

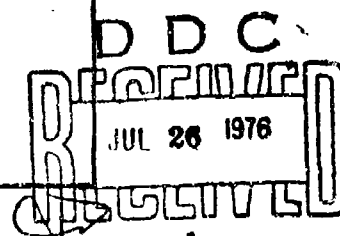
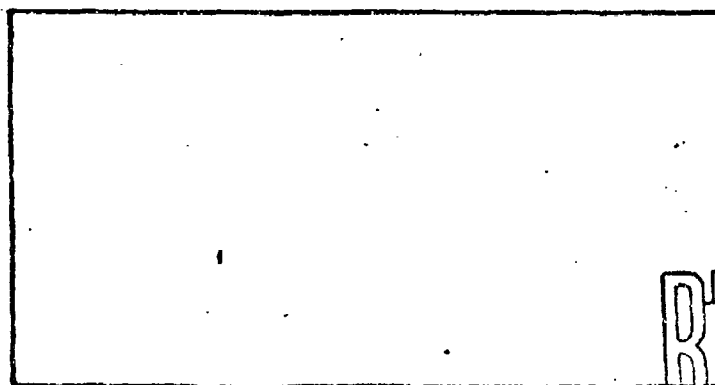
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DEFENSE SYSTEMS MANAGEMENT SCHOOL



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PROGRAM MANAGEMENT COURSE INDIVIDUAL STUDY PROGRAM



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DEFENSE SYSTEMS MANAGEMENT SCHOOL

STUDY TITLE:

PROJECT HANDOFF: A SYSTEM FOR TRANSITIONING NEW EQUIPMENT TO THE USER

STUDY PROJECT GOALS:

To explain the background and methodology of the Army Materiel Command's Project HANDOFF program for fielding newly developed items of equipment to a user.

STUDY REPORT ABSTRACT

(AMC) In order to meet the challenge of transitioning a new item of Army equipment to an operational capability in the hands of a new user in the field, the Army Materiel Command has developed a Project HANDOFF approach to this, the final step of the development cycle. Included in the HANDOFF program are a Materiel Fielding Operation, which is the responsibility of a Materiel Fielding Team composed of representatives from the project organization, the contractor, the functional organization, and the user himself. This team implements and coordinates the Materiel Fielding Plan which has, as an innovative feature, a Statement of Quality and Support outlining a Commitment on the part of the Army Materiel Command to user satisfaction, in the form of a joint user-AMC document formally attested to by signature.

Also included, in this study report, is a sample Outline Materiel Fielding Plan that suggests an approach for implementing the HANDOFF concept.

KEY WORDS

MATERIEL ACQUISITION MISSILES LANCE
RELIABILITY MAINTAINABILITY
INITIAL PROVISIONING
INTEGRATED LOGISTICS SUPPORT
AVAILABILITY

NAME, RANK, SERVICE
James Vander Naald, Major, USA

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November 1975

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PROJECT HANDOFF:
A SYSTEM FOR TRANSITIONING
NEW EQUIPMENT TO THE USER

STUDY PROJECT REPORT
PMC 75-2

James Vander Naald
Major USA

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PROJECT HANDOFF:

A SYSTEM FOR TRANSITIONING NEW EQUIPMENT TO THE USER.

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James Vander Naald
Major USA

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Study Project Advisor
LTC William Chen, USA

This study project report represents the views, conclusions and recommendations of the author and does not necessarily reflect the official opinion of the Defense Systems Management School or the Department of Defense.

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EXECUTIVE SUMMARY

The purpose of this report is to consider the special problems inherent in the period immediately following acceptance of a new defense system item of equipment by the government from a contractor's production facility. The report examines this period through the transition of that item to an operational unit, up to the point when the system is routinely operated by that unit as a trouble-free operational capability.

As a methodology to manage and plan for this transitional period, the Materiel Fielding concepts of the Army Materiel Command's Project HANDOFF are examined both through analysis of AMC implementing instructions and the experiences of the deployment of the LANCE missile system to USAREUR.

The objectives of the Army Materiel Command in the materiel fielding effort are to insure that the soldier is provided with equipment that performs well, meets user expectations and results in user confidence, in addition to demonstrating that AMC is prepared to stand solidly behind its equipment, and is committed to user satisfaction.

To back up this commitment, AMC has provided for an AMC/user fielding agreement, jointly arrived at, and jointly agreed to by formal signature, documenting the commitment of AMC to the fielding operation.

A sample Outline Materiel Fielding Plan is provided for the guidance of projects implementing this concept.

The report concludes with some observations and conclusions regarding the philosophy and spirit of project HANDOFF and the Materiel Fielding Plan development process.

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SECTION 1

INTRODUCTION

General

After the production phase of the military defense system development and procurement cycle, begins the phase of transition of the system to user operation and establishment of an initial operational capability (IOC). This transition is critical since the prime equipment, software, and logistic support must be delivered on a concurrent basis and in a timely manner. Logistic support in this transitional stage addresses two basic areas: (15:247)¹

1. The packing and shipping of the product from the production facility to the user's site, together with the consolidation of initial spare-parts stockages and final quality assurance checks prior to user acceptance.

2. The provision of an extraordinary logistic support assistance capability for the system so that support may be adequate during the transition period. Special logistic assistance to the user is necessary during this period for these reasons:

- a. Experience indicates that system failures are much more common during the early period of operation than later. Systems typically exhibit a failure rate profile similar to that shown in fig. 1-1. (15:249) The objective of dealing with this failure rate profile should be to fix as many failures as possible prior to arrival in the user's theater and

¹This notation will be used throughout the report for sources of quotations and major references. The first number is the source, keyed to the bibliography. The second number is the page reference.

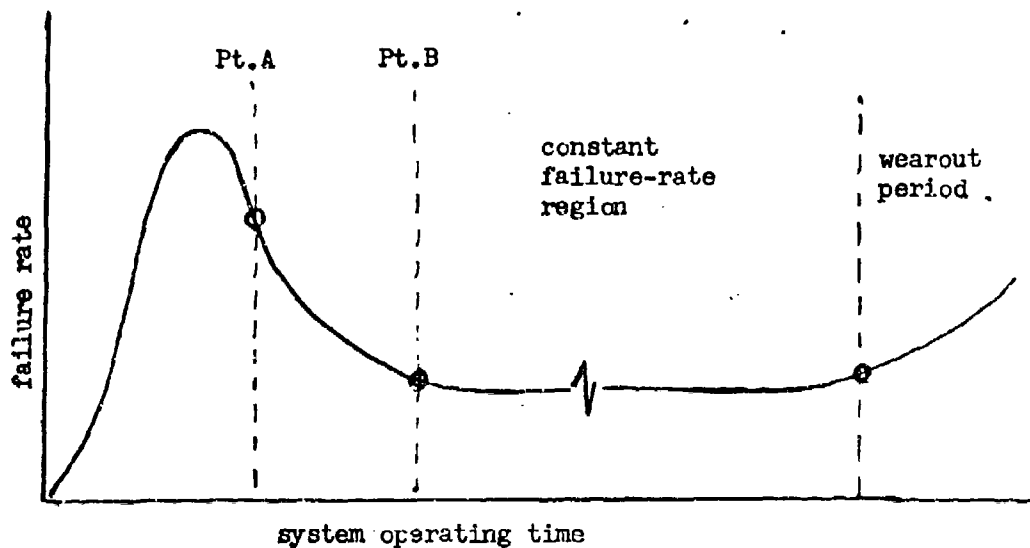


Figure 1-1 System Failure Profile

his receipt. To this end, testing at the manufacturer's plant prior to government acceptance is desirable. Finally, testing at the user's location following transportation and unpacking will serve to uncover as many initial failures as can reasonably be found prior to issue. Still, the result of these efforts may be only the attainment of point A on the failure profile graph. In order to reach the steady maintenance state of point B on the graph, a special maintenance and supply assistance effort will be necessary to insure logistics system responsiveness and user satisfaction, prior to attainment of the steady maintenance state past point B.

b. Also when introducing a new system to the field, there is a period where formal training and equipment familiarization occurs. This period may be plagued by operator and maintenance-personnel inexper-

ience, and operator-induced faults which cause total maintenance and support requirements to exceed initial expectations.

c. Long repair-parts procurement lead times and deficiencies in parts-provisioning planning may result in a delay in establishing a capability in certain maintenance functions; thus a special interim support assistance program must be established to ensure responsiveness of the Army supply system.

Purpose and Goals

It is the purpose of this study report to describe how the project HANDOFF Materiel Fielding program of the Army Materiel Command has addressed this transition process. In addition, a sample outline Materiel Fielding Plan has been included as a guide for use by Army projects approaching this development milestone. It is intended that this document will provide sufficient background guidance for an Army project office to begin its Materiel Fielding planning in accordance with AMC's Project HANDOFF objectives.

Methodology

The information contained in this study has been based on data, policies, and information received from the Army Materiel Command; the Project Manager, LANCE, Army Missile Command, Huntsville, Alabama; the Project Manager, Mortar and Artillery Locating Radar (MALOR), Army Electronics Command, Fort Monmouth, New Jersey; and other sources found in the Defense Systems Management School library, Ft Belvoir, Virginia.

Limitations

The information contained in this study relates to the transition from production to user operation of Army defense systems, constrained by Army logistics procedures. It is felt, however, that these same principles are applicable in general to similar systems of the Navy, Air Force, and Marine Corps.

Organization of the Study

Section 1 includes the general introduction, the purpose and goals of the study, the methodology used, and the limitations and organization of the study.

Section 2 discusses the present logistics concepts of the Army as a background to the transitioning of a new system to these system support concepts.

Section 3 discusses the experiences of the LANCE missile system during the transition of that equipment to its IOC user.

Section 4 examines the Army Materiel Command's Project HANDOFF concept and details of its implementation.

Section 5 presents a sample outline of a Materiel Fielding Plan in accordance with AMC objectives. This plan addresses the fielding of Radar Set, AN/TPQ-36, in response to a specific request by PM, MALOR for such a starting point in the development of MALOR fielding plans. This plan can be considered, however, as a sample outline for other Army systems of similar complexity.

Section 6 summarizes the HANDOFF concepts and recommends an approach for fully implementing its provisions.

SECTION 2

GENERAL LOGISTICS CONSIDERATIONS

The Army's Materiel Maintenance System

Toward the close of the Vietnam conflict the defense procurement process found its greatest challenge to be the control of spiralling costs in all areas. Early in 1974, the Comptroller-General of the United States estimated that the demand for better weapons systems had forced system prices to rise two to six times higher than predecessor systems. (1:21)

In response to this trend, and in an effort to optimize management of defense spending, a concept of Integrated Logistics Support (ILS), was instituted by the Department of Defense who, in 1970, defined the concept in DOD Directive 4100.35 in this way:

Integrated logistics support is a composite of all the support considerations necessary to assure the effective and economical support of a system for its life cycle. It is an integral part of all other aspects of system acquisition and operation. Integrated logistic support is characterized by harmony and coherence among all logistic elements. (2:2)

The logistic elements which were intended for this system were further listed as:

- Maintenance and Planning
- Support and Test Equipment
- Supply Support
- Transportation and handling
- Technical Data
- Facilities
- Personnel and Training
- Logistic Support Resource Funds
- Logistic Support Management Information (2:3)

What made this concept an innovative one, was the idea that costs

incurred by a weapons system after deployment of a system to using units, were as much a consideration to the project manager as those costs incurred prior to procurement. The concept required the project manager to produce an effective ILS plan through an iterative process begun early in the systems acquisition cycle. Throughout the cycle, the plan was to evolve and become an instrument that would result in a design parameter for the system; forcing tradeoffs between cost, schedule, and performance based on costs incurred not only through production, but through the duration of operation and even final salvage or disposal.

In implementing this philosophy, the project manager is constantly faced with the dilemma of trying to estimate unit production costs with fair accuracy, but not being able to accurately quantify the countless variables of operational costs after the first units roll off the production line. But this challenge is to optimize forecasting, and to concentrate a constant management effort on nebulous life-cycle costs.

This, then, is the philosophy of logistics and maintenance considerations throughout the systems acquisition cycle at the Department of Defense.

In order to meet this challenge, and to formally document his logistics support concepts, the project manager develops, in accordance with Army Regulation 70-27 (4), a document called the Development Plan for his system. This plan addresses ILS and system logistic support in section VI of its format, titled Logistics Support. The Logistics Support section of the Development Plan includes nine subdivisions titled exactly the same

as the nine logistics elements defined by DOD Directive 4100.35 and listed on page 5 of this section. The Logistics Support Plan is, therefore, the Project Manager's plan for his implementation of DOD ILS goals and guidelines. The plan enables the project manager to guide his system design along a path that will efficiently and economically enhance his achievement of each area of ILS planning.

In his plan, the Project Manager will state his maintenance concept, delineating responsibility for operator, organizational, direct support, general support, and depot maintenance. He then plans his system so that the principles of Reliability, Availability, and Maintainability (RAM) are effectively applied to the contractor's design effort. (15:96) Should the contractor design for a maximum repair capability at operator and organizational level in order to decrease mean-time-to-repair (MTTR) or should a high mean-time-between-failure (MTBF) be an overriding goal, reducing the need for maintenance at the organizational level and shifting the concept to one of repair at a higher level at the expense of a larger MTTR. Tradeoffs of cost versus RAM performance will be considered in arriving at his maintenance concept and his maintenance design goals.

Based on this maintenance plan, the project manager will determine requirements for test equipment and a test plan. (15:192) He will again trade-off the advantages of costly special test equipment versus standard items found in the Army supply system. He will find that special equipment costs more in procurement, but may result in operational savings by means of enhanced RAM effects.

Having progressed this far, he must provide for an orderly flow of repair parts from industry to each level of maintenance to be performed. Which parts must be stocked at what levels in what quantities? What parts can be specified as national stock numbered items? Which must be specified as manufacturer special items? When will firm RAM data be available to determine minimum provisioning levels? How long before the Initial Operational Capability (IOC) date must parts-provisioning contracts be let? Here, the project manager must weigh cost versus schedule, making decisions based on RAM data not firmly established. (16:7)

Transportation and handling considerations must include size and weight limitation of military aircraft and/or vehicles. Vibration and shock exposure must be considered, and transportation to the IOC location must be planned for. (16:20)

Technical data including operator's manuals, maintenance/parts manuals and equipment serviceability criteria publications must be planned for, and integrated into a plan for training materiel and training responsibilities. (11:36)

In planning for logistic support resources funding, the project manager must estimate his fielding costs and the subsequent user's maintenance costs. RDT&E and production appropriation costs must be estimated for system support. (11:42)

Finally, a Logistics Support Management Information Plan identifies the extent to which information such as maintenance engineering, analysis control documentation and data collection will be used in managing the life cycle of the system. (11:44)

The product of this planning effort is a document which plans for and coordinates the logistics management concepts of the weapons system. If adequately reviewed and updated, it is a living document that will evolve toward the IOC date in an orderly manner.

The Need for a Materiel Fielding Plan

Having produced a well-conceived logistics support plan and having entered the production phase, the project manager's job now focuses more and more on the initial operational capability date when his system will first be available for use by an Army unit. But preparation for this phase of the project involves much more than telling the contractor where to ship the first production models released for issue. The logistics planning process has anticipated and prepared for issue, transportation, training, supply, and maintenance, but who now has the responsibility to coordinate these efforts to insure an orderly transition of the system to a new user?

At this point, the PM must orient his planning process to the user's needs during this transition process. The IOC unit commander, anticipating the arrival of a new system in his unit, wonders if the transition will be smooth, and tries to anticipate problems. But who is better qualified to anticipate problems and plan for these transition contingencies than the project manager? The responsibility for transition is thus still with the PM, to ensure that his system is received by the IOC unit and each subsequent unit, in an efficient manner and that adequate supply, maintenance, and training support is received during the period of initial

deployment. (8:1)

The Logistics Support Section of the Project Development Plan, described in the previous chapter, suggests an excellent starting point for the PM to address planning for transition to an IOC or other user. This plan will already have addressed most of the procedures for transition to the user. This Logistics Support Plan will be found to be lacking in that it is not a complete, user-oriented document, written in the user's language, telling him specifically the plans, schedules, procedures, actions and status of his new system in order that it may be deployed, processed, and sustained in its new role. (8:1)

A new document is required that will answer the IOC deployment questions for operators, supply sergeants, platoon leaders, and commanders and staff at all levels in the operational unit receiving the new capability. Not only must such a document identify broad maintenance concepts, provisioning schemes, new equipment training team responsibilities and milestone dates, but it should detail modes of transportation of equipment, arrival dates, responsibilities for deprocessing, facilities provided for training, and all the details of coordination and responsibility required during the transition process. Being a user-oriented document, the user should have a great deal of the tasking to write it in its final form. It should be a document that he is satisfied with, that answers his questions, and that provides for all the support he needs. This can only be a product of close user-developer coordination and interaction during the preparation of such a document. (7:1)

SECTION 3

DEPLOYMENT OF THE LANCE MISSILE SYSTEM

The LANCE Maintenance Concept

The following is a summary of how one project manager, PM LANCE, recognized and met this deployment challenge. (13:I)

Early in the LANCE development cycle, the LANCE missile system support philosophy was directed by the Deputy Chief of Staff for Logistics to include these concepts:

1. Maintenance for LANCE was to be in accord with current Army operations and support concepts.
2. Common type hardware such as vehicles and launchers, would be supported by the Direct-Support/General Support (DS/GS) conventional automotive/armament type companies.
3. There was to be only limited missile maintenance at organizational and field levels.
4. Electronic support was to be from the already fielded, multisystem test units (LCSS, 9-550 TOE).
5. There was to be no DS organization organic to the firing battalion but DS electronic support was to be provided by contact teams.
6. No depot maintenance facilities were to be outside CONUS.
7. Supply would conform with established procedures.

Based on this logistics support guidance, PM LANCE began early in the development cycle to plan and update plans for logistics support.

The project feels one of the reasons for the success of its planning as reflected in a smooth transition of its equipment to the IOC user, was its intensive management of this logistics support plan, with emphasis on continuous coordination with all command facilities, and activities that could have impacted on the fielding of the LANCE system.

To specifically address the implementation of this planning during deployment, the project published a draft deployment plan one year prior to the IOC date, and coordinated this plan with all CONUS organizations involved in shipments and deployment. The final plan for LANCE deployment (Project DOLE) was published nine months prior to deployment, and was given very wide dissemination. The plan made all participants aware of their responsibilities and schedules and contributed greatly to a smooth IOC transition. (14)

The plan is a noteworthy achievement in deployment planning due to such concepts and features as outlined here.

The LANCE Deployment Plan

In order to ensure every effort had been made to field a system free from new equipment bugs and to provide for expeditious correction of minor production-related deficiencies, PM LANCE required contractor testing of each equipment set prior to acceptance by the government. This Weapons System Integration Test (WSIT) conducted tests of all user operations on a fully assembled weapons system, and corrected over seven-hundred discrepancies in both contractor and government furnished equipment. These deficiencies were items that had escaped normal

quality assurance checks, and would have resulted in problems to the receiving unit. (13:II-G)

LANCE provided for training of a small 22-person cadre in CONUS which was sent to USAREUR to train an existing missile battalion for conversion to LANCE as the IOC unit. Previous missile systems were deployed after training complete battalions in CONUS, and after completion of an Operational Readiness Training Test (ORIT), a Technical Proficiency Inspection (TPI) and Annual Service Practice (ASP) firings. Conversion of an existing unit proved to be more efficient in manpower and travel than creation of a new battalion in CONUS and deactivation of an obsolete battalion in USAREUR. (13:II-2)

The LANCE project manager established a field grade officer position within the LANCE project office with the specific assignment of coordination in preparation for IOC fielding, along with subsequent assignment of this same officer to USAREUR as the PM's Staff Officer (PMSO) six months prior to the IOC. This gave the IOC user a responsible contact person with an immediate informal communication link to AMC and the LANCE project office that greatly enhanced orderly system transition. (13:II-2)

The LANCE project acted as the user's advocate throughout deployment in coordinating the actions of other commodity commands and activities that interfaced with the LANCE system. This assumption of total system responsibility by the project and the PMSO group at USAREUR greatly enhanced timely support and user satisfaction.

Acting on experience gained from previous missile system deployments, sets of LANCE systems destined for USAREUR were consolidated in one

shipment, closely monitored from origin to destination. This decreased the possibility that a portion of the shipment might be diverted or delayed, ensuring that the deployment schedule was adhered to.

The individual systems were deprocessed at Pirmasens Army Depot, and were subjected, under PMSO supervision, to a pre-issue inspection and operational check prior to issue to the IOC battalion. This relieved the gaining unit of all deprocessing responsibility and ensured that the equipment they received was free of transportation-related defects.

(13:II-4)

A spare parts support list allowance card (SLAC) deck was forwarded to USAREUR for their approval and requisitioning of all required spare parts. Parts requisitioned were packaged in standard CONEX containers with bin inserts and a locator card deck to facilitate receipt and issue. Separate CONEX shipments were sent to each of two direct-support units and one general-support unit. Due to an oversight, however, the three missile support units received not only their missile-peculiar parts, but also mixed in with these, all conventional repair parts such as automotive and optical. This necessitated sorting and lateral transfer to appropriate units after receipt by the missile support units. (13:II-3)

IOC units were advised to establish pinpoint publications distribution accounts for LANCE publications, and were provided with recommended requisition quantities. In addition, two complete sets of operator and organizational publications were packed with each LANCE vehicle, and five complete sets at a pertinent maintenance level with each supply-parts package. Despite this, operator type technical manuals later proved to

always be in short supply, probably due to "pigeonholing" of copies by operators. (13:II-3)

Overpack and MILVANS were used to minimize the number of shipment containers required and to minimize transportation damage. Each pack was marked with a distinctive symbol to facilitate identification at trans-shipment points. (13:II-4)

The U.S.S. Callaghan, a roll-on-roll-off (RORO) vessel permitted shipment by level C packaging, thus simplifying loading, unloading, and deprocessing. (13:II-4)

Finally, but by no means the least important to the success of the LANCE deployment was the viable, well-coordinated deployment plan that the project produced. It was characterized by completeness and attention to detail, and by the great part played by the user and others outside the project, in its development. It served as a successful user-oriented integrator for all deployment events. (14)

Summary

The LANCE project sums up its deployment effort as characterized by these particularly successful procedures and techniques: (13:II-6)

1. Early in the program, and continuing through planning for deployment, logistics planning included full coordination with all interface organizations, including the training base and the user.

2. A final integrated operational check of each system was accomplished at the contractor's plant prior to acceptance by the government.

3. Provision for a field-grade project representative at the IOC site six months prior to deployment.

4. Use of closely monitored package shipments and supervised deprocessing.

5. Personal visits to USAREUR by the PM in order to coordinate deployment operations and develop an interest in and emphasis for the deployment program.

SECTION 4

THE ARMY MATERIEL COMMAND'S PROJECT HANDOFF

Background

Partly as a result of the success of the LANCE fielding effort, the Army Materiel Command (AMC) undertook a study known as Project HANDOFF which had two objectives: (9:1)

1. To insure that AMC fielding operations provide the soldier with equipment that performs well, meets user expectations, and results in user confidence.

2. To demonstrate to the user that AMC is prepared to stand solidly behind its equipment, and is committed to user satisfaction.

This study was carried out under the sponsorship of the AMC Deputy Commanding General for Materiel Acquisition and resulted in the following instruments of implementation: (9:2)

1. The Materiel Fielding Plan: This is a user oriented document created for all items requiring release under AMCR 700-34, detailing all actions which must be completed prior to materiel release. Its goal is to insure success in the physical deployment to the user, followed by successful assumption of operational capability by the user.

2. The Materiel Fielding Operation: These are the activities of a PM-sponsored team which plans, during development, for materiel deployment and, just prior to IOC, physically establishes a project field office at the IOC location so that system problems are efficiently solved.

3. The AMC/User Fielding Agreement or the Statement of Quality and Support is a jointly written document which formally states the AMC commitment to the user and details specific procedures for honoring the commitment. After completion of a successful fielding operation, the user certifies his satisfaction by formally signing a document attesting to the success of the transition period, thus terminating the fielding operation. (7:5)

The Materiel Fielding Plan

The Materiel Fielding Plan (MFP) is a gaining command oriented document that is fully coordinated with the user. It is created just prior to the full scale production decision. It is an iteratively developed document that stands alone, outlining the plans, schedules, procedures, and actions necessary to deploy, process, and sustain the item as a new operational capability. (6:1)

The MFP, along with gaining command implementing plans, serves as the basis for signed agreements stating what each party will accomplish.

The following is an outline of the Materiel Fielding Plan: (6:11-15)

I INTRODUCTION: This section outlines the purpose of the materiel Fielding Plan, the name of the gaining command, a brief description of the system being fielded, a summarization of the logistic support concept, and any limitations or qualifications of the MFP.

II END ITEM DESCRIPTION: This section describes the system by furnishing a detailed end-item list, photos or drawings, a summary of system characteristics, major missions of the system, its deployment scheme,

and dates of planned deployments.

III LOGISTIC SUPPORT COMMAND AND CONTROL: This section details these areas:

- a. Responsibilities and procedures for logistics support before, during, and after deployment.
- b. The type, degree and timing of logistics assistance.
- c. Personnel requirements such as liaison offices, and points of contact to be with the gaining command.
- d. Methods and procedures for correcting materiel defects.
- e. Arrangements for briefings and classes for gaining command so that provisions of the MFP are understood.

IV SYSTEM SUPPORT DETAILS: This section discusses in detail, all relevant concepts, procedures, and actions, that constitute total logistics planning and support of the applicable system. It includes:

- a. An outline of the provisions for support and test equipment at all levels - organizational, DS, GS, and depot.
- b. An outline of how the user will receive supply support.
- c. An outline of the system technical data to include manuals, orders and written procedures as applicable.
- d. An outline of system transportability criteria and a detailed plan for transporting system equipment to the user.
- e. An outline of facilities required for support, facilities required by environmental considerations, and facilities required for operation and security of the system.

f. An outline of plans for TOE/TDAs, and details of training to include school training, key personnel training, new materiel introductory briefing teams, and new equipment training teams.

V ARMY MATERIEL COMMAND COMMITMENTS TO THE FIELDDED SYSTEM: This section includes commitments to the field with respect to the logistics support and services which the Army Materiel Command will provide during the period of new item training and initial use by the recipient.

VI SUMMARY: This section is intended to summarize the status of logistics support for the item. It highlights major accomplishments or weaknesses and any significant issues to be resolved before, during, or after fielding.

VII APPENDICES (as required)

The success of this fielding plan will be the extent to which it reflects a sincere effort to enhance user satisfaction with the newly received system. AMC states (6:1) that the key principles to be followed in developing this plan are:

1. It must be conceived as a user oriented plan, containing all the logistics support details necessary to assure success in materiel release and deployments.

2. It must be thoroughly coordinated with the user to assure interrelated actions are tied together. Coordination must be early enough to assure support is adequate, timely, and suitable to local conditions.

3. It must serve as the basis for complete understanding and agreements as to the logistics support to be provided.

4. It must provide sufficient management controls to assure logistics support schedules and actions required before, during, and after deployment are properly accomplished.

5. It must serve as an audit trail to fix responsibility for any occurrence that impacts adversely on deployment.

Materiel Fielding Operations

Materiel Fielding Operations pertain to the positive implementation of the Materiel Fielding Plan, by a Materiel Fielding Team (MFT). The MFT members are identified early in planning for deployment, so that they can have access to the contractor's plant, to contractor and government training programs, to DT/OT, and to such other actions that provide team members with item experience. It is not expected, especially when first constituted, that the MFT will operate as an entity, but rather will come together at specific points where product expertise is to be acquired.

The team consists of these members: (7:13)

1. A team leader (usually the Chief, Logistics Management Division) who is accountable to the PM for fielding.
2. A contractor technical representative.
3. A quality assurance team.
4. A design engineer who has been with the system through FSD and who is contracted to move to the field with the system.

5. The New Equipment Training Team and the New Materiel Introductory Briefing Team.

6. The IOC user.

7. Logistics Assistance Office (LAO) personnel, both maintenance and supply qualified.

Another element of the fielding operation is the AMC/User Fielding Agreement and the Statement of Quality and Support. This element of the fielding operation is generated from a dialogue between the user and the PM. To arrive at this agreement and statement, the Materiel Fielding Plan is compared with the user's Mission Support Plan. After interface problems have been solved, AMC states, in writing, its Statement of Quality and Support and specific procedures for honoring the commitment. Finally when the agreement has been fulfilled to the satisfaction of AMC and the user, arrangements are made for a joint sign-off to acknowledge success of the fielding operation. (7:I5-I6)

Throughout the materiel deployment, the materiel fielder must validate to his own satisfaction, the effectiveness of the regular Army logistics system as it affects deployment, and must take responsibility for correction of deficiencies in the system.

SECTION 5

THE OUTLINE MATERIEL FIELDING PLAN

As a first step in the Materiel Fielding Operation, the Outline Materiel Fielding Plan is prepared. This outline plan defines the planning issues involved in the fielding operation, and provides a framework for the Materiel Fielding Team's initial operations.

Presented here is a draft Outline Materiel Fielding Plan for suggested use by a specific Army project, the Radar Set, AN/TPQ-36 of the Mortar and Artillery Locating Radar (MALOR) project office of the U.S. Army Electronics Command at Fort Monmouth, New Jersey. It is prepared in response to a request by the MALOR project manager, Col William J Harrison, for an analysis of Project Handoff requirements as they pertain to Project MALOR equipment. The plan addresses deployment to USAREUR as a representative situation of maximum logistic complexity.

Other readers will note the usefulness of this outline in preparation of plans for similar items of other projects.

OUTLINE MATERIEL FIELDING PLAN

RADAR SET, AN/TPQ-36

SECTION I

INTRODUCTION

1.0 PURPOSE This outline Materiel Fielding Plan has the following Objectives:

- a. To provide methodology for deployment and subsequent logistics support of Radar Set, AN/TPQ-36 to (gaining command).
- b. To specify procedures for this deployment and logistics support.
- c. To delineate responsibilities for accomplishing this deployment and logistics support.

1.1 SCOPE

- a. This plan contains the procedures for deployment of Radar Set, AN/TPQ-36 peculiar end-items and supply support packages consisting of repair parts, manuals, and tool kits, to support those end items shipped.
- b. Common items for operational units and conventional maintenance organizations will be obtained from existing in-theater stocks or requisitioned as required, and are not addressed unless listed in this plan. Selected common items considered critical to the operation of this system are listed in Appendix (). The MALOR Project Office is prepared to assist, as required, in expediting delivery of these items.

1.2 GENERAL CONCEPT FOR DEPLOYMENT This paragraph will outline the general concept of shipment and processing for each shipment package to include antenna trailer, power generator, operations shelter, vehicle, and support-unit equipment. Details of this shipment and deployment concept will be contained in section IV.

1.3 GENERAL CONCEPT FOR LOGISTICS SUPPORT Maintenance support for Radar Set, AN/TPQ-36 will be in accord with current Army operations and support concepts, and will include operator, organizational, direct support, general support and CONUS depot maintenance echelons.

SECTION II

SYSTEM DESCRIPTION

2.0 GENERAL (10:2)

a. Radar Set, AN/TPQ-36 is a highly mobile radar set for automatically locating hostile mortar and other high angle of fire weapons and short range rockets. Its automation provides for the capability of locating weapons firing simultaneously from multiple positions. In addition, the radar can be used to register and adjust friendly artillery fire.

b. The Radar Set, AN/TPQ-36 consists of an S-250 Operations Shelter, carried on an M-561 Gama Goat vehicle which pulls the antenna trailer assembly. Power for the system is provided by a 10 Kilowatt, 400 Hertz power generator, which is carried on the antenna trailer. The trailer assembly includes the antenna and associated electronics, the transmitter, and a major portion of the receiver. The S-250 shelter provides space for the operation of the radar, and includes the majority of the data processing hardware. The shelter and the antenna trailer may be transported by CH-47 Helicopters. Figures 1 through 4 illustrate these end items.

c. Using a combination of radar techniques and computer controlled signal processing, the Mortar Locating Radar detects, verifies, and tracks projectiles in flight, extrapolating the track data points to the location of the firing position. When the location has been corrected by the operator for altitude, it is automatically transmitted

to the TACFIRE computer.

At this point, the following artists drawings or
photographs will be added:

Figure 1: Antenna Trailer

Figure 2: Operations Shelter, S-250, installed on
Gama Goat, M-561 Vehicle

Figure 3: A view of the interior of Shelter, S-250

Figure 4: Power Generator

Paragraphs 2.1 through 2.3 respectively, will provide detailed descriptions of Antenna Trailer, Shelter, Power Generator, and Vehicle as finally configured. Included will be weight, physical dimensions, and pertinent performance characteristics. Maximum use will be made of photographs and diagrams to illustrate these items.

Paragraph 1.4 will list the issue dates and quantities of initial and subsequent shipments to the gaining command.

SECTION III

LOGISTICS SUPPORT COMMAND AND CONTROL

3.1 GENERAL

A Materiel Fielding Team shall be established 18 months prior to the IOC date. Initially, this team will meet periodically as a committee to plan and coordinate the materiel fielding operation. Later, when fielding operations commence, this team will act as a unit under the supervision of the team leader. The team will be charged with the following responsibilities.

- a. To manage the preparation, coordination, revision and implementation of the Materiel Fielding Plan.
- b. To act as a coordinator on behalf of the receiving unit which, by virtue of experience with the system, and knowledge of the supply system, backed by the authority and communication channels of the Project Manager, can expeditiously bring the total resources of the Army Materiel Command to bear on solving user problems.

3.2 THE MATERIEL FIELDING TEAM

- a. The team leader shall be the Chief, Logistics and Test Management Division, Project MALOR. As team leader, he is responsible to the Project Manager for implementation of this plan.
- b. A contractor technical representative shall be provided by contractual arrangement, to be made available at the time of initial deployment.
- c. A quality assurance team member will be designated to

conduct not only a final quality assurance check of each system prior to acceptance by the government, but also to supervise deprocessing at a designated USAREUR maintenance facility prior to issue to the receiving unit.

d. A government design engineer will be designated to provide on-the-spot engineering analysis of early deficiencies and to expedite the correction process. This individual will be contracted by job description to move with the system into the field during initial fielding operations.

e. New Equipment Training Team (NETT) and New Materiel Introductory Briefing Team (NMIPT) members will also be members of the Materiel Fielding Team.

f. The IOC user will be represented early as a member of the MFT.

g. Logistics Assistance Office (LAO) personnel will be designated as team members.

SECTION IV

SYSTEM SUPPORT DETAILS

4.0 GENERAL MAINTENANCE SUPPORT CONCEPT (12:1-4)

a. Operator Maintenance. The military operator will monitor equipment and perform non-critical adjustments and preventive maintenance such as cleaning, visual inspection and operational testing of the radar. Selected repair functions such as the replacement of defective fuses, lamps, and bulbs will also be performed by operator personnel.

b. Organizational Maintenance. Organizational maintenance will be performed by designated personnel organic to the using organization. In view of the fact that organizational maintenance is on-site, requires no transit time, and will have spares on-hand, 90% of unscheduled maintenance actions will be accomplished at this level. Organizational maintenance functions for the radar set will include the following:

(1) Validation of operational and post-operational checks.

Maximum use of built-in test equipment and test routines, will be provided.

(2) Detection of system malfunction and isolation of malfunctioning circuit cards, modules or chassis' through the use of built-in and external "go-no-go" type test equipment.

(3) Replacement of malfunctioning circuit cards, modules or chassis' with spares, on site. When a spare is not authorized for on-site stockage, it will be ordered through appropriate supply channels.

(4) Return of defective cards to the next higher level of maintenance for repair and return to stock if it has been determined that repair is economically feasible. Other defective modules, subassemblies, or chassis' are forwarded to the maintenance level authorized to repair according to the Maintenance Allocation Chart.

(5) All checks, adjustments, and alignments required to maintain the system in peak operational readiness. These will be accomplished to the maximum extent practical using built-in test equipment.

(6) Replace limited life items such as TWTs, TR/limiters, and similar items, as authorized by the MAC in keeping with skills, tools and test equipment.

d. Direct Support Maintenance Direct support maintenance personnel will:

(1) Provide quick response technical assistance to organizational maintenance units by the use of highly mobile contact teams. They will make maximum use of direct exchange and/or operational readiness floats in support of user units.

(2) Concentrate effort at this level on end item repair in support of operational readiness.

(3) Troubleshoot, adjust, align, calibrate, and repair only selected assemblies, components and equipments as authorized by the MAC, taking maximum advantage of built-in aids.

(4) Replace and forward unserviceable items to the authorized level of maintenance.

(5) Provide forward maintenance support through use of mobile contact teams on a periodic or as-required basis to make instrumented performance test, alignment, repair or replacement.

d. General Support Maintenance. General support maintenance personnel will:

(1) Perform maintenance on operational readiness float items for return to a direct support unit.

(2) Perform maintenance on defective cards, modules, subassemblies, and chassis' as authorized by the maintenance allocation chart.

(3) Effect repairs that require special tools and test equipment, and accomplish adjustments and performance checks that require special test equipment.

(4) Troubleshoot, adjust, align and calibrate as authorized by the MAC.

(5) Evacuate designated replaceables requiring overhaul, to the depot facility.

e. Depot Maintenance. Depot maintenance will provide the capability of complete overhaul and reconditioning of the major end items and assemblies which are beyond the scope of, or exceed the practical capabilities of field maintenance units.

NOTE: Final allocation of the repair of cards, modules, subassemblies or chassis' to a specific maintenance level will be based on a maintainability analysis of the equipment. Repair of cards or modules (if not found cost-effective to throw-away) will be performed at that

level considered best qualified, responsive, and most cost effective for performance of the work required.

f. Software Management and Support. The General Purpose Computer, AN/UYK-15, which is the heart of the AN/TPQ-36 Radar Set, makes use of both operational and diagnostic computer programs, referred to as system software.

(1) ECOM laboratory will develop and maintain software for the system. The Combat Surveillance/Target Acquisition Laboratory will be responsible for management of the software configuration baseline including software for the entire life cycle.

(2) The National Maintenance Point (NMP) will be responsible for development of the integrated logistic support of the software (i.e.: literature, training, technical assistance, and other software support elements). ECOM NETT teams and technical assistance personnel will be trained on both hardware and software of the system.

4.1 UNITS PERFORMING MAINTENANCE

Designation of units performing categories of maintenance listed in par 4.0 above is outlined in figure 5.

4.2 MAINTENANCE ALLOCATION CHART The Maintenance Allocation Chart for Radar Set AN/TPQ-36 is included as figure 6.

4.3 SUPPORT TEST EQUIPMENT (12:7)

a. A requirement for identification of tools and test equipment is being developed as a contractual effort. The list to be submitted will be the basis of definitized tool and test equipment requirements, both common and special. Where possible, tools and test equipment for maintenance support will be of the type available within the Army

(A chart of specific maintenance units designated to perform organizational, DS, GS, and depot supply and maintenance support for Radar Set, AN/TPQ-36, after deployment as an operational capability to a specific unit, will be included here. Indicated will be unit designations, TOEs, locations, and organizational relationships.)

(to be determined)

Figure 5: Designation of Units Performing Supply and Maintenance Support

(to be determined)

Figure 6: Maintenance Allocation Chart for Radar Set, AN/TPQ-36

supply system.

b. An outline of the Support Test Equipment Plan; including equipment allocations and support equipment literature will be included in this section when available.

4.4 SUPPLY SUPPORT CONCEPT

a. Supply support will be provided through Army supply channels to the maximum extent possible. Organizational repair parts, cards, fuses and lamps, will be stored on-site.

b. Initial system-peculiar repair parts provisioning planning is now in progress. Upon availability of the initial provisioning plan, action will be taken to provide for initial repair parts issues as follows: (14:85-89)

(1) Support List Allowance Card (SLAC) decks and listings depicting repair parts required as initial issue for support of the AN/TPQ-36 system, will be provided by ECOM to USAREUR by (TBD). The SLAC decks, in accordance with the provisioning plan, will list parts segregated in these categories:

(a) Parts lists or decks segregated by unit designated to stock that part to include provisions for theater stockage.

(b) Parts to be procured by ECOM from the end item manufacturer will be segregated from parts designated as commercial or military types, procured through the Defense Supply Agency and normal supply channels.

c. Upon receipt of these SLAC decks, and listings, USAREUR will screen these decks against theater on-hand assets, will mark them accordingly, and will return them to ECOM within 30 days.

d. Upon receipt of the marked-up SLAC deck, ECOM will initiate supply directives to applicable commodity commands, DSA agencies, etc., directing movement of repair parts requisitioned under these supply directives to Sacramento Army Depot for consolidation and packaging. Parts will be packaged separately according to the unit designated to receive those parts.

e. Subsequent shipment of initial issue repair parts packages will be directed by ECOM, based on supply directives (as opposed to USAREUR requisition numbers). Supply directive numbers will be provided to ECOM by USAREUR to enable "receipt-due-in records" to be established.

f. Repair parts for each organizational stock will be marshalled, assembled, and packaged at Sacramento Army Depot in the manner described above. Packing lists will be provided for each package, and each package identified for the sole use of a specific unit. Parts packages will be consolidated into one shipment to Bayonne Military Ocean Terminal (or other designated shipment point) for consolidation with end-item shipments.

4.5 SUPPLY AND MAINTENANCE TECHNICAL ASSISTANCE

a. ECOM NET teams and technical assistance personnel of the Materiel Fielding Team will be on-site during initial fielding to assist the user in solving technical problems.

b. During fielding technical assistance personnel of the Materiel Fielding Team will be responsible for reporting field problems

to the NMP on both hardware and software. Field reports relative to equipment failures and operating problems in general, fall into five categories. These categories are:

- (1) User report to Materiel Fielding Team Representative on-site for team resolution.
- (2) User report to the MFT Representative for referral back to ECOM for resolution.
- (3) Daily and weekly flash reports on problems reported by the MFT.
- (4) ECOM Director of Maintenance Equipment Improvement Recommendation (EIR) submitted by the MFT to the NMP for action.
- (5) Department of the Army EIR submitted by the user organization.
- (6) Department of the Army Form 2028 submitted by the user organization.

b. Technical assistance provided by the Materiel Fielding Team shall be within the provisions of AR 700-4, to provide training advice and instruction associated with the installation, operation and maintenance of weapons, equipment and systems. Maintenance and supply assistance will be provided within the framework of established Army supply and maintenance procedures, with the goal of effecting smooth and reliable system performance through system responsiveness. To this end, the Materiel Fielding Team will coordinate the resources of the Army Materiel Command to solve any unusual problems connected with the

fielding, and will act as the user's advocate in transitioning the system to standard supply and maintenance support. (5)

4.5 TECHNICAL DATA Technical data is currently in the process of formulation under a contractual effort. Included in this section will be listings and distribution details for the following data items:

- a. A complete end-item listing by NSN and lin number.
- b. A listing of Integral Components of End Items.
- c. A listing of Basic Issue Items and Additional Authorization List Items.
- d. An outline of policy and provision for Direct Exchange (DX).
- e. Maintenance float factors, quantities, and locations.
- f. Plans for removal of end-items, parts and related equipment no longer required by the gaining command because of new materiel deployment.
- g. Special requirements for evacuation of unserviceable equipment or components.
- h. A list of technical data publications such as TMs, Supply Manuals, LOs, Special Purpose Computer Programs, and Inspection Procedures.

4.7 TRANSPORTATION Specific details of transportation will be incorporated into this plan upon completion of classification status and distribution pattern requirements. As a minimum, these requirements will include: (14:71-83)

- a. A plan for marshalling repair parts at Sacramento Army Depot or other designated location, so that they may be segregated and packed separately according to organizational destination.
- b. A plan for designating specific transportation modes for

each end item and each parts package to a final marshalling location such as Bayonne Military Ocean Terminal or other designated location.

c. A plan for consolidating these items at the marshalling location as much as possible into CONEXs, MILVANs, or other containers, size and weight permitting.

d. A method of distinctively marking each item to be shipped so that each may be located easily in storage locations.

e. Designation of a responsible individual for each shipment segment. This individual will maintain bill of lading and other data for tracing and monitoring the status of shipments during each segment. Names, locations and phone numbers of these individuals will be listed here in the final plan.

f. Designation of a depot or other support unit at USAREUR to receive each shipment, and assist in a final operational checkout prior to issue to the receiving unit. This operational checkout will be made under the direction and supervision of the Materiel Fielding Team leader or his representative, assisted by personnel from the designated USAREUR depot or support facility, and by personnel of the gaining unit.

4.8 PERSONNEL AND TRAINING (12:18-19)

a. MTOE, TOE, MTDA, and TDA requirements and status will be summarized here.

b. Firm qualitative and quantitative personnel requirements cannot be determined at this time. When available, this information will be included in this section. It is expected, however, that the introduction of Radar Set AN/TPQ-36 as a replacement for the AN/MPQ-4A will

not require revisions or additions to the existing MOS structure. One person is required for operation of the set. Emplacement and displacement time versus manpower will be evaluated during DT/OT II. Final MOS decisions will be made by the Department of the Army Office of Personnel Operations (DAOPO) after coordinated submission of formal studies.

c. Expected and tentative MOS requirements are:

(1) Operator: MOS 17B, Counterbattery/Countermortar Radar Crewman.

(2) Organizational Maintenance: MOS 26B20, Weapon Support Radar Maintenance Repairman.

(3) Direct Support Maintenance through Depot Maintenance: MOS 26B, Weapon Support Radar Maintenance Repairman.

b. Training Courses: Formal contractor training courses are anticipated to provide initial key personnel training.

c. New Materiel Introduction (NMI) will be accomplished through distribution of an NMI letter 180 days prior to equipment issue to troops. NMI briefing teams will be considered at a later date for inclusion in this plan. It is expected that close cooperation and liaison between the MMT and gaining commands may preclude the need for NMI briefing teams.

d. A NET team will be available to the gaining unit concurrent with the deployment of equipment.

4.9 FACILITIES (12:18)

Plans for facilities such as mobile and/or fixed facilities, required for maintenance and/or supply will be included when determined.

4.10 SAMPLE DATA COLLECTION (11:44)

a. SDC is a method for selective reporting on specific equipment designed to compile precise maintenance and performance data for effective maintenance management purposes.

b. The objectives of the SDC as outlined in AR 750-37 are:

(1) To reduce the volume of maintenance management data to a level consistent with the Army's resources to manage it.

(2) To provide a means for collecting, under controlled conditions, valid data required to assess the performance effectiveness of Army materiel.

(3) To improve the quality, accuracy, and timely submission of data used in product improvements and performance assessments.

(4) To evaluate the adequacy of supply and maintenance support.

(5) To reduce the administrative processes at data processing installations at all levels.

c. SDC is presently planned for submission by the using activities who will be notified in accordance with AR 750-37. Details of the SDC plan and updates will be reflected in subsequent draft and final versions of this plan.

SECTION V

THE ARMY MATERIEL COMMAND COMMITMENTS TO THE FIELDDED SYSTEM

a. This section will discuss the commitments to be made to the gaining unit with respect to the logistic support and services which the Army Materiel Command will provide during the period of new item training and initial use by the recipient. The specific terms, conditions and period will be specified herein as well as the specific arrangements planned to implement and administer the commitment.

b. The terms and conditions listed herein will be in part, a summary of responsibilities of the MFT, but will be augmented by specific agreements with regard to initial funding, and interface problems. The agreement will specify the terms and conditions for eventual termination of fielding operations and a joint sign-off to acknowledge the success of the fielding operation.

c. Since this section is in effect, an agreement between AMC and the user, it should be arrived at as a result of a dialogue between the Materiel Fielding Team and the user where the Materiel Fielding Outline Plan and the Materiel Fielding Draft Plan are compared with the user's Mission Support Plan. This dialogue should solve the AMC/user interface problems in a mutually satisfactory way, resulting in an agreement or Statement of Quality and Support and the procedures for honoring AMC's commitment.

d. This document serves as a starting point for development of this agreement which will be tentatively formalized in the Draft Materiel

Fielding Plan, and which will formally address the AMC commitment for these periods:

- (1) Deprocessing.
- (2) New Equipment Training.
- (3) Transition Support and Technical Assistance.

SECTION VI.

SUMMARY

The final draft of this plan, in addition to a summary of the elements and philosophy of this plan, will highlight any significant issues to be resolved before, during, or after fielding.

SECTION VII

APPENDICES

This section will generally describe what is contained within the appendices affixed to the Materiel Fielding Plan and provide an appropriate table of contents. Appendices should be used for specific documents which serve to authorize, justify, clarify or prove significant decisions, issues, or problems raised within the Materiel Fielding Plan. It should also be used to document plans or agreements reached with respect to logistics support matters discussed in the Materiel Fielding Plan.

SECTION 6

SUMMARY

The HANDOFF Philosophy

Implementation of Materiel Fielding of Army systems has been described by General John R Deane, Jr., Commander, AMC, (7:1) as having the primary goal of user satisfaction, and the recognition by the user that AMC is an aggressive "can-do" outfit that puts the soldier first in its priorities. General Deane has further stated that AMC should reach the point where its responsiveness becomes a byword to the field soldiers, and that an effective initial fielding operation is the first step in attaining these goals.

This is the spirit and philosophy inherent in the Materiel Fielding Plan and operation, and should be the underlying philosophy that produces the final fielding concept and plan.

It should be noted that the fielding operation is meant to provide special considerations and procedures to accomodate a new system during its break-in period and to provide for aggressive AMC advocacy of the user in order to solve his problems during this period. It should be remembered, however, that the final goal of the fielding operation is to make the standard Army logistics system work, and not to devise a special system for new equipment. The materiel fielder should, therefore, guide his planning by the object of working within the standard organization of supply and maintenance, not in opposition to it. Certainly, problems will develop that may require special expeditious action to secure

unusual supply assistance or equipment modifications or technical assistance, but the materiel fielder should solve these by a program of aggressive coordination and expedition rather than a process of system subversion.

In developing a Materiel Fielding Plan, the project office will be tempted to simply re-write section VI of the development plan, and exhibit it as a final Materiel Fielding Plan. At the initial stages of the development cycle, the two plans will be similar, but as the user and the Materiel Fielding team members become more closely involved in planning for IOC, the document will grow in usefulness. The key to this evolution is user involvement. The resulting plan should be as much a product of the user's efforts as that of the materiel fielder.

Evolution of the Materiel Fielding Plan

An approach to evolving a final Materiel Fielding Plan is suggested here:

1. The program office should prepare an Outline Materiel Fielding Plan prior to the production decision point, no later than 24 months prior to IOC. This plan should incorporate all applicable portions of section VI of the Development Plan, and should provide an outline of issues to be resolved and planning to be accomplished by the Materiel Fielding team prior to issuance of a draft plan.
2. The Materiel Fielding Team should be appointed as soon as possible following issuance of the draft plan. User representation on the team should be incorporated as early as possible.
3. The Materiel Fielding Team should complete the Draft Materiel Fielding Plan no later than twelve months prior to IOC. This plan should be as complete as possible in final detail. The draft plan should be

disseminated widely for comment and concurrence.

4. The final plan and final signing of the AMC Commitment to User Satisfaction, should be accomplished no later than 8 months prior to IOC.

The planning process is, therefore, an evolutionary one and is dependent for success on a constant user-fielder working relationship, and a constant awareness of the spirit of this planning process, that of user satisfaction, resulting from AMC's commitment to successful equipment transition.

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