate appears functionally similar to an existing or soon-to-be-available Army capability (space or nonspace), obvious questions arise about whether the Army should seriously consider attaining the new space-demonstrated capability (if successful) instead of the contemporary competitors, or strive to ultimately procure both . . . and why. Finally, the panel outbriefs should, when possible, avoid the direct use of highly detailed/technical contractor charts.

Given the compressed time in which the panel chairmen must conduct their many tasks and prepare their briefs, it would be unrealistic to expect much analysis of the above; but we are suggesting more attention be given to the above points by further drawing upon the available knowledge/expertise of each panel's participants.

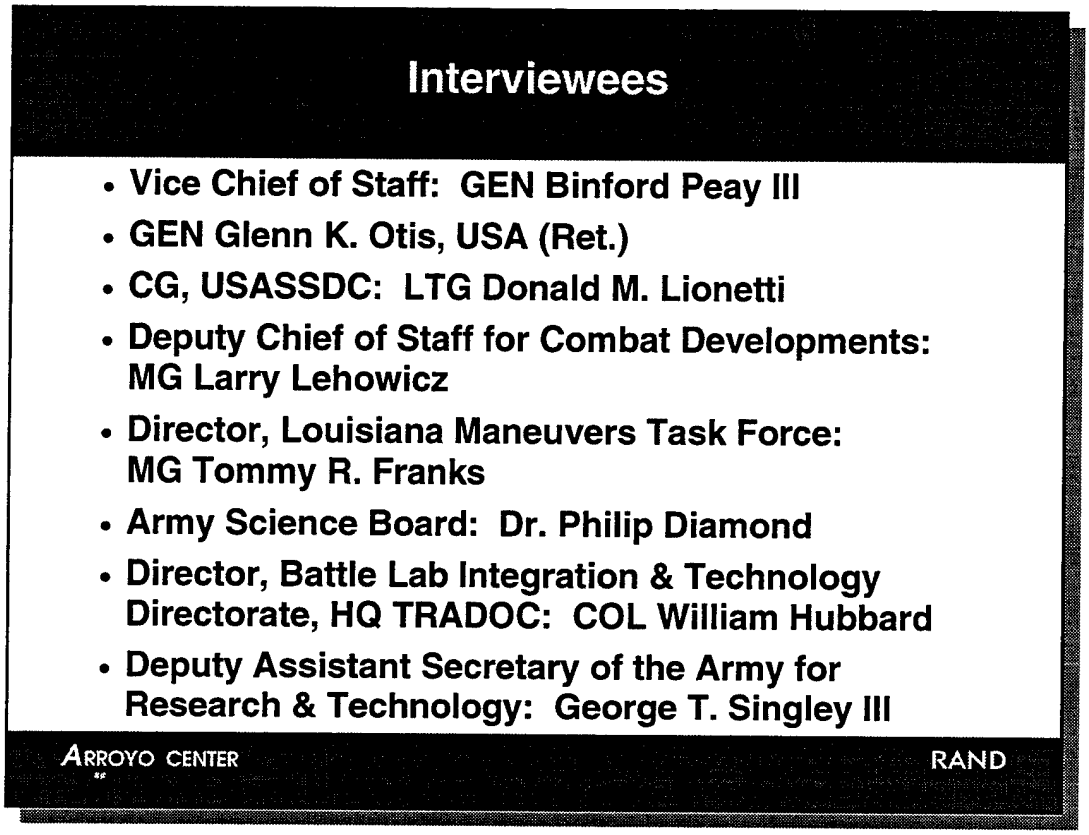
To summarize this discussion, we believe the recent improvements to the demo selection process are both substantive and promising, and we are offering some suggestions for further refinement based on our observations during the FY95 process review.

Now, we move on to what we learned from our interviews.



3. INTERVIEWS: WHAT DO KEY ARMY PEOPLE THINK ABOUT THE PAST/PRESENT PERFORMANCE OF THE ASEDP?

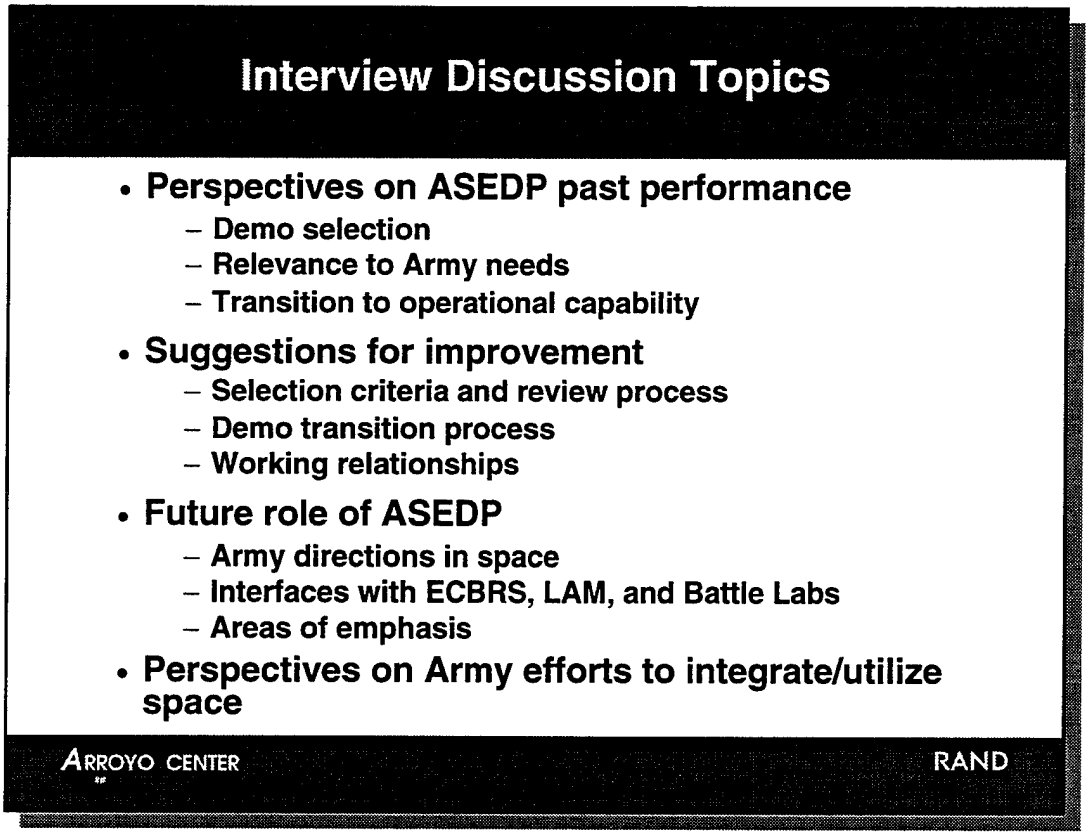
First, in exploring what people thought about the past and present performance of the ASEDP, we found broad agreement on the value of the program and the need to continue it, especially in view of the recent improvements. (However, not surprisingly, there was no apparent uniformity of intimate knowledge of those improvements among the 16 interviewees.)



We begin this discussion by listing the people we interviewed. These interviewees comprised most of a candidate list (initially suggested by ARSPACE) of individuals having some past involvement or familiarity with some aspect of the ASEDP.

Interviewees (continued)

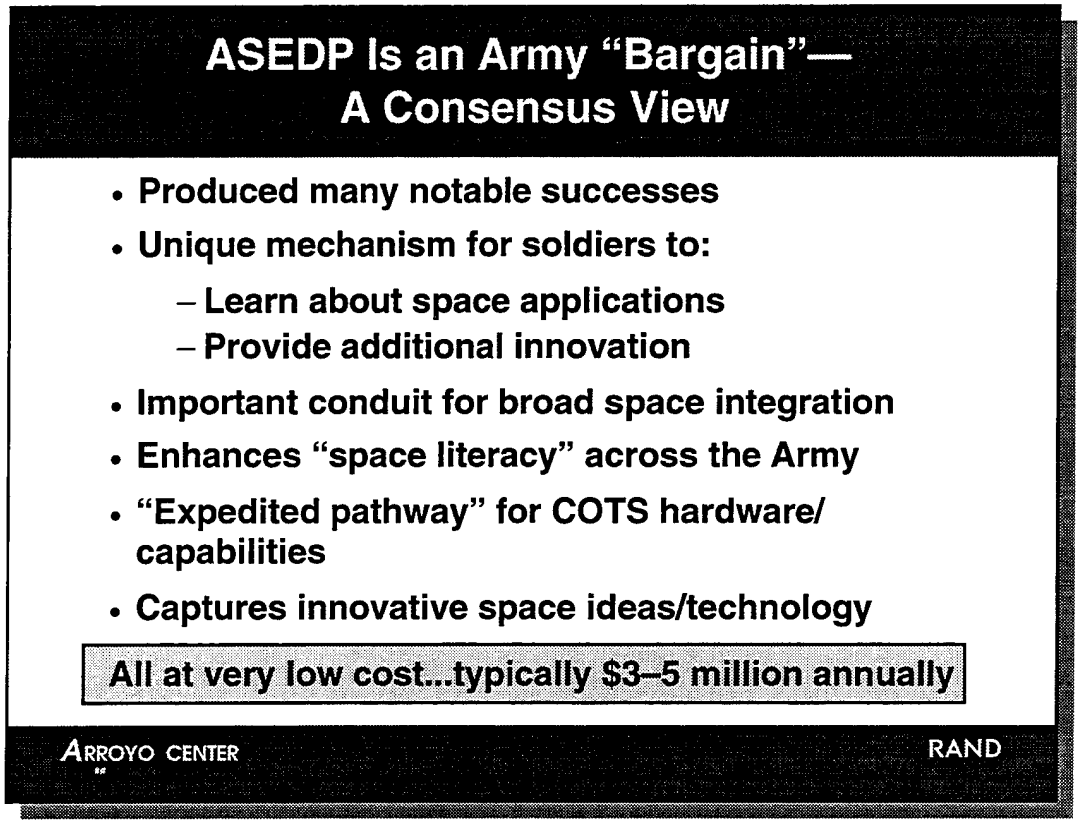
- Director, Army Space Program Office: COL Sherwood C. Spring
- HQ ODCSOPS, Space Integration Division DAMO-FDW: COL William Hoyman
- Associate Director of Technology, USA Topographic Center (TEC): Dr. Richard Gomez
- ARINC: Mr. Ron Forkenbrock
- Battle Command Battle Lab, Fort Leavenworth: Mr. Mike Freeman and Mr. Lee Garrison
- US Army SSDC: Mr. Ron Dickerman
- Director, Space and Electronic Combat Directorate, HQ TRADOC: COL Michal Robinson



The menu of topics presented for discussion at each interview included (1) perspectives on ASEDP past performance, (2) suggestions for improvement, (3) future role of ASEDP, and (4) perspectives on Army efforts to integrate/utilize space.

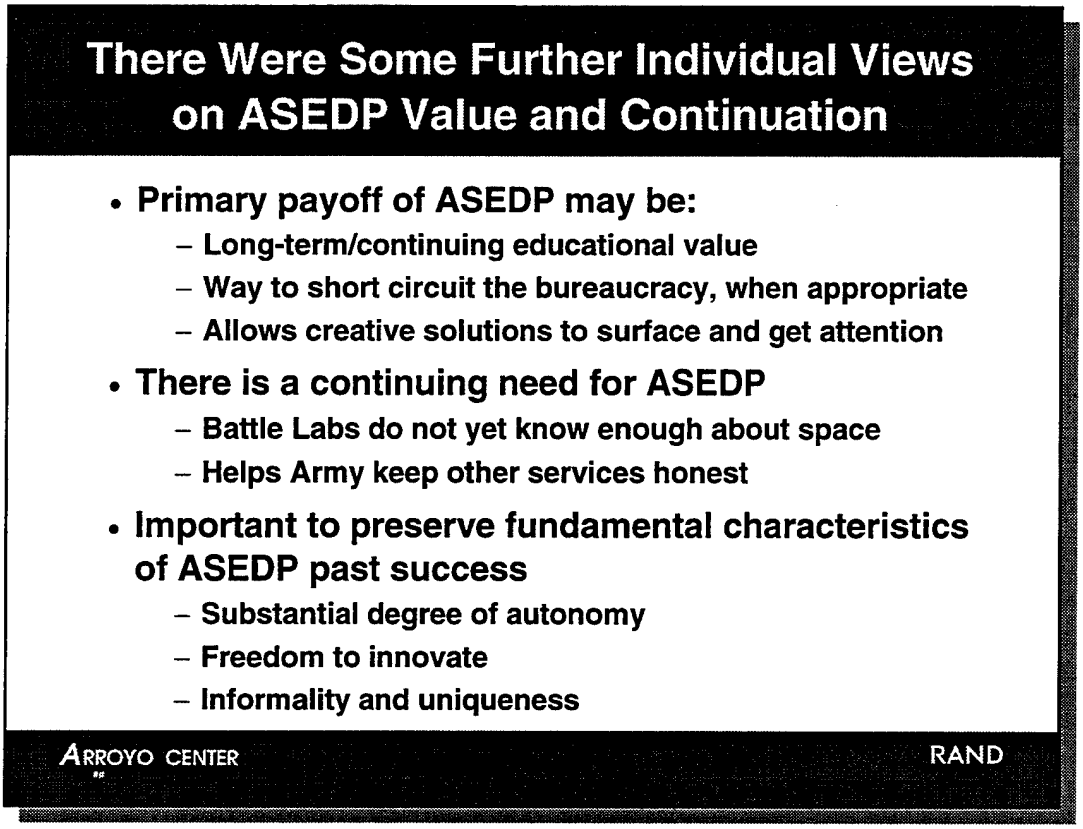
The interviewees were free to pick and choose among the topics depending upon their background and interest. Almost everyone had something to say about the last topic; most had comments on the first; and the depth of discussion regarding the two middle topics was more varied.

As a caveat here, we made no particular effort to track who said what. We were more interested in content than source, and felt that it was more important to try to capture the essence of the viewpoints resident in a fairly wide sampling of key people.



We found a consensus view regarding the overall value of the ASEDP to the Army. Our respondents readily recalled examples of past successes, including the fact that 4 of the 5 original demos produced important capabilities used in Desert Storm, SLGR being the most notable; and that most of the items in the commercial space package came out of this program. The Joint Tactical Ground Station (JTAGS) was mentioned as a more recent demo success that has now been transitioned to developers, and many of the underpinnings of the current use of commercial space communications were derived from this program as well.

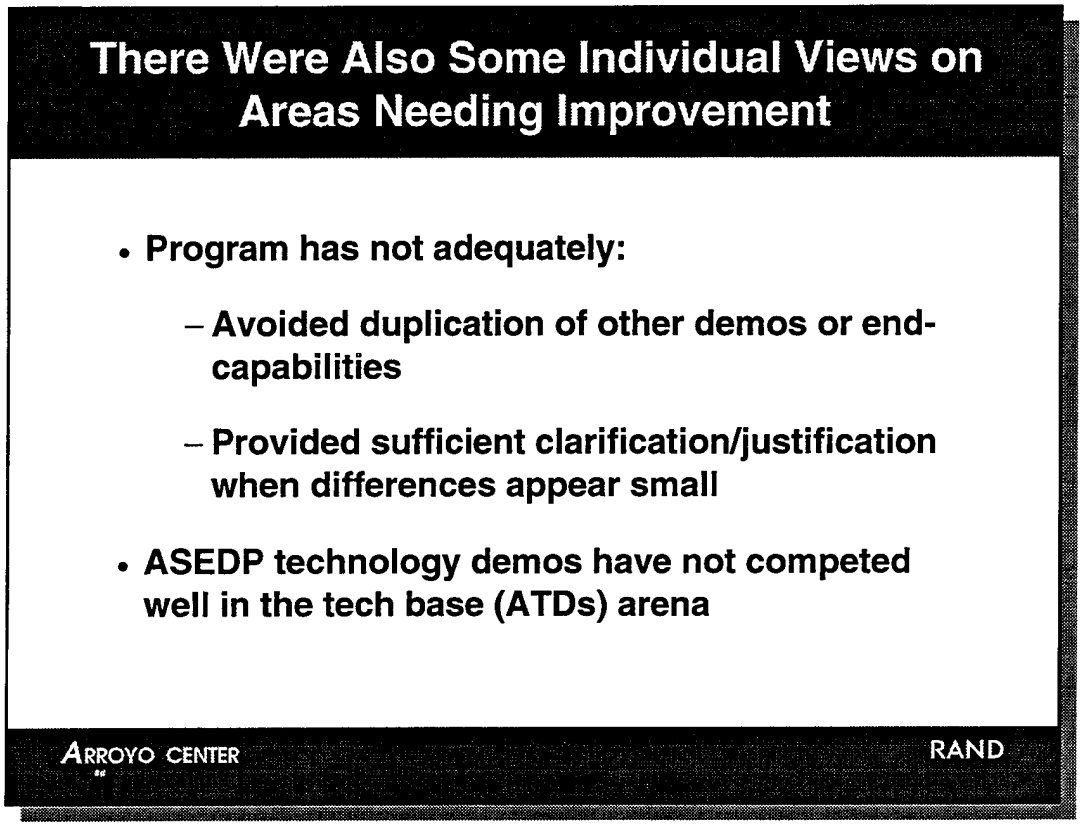
Without belaboring each of the remaining bullets on the above chart, we were impressed that the consensus view reflected nearly verbatim the perceived achievement of the program purposes shown on a previous chart, and all at low cost. Hence, the program appears to be generally viewed as an Army bargain.



There were some additional individual views about the program's value, and the need to continue it, that we thought were worth passing on. In recalling various benefits, one interviewee tended to prioritize them in this order: (1) long-term/continuing educational value, (2) a way to short-circuit the bureaucracy, when appropriate, and (3) a mechanism to allow creative solutions to surface and get attention.

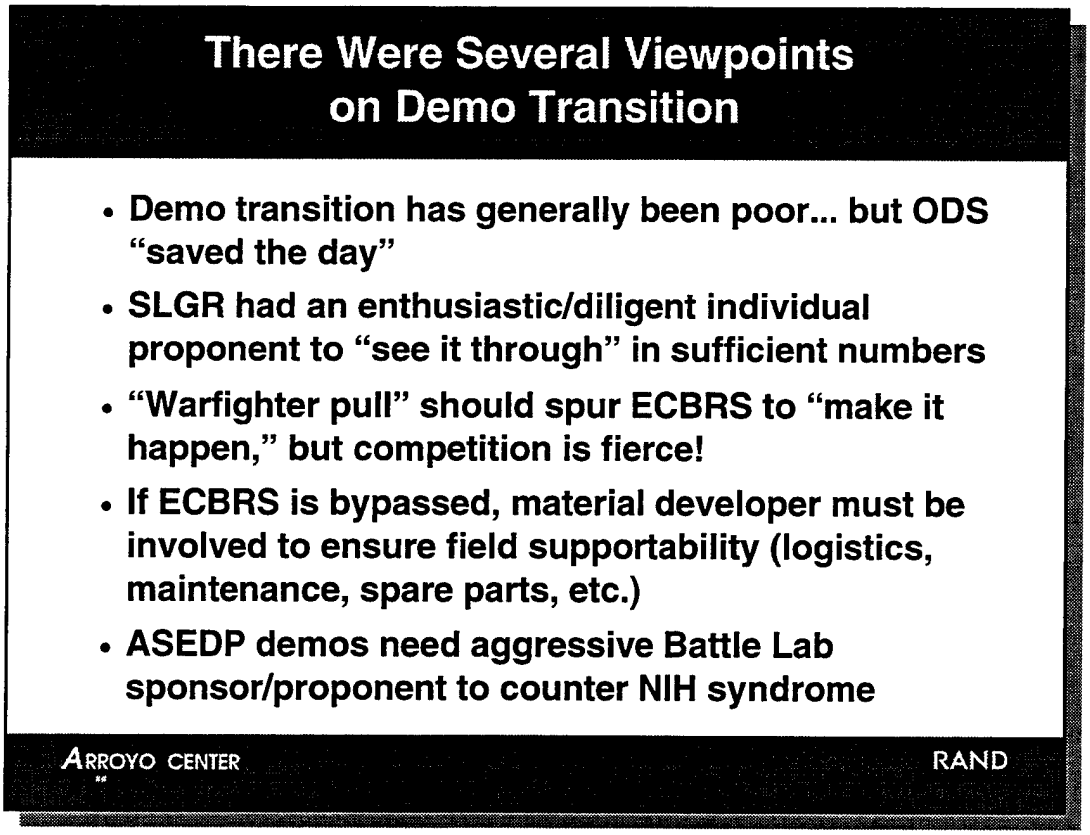
A couple of interviewees thought that, if for no other reason, the ASEDP program needed to be continued because of the view that the Battle Labs do not yet know enough about space to keep it alive and vibrant. And the ASEDP helps the Army stay abreast of new space developments and capabilities and, hence, better prepares them to protect and promote their interests in joint service deliberations regarding larger space issues.

As we discussed the changing context for the future ASEDP, programmatic improvements, trends toward formalization and normalization, etc., some cautioned that it is important to try to preserve certain fundamental characteristics of the past program that, in their view, were significant contributors to its success; i.e., a substantial degree of autonomy, freedom to innovate, relative informality, and uniqueness.



There were also comments regarding needed improvements. The past program was criticized for too much duplication of demos and/or end capabilities, and for not providing enough clarification or justification when the differences are small.

Moreover, ASEDP technological demos have had a poor track record in being transitioned into Advanced Technology Demonstrations in the tech-base arena, particularly those previously conducted by the Army Space Technology Research Organization (ASTRO). They have not competed well and need to do better on their own merits.



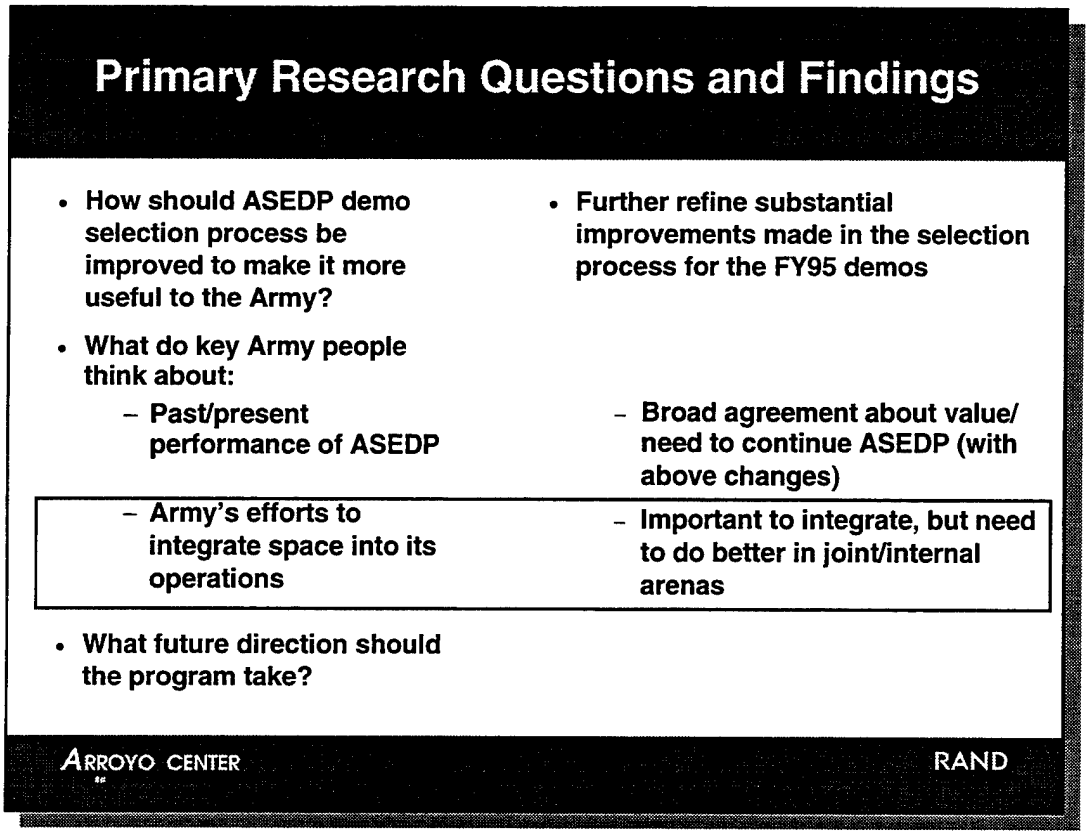
The subject of demo transition brought forth a number of viewpoints, which are summarized here.

Some felt that had it not been for Desert Storm, the track record for transitioning demos out of this program might have been fairly poor. The most notable successful example is SLGR (Small Lightweight GPS Receiver), but people felt that perhaps one of the ingredients of its success had been the diligent and enthusiastic individual proponent who was willing to "see it through," in sufficient numbers to make a difference.

Others felt that if you successfully demonstrate a space-related capability to enough of the right people and generate enough interest in the field, the "warfighter pull" in itself should be sufficient to spur the Enhanced Concept-Based Requirements System (ECBRS) to bring it to fruition in a timely manner and in sufficient numbers. But the problem is, as others pointed out, even if Operational Needs Statements are written and submitted, they go into a big basket where the competition is fierce, and there is no assurance that a needed space idea is necessarily going to survive the process.

Alternatively, if you bypass the ECBRS, a materiel developer must be involved to ensure field supportability.

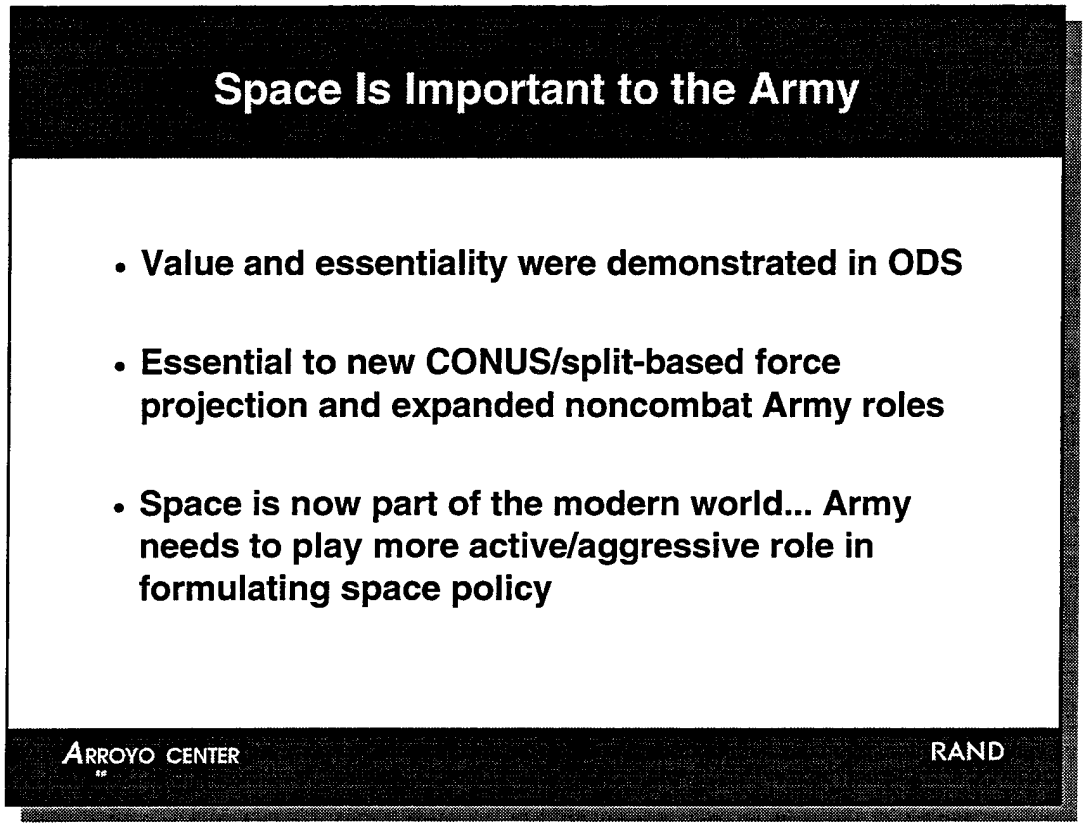
Finally, even though there is now markedly increased coordination/cooperation with the Battle Labs as another demo transition route, some argue the need for an aggressive/dedicated Battle Lab sponsor and/or proponent to shepherd a space idea through, as a counter to the "not-invented-here" (NIH) syndrome and the resident nonuniformity of space education and awareness.



4. INTERVIEWS: WHAT DO KEY ARMY PEOPLE THINK ABOUT THE ARMY'S EFFORTS TO INTEGRATE SPACE INTO ITS OPERATIONS?

We turn now to the various views we found on the Army's overall efforts to integrate space into its operations.

The short answer is, again, essential agreement as to the importance of space integration but some rather strong feelings that the Army needs to do better, in both the joint and the internal arenas.



This chart briefly summarizes the many comments we heard on the importance of space. Operation Desert Shield/Desert Storm was particularly effective in demonstrating the value and essentiality of space to Army operations; that importance may be underlined as the Army undertakes its new CONUS/split-based force projection and expanded noncombat roles.

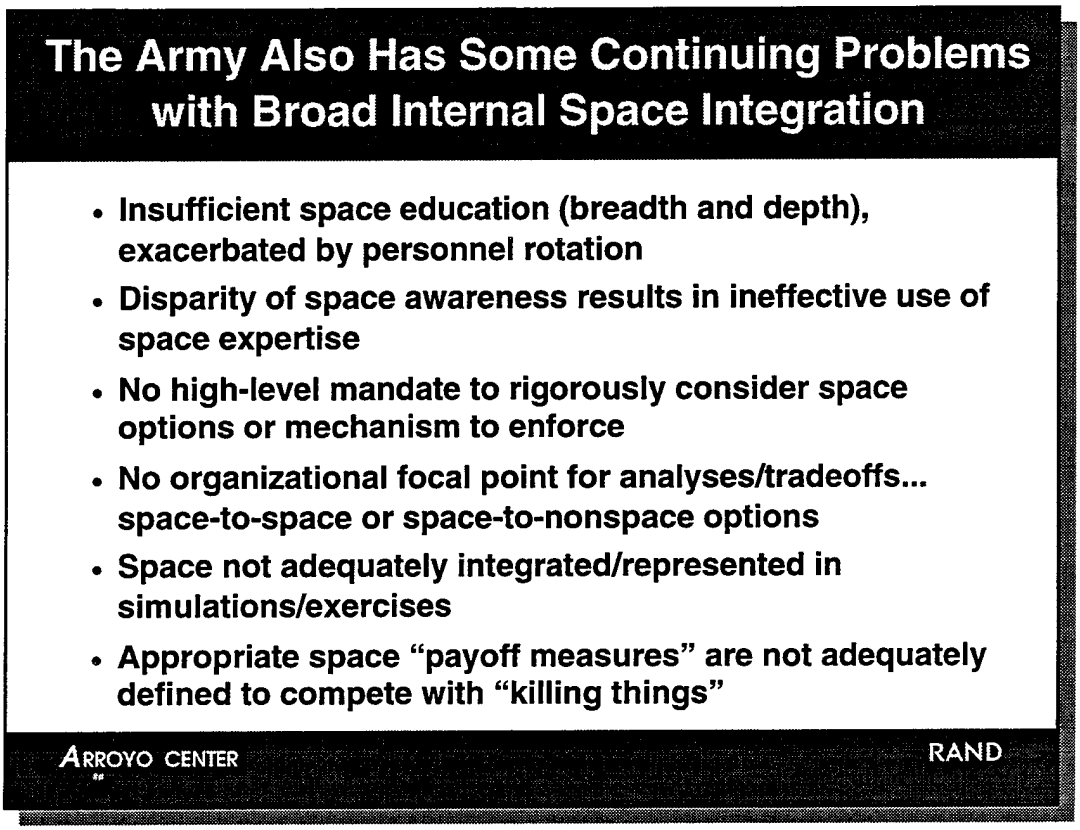
There is the view that it is now time for the Army to depart from its past, rather benign, strategy for space implementation and take a much more active and aggressive approach, both internally and in the formulation of joint space policy.

In the joint arena, the Army has not done as well as it will need to do. Better preparation is necessary so that Army requirements can be stated early on in the joint space process, and persistent follow-through is essential to ensure that the resultant space asset designs do in fact reflect those requirements.

It is important to aggressively pursue adequate space asset allocation and access, and to provide the types and numbers of terminals necessary to take effective advantage of that access. Moreover, those who sit at the joint table will likely be asked to ante up a share of the funding; the Army needs authoritative representation that can commit its share.[7]

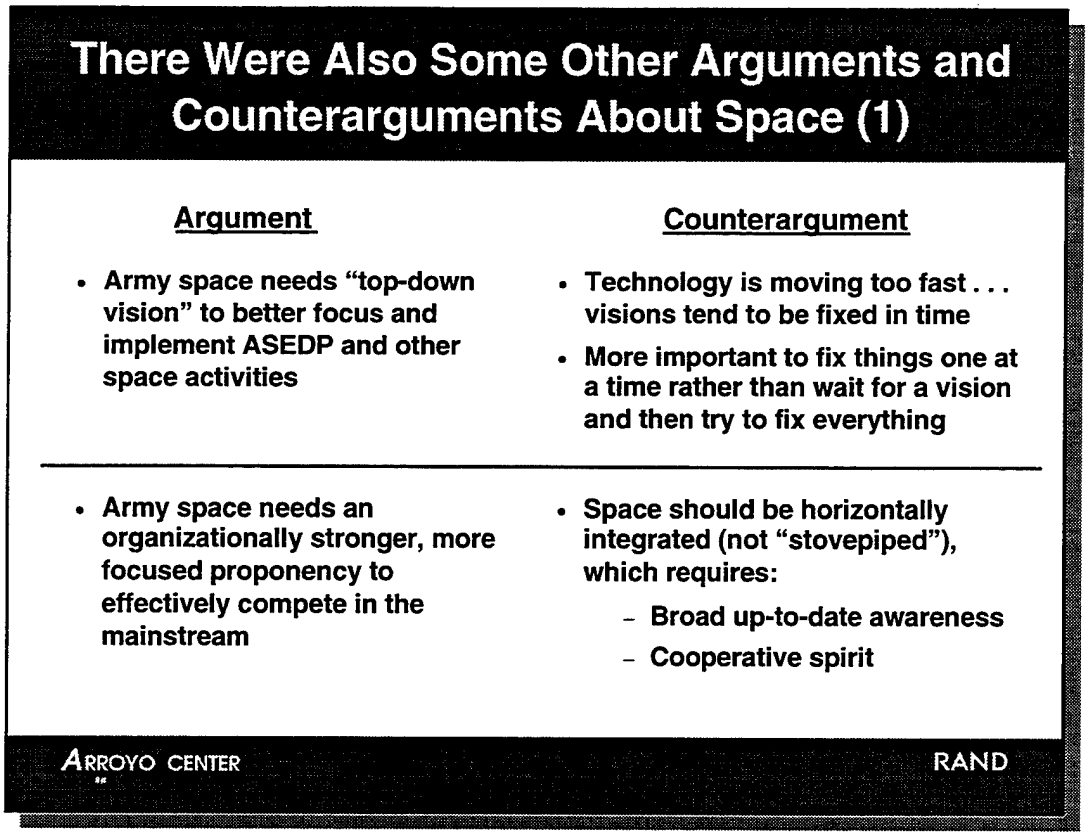
There was recently a positive and possible model for the future in this regard, namely, the proactive approach taken by the Army in getting the Medium Data Rate package on Milstar.

[7]In today's environment it seems increasingly clear that the U.S. Air Force will not be providing free space capabilities to other services and government agencies out of their Total Obligational Authority (TOA).



We received a rather long list of concerns about the internal integration of Army space. The space education problem, in both breadth and depth, was mentioned by nearly all those interviewed; the unevenness of space awareness in the mainstream Army was felt by some to be particularly troublesome when space expertise is placed in various largely nonspace activities. The unevenness of space awareness tends to feed the "not-invented-here" syndrome and the seemingly always-present competition with in-house "pet rocks." The result is a diminished effectiveness in the utilization of valuable space expertise.

There is no high-level mandate to rigorously consider space options or to ensure that it happens. There is no organizational entity to do such analyses and tradeoffs, and there have only recently been efforts to begin to integrate space into simulations and exercises. Finally, payoff measures for space contributions have not been adequately defined in ways that can effectively compete with "killing things." And this exacerbates the problem discussed earlier having to do with the frustrations and effective utilization of space expertise operating in largely nonspace activities.



The next two charts briefly summarize some arguments and counterarguments that surfaced in the interviews regarding important Army space issues.

First, some felt that the ASEDP and other activities provide a good bottom-up approach to Army space, but that a high-level, "umbrella" or "top-down vision" was also needed to better integrate and illuminate what the Army wants to do with space and how it intends to carry that out.[8] The "Army Enterprise Strategy" effort was alluded to as the kind of "top-down vision" they had in mind, but obviously focused on space.

Counterarguments (from fairly high levels) stressed that technology moves too fast, that visions tend to be fixed in time, and that it is more efficient to "fix" things one at a time, and do it quickly. The Army cannot afford to wait for a vision to be developed and then be swamped by the large menu of things that visions tend to present.

[8]The recent July 1994 "Army Space Policy" addresses this issue.

Another argument was that even with the recent merger of SDC and ARSPACE, and the resultant increased focus on space with SSDC,[9] space in the Army still does not have sufficient proponency to effectively compete against the long-established proponencies for areas such as armor, artillery, and infantry.

Others felt it would be counterproductive to "stovepipe" space. Rather, the focus should be on horizontal integration, and to accomplish this requires an environment that stresses Armywide, up-to-date space awareness and a broad-based cooperative spirit.

[9]ASPO (Army Space Program Office) became an organizational element of SSDC on July 1, 1994.

There Were Also Some Other Arguments and Counterarguments About Space (2)

Argument	Counterargument
• Now is the time to "normalize" space in the Army	• It is premature to "normalize" space • It must be nurtured and protected until mainstream space literacy is sufficiently enhanced to ensure its equitable consideration and survival

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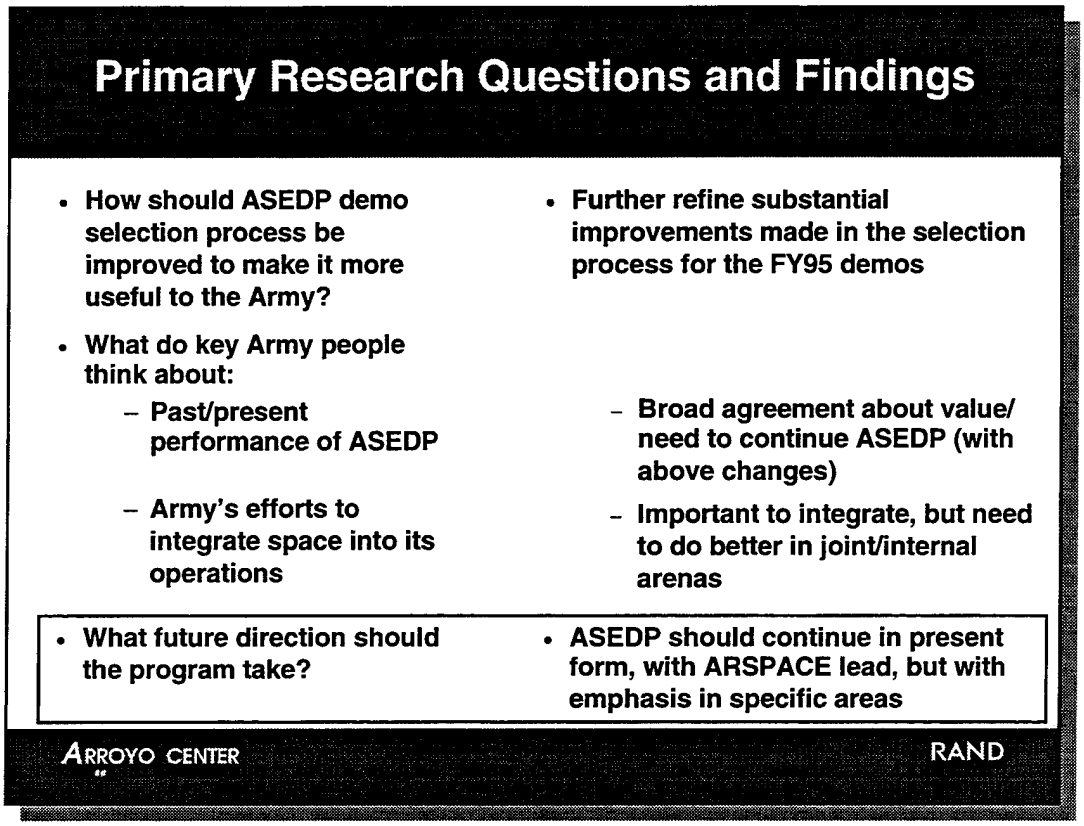
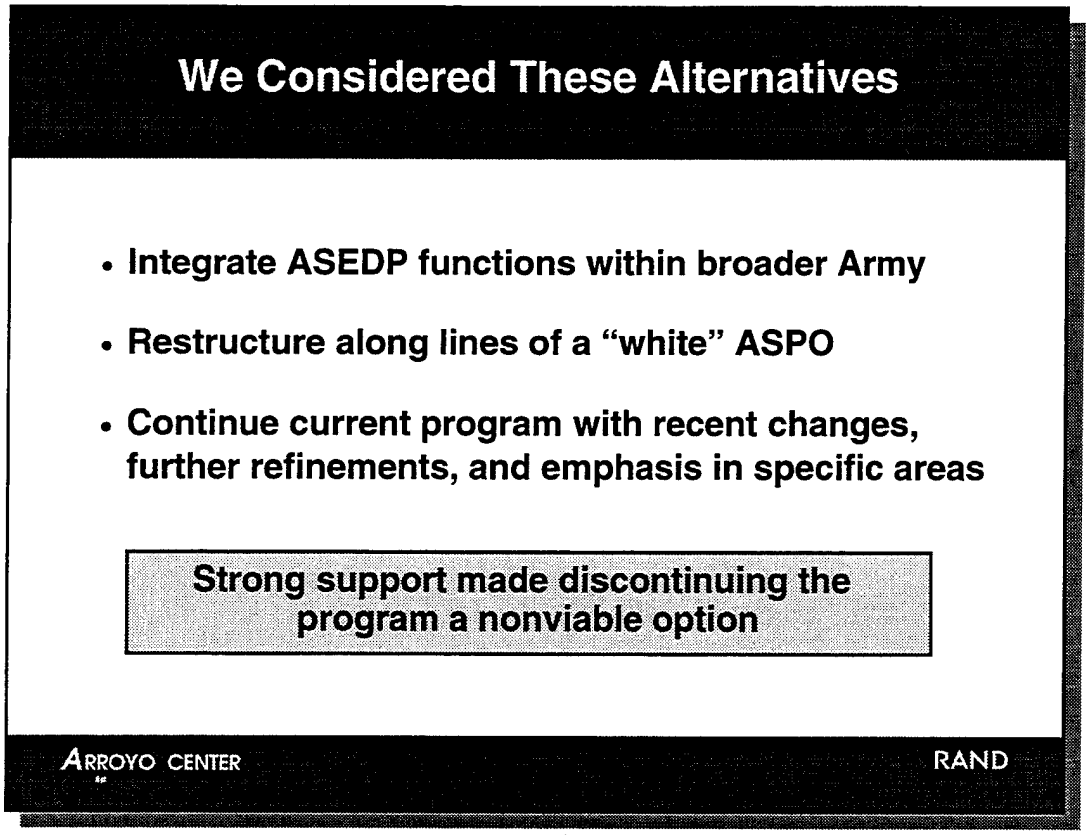
Another argument was that space has been given "special treatment" too long in the Army, and it is now time to make it part of day-to-day operations. The counter was that now is not the time to make such a transition because the literacy problem has not been solved with sufficient effectiveness, and if space does not continue to be nurtured and somewhat protected, it is not likely to get a "fair shake" in most competitions and its survival may be threatened.

Having concluded our report on the essence of what we learned from the interviews, we now discuss some options for the future direction of the ASEDP.



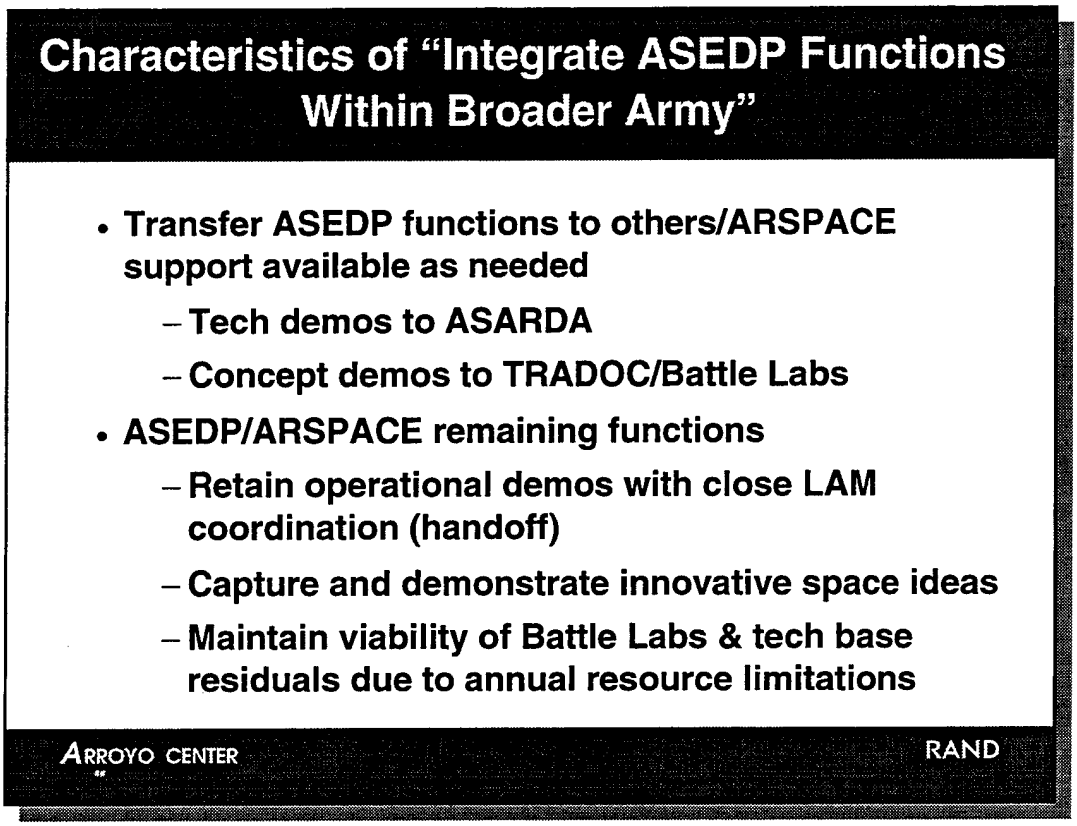
5. WHAT FUTURE DIRECTION SHOULD THE ASEDP TAKE?

Based on our assessment of various alternatives and information gained through the interviews, we believe the ASEDP should continue as it is currently structured, under ARSPACE leadership, for the near term, but with continuing emphasis in specific areas that are later summarized.



Early in the project we began to conceptually formulate various future paths the demo program might take. The interviews aided in exploring both the advantages and disadvantages of each. The chart shows the primary options considered. As we went into the interview process we were particularly sensitive to any comments that might suggest discontinuing the program; we heard none. Hence, that currently appears to be a nonviable option.

The next few charts further explain the three options we seriously considered as well as our summary assessment.

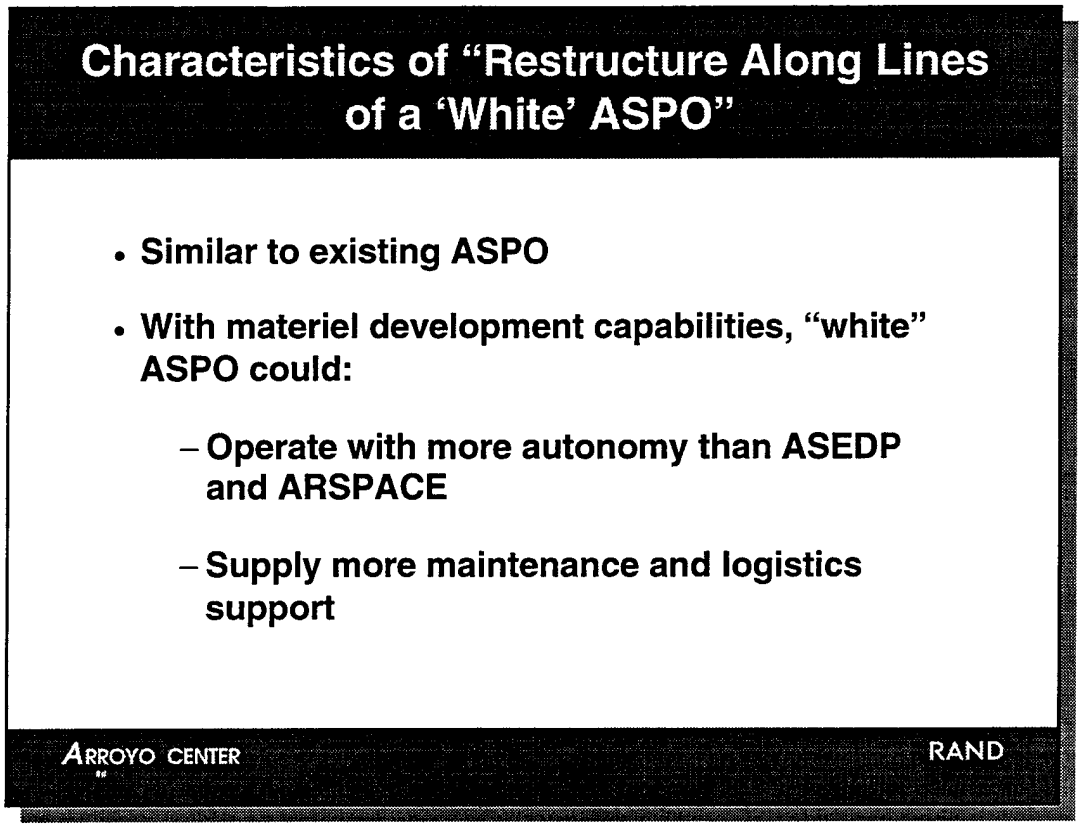


One approach was to consider whether it is now prudent and timely to reduce the scope of the ARSPACE-led ASEDP by transferring total responsibility for some portions of the current program to other agencies. ARSPACE could continue some support in these areas, but on an as-needed basis. Specifically, all responsibility for space technological demonstrations might be transferred to the Assistant Secretary of the Army (Research, Development & Acquisition) (ASARDA), and routinely become part of the tech base process—from industry call, selection, and through transition. Likewise, the responsibility for conceptual demos might logically be handed over, in total, to TRADOC and the Battle Labs. This would result in a reduced-scope ASEDP under ARSPACE lead, and that program might be made up of the following elements.

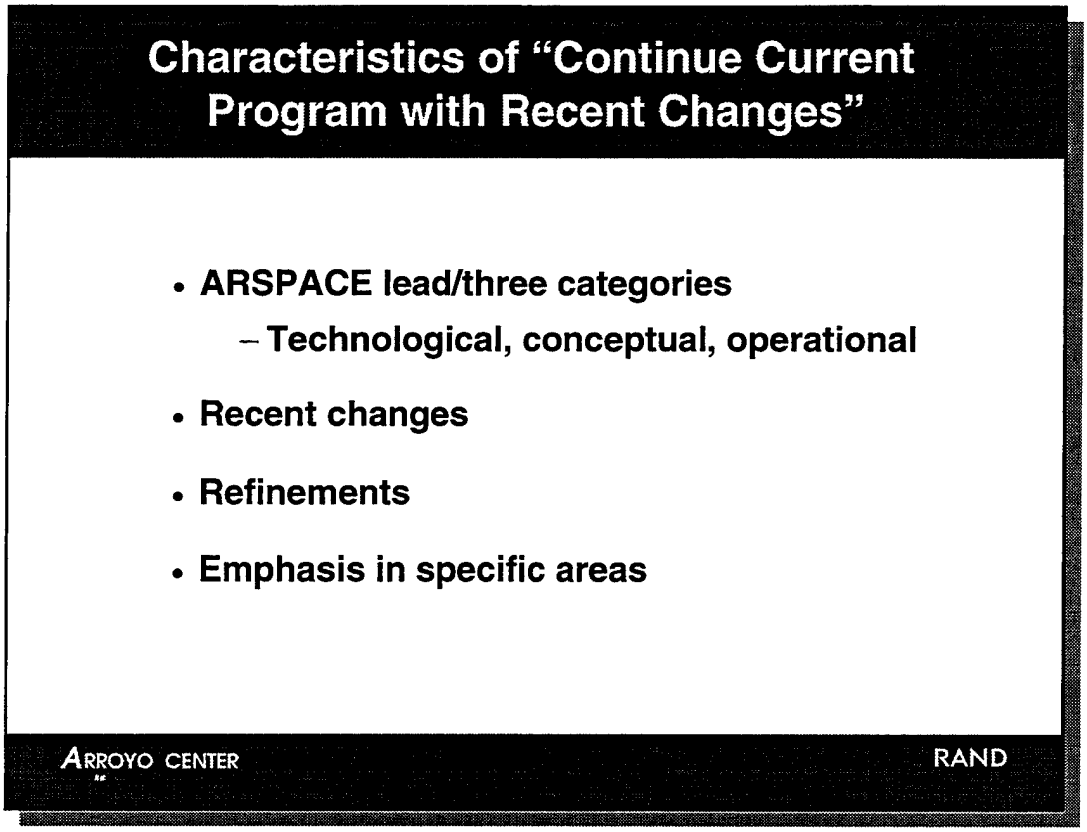
ARSPACE would continue to ferret out (from industry and elsewhere) operational demo candidates and evaluate, select, and conduct them, but in close coordination with LAM (and perhaps the Battle Labs) as eventual transition agencies.

It would also focus some portion of demos on simply innovative space ideas for which the ultimate application and payoff was not yet in clear focus but that seemed worthy of exploration.

ARSPACE might also pick up (for short-term continuation) certain technological or conceptual demos from ASARDA or TRADOC that could not be accommodated in a current year's budget, but were considered important enough to carry over until they could be reinserted in those programs at a later time.



Because of the importance of a materiel development capability, as previously discussed, and the possible merits of closer coordination between black and white world space demonstrations, some have entertained the idea of transforming the ASEDP along the lines of a "white" Army Space Program Office (ASPO), perhaps under common command leadership. This type of organization could likely operate with more autonomy than the current ASEDP and might emulate ASPO's role as a material developer and support organization for fielded TENCAP equipment. Accordingly, we also considered this option.



The third option considered is to continue the present program in its improved state, under ARSPACE leadership. The current lead responsibilities for the technological, conceptual, and operational subcomponents of the program would be retained along with the recent changes, proposed refinements, and areas of specific emphasis.

Assessment Shows That the "Continue" Alternative Is the Best Choice

Alternative	Assessment
Integrate ASEDP	• Premature due to lack of more uniform space knowledge (NIH syndrome, budget competition, insufficient top-level mandate to integrate space)
Restructure	• "White" ASPO may be viewed as stovepipe • Negative impact on horizontal integration of space • Could reduce Battle Lab and technology program interfaces with industry
Continue	• Appears on sound course given recent changes and continuing refinements • Warrants opportunity to test new results

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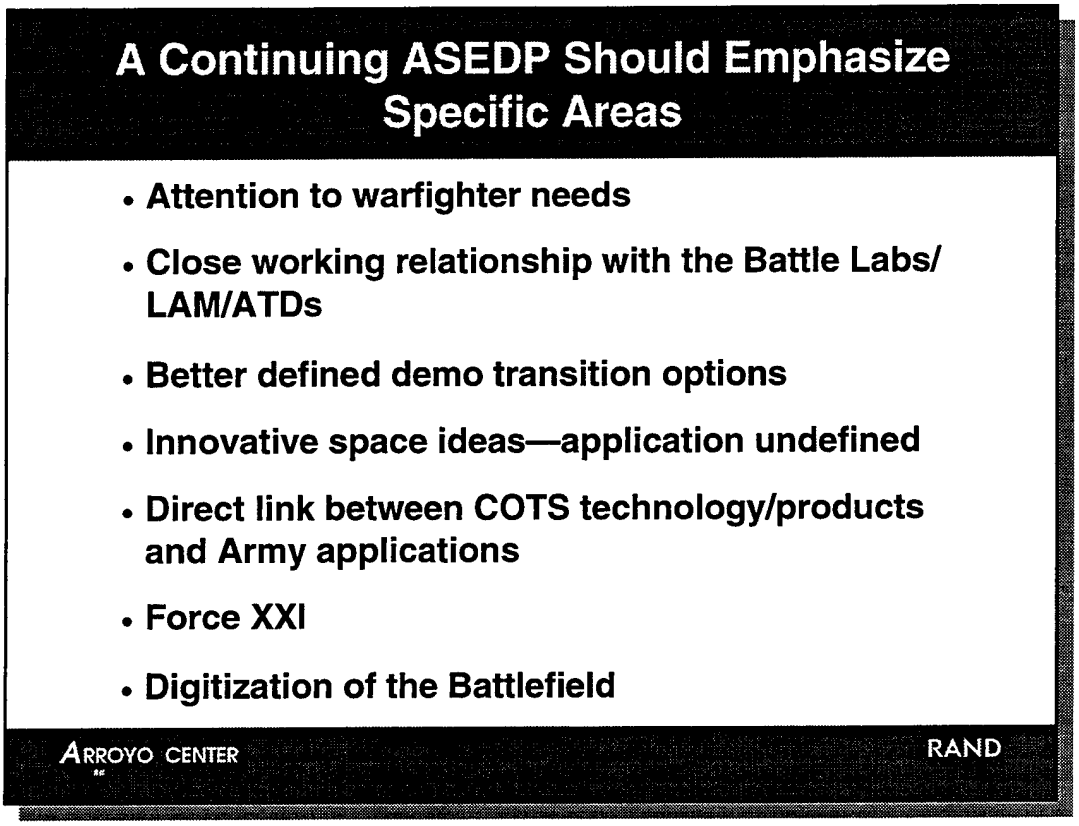
This chart summarizes our assessment of these alternatives (including input from the interviewees). Regarding the first concept, the basic conclusion is that it is probably premature in the near term to separate, and integrate elsewhere, the technological and conceptual demos; the reasons are a lack of more uniform space knowledge, the "not-invented-here" (NIH) syndrome, budget competition, and an insufficient top-level mandate to integrate space throughout the Army. This is not to suggest that the idea is without merit. It may be useful to reevaluate it at some future time as space becomes more integrated into the overall Army and as more space-literate soldiers make up the force.

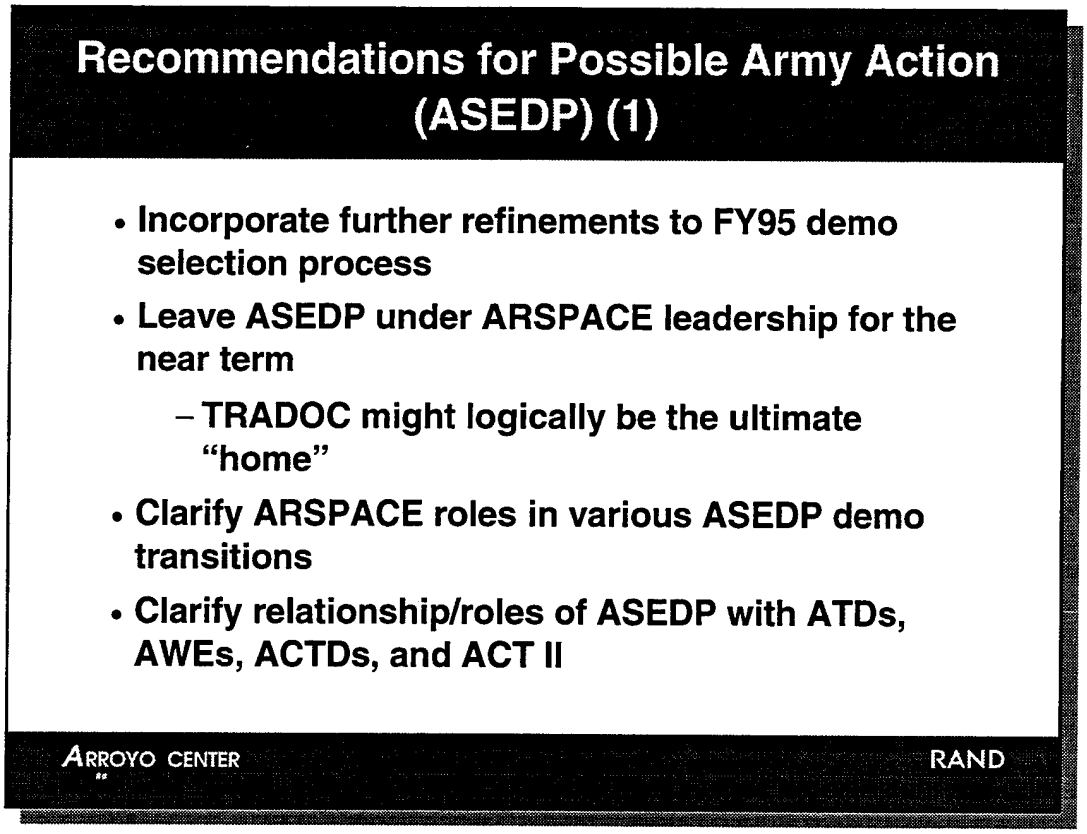
The idea of transforming the ASEDP along the lines of a "white ASPO" has several merits, as discussed earlier, but there are concerns that such an operation might operate and be viewed too much as a "stovepipe," thereby negating, to some extent, current efforts toward horizontal integration of space. It is also conceivable that such an arrangement could encumber Battle Lab and other technology program interfaces with industry regarding the free flow of space ideas.

Hence, our judgment is to continue the present program in its improved form, over the near term, with emphasis in special areas. We would,

however, encourage exploration of any options for incorporating some degree of materiel development capability into the program as it goes forward.



This chart recaps specific areas of emphasis that should be continued in addition to the long-standing program contributions to overall Army space education and awareness, and the provision of prototype space-related hardware/software for use in contingency operations. Of particular note is the need for ongoing coordination between the ASEDP and Force XXI and Digitization of the Battlefield efforts in order to ensure integration of space demos and capabilities into these activities.



6. RECOMMENDATIONS FOR POSSIBLE ARMY ACTION RELATIVE TO THE ASEDP

The next two charts present our recommendations for possible Army action relative to the ASEDP, derived from our interviews and our own assessment. The first would be to incorporate at least some of the aforementioned suggested refinements into the current ASEDP selection process, and to leave the program at ARSPACE for the near term. Some we talked with felt that TRADOC might ultimately be the logical home for this program.

We recommend better clarifying ARSPACE's role in transitioning demos because there were interesting discussions about whether, or to what extent, ARSPACE should be involved in the transition of ASEDP demos to fielded capabilities, to the establishment of requirements, etc. Some interviewees felt that the ARSPACE/ASEDP role should essentially end when they have successfully demonstrated an idea and generated reasonable support.

However, our understanding is that the broader charter of ARSPACE, aside from the ASEDP, is to provide continuing space support to Army operating units and Commanders-in-Chief (CINCs). From that viewpoint, it is not clear whether it would be reasonable for them *not* to be involved throughout the transition phase. Hence, we are recommending some clarification be given to this issue.

With respect to the initiation of additional demo programs, there is some uncertainty as to whether these new programs diminish or increase the role for the ASEDP; therefore we recommend that more thought be given to this area as these new relationships begin to mature.

Recommendations for Possible Army Action (ASEDP) (2)

- **Explore options to incorporate some materiel development capability into future ASEDP program**
- **Actively involve TRADOC "06 through 1-STARs" in the ASEDP process to stress TRADOC/Battle Lab requirements**
- **Get ARSPACE/TRADOC Memorandum of Understanding signed and require adherence by Battle Labs**

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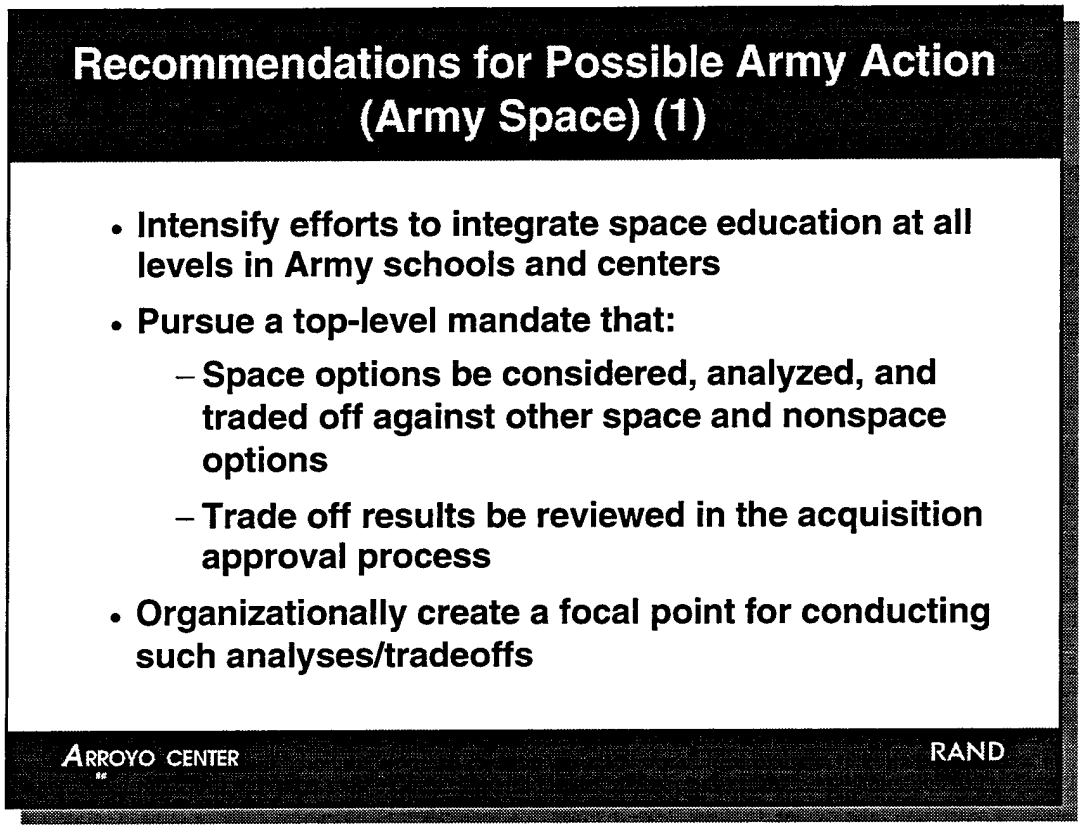
The first bullet on this chart derives from, and was discussed in, the earlier section on program alternatives.

We were encouraged to include the second recommendation above, based on the interviews. Some felt the need for a higher level of TRADOC representation at the Industry and Planning Conferences to give more emphasis to their requirements.

Finally, we believe the draft Memorandum of Understanding between ARSPACE and TRADOC should be signed and adhered to by all parties involved.



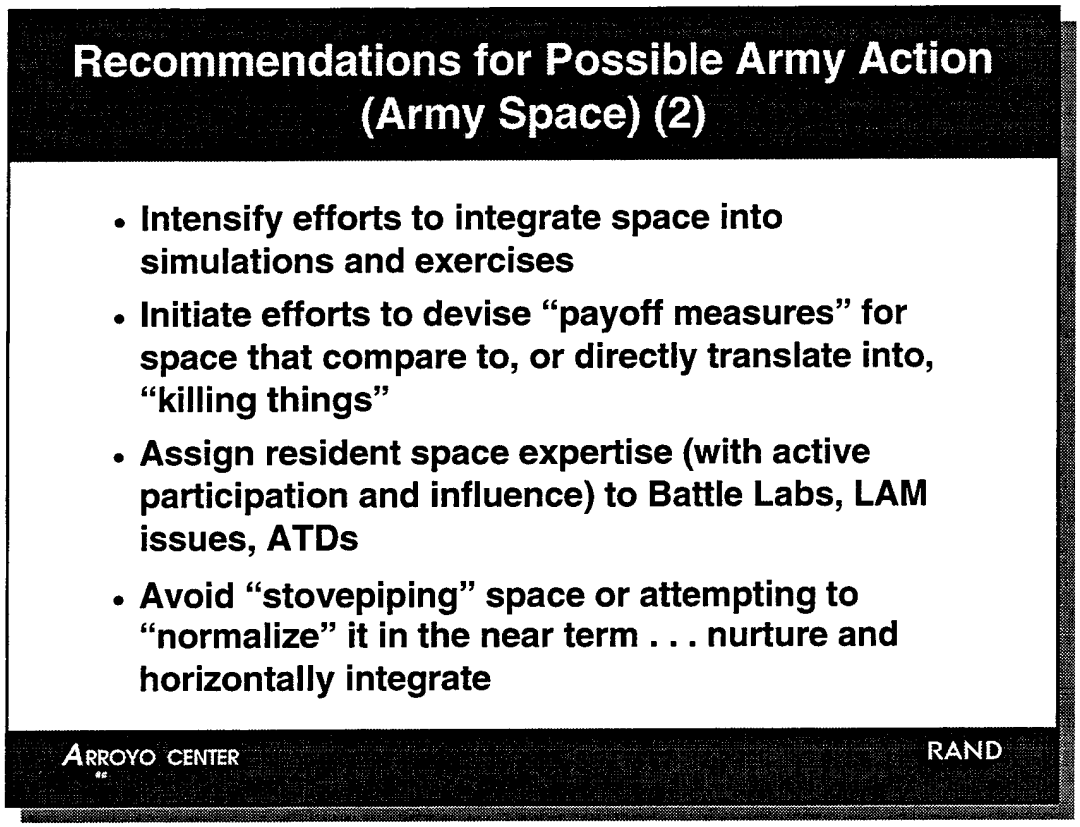
7. RECOMMENDATIONS FOR POSSIBLE ARMY ACTION RELATIVE TO ARMY SPACE

The final two charts present recommendations for possible Army action relative to the larger issue of Army space efforts in general. They reflect much of what we interpreted from the interviews and what we would endorse. The recommendations are essentially the mirror image of the list of perceived problems with Army space earlier discussed, so we can be brief.

The space education problem remains as a fundamental hindrance to the Army's space progress, and efforts to seriously address it should be intensified.

The second recommendation was put forth as a possible way to instill real meaning behind the recognition that space really is important to future Army operations and it is time to "get on with it" in a more effective way. From the interviews, it was suggested that such a mandate be at the VCSA level. However, upon reflection, the Deputy Chief of Staff, Operations & Plans (DCSOPS) may be as effective. Implementation of this action may

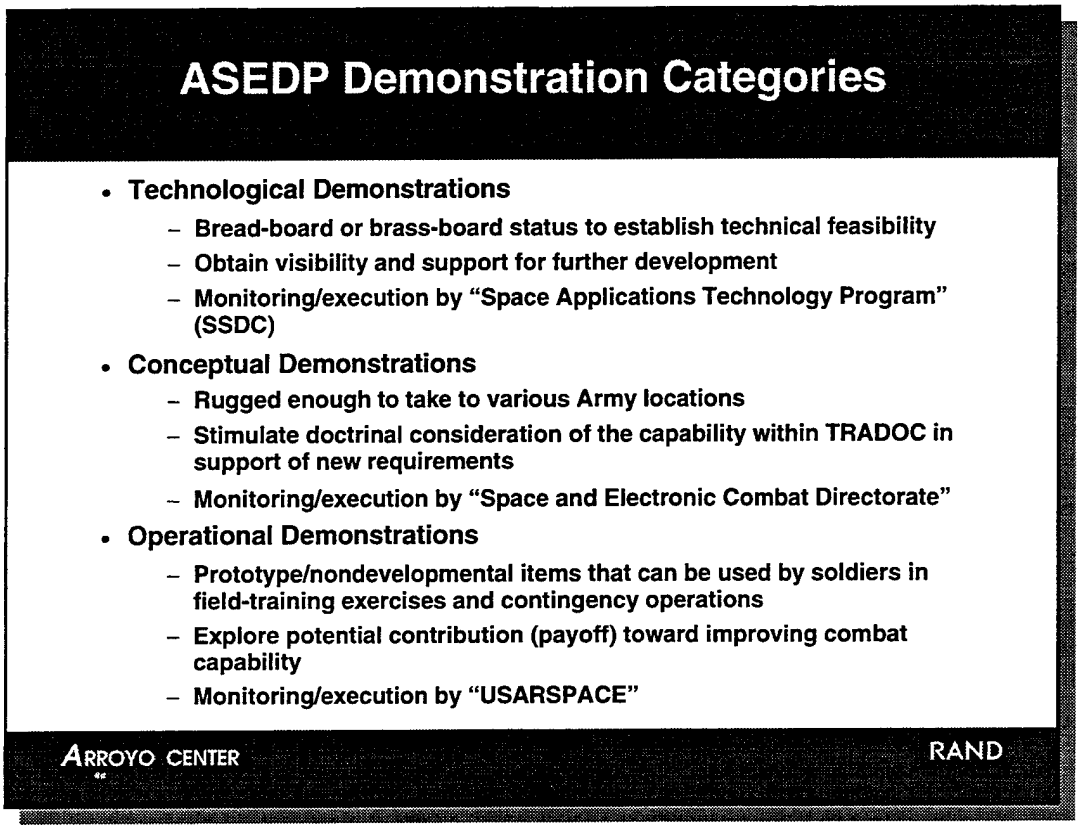
necessitate organizationally creating a focal point for conducting space-to-space and space-to-nonspace tradeoff analyses, and it would create increased demand for SSDC space expertise to support those efforts. It is also conceivable that these tradeoff analysis responsibilities could be assigned to an existing organization.



We recommend intensifying efforts to get space capabilities better integrated into simulations and exercises, and to devise new measures that demonstrate the ultimate payoff of space in ways that better compete with more traditional measures such as "killing things."

Ideally, we believe there should be space expertise resident in all of these new activities. Although there are two new space liaison officers now assigned to Battle Lab operations, we are raising the question of whether that is enough.

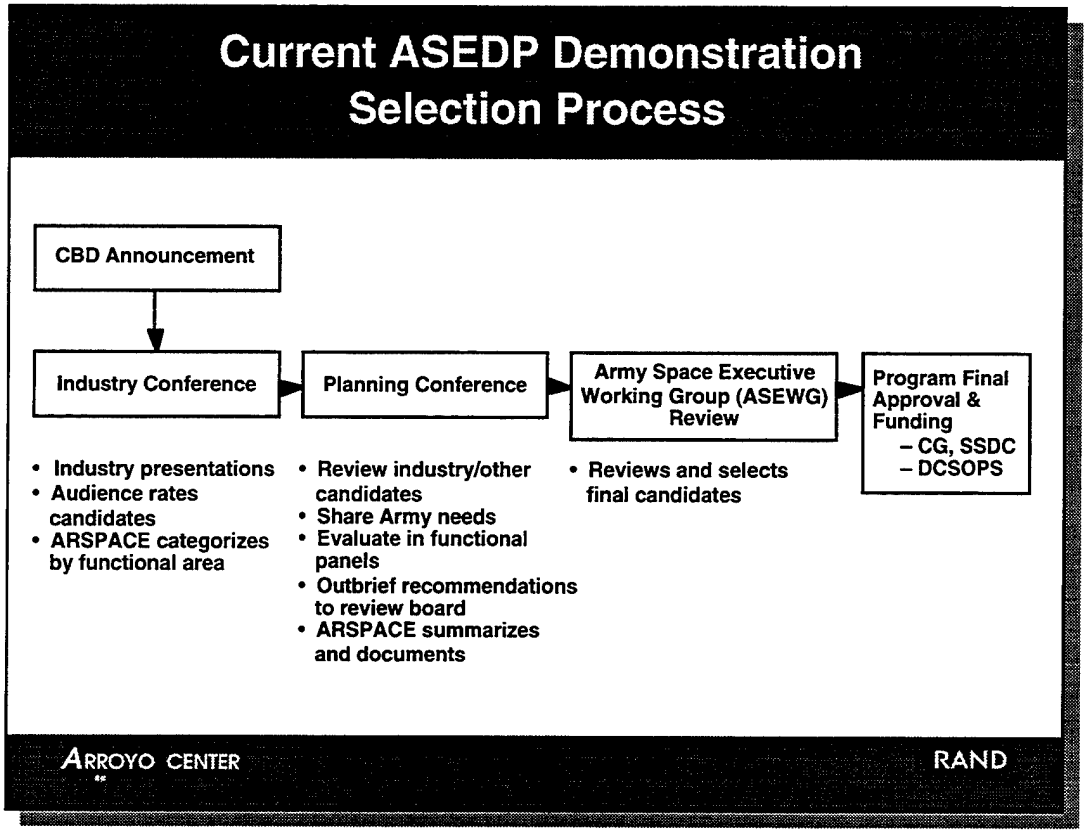
At this point in time, moves toward "stovepiping" or normalizing space appear premature because of the education problem. It should continue to be nurtured for a while, with continuing efforts toward horizontal integration.



APPENDIX

This Appendix contains background information that may be useful to those readers not otherwise familiar with certain aspects of the ASEDP.

This chart briefly describes the three types of space demonstrations conducted in the ASEDP.

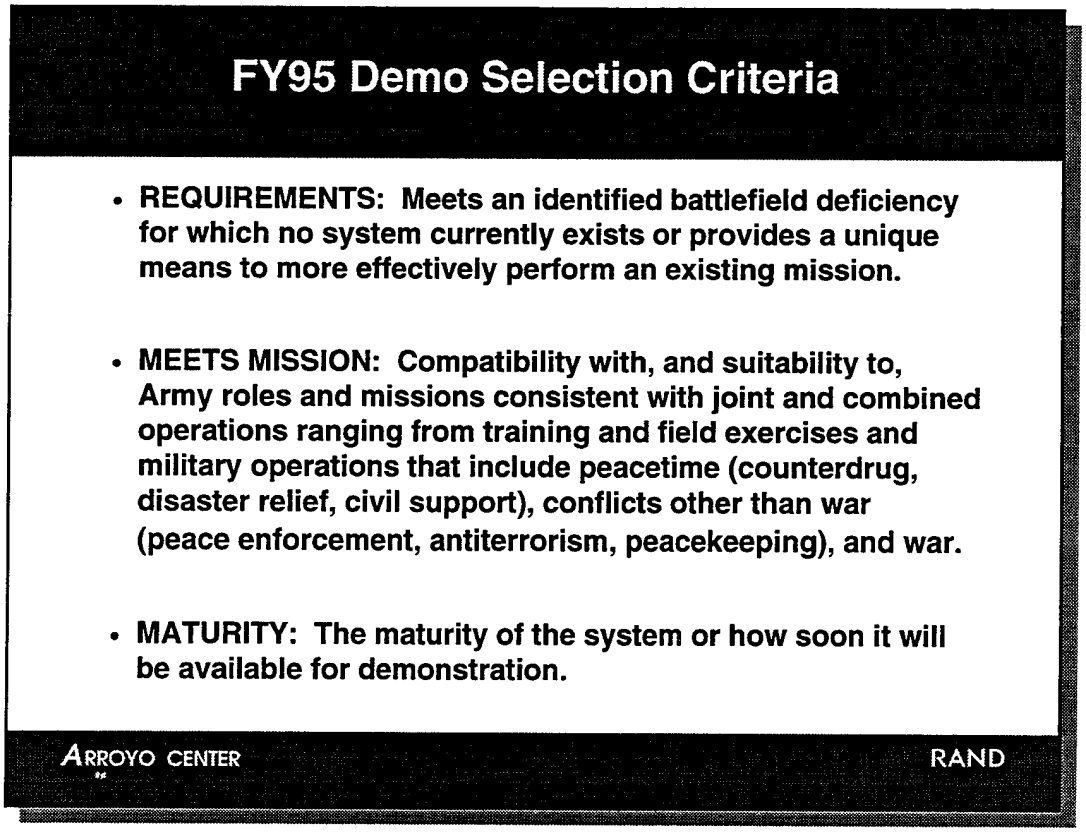


Shown here are the basic steps of the current (FY95) ASEDP demonstration selection process. It begins with a Commerce Business Daily announcement to solicit candidate space demonstration proposals from industry and others, along with information on the forthcoming Industry Conference (typically hosted by USARSPACE in Colorado Springs, Colorado). At this conference, industry/academia representatives present proposed demo candidates to a broad cross-section audience, which rates each proposal using a set of objective criteria provided by ARSPACE. ARSPACE subsequently screens and categorizes the list of demo candidates from this conference into six functional areas: Communications, Intelligence, Command and Control, Remote Sensing-Terrain, Remote Sensing-Weather, and Position/Navigation.

Soon after, a Planning Conference is held to convene a largely Armywide audience of participants to review and evaluate the industry proposals as well as any others that may come forth from Army or other agencies. Army needs, requirements, and concerns are presented and shared among the participants, and the six Functional Panels are convened to discuss and evaluate all demo proposals assigned to their area of interest, again focusing on the objective criteria. After the panels discuss, combine,

eliminate, and modify their assigned demo candidates, they rate and prioritize them. The summary recommendations from each panel are then briefed to the Council of Colonels Review Board and the general audience. The Council of Colonels independently discusses, rates, and prioritizes the demo proposals according to the objective criteria and their own experienced perspectives.

After the Planning Conference, ARSPACE summarizes and documents the selected list of demo candidates, providing all necessary details such as cost, schedule, agencies who will conduct each demo, prospective demo audiences, etc. This summary documentation is then provided as read-ahead material for the final review and approval steps, which involve the Army Space Executive Working Group (ASEWG) and ultimately the CG, SSDC, and DCSOPS.



This chart and the following one show the objective demo selection criteria used in the FY95 demonstration selection process.

FY95 Demo Selection Criteria (cont.)

- **CONSTRAINTS: System will not pose unrealistic costs, size, weight, or other operational or logistical constraints.**
- **DEMONSTRATION DEFINITION: How well the demonstration concept is defined as it relates to Army mission needs and the capability to be provided.**
- **PAYOFF: Relative payoff if demonstration is successful versus the likelihood of success (what are the risks).**
- **TRANSITION: How well the proposed system relates to TRADOC Battle Dynamics Concepts.**