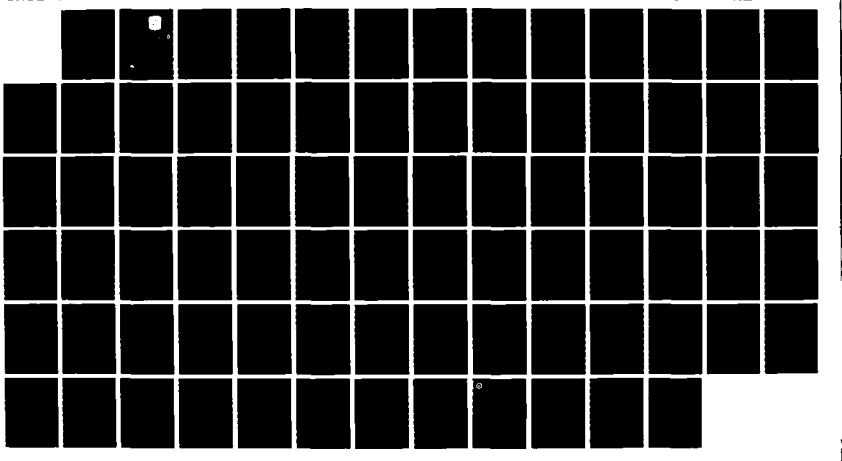
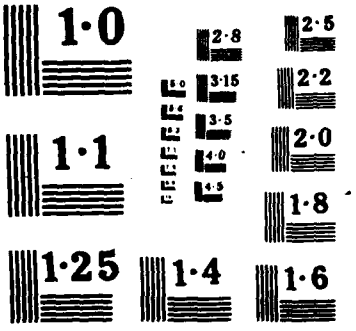
AD-A170 609 AN ALTERNATIVE APPROACH TO EQUIPPING AND MODERNIZING THE FORCE(U) ARMY WAR COLL CARLISLE BARRACKS PA P J MILLER ET AL. APR 86 1/1

UNCLASSIFIED F/G 15/5 NL




1·0
1·1
1·25
1·4
1·6
1·8
2·0
2·2
2·5
2·8
3·15
3·5
4·0

(2)

STUDY PROJECT

AN ALTERNATIVE APPROACH TO EQUIPPING AND MODERNIZING THE FORCE

BY

MR. PAUL J. MILLER
LIEUTENANT COLONEL WILLIAM J. PARKER, JR., QMC

APRIL 1986

US ARMY WAR COLLEGE, CARLISLE BARRACKS, PA 17013

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A170609	3. RECIPIENT'S CATALOG NUMBER
4. TITLE *(and Subtitle)* An Alternative Approach to Equipping and Modernizing the Force		5. TYPE OF REPORT & PERIOD COVERED STUDENT PAPER
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Mr. Paul J. Miller LTC William J. Parker, Jr.		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Army War College Carlisle Barracks, PA 17013-5050		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS SAME		12. REPORT DATE April 1986
		13. NUMBER OF PAGES 76
14. MONITORING AGENCY NAME & ADDRESS*(if different from Controlling Office)*		15. SECURITY CLASS. *(of this report)* UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT *(of this Report)*

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

Upon suggestion by the Undersecretary of the Army, this study investigates the benefits and drawbacks to a sequential method of modernizing the Army. Such a method seeks to select a subset element of the Army (E.G., a brigade, division, or corps) and modernize it with every current state-of-the-art piece of equipment available. The most modern radio, truck, tank, rifle, etc. currently available would be provided to that element. Then, that Army unit would be left alone with respect to modernization effects until all other

(continued)

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

BLOCK 20 (continued)

such Army units were similarly modernized. Thus, over a number of years, each Army element would be sequentially modernized and hence the Army would be stratified from the most to the least modern units. Ramifications such as impacts on unit procurement costs, impacts on readiness levels, and impacts on production strategies are investigated. Program Managers and individuals at Army staff and agency levels are queried for inputs and views.

USAWC MILITARY STUDIES PROGRAM PAPER

AN ALTERNATIVE APPROACH TO EQUIPPING AND MODERNIZING THE FORCE

A GROUP STUDY PROJECT

by

MR. PAUL J. MILLER

LIEUTENANT COLONEL WILLIAM J. PARKER, JR., QMC

COLONEL WILLIAM A. HEIZMANN III, TC

PROJECT ADVISOR

U.S. ARMY WAR COLLEGE

CARLISLE BARRACKS, PENNSYLVANIA 17013

APRIL 1986

ABSTRACT

Authors: Mr. Paul J. Miller
LTC William J. Parker, Jr., QMC

Title: An Alternative Approach to Equipping and Modernizing the Force

Format: Group Study Project

Date: April 1986 Pages: 71 Classification: Unclassified

Upon suggestion by the Undersecretary of the Army, this study investigates the benefits and drawbacks to a sequential method of modernizing the Army. Such a method seeks to select a subset element of the Army (e.g., a brigade, division, or corps) and modernize it with every current state-of-the-art piece of equipment available. The most modern radio, truck, tank, rifle, etc. currently available would be provided to that element. Then, that Army unit would be left alone with respect to modernization effects until all other such Army units were similarly modernized. Thus, over a number of years, each Army element would be sequentially modernized and hence the Army would be stratified from the most to the least modern units. Ramifications such as impacts on unit procurement costs, impacts on

readiness levels, and impacts on production strategies are investigated. Program Managers and individuals at Army staff and agency levels are queried for inputs and views.

Table of Contents

List of Tables

Chapter I

Introduction

Historically, our Army has followed a straightforward process for modernization of equipment. Total Army requirements are aggregated at the item level from input from all Army elements. This unassuming process has served the Army well through many years. With the advent of the overwhelming force modernization thrust in the 70's and now into the 80's, Army units are receiving new equipment and materiel much more frequently. This has resulted in what Honorable James Ambrose, Undersecretary of the Army, has called "Christmas every day" for the soldiers in those Army units.

Today's process for modernizing the Army is fundamentally the same whether the item in question is a radio or a diesel engine. A sum total required for the item, based on all Army elements, is planned for with subsequent programming of acquisition strategies to meet those needs. In the ideal state, this process would prove to work fine. In reality it results in requirements almost always exceeding acquisition capabilities, whether due to budgetary limitations or production capacity constraints. Thus, some percentage less than 100% of the total Army's requirements are

procured in any given year. To eventually satisfy the total Army needs, the cycle repeats itself annually, or less frequently, until all Army elements are fulfilled.

The Undersecretary of the Army has suggested an alternative method of modernizing and equipping the force which this paper will address. Mr. Ambrose has offered for study a concept which would sequentially modernize the Army, one subset at a time. Specifically, one brigade (or division or corps) in year X would be provided the current state-of-the-art in terms of equipment and materiel that existed at that time. That element would then be left alone and issued no modernization based equipment until all other Army elements were modernized in years X+1, X+2 and so forth. Once all elements were modernized the cycle would repeat itself with the initial Army element. The Army would thus become one stratified by elements ranging from the most modern to the least modern. Requirements for individual items of equipment would come only from the Army element undergoing modernization that year. Soldiers would not experience the "Christmas every day" phenomenon but rather Christmas once every so many years (as many as would occur until the cycle repeats).

This paper investigates the impacts of such a significant change in modernization strategy. It seeks out the benefits and the drawbacks to this alternative approach

to modernization. The methods of analysis are two: qualitative and quantitative data from select, high visability Army Program Managers; and impressions and insights from numerous individuals of Army staff and agencies. All inputs are unofficial in nature yet highly valued due to the wealth of experience and knowledge of individuals queried.

Chapter II

Army Program Manager's Input

To better assess the advantages and disadvantages of this alternative way of equipping and modernizing the Army, the direct input of those currently in the business was sought. What more knowledgeable subset of the Army exists than current Program Managers and their staffs when it comes to modernizing and equipping our Army? It is those Program Managers and their staffs whose collective knowledge and insights span both numerous decades and commodity types. It is those Program Managers and their staffs who would be charged with major implementation of any revised method of modernization.

As such, a solicitation via questionnaire was made of seven (7) high visibility, high interest Army systems. Not only were weapon systems queried but also support systems. Of the seven Program Manager Offices asked for input, six responded in candor and with concerted insight. The respondees include two tracked vehicle weapon systems, the MI Abrams Tank System and the M2/M3 Bradley Fighting Vehicle Systems. Included are two communication systems, namely the Mobile Subscriber Equipment (MSE) system and the Single Channel Ground and Airborne Radio System (SINCGARS). Finally one missile system and one aviation system, the Patriot and the Blackhawk respectively, offered views on the topic.

It should be noted that any and all misinterpretations and/or oversights of questionnaire data lie not with the Program Managers' responses but rather with the study authors. Maximum effort was made to preclude any such conditions.

The questionnaire consisted of ten (10) basic questions many of which contained multiple sub-questions. A complete questionnaire and attached sample cover letter as was sent to all seven Program Managers is provided in Appendix A.

The initial questionnaire item establishes a baseline from which to assess the magnitude of the dollar dimension. It asks "What is your current unit procurement cost as reported in your last Selected Acquisition Report (SAR)?" As intuition and knowledge of the six (6) responding Army Program Managers' systems infer, substantial procurement dollars are dedicated to those six systems. Unit procurement costs for those systems range from approximately $150,000 to just under $100,000,000 when measured in FY86 dollars. Table 1 provides unit cost data as reported by the Program Managers. Of the six systems, five report unit procurement costs in FY86 dollars in excess of $1,000,000 and most often unit procurement costs are in multi-millions of dollars.

The significance of this above data is for a variety of reasons. First, it clearly shows that the sampled Program Manager systems are the driving systems for the Army when viewed from the cost standpoint. Any changes to the Army modernization strategy and procedure will be exacerbated by

five of these six systems, given their dominant cost characteristics. Secondly, when coupled with the planned quantity buy or with a severely reduced quantity buy, the ramifications for the Army budget are great. Planned quantity buys times the unit procurement costs generate major percentages of the total Army budget. Even greater percentages of the Army procurement budget are achieved when computing these six systems costs under current modernization strategies. The alternative modernization strategy of reducing the annual quantity buy through modernization of subsets of the Army annually could generate reduced procurement dollar needs, though as shown in later questions it is certain that unit procurement costs would increase. A third and final reason for the significance of the data revolves around the commodity mix represented in this cost data. Communications, aviation, missile and combat tracked vehicles are all shown to have substantial cost impacts. No one should be misled into believing that weapon systems alone drive the Army modernization effort from a cost dimension. Furthermore, no one should be misguided into believing that Army procurement is synonymous with high cost tanks or armored personnel carriers alone. All Army weapon system commodities can be drivers in the procurement segment of the Army budget.

With the assurance that the six responding Program Managers' systems represent a substantial, diverse segment of the current Army procurement program (and hence of the current

Army modernization strategy), it is appropriate to investigate the other Program Manager views on the alternative method of modernizing and equipping the force.

Table 1

Unit Procurement Cost Data

System #	Unit Procurement Cost	FY $
1	$ 140,000	FY84
2	$ 1,491,000	FY86
3	$ 1,743,000	FY71
4	$ 2,250,000	FY85
5	$10,124,000	FY85
6	$29,286,000	FY72

The second questionnaire item called for a measure of professional judgment from the Program Managers. Structured as a "what if" question, each Program Manager was asked, "Do you believe unit procurement cost would increase, decrease, or stay the same if the quantity in the annual buy was reduced by 10%?" Corollary questions were also asked to determine their views "...if the quantity in the annual buy was reduced by 33%...if the quantity in the annual buy was reduced by 50%...if the quantity in the annual buy was reduced by 67%?"

The fundamental reason for identifying this question was to substantiate or refute the economy of scale premise

based on the Program Manager's professional judgment. The intuitive as well as classical economic theory argument purports that reduced unit costs are achieved as the lot size for procurement is increased. The impact most often is thought to be greatest at the subcontractor and even vendor level where very large production runs of a widget can be made from relatively few set-ups, thus minimizing the fixed cost portions of production. In theory, scrap is also reduced when large lots are produced without repetitive start and stop conditions. But does the economic theory and the intuitive appeal of economy of scale hold true for those professionals in our Army charged with Program Management? That serves as the basis for solicitation of their professional judgment on this question.

Annual quantity buy reductions of 10% would affect the six systems responding in the same fashion--<u>increase</u> unit procurement cost. Five of the six responses were unqualified "increase." These responses show not even the slightest hesitancy or caveat to the impact -- the unit cost increase. One respondee indicated that the system was structured such that though a unit cost increase would result, a range had already been established for annual quantity buy reductions and that the 10% quantity buy reduction would equate to a shift to the lowest range procurement profile.

Annual quantity buy reductions of 33% and of 50% would clearly result in unit procurement cost increases in the judgment of all six respondees. Of note was the 50%

quantity buy reduction in one Program Manager's response which indicated that such a reduction was at the very edge of what was possible to implement. This point was underscored in the final question of an annual quantity buy reduction of 67% which one respondee indicated procurement would not be possible under terms of the current contract. Ostensibly, the Army could receive reduced procurement quantities for the same total procurement price. This is equivalent to letting unit procurement cost approach total procurement cost. All other five Program Managers offered an unqualified "increase" to unit procurement cost with respect to the ultimate 67% reduction of quantity.

It is clear that in the professional judgment of some of the Army's most visible and priority Program Managers, any reduction of the annual procurement quantity buy would result in increased unit procurement costs. In this case, reality as viewed by these Program Managers, theory as professed by economists and intuitive thinking as practiced by acquisition laymen are all one and the same.

To achieve the alternative method of modernizing and equipping the force, very high unit procurement costs will be driven even higher. The question thus becomes: how low can the quantity buys become in order to achieve a total procurement bill equal to or less than the base case? All this must be done while insuring that the Army unit being modernized

is of sufficient size such that all of the Army will achieve modernization in some reasonable time frame (e.g., 20 years which would imply division size units would be modernized sequentially).

Now that it appears clear that a unit procurement cost increase will occur for any reduction in the annual buy, it is necessary to approximate to what degree that increase will be. The third questionnaire item does just that. Each Program Manager was asked "...by what amount do you feel unit procurement cost would change if the annual quantity were reduced by 10%" As done previously, corollary questions were also asked to determine their thoughts on unit procurement cost change "...if the annual quantity were reduced by 33%... if the annual quantity were reduced by 50%...if the annual quantity were reduced by 67%?"

For the 10% annual quantity reduction, Program Managers' responses cluster around single digit percentage unit cost increases. The lowest estimated unit procurement cost increase was but 3%. The group as a whole implies between a 5% and 10% unit procurement cost increase, given a reduced annual quantity buy of 10%. It would appear that under this most reserved quantity reduction premise, the unit cost increase to procurement would be manageable.

At the next higher level of annual quantity reduction, the 33% tier Program Managers' professional judgment indicates

equilibrium in the rate of unit procurement cost increase when compared to the rate of change in reduced quantity buys. In some instances, responses show a slightly more than a tripling of unit cost when moving from the 10% quantity reduction to the 33% quantity reduction. Of significance at this point are two of the six Program Managers' responses which indicate marginal increases to unit procurement cost even though quantity buy reductions had changed from 10% to 33%. It is not clear why, for these systems, unit cost increases essentially topped out at a level approximating 15%. This held true for these two systems even at the 50% reduction in quantity buy level.

The majority of systems were projected to incur substantial unit procurement cost increases when the quantity buy was reduced by 50%. Percentage cost increases clearly start to outpace percentage quantity reductions at this level. Unit cost increases for four of the six respondees were in the 33% to 48% range. It appears that somewhere between the 33% to 50% points in quantity buy reduction, it would become distinctly non-cost effective to procure.

The last stage in estimating unit procurement cost increases was when the annual quantity buy was reduced by 67%. Unit cost increases were projected between 57% and 65%. One Program Manager's estimate was that given the 67% quantity buy reduction, the item would not be procurable under terms of the contract and inferred major costly revision would be

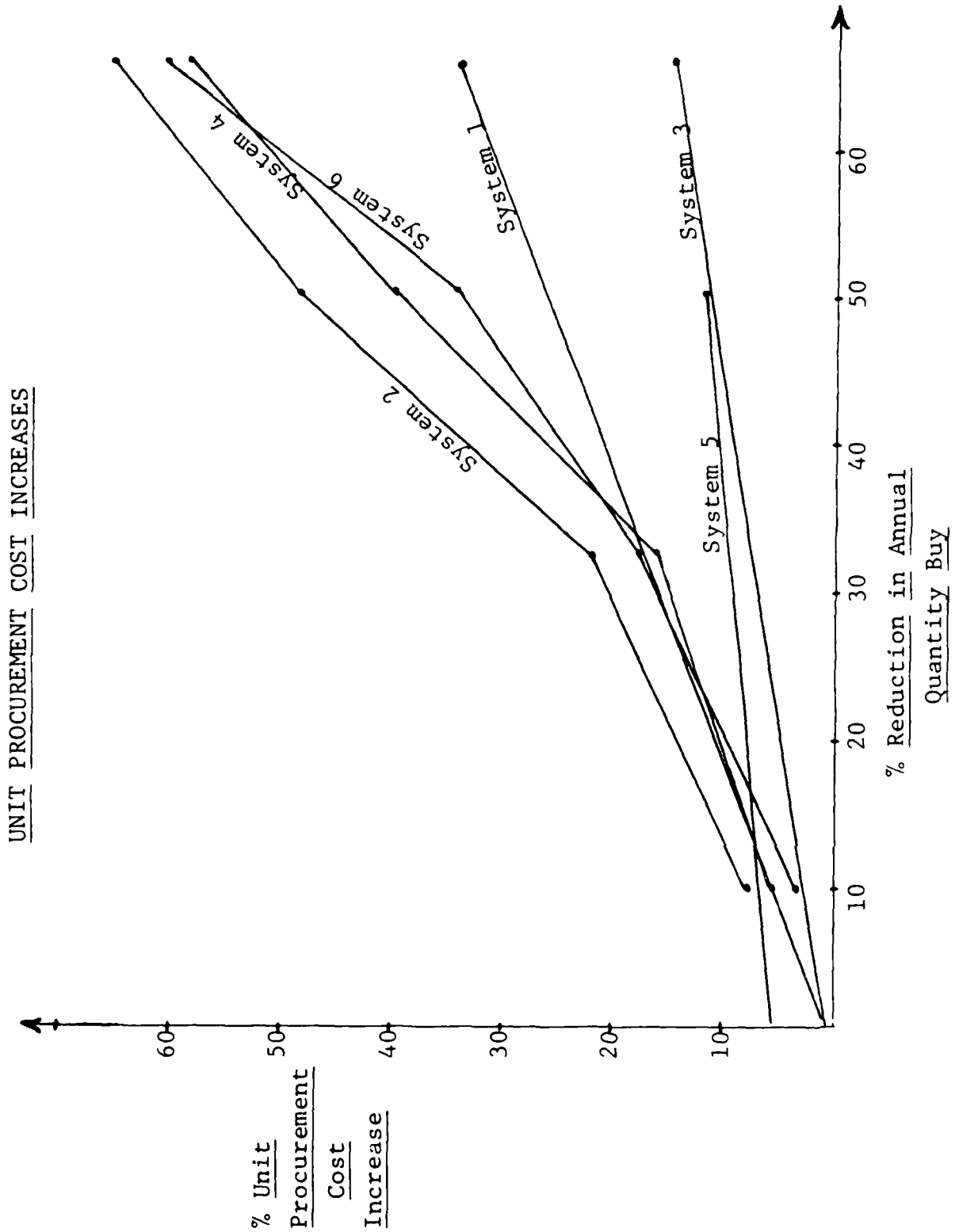
necessary. It should also be pointed out that the two respondees who leveled unit cost increases regardless of quantity reductions maintained their projected 15% maximum unit cost increase even with the 67% quantity reduction.

The implications for the alternative method of modernizing the Army are obvious, given the above data. Costwise it will only be beneficial to embark on such an alternative method if quantity buy reductions are less than approximately 33%. Reductions above that level suggest unit procurement cost increases of hefty amounts, unlikely to be supportable by the budget. Table 2 provides data for all six systems under the four projected quantity buy reductions.

What remains to be determined is, if the alternative method of modernization can attain a partitioning of the Army into units with associated equipment authorization levels large enough to limit quantity buy reductions to something less than 33%.

To understand the complexities of the current contract environment of the Program Managers sampled, the next question addressed the multi-year contract arena. Not only does multi-year contracting show the complex procurement arrangements, but also it vividly displays the inherent cost benefits to the Army of such procurement practices. Specifically, Program Managers were asked, "Do you currently procure the majority of your system on a multi-year contract?" As the

Table 2


UNIT PROCUREMENT COST INCREASES
% Unit Procurement Cost Increase
60
50
40
30
20
10
10
20
30
40
50
60
% Reduction in Annual Quantity Buy
System 1
System 2
System 3
System 4
System 5
System 6

single follow-up question, it was asked "Do you plan to do so in the future?"

Of the six respondees, three systems currently have some significant components (such as engines, transmissions, etc.) procured under multi-year contracts. However, the basic prime contract for system production for these three systems is not a multi-year contract.

Two systems apparently do not procure under the rigorous definition of a multi-year contract. However, these two systems are procured under the auspices of an initial single year, firm-fixed price contract which has either four or five production option years beyond it.

One system is being procured with no multi-year contract from either the prime or subcontractor tiers. Furthermore, no indication exists that production options (options agreed to at the initial production contract) exist either.

Concerning future planning with respect to multi-year contracts, a majority of Program Managers responded that plans called for continued or increased multi-year contracting. Additional subcontractor component work is contemplated for multi-year contracts. Certainly, those elements of the system already on multi-year contracts are projected to continue so. One Program Manager noted that even though multi-year procurement is currently done and is projected in the future, it may be exceedingly more difficult to justify due to the

Gramm-Rudman-Hollings law. The inference is that erratic budget cutting mandated by that law might very well force a reduction in multi-year contract commitments. There appears to be a valid basis for such concern by the proponents of multi-year contracts.

Only one Program Manager gave a clear indication of absolutely no future multi-year contracting. This system was one of the two operating under production options identified under the initial production contract.

Thus, it is apparent that most Program Managers sampled have at least dabbled in multi-year contracts. Many are planning on doing so to the same or greater extent in the future. Though such contracting techniques can be highly cost effective for the Army, they do result in a distinct impediment to the alternative method of modernization. Should the Army change to the defined alternative modernization scheme, there appears to be numerous multi-year contracts which would require at a minimum alteration and at a maximum termination. Though this would theoretically only be a turbulence in the initial conversion to the alternative modernization method, it is plausible to expect a reduction in multi-year contracting thereafter, until the Army becomes comfortable with sequenced Army unit modernization.

Given the above, it is believed that current and planned multi-year contracts present an obstacle to the alternative modernization method. It, however, is not such a

problem that by itself would negate the benefits of the alternative modernization scheme. It merely is one factor to cope with under such an alternative strategy.

Another important facet of current defense procurement practice is that of competition. Time and time again it has been shown that when a healthy competitive procurement environment exists, the procurer achieves lower cost and surprisingly higher reliability of product. An important cog in this competition machine is the necessary and sufficient element of minimal production quantity upon which to compete. This is true regardless of whether competition is of a leader/follower concept or of a single producer subjected to subsequent competitive challengers.

It is, therefore, revealing to ascertain how much procurement competition currently exists and at what level (prime or subcontractor) it is. Thus, the question asked of the sampled Program Managers was "Do competitive prime contractors exist, or does a sole source environment exist?" Furthermore, it was queried, "Do competitive major subcontractors exist?"

Of the six responses, four systems are clearly sole source when it comes to the prime contractor. It is unknown what sequence of events and facts have led to that situation. Facilitization costs may be prohibitive; political lobbying may argue against other sources; technical merit may limit

qualified sources; or even historical precedence may be towards one producer. Another plausible reason for the sole source decision may be the already minimal production quantities.

One system certainly has entered into competitive procurement by virtue of the initial production contract awarded under competitive conditions. The final system is currently sole source at the prime contractor level; however, a second source is currently being selected via a request for proposal (RFP) with award expected by the end of CY86.

When analyzing the major subcontractor level of production, a much greater tendency exists toward competition. This could arise from a number of factors. Facilitization costs are typically much less at the subcontractor level, thus fostering development of dual production capabilities. The subcontractor level is also often "broken out" for direct procurement by the Army and therefore more open to competition suggestions. Moreover, the subcontractor level often is such that the product is seen to be viable by industry for alternative major systems or by industry itself. As example, engines are clearly of interest to more than tanks or armored personnel carriers and therefore industry assumes a greater willingness to enter such a business even given competition advocacy by the Army.

At the major subcontractor level, only one system clearly indicates no competitive subcontracting exists. All

others either directly or indirectly indicate that major subassemblies and components have been subjected to competition. Furthermore, the trend appears to be towards more competition in the future at this level.

What does this competition aspect forebode for the alternative modernization method for the Army? It would appear that nothing in terms of procurement cost efficiency would be lost at the prime contractor level since so few currently have competitive primes. The single caution is whether a reduced production quantity of up to 33% would impact on the exceedingly competitive nature of the subcontract level. Would such a quantity reduction exacerbate the procurement costs at that level? Only through much more in-depth investigation of industry abilities and profitabilities can such a question be ultimately answered. Suffice it to say that a potential sacrificing of competition in procurements could be an impact of the reduced annual quantity buys resultant from the alternative modernization approach.

Exactly where are the sampled Program Managers in terms of current annual quantity procurements? Have they reached the stable, normal production quantities originally sought? These points served as the basis for the next question asked of the Program Managers,..."What is your current annual quantity buy, and is that considered 'steady state?' If it is not, what is 'steady state?'"

Responses were evenly distributed among three groupings. Two systems were currently producing at a "steady state" rate. One was at 840 units annually and the other at 15 units annually. Two other systems were producing below the projected steady state, yet appear to have ample production quantities to enable them to claim that they have passed the low rate initial production (LRIP) level. Of these two, one was annually producing 78 units with a "steady state" point at 96 units. The other system was producing at 10,750 units annually with a "steady state" of 35,400, approximately triple current production. The remaining two systems professed that no bonafide "steady state" exists for their system. Reasons differed from erratic Congressional directions with likely continued ramifications due to the Gramm-Rudman-Hollings law to the basic nature of the materiel system and its procurement. Nonetheless, both systems would apparently be immune to anything which might impact on the "steady state" production level.

It is this last point which is most important. Of the sampled systems, four would seem to not be in danger of sacrificing an existing stable production line. That is, any directed reduction in quantity procurement from current levels would do no harm to a not-as-yet attained "steady state" rate. However, the two systems which have produced at their "steady state" rates will likely incur some degree of momentary turbulence, and hence cost impact, in switching to reduced quantity

buys envisioned under the alternative modernization method.

Irrespective of the cost impacts perceived by any quantity reductions, competitive contract impacts, multi-year contract perturbations and the like, it is necessary to deduce the impact, if any, on distribution planning for the produced systems. Therefore, the Program Managers were asked..."Would reducing the annual quantity buy, in your opinion, result in more, less, or same stability in distribution planning for those produced systems?"

Four of the six sampled Program Managers indicated that distribution planning would not be impacted by reductions in annual quantity buys. Essentially distribution planning of assets is not subject to turbulence even when production quantities are reduced. That is not to say that distribution is unaffected since obviously a reduced quantity impacts on the total systems available for distribution. Rather, the planning process for distribution is immune to fluctuations in procurement quantity as reported by these four Program Managers.

Two of the Program Managers reported that less stability would occur in distribution planning if the annual procurement quantity were reduced.

With the data received, it appears inconclusive whether the alternative modernization method would affect distribution planning. However, Program Managers believe that reducing

the annual quantity buys would not enhance the distribution planning process since none of the sampled Program Managers felt that more stability would result. Thus, the alternative modernization method would at best unaffect the distribution planning process.

Another process which might be impacted, either favorably or otherwise, by the alternative modernization method is the budget process. The Program Managers were quizzed on this aspect, "Do you feel that reducing the annual buy quantity would complicate, simplify, or not affect the budget process for your system?"

Two responses directly stated that no effect on the budget process would result from reducing the annual quantity buys. These two systems happen to be the most and the least expensive in current unit procurement cost. This may add more credence to the position for "no effect."

The remaining four systems were equally as certain that reducing the annual buy quantity would complicate the budget process. The paramount reason offered was due to the multi-year contracts which exist at the component level.

From the responses, it is inconclusive whether the reduced annual quantity buys resultant from the alternative modernization method would complicate or not affect the budget process. The single most certain determination is that the budget process would not be simplified under the alternative modernization process.

Each of the systems surveyed is clearly at or near the state-of-the-art in its commodity arena. As a result, each is at the front end of its technological life-span. To better ascertain the rate of evolution of these materiel systems, both weapon and support systems, it was necessary to ask, "Excluding the normal product improvement program (PIP), what technological life do you believe your system to have (i.e., how long until state-of-the-art essentially overtakes your system, even given PIP's)?"

Some responses were point estimates of technological life and others were range estimates spanning up to fourteen years. At the low end of the spectrum, one system was projected to have but a six-year technological life. This would seem to belie the sizable facilitization, investment, and research and development costs. At the high end of the spectrum, one system had an estimated technological life of 35+ years. The arithmetic average for all six systems unweighted by cost, quantity or any other factor, was 21 years. This average results from assuming the mid-points for those systems which provided range estimates for technological life.

What this average infers for the alternative modernization method is good news. The technological life of systems appears to be of sufficient length such that all units (e.g., divisions or brigades) in the Army would be assured of receiving equipment common to other Army units prior to

technology resulting in a completely new system. Had the average technological life of the systems been less than ten years, for example, then vast subsets of the Army would skip a generation or more of equipment commodities. The sole concern evolving from the responses to this question is that the systems which are clearly much less than the average technological lifetime of six years would ideally equate to more than three generations of equipment evolving due to technology demands prior to attaining the 21-year "normal" system technological life.

To this point Program Managers have provided their views on numerous questions which pertain to and could be impacted by the alternative method of modernizing the Army. Areas ranged from the basic unit procurement costs, whether units costs would increase and by how much, and the degree of contract sophistication by virtue of multi-year contracts and competitive environments. Questions of the distribution planning process and the budget process were pursued. Lastly, the projected turnover rate of weapon and support systems was addressed through assessing technological life of equipment. Each of these areas shed considerable light on the alternative modernization method's impacts.

To minimize misinterpretations and faulty deductions which could result from the series of questions up to this point, the questionnaire was concluded with the fundamental

question of this research paper. The final question of the Program Managers was:

> Currently the Army aggregates total requirements for a given system in order to procure on the premise of economy of scale. A significantly different means of modernizing the force would be to modernize <u>everything</u> in a given unit (e.g., battalion) at one time and then leave that unit alone until ready to modernize again ten or so years later. Do you believe such an alternative approach would be cost beneficial? If not, do you believe unit procurement cost would stay the same? a) increase by 10%; b) 25%; c) 33%; d) 50+%? Do you believe such an alternative approach would be readiness beneficial? Do you believe such an alternative approach would be beneficial for other reasons?

Four of the six respondees clearly indicated the alternative approach as explained would not be cost beneficial to the Army. A fifth Program Manager saw a potential for cost effectiveness only if all of the reliability, availability, maintainability and durability (RAM-D) and safety related improvements could be captured as weapon system units are procured. The sixth responding Program Manager viewed the alternative approach as the acquisition stragegy under which his system was procured. Of course, the alternative approach to modernization is not so much an individual weapon or support system acquisition strategy as it is a total Army materiel systems acquisition strategy.

The unit procurement costs were generally believed to increase. Those who definitely felt the alternative method of modernization would not be cost beneficial provided unit

increases in the 10%-25% range. Clearly, unit procurement cost increases, if any, are a major function of the amount of reduction of the annual quantity buy for all of the materiel systems attributable to a given Army unit.

The Program Managers were basically of the belief that the alternative approach to modernization would be beneficial to the Army from a readiness standpoint. Four responses indicate some degree of sentiment that Army readiness would be enhanced. That intuition was founded on perceptions of increases in morale since turbulence of new equipment introductions would be minimized to the belief that standardization within the Army unit (e.g., division or brigade) would be maximized. Two Program Managers felt that readiness would not be enhanced. One of them saw a domino-readiness effect due to many systems becoming available at distinctly different time frames. The other Program Manager felt that the theoretical readiness benefit would not be feasible in practice due to too much unpredictability in individual equipment development and, therefore, fielding schedules. Many of the Program Managers suspect the most burdensome facet of the alternative approach to modernization is the inability to synchronize technology advances and research and development breakthroughs in some meaningful pattern so as to preclude a haphazard, quilt-like pattern of modernization. Were all, or even many, commodities of such a nature as to allow roughly simultaneous

initial and subsequent full production, then the alternative modernization method would be more plausible. In sum, the preponderance of Program Management thought, as sampled through the questionnaire, argues against the alternative modernization method as described to them.

Chapter III

Army Staff and Agencies Input

Background

The focus of this chapter is a summarization of oral interviews conducted with various representatives of the Army Staff and Major Headquarters concerning Mr. Ambrose's premise. It is important to note that the views discussed here are those of individuals and do not represent that of the command or staff agency in which they work. Interviewees were candid and basically relied upon personal and professional experiences in stating their views. It was our collected opinion that in order to properly research the concept postulated by Mr. Ambrose, it was appropriate to discuss it with a representative sample of commands/offices/action officers who could affect or be affected by the concept. Although somewhat philosophical in nature, they are key to the flushing-out process necessary to understand and adequately address a new concept.

Assistant Chief of Staff, Information Management

The following comments were obtained from discussions with Major Bert Dollahite and Captain Jim Fitch, Office of the Assistant Chief of Staff for Information Management, Documentation Modernization Office. The Ambrose Concept was discussed in relation to documentation/data modernization issues.

The concept is to buy a percentage of modernization equipment required to modernize a unit(s), field it, and continue the process throughout the Army commensurate with technology changes. It appears from our discussions that this concept originally was introduced by Mr. Ambrose during the Sustaining Base Information Architecture Relook. The focus of this study was to go after the best technology, buy it, field it, and continue to upgrade as technology improves and modernize that portion of the Army that has not been modernized. The Ambrose Concept is interesting in relation to the way we build our force requirements to full TOE and tell Congress that this amount is what we want to buy, when in fact we never buy that amount nor would we want to in one given year. The result is inflated Army-Acquisition Objectives and Initial Issue Quantities which make it is impossible to track initiatives back and forth. If we had a cohesive policy of buying one-thirds (or any percentage), we could shrink back the blow-up. The key point is how do we know what our requirements are? Should they be for the modernization of every Army unit? Take the tank for instance; should every armor unit have an M-1 tank in view of the fact that there are three versions already? The larger issue is that whatever we go after, we must have a full set. The decision about how much of the Army will have what generation of equipment is a separate

issue from the issue of that whatever we go after, we have realistic force programming objectives and make sure we capture the full set that is required to effectively modernize. Currently we do this incrementally and change our minds because we don't use the unit set or force packaging methodology for the acquisition or distribution in the modernization process.

The Total Package/Unit Materiel Fielding was briefly discussed and the consensus was that the concept is not working as well as originally anticipated. It was never an acquisition exercise, but rather a distribution drill. The idea was to make Army Materiel Command the distribution manager for a number of changes and distribute the total changes as a packet as opposed to having the gaining unit accomplish this process. It is a simple process, expensive, and in actuality, difficult to orchestrate. However, there are some benefits to be derived from the total package concept. If we could issue in unit sets and leave the receiving unit alone for three years, it is felt that the unit would have the opportunity to achieve a high degree of proficiency in training. In Europe and at the National Training Center here in CONUS, training areas are scheduled almost three years in advance. By issuing a complete force modernization package to a unit, it could plan ahead for three years. This would force the modernization issue.

For example, we could modernize the 82d Airborne Division this year and then leave it alone for three years. It is hard to visualize what level of combat proficiency that could be obtained by a unit which had three equipment-modernization free years. Today, we continually force feed equipment modernization in eaches; thus a unit does not get the full knowledge of integrated systems over a prolonged period. This, coupled with personnel turbulence, has an adverse impact on combat readiness. The benefits of the total package are improved training, knowledge of equipment and having all the equipment needed to fight with on-hand. Under a total systems fielding concept that tied in personnel, training and equipment, we could articulate to TRADOC exactly how many training seats we need; we could tell them how long the load will last and if technology does not evolve, we simply extend the Programs of Instruction, extend the training base requirement and buy another increment's worth.

On the other hand, there are problems with the Ambrose Concept. A major problem is that of Data Interchange. This basically means that when you buy an item, some major items come packaged with an inclusive support set(s) of equipment. For example, a generator with a tank. However, if the generator is being modernized, how do we handle it? The problem arises when we fail to recognize

the requirement for a system which is a component of the larger system. A good example of this is SINCGARS, which is a part of the SHORADS Systems. If we don't buy SINCGARS as a part of the system, then SHORADS will not function in an operational and doctrinal sense. The other side of data interchange is the acquisition and distribution issue, i.e., making sure Project Managers conduct the necessary interface with other Project Managers to insure a complete package is fielded. This puts us right into the middle of the Organization Integrator Concept which we will discuss later.

Another strong point for the Ambrose Concept is that for the first time you can talk about capability in real terms. In other words, we can discuss enhanced capability in a modernized unit; we can quantify capability. We confuse Unit Status Reporting with readiness. We could quantify enhanced capability by having Multiple Subscriber Equipment (MSE) or the M-1 tank versus what the unit had before. Additionally, this would allow us to better portray capabilities to Congress in the budget process. It would force us to implement in the structure what we've been programmed and budgeted to do. The guts of such a concept would allow us to better present our programs to Congress. It might also allow us to fix that part of the Army which is "broke," i.e., the marrying up of programming, budgeting and structure for actual execution through

whatever methods are used, i.e., Organization Integration, Total Package/Unit Materiel Fielding, etc. Perhaps the Ambrose Concept will assist in fixing internal Army Management practices so we can respond to PPBES. On the structure side alone, when you go through TOE Development, TADDS, FAS, TAEDS, etc., i.e., all the tools that are used internally in the Army to implement the decisions that come out of the three Five-Year Development Plan (FYDP) each year, we set ourselves up for failure because it takes twenty-four months to be able to walk through the process. By the time all the data is analyzed to the point where it is loaded for execution by the various commands, we have been superceded by several decision points in PPBES.

The next issue discussed was the corps as it relates to our efforts to man and equip our units. The analysis is that the corps is the Army's "ship." Our doctrine is to deploy and fight corps. Airland Battle is corps doctrine. It is a self-sustaining element. The question then is, how we resource our corps? Perhaps the Ambrose Concept is the answer to the Army's ship. We should be able to go to Congress and say, "don't give us the M-1 tanks without the rest of the corps to go with and support it." Perhaps this then is the driving thrust behind the Ambrose Concept, i.e., to give the Army a mechanism with which to compete

with the Air Force and Navy for limited dollars. The focal point is the corps. This is supported by Army of Excellence force structures. Even though we don't run the Army in peace as we fight it in war, our push will be more successful if we market a program that postulates how we will conduct business in war and package our forces that way. For example, this year Multiple Subscriber Equipment (MSE) was sold to Congress by Undersecretary Ambrose and General Thurman as a corps package. Congress indicated that for the first time, it understood the Army's program in relation to MSE. As a result, the Army obtained 24% of DOD's Total Obligation Authority as opposed to 22% previously. The point is that if Congress understood our programs, we would probably do better. We do worse because we portray our needs less and we tend to be more flexible. If we could tie all our lines of equipment to a corps and define what the deletion or reduction of the lines would do in terms of readiness and more importantly capability, we might get more money. Previously, we have defined our needs in terms of sets of eaches as opposed to a "Corps Worth." The concept of incremental buying also fits into the "Corps Worth" concept. Therefore, it is packaging and marketing tool, a way of expressing requirements.

Also, this concept would allow us to transition more smoothly to a smaller force whether caused by demographics,

decreased defense spending, etc. The integrated package concept will allow us to reduce in a sensible, logical fashion that is tied to doctrine oriented in the corps so that as resources are taken out, the impacts can be articulated in terms of readiness and capability. We can also articulate to the force planners and the operational planners the total effect.

As stated earlier, the Ambrose Concept could be linked to the Organization Integrator (OI) Program. The OI Program is a logical, sensible program, but there is a hesitancy, and understandably so, to fully adopt the program because the program has not been fully tested. A corps modernization program will be the true test for OI, especially when Combat Service Support is considered. From the DOC MOD view, OI is viewed as total Army management, i.e., all eight functions of the Functional Life Cycle Model of the Army, while DCSOPS views OI as the function of Force Development. Therefore, we may have a problem with the definition of OI. No matter how an agency views OI, the energies of each agency must be captured in a total context to make the concept work. How you plan and present the package is what Mr. Ambrose is concerned about. Do you plan to buy only so much now, or all now? The concept asks the question: how far out should we plan? For example, should we plan to modernize every tank battalion or should we plan for only a portion of the force? This, then, becomes an implementation question to OI, i.e., you can do OI

independent of the Ambrose Concept. The OI concept can be implemented in support of the Ambrose Concept. They do not have to go together, but certainly can. They make sense together; it is easier to talk about packaging the force if we have a method to do it. The question is that, before implementing OI, is it realistic to think of buying only a certain percentage of a force or should you buy out a force? Additionally, the question of force structure is something that must be resolved prior to developing an acquisition strategy. We must know the long-range force structure goals, whether they are total modernization with emerging technology, or partial modernization with current technology. We simply do not have an enduring set of consistent force structure goals. The Air Force and Navy do, and this fact helps them immensely in the battle for constrained resources. The point is that force structure goals must be consistent and enduring to be successful on Capital Hill and to be able to articulate any modernization program.

The issue of Army of Excellence (AOE) was discussed in the context that it may be the answer to the force structure question. It focuses on the corps and once it is locked in, it may allow us to implement the Ambrose Concept, i.e., lock onto current technology, define what practices and operational concepts we want to implement, and simply do it--get there smartly and quickly. The fact is that

Army of Excellence, although controversial, gives us force structure goals and objectives provided the Tables of Organization and Equipment are adequately addressed to allow timely, accurate and forecastable acquisition programs. What AOE may allow us to do is to put some consistency into our budget lines. If AOE can solve the question of structure requirements, we can better plan and program.

In summary, from a DOC MOD point of view, the Ambrose Concept is simply telling us to "Be all you can be, but don't be what you can't." We can't be all fully modernized at once, but we can be what we can be and program that out. He is putting the first "P" in PPBES. He is giving a strategic direction for acquisition, to plan and buy in a realistic fashion to optimize the force.

Deputy Chief of Staff, Operations and Plans

The following comments were derived from discussions with LTC. Don Smith, Office of the Deputy Chief of Staff for Operations and Plans, Functional Area Assessment Coordination Division. The Ambrose Concept was discussed in relation to the implimentation of the Organization Integrator.

Discussion initially focused on the premise of "What's Different"? The feasibility of modernizing one unit is questionable; modernizing a corps is a more realistic approach.

Modernizing a corps is what the Army is basically trying to do today. For example, in the area of communications there is great emphasis on placing one set of radios in one theater of operations at one time. There is also great emphasis on placing one type of trucks in one division. The thing which drives this more than anything else is retention of Authorized Stockage Lists and Prescribed Load Lists and supportability. The problems with doing this are not new issues in the force modernization arena, i.e., how do you field a whole set of new equipment at a point at one time? For example, we are trying to do this with HEMTT trucks. In an upgrade of a Field Artillery Battalion, do we upgrade or undergo Product Improvement Programs (PIPs)? Normally, we PIP the unit and we do this process in corps sets. The fact is that the Ambrose Concept is close to the way we do business now, or attempt to do business now. Whether or not it is a recognizable facet is questionable. Can we, in fact, modernize a unit at a point in time and leave it alone? The real analysis is whether or not we want to do business this way. We simply do <u>not</u> leave a unit alone for any given period of time because of constant technological changes and procurement issues which dictate fielding. The issue of supportability for trucks and radios, i.e., the items we come closest to field in doctrinal sets, deals with the ability of the unit, corps or division, to maintain ASLs

and PLLs to keep new equipment and old equipment maintained when there is a mix. Both ASLs and PLLs suffer simply due to the quantity that must be maintained to support the equipment. If we look at HEMTT fielding the past few years, it has been accomplished in brigade and division sets. The question of whether we can go in and modernize a unit and leave it alone for ten years raises some key issues. First, it can be done and closely resembles the Army Materiel Command's concept of Total Package/Unit Materiel Fielding (TP/UMF). However, this concept has not worked well initially because of the complexities involved and the fact that the Army, as a whole, has had a problem of coming to grips with what the concept is and how to do it. Second, the issue of living TOEs and Incremental Change Packages is designed to issue all new equipment to a unit in the change package at one time. Therefore, the unit moves to a more modernized position. This is basically no different from the basic principle of the Ambrose Concept. However, to postulate that we can modernize a unit at a point in time may defy technological breakthroughs. Technolog, and procurement simply will not allow this. Basically, the Army is trying to accomplish the business of modernization in a package concept now. Third, there is also the issue of a totally modernized unit, i.e., the definition of it. Under the Ambrose Concept, a modernized unit would be the last unit which was last

modernized in a time sense. The type of unit involved must also be considered. For example, the Light Infantry Division's equipment is archaic in some regards, particularly transportation assets. There is also the issue of technology and doctrine that is evolving throughout the multifunctional areas. For example, in a brigade consisting of two Armor Battalions and one Infantry Battalion, there may be inherent differences in the most modern armor equipment versus the most modern infantry equipment.

A key issue which cannot be overlooked in the modernization business is that the whole process is a political decision process. It is not a cut-and-dry procedure. The business of giving anything to anyone in the United States Army in terms of resources is a political decision perhaps more than a rational force building procedure. It is political in relation to where the most threat is, based on CINC input and threat analysis. There is and always will be a battle for constrained resources.

The issue of the Organization Integrator (OI) was discussed. The definition of an Organization Integrator (OI) is as follows: The HQDA coordinator for the management of change in designated units. The OI is charged with the planning, programming and resourcing to units over time and acts as the Army Staff Coordinator for force integration issues. The OI is a manager of packages with focus on battalion through divisions.

For example, an OI would be concerned with VINCENT for the entire division and all ancillary equipment required to support the VINCENT, division-wide. The OI would deal with the question of distribution. He would also look at data bases and look at units over time, i.e., look at a unit now and in the out years. In effect, the OI would become a data base interpretor to insure that force modernization was accomplished in a logical, predictable manner. It should be noted that the OI concept was not possible until now. OI is dependent upon computer technology from data based information management sharing. Now the ability to access HQDA data bases is available to the OI to allow him to look at a unit over time. He will be able to assist in the projection of procurements which could support the Ambrose Concept. The capability to look at a unit in every current and future iteration between now and 1993 will allow not only the OI but the procurement community to better project. Additionally, what the end product should be is the most modern unit in FY88 given the priority that particular unit has, depending on the type of unit and its priority by DAMPL. One of the precepts of OI is that you field in doctrinal sets based on a rational decision-making process rather than a shared decision-making process. A major concern is that of command prerogatives, i.e., the intermediate commander changing the distribution plan based on local issues. We are at a point in technology today where the diverting of

equipment by intermediate commanders is not smart because if the equipment is diverted it may not be supportable in terms of maintenance, PLL, and ASL. This problem has not been resolved. The bookkeeping on modernizing the force under the Ambrose Concept is awesome because it goes against the "eaches concept." In effect, the Ambrose Concept is talking about completely revamping how it does business. It has been postulated that if we could start from a scratch basis, and determine the data base to support modernization, determine the mechanisms to support it, i.e., determine requirements, determine on-hand quantities and assets, determine needs over time, prioritize, procure, distribute and account for, the problem would be solved. What we are saying is that we want to do this in packages of unit sets and distribute in unit sets. Again, we are trying to do this but is it smart to go with a ten-year cycle or to continue to go with a Product Improvement Program? The problem we have in fielding a total package is that we can field a major item, for example the AH64. The real problem lies in the fielding of the ancillary equipment, sets and kits.

Will the OI concept solve the problems of force modernization? Not until there is a recognition that the data base is insufficient and inaccurate. The data base is the key to OI success. There is a current effort to get TAEDP, CBS-X, TAADS, TOE/MTOE and USR on one data base. When this is accomplished, the OI concept can be successful. The Army is trying to modernize

the force under the principle of unit sets, but until we can define constantly the most modern type unit over and over, this concept will be difficult to implement. Then, along with manageable and accessible data bases, the OI is the starting point for implementing the Ambrose Concept.

TRADOC

The following comments were derived from discussions with Colonel Douglas Burgess, TRADOC Systems Manager for Tank Systems, Fort Knox, Kentucky. We discussed the Ambrose Concept with him based on the Undersecretary's interest in the M-1 tank and how the concept would effect the fielding of the Abrams Main Battle Tank and supporting equipment.

Our discussions initially focused on a clear understanding of the Ambrose Concept, i.e., that in the past we (the Army) have bought new systems without a master plan. Basically, the "eaches principle" has been in effect and when the equipment has been procured, it was distributed under the "eaches principle" as opposed to a total package fielding of new equipment, for example, the M-1 tank plus its complement of M-2 Bradleys, HEMTTs, SINCGARs, generators, etc. The groundwork was also laid for a discussion of "spin-off economics," if any, that would be gained under the Ambrose Concept. For example, could the turmoil experienced by receiving commanders be reduced by a total package fielding concept?

According to Colonel Burgess, Army Materiel Command guidance being given to Project Managers is that they are

required to field all Associated Support Item of Equipment (ASIOE) generated by their product or that is required to support this product. They are also required to insure that ancillary ASIOE is fielded with the pacing item, for example HEMTTS and special tools that are required to support the M-1. Therefore at least nominally, the Army is heading in the direction as proposed by Mr. Ambrose. On the other hand, the vagaries of our procurement system and cycles that we experience are such that we may have a marvelous fielding and distribution plan, but a lack of dollars or some other decision may not allow us to execute total fielding as desired.

A primary consideration in the discussion of the total package fielding concept from the TRADOC community is: How fast can the receiving unit train? For example, at the battalion level, a significant amount of the unit is involved when a new piece of equipment comes on board, particularly so when the unit conducts labor intensive activities such as firing. Depending on how the major command supports the fielding effort, there would be different levels of efficiency. For example, Division X might decide to field in a manner dissimilar to Division Y in relation to support requirements for firing. This would affect how long it took the battalion to attain proficiency. Additionally, if the M-1, M-2 and SINCGARS were simultaneously introduced into a unit, that unit would be incapable at some point of doing anything but training. It

currently takes a tank company twenty-eight days just to go through the fielding experience for the tank alone. If additional equipment such as radios, PMCS checks, etc. were added to the tanks, an additional three to five days would be added to the fielding time. The point is that the tank commander is the key individual who is absorbing the new tank and when additional pieces of equipment are added to the fielding, additional time is required to absorb the other new equipment. An alternative approach is to work a tank battalion from front to back and back to front simultaneously. Alpha Company absorbs tanks while Delta Company absorbs radios and continue this alternative approach until all units attain the desired level of initial proficiency. If the Bradley were being fielded along with the M-1's, the entire scout platoon would be involved and therefore not available to support the remainder of the battalion. The point is that there is a period of non-availability for the battalion if all the new systems are fielded to the unit simultaneously and if there is no external support.

Additionally, the reality of being able to receive this new equipment is sometimes driven by ancillary considerations, not just the unit's desire to cut down on its long-term turbulence because of receipt of new equipment. For example, at most CONUS installations, the limiting factor which paces how fast one can field the M-1 tank is the availability of ranges. Only one tank company can use the range at a time and at many posts many of the same ranges and facilities are required for

the fielding of the M-2 Bradley. Also, the lack of Military Construction Army (MCA) monies to convert/build new ranges coupled with a lack of real estate further compounds and lengthens the fielding process. Therefore, it is not just the availability of the new equipment that drives the entire fielding process. Because of these limitations, consideration may be given by a post/division to provide outside support to the receiving unit such that the unit would not be completely down, and both the post/division and the receiving unit would benefit from the process. This does not necessarily cut down on the long-term turbulence experienced by the post/division, because if Battalion X is to receive all new equipment, i.e., M-1, M-2, SINCGARS, HEMMT, etc., simultaneously, then the unit, Battalion Y, that is designated to support Battalion X is also out of commission. However, Battalion Y does gain a great deal of experience which may make its new equipment fielding more efficient. Additionally, there is a cost in that someone else, say Battalion Z, has to pick up the Post Camp and Station missions of Battalion X and possibly some of Battalion Y's. It is easy to see that a simultaneous fielding of new equipment has a monumental impact on the post/division. In Europe, the problem would be even more compounded due to location and fragmentation of facilities. Additionally, when you consider it currently takes about five months to completely field M-1s into an M-60 Tank Battalion and the associated turbulence, it is difficult to adequately assess what additional time and

turbulence would result from the simultaneous fielding of other new pieces of equipment and whether there are any economies derived from a simultaneous fielding effort. If a unit were scheduled to receive its Bradleys and other new equipment three to six months after it received its M-1s, would it have been better to field them all at once? It would appear so, in that instead of an additional "down-time," the flat time could have been experienced all at once. Through careful planning, a tank battalion could receive its 58 M-1s, 6 M-2s, 25 HEMTTs and SINGCARs at once, but the cost is a unit that is "flat" for an undetermined period of time. This then is the basic question, can we trade off total modernization of a unit at one time for its inability to perform its mission for an unspecified period of time versus partial modernization and the ability to continue to perform its mission after a specified period of flat time?

Another area for consideration is, at what level would it be feasible to try to accomplish a total modernization? Take a post such as Fort Carson, which is a self-contained installation, from a point of Direct Support and General Support maintenance facilities. The entire post, i.e., the division base, would have to be set up to accept the new equipment if the division were to be completely modernized. Can we afford to have division flat, or in Europe possibly a corps flat for total modernization? As articulated above, there are at least three battalions out of the picture at any one given time.

Even though Battalion X has completed the modernization process, there is still an undefined period until it is as combat ready as it was prior to modernization even though it may be considered combat ready. Additionally, a good portion of the Direct Support (DS) and General Support (GS) mechanics are tied up in the modernization process. Both DS and GS mechanics are sent to Aberdeen Proving Grounds for retraining prior to the beginning of the fielding process. They receive "generic" training which again is immeasurable when considering the entire fielding process. The planning for the fielding of M-1's begins one year out regardless of the size of unit to be fielded and is continued on a quarterly basis for three quarters and then monthly for the last quarter. What level is best is basically dependent on the mission of the unit to be modernized, its capability to support itself or to be supported, and whether or not its inability to perform its combat mission is acceptable in terms of readiness to support its assigned mission. It would appear that a battalion-sized unit would be the ideal size given the method we field now. However, if we proceeded upon a new method of fielding, whatever that might be, it might be more efficient to do this at another level.

For the M-1 fielding program there is a team of eighty officers and non-commissioned officers that accomplish the transition training for a tank battalion. If we went to another sized unit other than battalion for transition, the

support requirements would probably become unaffordable in terms of manpower. This would hold true unless a "train the trainer" concept were utilized. The eighty-man team could possibly train an installation/division team and proceed to another installation/division to perpetuate the process. However, experience has proven that commanders prefer having the "expert" team conduct the transition training.

Another issue which was discussed was the affect Army of Excellence (AOE) might have on the Ambrose Concept. The issue is that until we get the Army's force structure straightened out it will be difficult to effect the Ambrose Concept. The fact of the matter is that we are always changing and the force structure is never static. For the combat heavy forces, Army of Excellence changes have been less at battalion level. What has happened is that there has been a shifting of functions of total units from division to corps. Therefore, Army of Excellence turbulence probably does not adversely impact the Ambrose Concept. Because of the other turbulences we go through, it is there, but just at the noise level. However, it must not be overlooked that there is an impact on readiness caused by Army of Excellence changes, but these must be accepted with change. The point is that until we take a division and set up a hypothetical fielding, knowing what it takes to field an M-1, M-2, HEMTTs, MSE, SINCGARs, generators, etc. and set it out on a time schedule, to include

classrooms, ranges, schedules, etc., only then could one say with any degree of assurability whether or not that unit could assimilate a total battalion's worth of new equipment or not. Another aspect is the implementation of tactics and doctrine on the ground once the unit has received the new equipment. It may be better from an organizational/operational effectiveness standpoint to assimilate one major change before you take on another. It may not be best to have an Army that is stratified from most modern to least modern. The inference is that this posture may be better for readiness in terms of being able to fight our doctrine.

The question of technology was discussed in relation to the ability of the production base being able to keep up with needs and concurrently the Army being able to keep current technology fielded from an operational point of view. There is a physical limit to how fast a company can turn out equipment which is limited to physical space and how much we are willing to pay a producer to facilitize. It is easier for a tank battalion to transition from the M-60 series to the M-1 than it is for a mechanized battalion to transition from an M-113 to an M-2 in terms of technology. There is no similarity between the operational employment of the M-2 and M-113. Therefore, there is an operational issue that goes along with the fielding of new equipment. The tanker can probably assimilate the M-1 quicker because even though the M-1 is technologically advanced, it is the same gun and the same ammunition. Basically, the tanker has to learn how to operationally live with the

new capability for battlefield maneuver, which requires him to plan better and faster. There is an enormous impact on logistics planning. It must be relearned especially in terms of consumptions rates. On the other hand, a totally modernized unit may be easier to support logistically after the relearning process has been effected.

There was a brief discussion on the issue of whether or not this concept would allow the Army to better articulate our budgetary position to Congress in terms of quantifying readiness. There was a consensus that we do this fairly well now in terms of current processes and reviews, i.e., ASARCs and DSARCs which deal with combat effectiveness increases. We have a Basis of Issue Plan for each item along with an Army Acquisition Objective, an Initial Issue Quantity, therefore, we now articulate our position in terms of systems and combat effectiveness reasonably well.

Another key point that was made was that the TRADOC training base must be in place to support the new equipment. We must have the capability of providing soldiers trained on the new equipment in the right places and in the right numbers to support the force when it does get the new equipment. This is a hard issue especially in view of the fact that there will be a concurrent requirement for soldiers to be trained on current equipment. Therefore, the training base is in a constant state of flux to keep up with the modernization transition to support the force, that is, preparing to support the

force that is going to be and transitioning the training base.

In conclusion, a brief discussion was conducted on "the goal" of the Ambrose Concept, i.e., to save money. The point is that the practicalities of execution on the ground are not necessarily driven by the availability of new equipment. We might be able to persuade Congress to swap out old equipment and yet we still might not be able to physically execute on the ground. The problem is probably not the acquisition phase but one of physical distribution and training.

Army Materiel Command

The following comments were obtained from an interview with Colonel Walter B. Heggie, Jr., Executive Officer to Lieutenant General Robert B. Moore, Deputy Commanding General for Research and Development and Acquisition, Army Materiel Command. The Ambrose Concept was discussed in relation to Army Materiel Command. Following this interview, Colonel Heggie was reassigned to Tank Automotive Command as a Project Manager.

Initial discussions centered on a clear understanding of the concept, the focus being that we would upgrade a unit from front to back with everything we have now and leave it alone for a period of time until it was remodernized again. The question is, how quickly would we come back and modernize that unit again? Three to five years is too soon from an acquisition and distribution perspective and perhaps ten years creates too much of a technology gap. For example, let's

examine two items that are on current production lines, i.e., SINCGARs and Multiple Subscriber Equipment, and consider the time it takes to field them. Does the fact that they are completely fielded make a unit, for example a division, modern? We have to consider the entire gamut of new equipment, not just current production items. The point is that production must be concurrent for X amount of systems that are to be issued to a division in order to make it the most modern at a point in time. Currently, that does not occur. We cannot measure total modernization by the fielding of just two of the new systems that are pending fielding. All those systems must be synchronized to be fielded concurrently to measure modernization. Then and only then can the Ambrose Concept be fulfilled. If we try to accomplish modernization of a given unit for a five-year period, it may not be worth the effort from a technological point of view, but if ten years is used as a modernization base time frame, we may be able to effect the Ambrose Concept. If we look at those systems currently in production and those due out in near term production (three-five years out), one can see that it will be difficult to synchronize procurement initially and then to conduct a distribution that will issue all new weapons systems to Unit X, then Unit Y, then Unit Z. Once the process begins and is refined, it would be fairly simple to articulate procurements to Congress in terms of increased capability, readiness and

dollar saving buys optimizing new equipment acquisitions for force modernization. If we look at the Air Force, we know that force modernization is structured to squadrons and this how they upgrade. The Navy accomplishes force modernization in terms of ships. The Army's focus must turn to and be driven by the corps as the basic building block of force structure. Army of Excellence makes the corps the building block, but the problem is that Army of Excellence does not straighten out force structure which must translate into Army Materiel Command language, i.e., know how many systems to buy and distribute. What concerns the AMC community is that if there is a requirement for 10,000 M-1 tanks over a period of time and the industrial base can only produce 720 per year, irregardless of funding, the Ambrose Concept could not be supported unless certain trade-offs are made. If we are willing to make those trade-offs in terms of distribution priorities to corps-sized units, and then fully modernize that corps, then perhaps the concept can be supported. Take V Corps for example; it would have to be fully modernized before going to another corps-sized unit. This is a DCSOPS issue; AMC basically needs to know where to distribute. There is also the issue of multi-year procurements which are basically for three-year periods. Even though the Five-Year Defense Plan is for five years, it is difficult enough to manage these three-year procurement programs. Also, it is difficult to get resources for the three-year programs and to

ask for lengthened multi-year programs is not feasible with current Congressional thinking. It is also difficult to forecast what shortages will be six years from now. There is also no way to predict when Congress will lengthen out current short-term production and acquisition programs to effect tight resources as we may well experience under Gramm-Rudman.

Additionally, the force structure issue must be looked at in the context of requirements. Not only from a numbers question, but also from a question of needs in terms of battlefield requirements. This could have a tremendous impact on the sequencing process of modernization. For example, assume that the Army was in the middle of a modernization effort with a unit and distribution priorities were changed. There would be no way, once the modernization process began, to shift priorities without enormous impact. The system simply could not accommodate this. The reality of the situation is that the changing of priorities does often occur; not only from a distribution aspect, but also from a technology aspect. If we state the requirements and build to technology we normally end up with a good piece of equipment. The HMMWV is an excellent example. Original requirements called for a vehicle to pull 4,600 pounds. It is now up to 9,400 pounds. The trade-off is an additional eighteen months before the first system is fielded. In the meantime, we could have been upgrading a division, but our decision-process is such that we are willing to wait for the 9,400-pound version. The point is that in order for the

modernization process to be timely, we must avoid delays such as the one described above. As a rule we must not stop once the modernization has begun or at a minimum build the modification process into the modernization effort.

An additional sub-issue is that of low-rate production. Should we take equipment that is produced during the "ramp-up" process and may not have all the bugs washed out? We may start out with a production rate of two to three end items per month and after a period of time, the production line is geared up to go at full production rates. This is a decision which will need to be made.

The issue of facilitization was discussed in relation to whether or not we (DOD) should compete with industry for production of items. There are some cases where we should, for example, at Anniston (tank rebuild) or perhaps an ammunition plant to produce 120 mm mortar ammunition. It would appear that in some cases we might be able to better support the Ambrose Concept through in-house DOD production of certain items.

The discussion then turned to how best sell the concept. Perhaps the best way is to emphasize combat power as opposed to readiness. In other words, if the big four combat multipliers, i.e., M-1, M-2, Apache and Blackhawk could be issued to a division simultaneously during a force modernization upgrade,

it would be easy to articulate that units kill capability in terms of pure combat power because these items had been issued as a package as opposed to the way we do the process now. From an AMC perspective, it is reasonably easy to conduct a full upgrade in Division X, then Division Y and then Division Z. The problem arises when you get to the fourth or fifth Divisions and follow-on technology has now entered into the equation. For example, the 120 mm gun on the M-1 tank, (the M1 E1). Do we go back and upgrade units that were originally issued the M-1, or do we issue the M1 E1s to units that still have the M-60 series? The point is that it is conceivable that the unit to first be issued the M-1 may not see the upgrade for ten years. Another big point is that from a programmable aspect, the Ambrose Concept is doable, but from a field commander's point of view it just may not be doable. It is basically a mind-set, not a money issue. The real issue is when do we distribute, given that we will only buy X amount of systems, regardless of a distribution pattern? For example, the current HMMWV's distribution plan lays out by eaches where each HMMWV will go. We can change this based on a reprioritization dictated by DCSOPS.. We can do this for any system. The problem again arises that after a period of time, probably after the sixth year, we get follow-on modifications. If we issue to our seventeen divisions based on an established priority, there will come a point when we have to wait X years more before we can go back

and remodernize the first division to receive the modernized packet. If this is acceptable, the Ambrose Concept can be accomplished.

To reiterate, there are two basic questions: force structure, and distribution. From an AMC point of view, physical distribution is not a problem; the decision process that leads up to distribution is the problem, i.e., who gets what first? The DAMPL should solve this problem, but at times doesn't. Another key issue is the establishment of a determination criteria that a unit has been modernized. This criteria must be established up front and strictly adhered to.

In summary, the major issues from an AMC perspective are: 1) sequencing of follow-on pieces of equipment which have resulted due to technology upswing. This factor will not halt the modernization effort, but it will require a close look at the distribution process. The second major issue is distribution and the third is force structure. Distribution is not a problem based on guidance from DCSOPS. Force structure is a problem and the resolving of this issue is perhaps the key to the entire process.

Deputy Chief of Staff for Logistics

To assess the alternative modernization concept from a logistical perspective, Mr. Robert Norton, deputy chief of the Force Structure Division, Directorate of Plans and Operations, in the Deputy Chief of Staff for Logistics staff element was

interviewed. The focus of discussion related to battalion level initiatives and how to maximize the modernization of combat-ready units. A concept most helpful to this effort is one previously mentioned, specifically, organizational integration.

Organizational integration of the modernization of the Army would fit into the PPBES cycle. Organizational program decision packages would be developed for all battalions under purview of a single integrator. The Army in total would modernize around approximately 15 organizational integrators. The basis for the organizational integrator was a 1981-82 Army Inspector General report, originally aimed at eliminating duplication of materiel system requirements and associated management personnel in the form of Force Integration Staff Officers (FISO), Personnel Staff Officers (PERSO), etc. The concept would compliment the Ambrose alternative method of modernizing the force. For example, modernization of the Army light divisions might best be accomplished via organizational integration applied in the context of the Ambrose Concept for modernization. It appeared that organizational integration from a logistics viewpoint would mesh well with the alternative method of equipping the force.

Assistant Chief of Staff, Research, Development and Acquisition

The following comments were obtained from discussions with Mr. David Mercer, Procurement Programs and Budget

Division, Requirements and Analysis Team, Office of the Assistant Chief of Staff, Research, Development and Acquisition.

The focus of our discussions with Mr. Mercer centered on how the Research and Development community might support the Ambrose Concept. From a conceptual perspective, DCSRDA is developing a new published policy for systems acquisition due out to the field in the late summer time frame, which will basically support the Ambrose Concept. The basic premise behind the new concept will be "procuring to unit sets." This concept will feature a computer modeling capability that will give DCSRDA the analytical capability to permit a systematic study of which is the best method to procure unit sets. It was interesting to note that according to Mr. Mercer there are several different studies being undertaken to ascertain which is the best method to modernize the force. The issue of data interchange and compatibility was discussed in relation to timeliness and dependency upon one set of data relying upon another to make rational decisions on the force modernization process, i.e., LOGSACs and TAEDPs and their interaction. Basically, what DCSRDA is going to do is to obtain special TAEDP runs with variations of funding profiles based on the most recent LOGSACs and TAEDPs. The basic logic is to load TAEDP up to a point with assumed funding and zero funding past that point (FY87 funded and past that zero funding; FY88-93, the POM years, at the minimum level as defined in the Long Range Research Development Acquisition Plan (LRRDAP).

This approach gives the ability to approximate TAEDP to forecast requirements in increments for the out years. This process will permit forecasting of TAEDP distribution information. Also, using this TAEDP model information, the ability exists under the Logistics Readiness Rating Report (LRRR) to identify equipment at Line Item Number (LIN) by shortages, by Unit Identification Code (UIC) by year and identifies what equipment is required to raise the force to various readiness conditions. There is a problem in this method in that costing is behind, i.e., we do not have the ability to forecast costs in the out years. Therefore it does not help in the budgeting process. However, it does identify unit level shortages, and uses this data to project when the equipment could be delivered in terms of real fiscal years as opposed to funded delivery period years. This will allow for budgets to include funding for those years during which the equipment will be delivered as opposed to previous funded year's program. The goal is to go from unit level shortages and determine what year budget action must take place. This will tell us what we need to improve readiness. This then will be tied into Program Development Increment Packages (PDIPs), i.e., readiness related PDIPs. The goal is to buy in such a manner as to improve readiness. Whether the buys are actually used to optimize readiness is a priority issue versus a procurement issue. The point is that the Army must be able to relate its procurement in such a

fashion as to satisfy Office of the Secretary of Defense/ Congressional requirements. If having accomplished the above scenario, we project the new equipment we will buy, project where it will be distributed, then the question is, have we improved readiness? If not, at least a base line has been created which can always be related to units and unit requirements. The modernization equipment will be accounted for in this process as long as force structure is well defined. Using the LRRDAP to project predictive distribution, we can compare unit requirements based on assumptions about the force structure. Therefore, the thrust of DCSRDA's efforts is to take the TAEDP, LOGSACS, a procurement data base plus the AMP MOD data base, (an AMC data base for items under two million dollars) and to combine these data bases to suboptimize costs of procurement lines. In this context, DCSRDA's efforts suggest the Ambrose Concept. It is important to note that we must not lose sight of the fact that we will always be faced with the question of readiness versus efficient buy questions. However, DCSRDA is working on building analytical models that will allow us to do that in the "procuring to unit sets" scheme. The goal is to build analytical models that will allow us to adequately address readiness in terms of cost/time, i.e., we can maximize readiness now at a cost, but in many cases, we will be giving up our efficient buys. On the other hand, we can assume that we will modernize against a war scenario in the

late 1990s and project an efficient buy program that will get the force ready then. This then gets into the realm of political decisions which are many times based on monetary considerations. We have let Congress make these kind of decisions without being able to do the trade-off impact analysis and quantify this analysis. Now we should be able to quantify what readiness will cost in a given year. We can put a price tag on it.

In summary, in DCSRDA's current stated policy, they are trying in effect to support the Ambrose Concept. When the new method of programming is finished that will focus on economic buy quantities in unit sets, they will be able to project what we should buy to satisfy units requrements in our time.

Summary of Oral Interviews

Throughout our discussions with the various agencies and command several key points were made. Listed below are these points:

1. DCSLOG: The focus was that the Organizational Integrator is the primary link in the modernization process and in the subsequent fielding of force modernization equipment.

2. DCSOPS: Although the Organizational Integrator was discussed in detail, the focus was that we (the Army) are trying to implement this concept now and that perhaps this is the way we do business as evidenced by MLRS fielding.

3. DCSRDA: The emphasis here was on developing new analytical models and tools that will allow us to forecast buys to unit sets to support the way we currently attempt to achieve this end.

4. DOCMOD: The emphasis here was on "fixing" the force structure to allow us to make those economic buys to unit sets that will allow us to articulate readiness and capability. It was felt that once the force structure was fixed, the Ambrose Concept could be fully implemented.

5. TRADOC: From the "man on the ground" point of view, the concept was workable. However, we must not forget to take note of all the ancillary considerations which would accompany the implementation of such a concept.

6. Army Materiel Command: The concept is doable from a distribution point of view as long as the production base can supply the required equipment in accordance with established delivery dates.

The gut feeling of this twosome is that although the concept is doable, external considerations such as the political decision-making process, the effects of limited resources and the fact that no one office or agency is spearheading an effort to bring the concept to fruition, that in fact, the concept may never fully be developed to its fullest potential.

Chapter IV

Conclusions and Recommendations

The inputs from Army Program Managers and from HQDA and agencies provide substantial insights on the alternative approach to equipping the force.

Paramount among the impacts are certain unit procurement cost increases resultant from decreased annual quantity buys. This alone is not a condemnation of the Ambrose Concept. An unanswered question exists. That is, the annual buys, required to fulfill the modernization of the Army subset initially selected, must be quantified such that those quantity buys times the increased unit procurement costs are equal to or ideally less than the current total Army procurement budget. Such quantification and computation is beyond the scope of this research paper. However, the procedure is straightforward, albeit timeconsuming. It is recommended for further analytical study and is ideal for undertaking by either the Army Materiel Systems Analysis Agency (AMSAA) of the Army Materiel Command (AMC) or by the Army's Concept Analysis Agency, a HQDA element.

It is clear that the alternative modernization concept as proposed for study would affect not only weapon

systems but also support systems.

A 33% reduction in the annual quantity buy of a given Army system appears to be the maximum, prudent amount of reduction based on sampled Program Managers.

Also, the Ambrose Concept may result in some degree of initial turbulence due to the multi-year contracts currently in place. This, however, appears to be a minor point when multi-year contracts face the uncertain impacts of Gramm-Rudman.

Under the alternative modernization method, caution must be exercised to preclude any negative impact on the competitive environment which currently exists at the subcontractor and vendor levels.

Technological life of Army systems appears to be of a high enough norm to enable sequential modernization to take place with all Army subsets becoming modern prior to technological changeover.

Synchronization of technology advances in various commodity areas could never be attained, thus guaranteeing no pattern to modernized Army units.

Numerous on-going efforts which purport greater efficiency and effectiveness in Army modernization currently exist or are planned. These include Total Package/Unit Materiel Fielding, organizational integration, force structure revamping, unit sets procurement philosophy, etc. These

appear to be supportive of, though peripheral to, such a remarkable change as the Ambrose Concept suggests.

The basic fabric of the alternative approach to equipping and modernizing the force has been investigated. A significant amount of additional tailoring and weaving must be accomplished before a definitive, final apparel is complete. Only then will it be certain as to its worth and value to Army modernization strategy.

Bibliography

Periodicals

Armed Forces Journal International. "Ambrose Trying to Overcome Overstaffed, Overstuffed Army Acquisition System," pp. 56-58, 114. May 1985.

"Army Gears Up for Decision on Armored Vehicles," Defense News (3 March 1986), p. 12. Published by The Times Journal Co., Springfield, VA.

Merryman, LTG James H. and Major Dennis M. Moen. "Improving Weapon Systems Acquisition Management," Army Logistician (January-February 1984), pp. 2-5. Published by U.S. Government Printing Office, Washington, DC.

Smith, Bunnie. "Output Oriented Resource Management System," Resource Management Journal (Fall 1985), pp. 4-5. Published by U.S. Army Finance and Accounting Center, Indianapolis, IN.

Taft, William H., IV. "A Commitment to Quality," Defense 85 (November 85), pp. 2-7. Published by American Forces Information Service, Arlington, VA.

Pamphlets

Systems Acquisition Policy and Procedures for Materiel Acquisition (30 April 1985), Draft PAM 70-XX. U.S. Army Office of the Deputy Chief of Staff for Research, Development, and Acquisition, Washington, DC.

Total Package/Unit Materiel Fielding. Pamphlet published by U.S. Army Materiel Command (USAMC) Materiel Readiness Support Activity (MRSA), Lexington, KY. MRSA PAM 700-6.

Statement

Equipping the United States Army, A Statement to The Congress on the FY85 Army RDTE and Procurement Appropriations, by LTG James H. Merryman and Dr. J. R. Sculley.

APPENDIX

EXHIBIT "A"

DEPARTMENT OF THE ARMY
US ARMY WAR COLLEGE
CARLISLE BARRACKS, PENNSYLVANIA 17013-5050

REPLY TO
ATTENTION OF

November 15, 1985

USACECOM
ATTN: AMCPM-MSE
Ft. Monmouth, New Jersey 07703

Dear Sir:

As students at the Army War College for the Academic Year 85-86, we are conducting conceptual research on a topic initially suggested by the Under Secretary of the Army, Mr. Ambrose. His study thoughts were verbally given at the October 1984 Army Operations Research Symposium at Ft. Lee.

We've titled our study, "An Alternative Approach to Equipping and Modernizing the Force." It will address the pros and cons of a revolutionary concept for doing business. Essentially such a concept would enable the army to modernize all weapon systems and equipment in a given unit (e.g., a battalion) at one time. The fully modernized unit would be left alone until designated for subsequent modernization again in ten or so years. In this method, the army would sequentially be modernizing its units and hence generate a force stratified from fully modernized units to totally unmodernized units (which would thus be next in line for modernization).

Clearly there are many benefits as well as many drawbacks to such an alternative. Our study challenge is to shed as much light as possible on both realms. In so doing we solicit your organization's response to the attached questionnaire. We've tried to fashion it such that you can provide your best professional feedback without significant investigation or contractor involvement. We only seek your revered judgment on these questions. We intend to use all information on a strictly non-attribution basis.

We look forward to your thoughts and thank you in advance for whatever insights you can share with us. Our Autovon number at the War College is 242-4005.

Respectfully,

William Parker

LTC William Parker
USAWC - Class of 86
Box #192

Respectfully,

Paul Miller

Mr. Paul Miller
USAWC - Class of 86
Box #174

Questionnaire for Program Managers

1. What is your current unit procurement cost as reported in your last Selected Acquisition Report (SAR)? (What constant year dollar?)

2. Do you believe unit procurement cost would increase, decrease, or stay the same if the quantity in the annual buy were reduced by 10%?

   a) 33%? b) 50%? c) 67%?

3. If above is either increase or decrease, then by what amount do you feel unit procurement cost would change if the annual quantity were reduced by 10%?

   a) 33%? b) 50%? c) 67%?

4. Do you currently procure the majority of your system on a multi-year contract?

   a) Do you plan to do so in the future?

5. Do competitive prime contractors exist, or does a sole source environment exist?

   a) Do competitive major subcontractors exist?

6. What is your current annual quantity buy and is that considered "steady state"? If it is not, what is "steady state"?

7. Would reducing the annual quantity buy, in your opinion, result in more, less, or same stability in distribution planning for those produced systems?

8. Do you feel that reducing the annual buy quantity would complicate, simplify, or not affect the budget process for your system?

9. Excluding the normal product improvement program (PIP), what technological life do you believe your system to have (i.e., how long until state of the art essentially overtakes your system, even given PIP's)?

10. Currently the Army aggregates total requirements for a given system in order to procure on the premise of economy of

scale. A significantly different means of modernizing the force would be to modernize everything in a given unit (e.g., battalion) at one time and then leave that unit alone until ready to modernize again ten or so years later. Do you believe such an alternative approach would be cost beneficial? If not, do you believe unit procurement cost would stay the same?

a) increase by 10%? b) 25% c) 33% d) 50+%?

Do you believe such an alternative approach would be readiness beneficial? Do you believe such an alternative approach would be beneficial for other reasons?

END

DTIC

9-86