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January 1987

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# Equipment Evaluation Program for U.S. Army Installation Directorates of Engineering and Housing

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Army installation Directorates of Engineering and Housing (DEHs) are responsible for, among other tasks, maintenance management. This function includes the procurement of equipment and other materials that support the maintenance program. The DEH is always looking for new equipment, methods, and concepts that could reduce costs and increase productivity. However, at present, there is no systematic procedure for evaluating these items prior to purchase. Selection of an item often is by trial and error or through reliance on the manufacturer's product literature. Because items usually are purchased on such a wide scale—both in terms of numbers and cost—the Army needs to consider a structured approach for evaluating them before spending money on something that may not work. A coordinated assessment program would afford DEHs the opportunity to "try before you buy."

In 1977, the U.S. Air Force (USAF) implemented such a program, called the "Maintenance and Equipment Evaluation Program (MEEP)." MEEP allows the on-base testing of vehicles, concepts, procedures, and shop equipment at no cost to the Government. USA-CERL has analyzed the USAF MEEP to determine its feasibility for implementation in the Army. Based on its documented success within USAF and its cost avoidance savings, a program similar to MEEP is proposed for the Army, and a prototype structure is suggested.

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In 1977, the U.S. Air Force (USAF) implemented such a program, called the "Maintenance and Equipment Evaluation Program (MEEP)." MEEP allows the on-base testing of vehicles, concepts, procedures, and shop equipment at no cost to the Government. An item to be tested is simply substituted for a similar item which has been approved for USAF use, so that no additional personnel need to be hired. The program is mutually beneficial between USAF and industry, in that it allows manufacturers a single access point for introducing new products and gives the USAF a chance to see the item in action under actual working conditions.

The U.S. Army Construction Engineering Research Laboratory has analyzed the USAF MEEP to determine its feasibility for implementation in the Army. Based on its documented success within USAF and its cost avoidance savings, a program similar to MEEP is proposed for the Army, and a prototype structure is suggested.

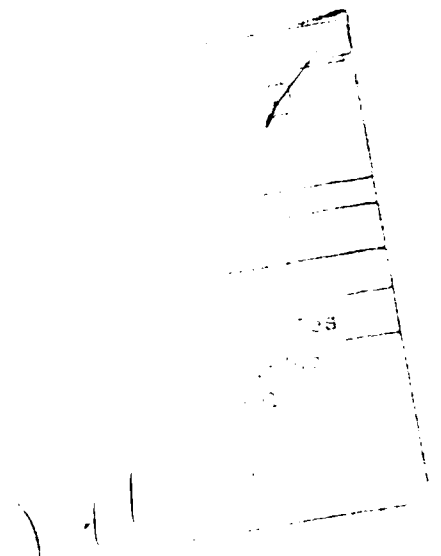
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## FOREWORD

This investigation was performed for the Assistant Chief of Engineers, Headquarters, U. S. Army Corps of Engineers (HQUSACE) under Intra-Army Order (IAO) E8786L104, "DEH Equipment Evaluation Study." The HQUSACE Technical Monitor was Walter Seip, DAEN-ZCF-B.

The work was conducted by the Facility Systems Division (FS) of the U.S. Army Construction Engineering Research Laboratory (USA-CERL). E. A. Lotz is Chief, FS.

COL Norman C. Hintz is Commander and Director of USA-CERL, and Dr. L. R. Shaffer is Technical Director.



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# EQUIPMENT EVALUATION PROGRAM FOR U.S. ARMY INSTALLATION DIRECTORATES OF ENGINEERING AND HOUSING

## 1 INTRODUCTION

### Background

A primary function of Army installation Directorates of Engineering and Housing (DEHs) is materiel management. Included in this task is the acquisition of equipment and other materials supporting the real property maintenance activities (RPMA) mission. Two conditions make it necessary to continually upgrade procedures and equipment: (1) an installation's mission may change over time and (2) new technologies with potential for facilitating the Army's goals are emerging constantly.

At present, the installation DEH has no systematic procedure for evaluating products prior to procurement. For lack of other available information, the DEH usually has to rely on manufacturers' literature in making choices--a practice which often is not cost-effective. The Army needs to consider a coordinated program for assessing these materials on a consistent basis.

The U.S. Air Force (USAF) has developed such a program--called the "Maintenance and Equipment Evaluation Program (MEEP)"--to evaluate vehicles, accessories, new concepts, procedures, and shop equipment.<sup>1</sup> USAF personnel can identify a potentially useful item, or manufacturers can submit their products for consideration. If an item appears promising, an in-bailment agreement is executed with the manufacturer to allow the USAF to test it. The product is used under actual working conditions at the USAF installation, so that no additional personnel must be hired. Thus, the cost to the Government is minimal. Craft workers document their experience with the product and, if it has been successful, these results are used as justification for procurement.

The MEEP is coordinated by designated USAF organizations that maintain an information base on all products, materials, and methods tested in the field. This system avoids duplicate testing, which lowers the program's cost even more.

USAF estimates it has saved \$29 million over 5 years using MEEP. The greatest tangible savings is attributed to the concept of "try before you buy" on which MEEP is based. All evaluation results are distributed among USAF installations.

The Army could benefit from adopting a program similar to MEEP. However, the installation DEH involves a larger, more varied program than that of the the USAF Base Civil Engineer. Thus, acceptance or rejection of a proposal by the USAF may not always apply in the case of the Army; that is, the two missions have different needs in terms of supporting equipment, concept implementation, and standard operating procedures. Because of these differences, the Army needs its own evaluation program. Nevertheless, careful monitoring of the USAF MEEP would be important to avoid duplication of effort.

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<sup>1</sup>Air Force Regulation 77-5, *Management and Equipment Evaluation Program (MEEP)* (U.S. Air Force, 5 August 1977).

The U.S. Army Construction Engineering Research Laboratory (USA-CERL) was asked to investigate the USAF MEEP to find if such a program would benefit the Army and, if so, whether it could be adapted to the Army's particular needs.

### **Objective**

The objective of this work is to analyze the USAF MEEP to determine its feasibility for use by the Army and its application to the RPMA mission of installation DEHs. If this program is found to offer potential benefits to the Army, a secondary objective is to develop a prototype program based on the Army structure.

### **Approach**

USA-CERL studied the USAF documentation on MEEP and interviewed USAF personnel directly involved in the program's coordination. A prototype program structure and procedures for implementation in the Army were then developed.

### **Scope**

This study is limited to equipment evaluation of commercially available equipment for the installation DEH. No recommendations are given for Directorate of Logistics (DOL) organizations or other organizations involved in base operations. Tactical item requirements were not considered.

### **Mode of Technology Transfer**

The results of this study will be used to establish a MEEP-type program within the Army. Technology transfer will be through Department of the Army guidance once the program is accepted for implementation.

## **2 DESCRIPTION OF MEEP**

Figure 1 summarizes MEEP. A detailed flowchart of the program's operation is in Appendix A.

### **Program Objective**

The objective of the USAF MEEP is to evaluate, under field conditions, potentially more effective, economical practices, techniques, plans, tools, vehicles, and equipment. The program serves as a central point of contact for presenting USAF with industry products or practices related to transportation and Civil Engineering equipment.

### **Program Scope**

MEEP is primarily concerned with Base Civil Engineering equipment and is supported through unit- and support-level maintenance shops located across the United States. Major Commands (MAJCOMs), in conjunction with Headquarters, USAF (HQ USAF) and the Air Force Logistics Command (AFLC), designate bases to operate as permanent evaluating activities for each program area. The participating bases provide personnel to conduct the evaluations.

### **Functions**

MEEP serves two types of management projects: maintenance and tools/equipment. Maintenance management projects involve the complete range of functions, including:

1. Facility layout
2. Equipment criteria
3. Inspection requirements and quality control provisions
4. Cost controls
5. Personnel testing and training
6. Repair and replacement criteria
7. Shop supply procedures
8. Calibration, certification, and repair of special equipment
9. Serviceability standards
10. Time schedules
11. Production control systems
12. Operational records

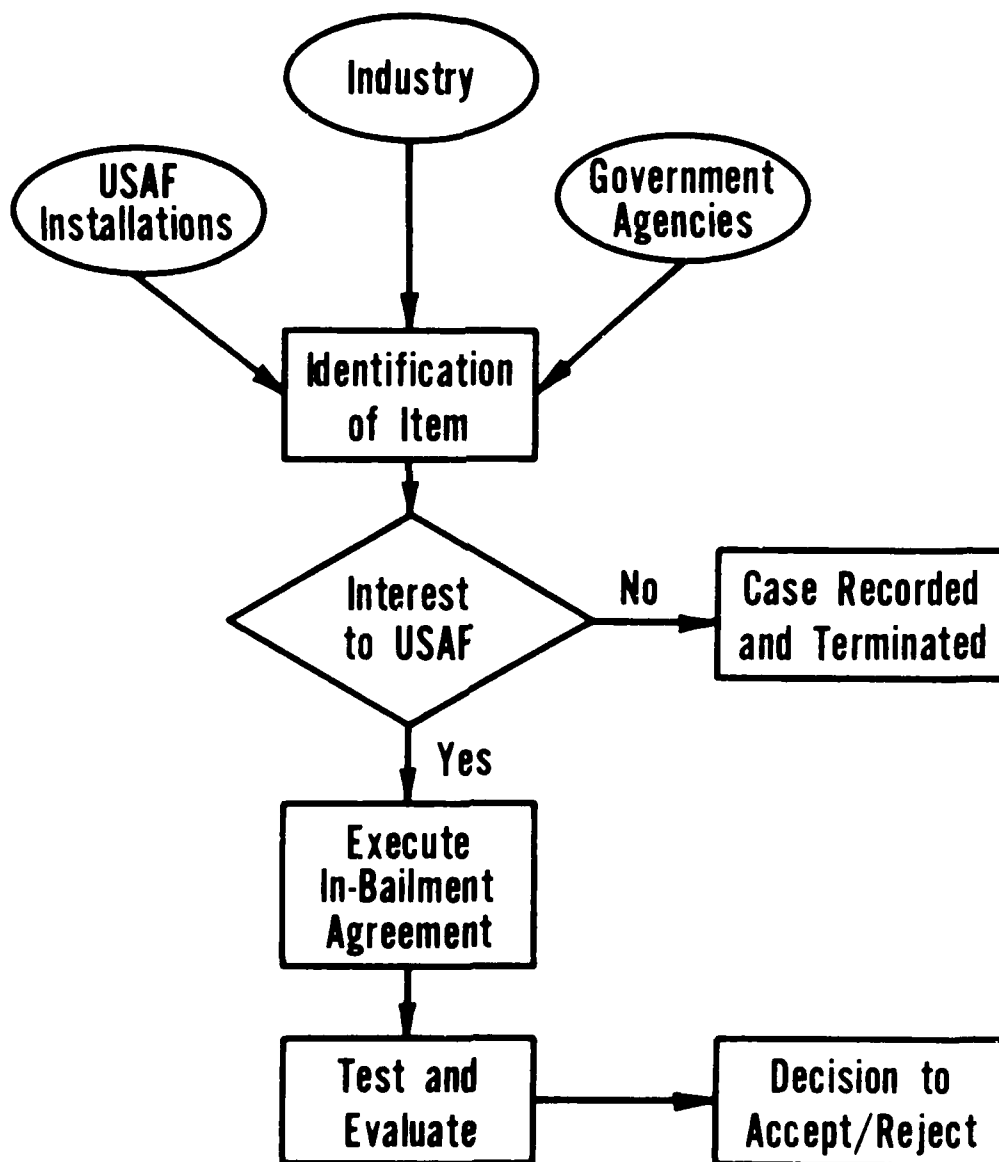


Figure 1. Air Force MEEP process.

13. Utilization controls and reporting
14. Preservation and storage techniques and procedures
15. Standardization, reliability, and maintainability of equipment
16. Reduction of manhour requirements.

Tools and equipment management involves items ranging from the simplest hand tool to the most complex equipment item.

The item to be tested may be a newly developed commercial product being considered for introduction into the USAF inventory. Or, an item already in the inventory may be field-tested to seek additional applications or to modify it for another specific application.

### **Coordinators' Responsibilities**

Several offices have a role in coordinating MEEP, each with different responsibilities. Those involved are: HQ USAF, AFLC, the MEEP Agency (Robins Air Force Logistics Center [WR-ALC], GA), designated commands--Strategic Air Command (SAC), Tactical Air Command (TAC), Air Training Command (ATC), and Air Defense Command (ADC), designated evaluating activities, action agencies, and industry. Their responsibilities are described below.

#### *HQ USAF*

This office:

1. Prescribes program policies
2. Reviews the program
3. Reviews proposed policy directives.

#### *AFLC*

AFLC's functions include:

1. Maintain program surveillance and provide command assistance
2. Maintain liaison with other military and Governmental agencies
3. Correlate results of program projects and fund projects for which justification is provided
4. Designate an AFLC central point of contact for resolving problems.

#### *MEEP Agency at WR-ALC*

This agency:

1. Serves as the central coordination point for MEEP projects

2. Organizes, plans, implements, and monitors all actions
3. Assigns projects, general objectives and policies, and guidance for achieving the objectives of MEEP
4. Insures that all action by assigned personnel is essential and represents the most effective way to achieve program objectives
5. Recognizes the need for and recommends programs, organizational, and procedural changes to more effectively complete section functions
6. Before submitting an item to evaluating activities, reviews MEEP project directives established in operating commands specifically in support of MEEP to insure compliance with program policies and accomplishment of objectives
7. Approves plan of action proposed by MEEP equipment specialist for implementing project results
8. Insures that the plan is within Air Force policy and is the most effective way of achieving desired goals
9. Correlates objectives and results of all projects under MEEP to insure a unified effort
10. Prevents duplication of effort in MEEP as well as in functions assigned to the other USAF organizations
11. Insures that data developed by other military services are used to the fullest extent in order to concentrate USAF resources on problems for which no acceptable solutions have been developed
12. Issues official in-bailment agreements with industry under no cost or obligation to the USAF
13. Determines necessity for MEEP conferences
14. Furnishes guidance to other MEEP functions in arranging and conducting conferences (decisions and commitments made by the incumbent with respect to MEEP are binding and commit WR-ALC, AFLC, and HQ USAF to specific courses of action)
15. Holds responsibility for internal operation of MEEP and for the total success and effectiveness of the program Air Force-wide
16. Develops and issues reporting instructions to MAJCOMs
17. Insures timely preparation of all required reports
18. Obtains any equipment or material needed to evaluate proposed items
19. Visits evaluating activities and centers that conduct research, development, and operational testing to discuss and coordinate the test program and related matters
20. Selects and recommends personnel for training courses

21. Maintains membership in and attends meetings of numerous industry organizations and other Government agencies

22. Completes project work as time permits

23. Issues and then sends official closing notices to all agencies involved in evaluation

24. Summarizes results of evaluation for the product's manufacturer.

*Designated MAJCOMs*

These offices:

1. Select, in conjunction with the AFLC monitoring agency, the activities to conduct evaluation projects

2. Insure that evaluating activities are staffed adequately with qualified personnel

3. Insure that test shops have the authorized equipment

4. Review projects

5. Submit requests for MAJCOM projects

6. Establish MAJCOM position on completed project reports

7. Take greatest possible advantage of the evaluating activity for MAJCOM-wide maintenance improvement

8. Insures that maximum stability of duty assignment is maintained for key military personnel to insure program continuity.

*Designated Evaluating Activities:*

An evaluating activity:

1. Receives all assignments or approval for MEEP projects from the MAJCOM in charge

2. Supports and participates actively in evaluation projects

3. Provides qualified personnel, facilities, and authorized equipment to conduct the tests

4. Initiates and tests ideas, techniques, methods, procedures, systems, and equipment designed to improve mission performance

5. Conducts projects at several locations to determine environmental and operational requirements

6. Evaluates and decides what types of equipment, material, and services are needed to support project assignments (develops liaison with other evaluating activities if projects seem to overlap)

7. Prepares budget for purchase of local items, TDY, and services needed to support project assignments

8. Maintains liaison with commercial engineering and manufacturing industries

9. Conducts continuous evaluation of the MAJCOM and base operations and maintenance (O&M) programs to identify any problems that could be solved under MEEP.

#### *Action Agency*

This office:

1. Implements actions recommended by the MEEP Agency for approved projects
2. Makes necessary changes to tables of allowances (TAs), procurement specifications, or technical orders for approved projects
3. Assigns a national stock number to approved items.

#### *Industry*

Companies that agree to participate in MEEP must:

1. Provide USAF with the proposed item at no cost or obligation to the Government
2. Deliver the item to the MEEP Agency (WR-ALC) or to the designated evaluating activity (more common) within 15 days after manufacturer's acceptance date
3. Advise the MEEP Agency when the item is shipped and the approximate in-place date
4. Pay for shipping or delivery of item to designated activity
5. Furnish shipping instructions for the in-bailed material to the WR-ALC 10 days before the in-bailed period expires
6. Agree to indemnify the Government with respect to claims for any damages or injuries incurred by the manufacturer or its employees
7. Understand that the Government is not responsible, in any event, for damage, destruction, and undue wear or tear resulting from or incident to testing of the item
8. Agree not to use information contained in WR-ALC's report for advertising or sales purposes. The fact that the Government has selected a product for testing does not imply endorsement.

#### **Procedures**

MEEP projects emanate from HQ USAF, AFLC, MAJCOMs, MEEP activities, bases, item managers (IMs), system managers (SMs), service engineers, material services

divisions, the Air Force Engineering Service Center (AFESC), and industry. The three most common ways to begin a MEEP project are:

1. HQ USAF or AFLC considers it important to conduct a MEEP project to evaluate a specific item. In this case, the MEEP Agency, upon receiving a proposal, invites manufacturers to participate in an evaluation. If manufacturers respond positively and provide all information requested, the MEEP Agency will send a proposed project directive to evaluating activity(s) through the MAJCOM that has agreed to conduct the evaluation.

2. Any installation may review information about an item (on TV, radio, exhibit, publication, etc.). An activity interested in testing the equipment submits a proposal to the MEEP Agency through the designated MAJCOM in charge. (The proposal must be sent through the designated MAJCOM to prevent duplication; a similar item might have been evaluated before at a different base.) The proposal must:

- o Include a full description of the problem and a proposed way it can be solved
- o Describe the item or procedure to be considered
- o Furnish brochures, drawings, cost data, etc.
- o Describe the expected advantages of the proposal (e.g., concerning safety, energy, manhours, or material).

Upon receipt of the proposal, the MEEP Agency contacts the manufacturers and evaluates the potential benefit of the proposal to USAF. If the project is approved, a project directive is sent to the evaluating activity(s) through the designated MAJCOM.

3. A manufacturer can contact the MEEP Agency and propose that one of its products be evaluated. Manufacturers must submit a proposal to the MEEP Agency that contains detailed information about the item and explains why and how the item will be useful to USAF (if it is a new product or an updated model) or more efficient than a similar one used at present. The MEEP Agency evaluates the proposal. If the offer is approved, a project directive is issued and then forwarded to the designated MAJCOMs that have agreed to evaluate items in this category.

### **Communications**

Communication between industry and the MEEP Agency can begin from either side. The MEEP Agency is responsible for keeping up to date on new equipment introduced into the market; in the process, a potentially useful product may be noticed. If so, the MEEP Agency would be the one to initiate communication.

In most cases, manufacturers contact the MEEP Agency first to propose a product evaluation. Initial communication might be through an office visit, telephone call, or letter. Figure 2 is a flowchart of the MEEP communication pattern.

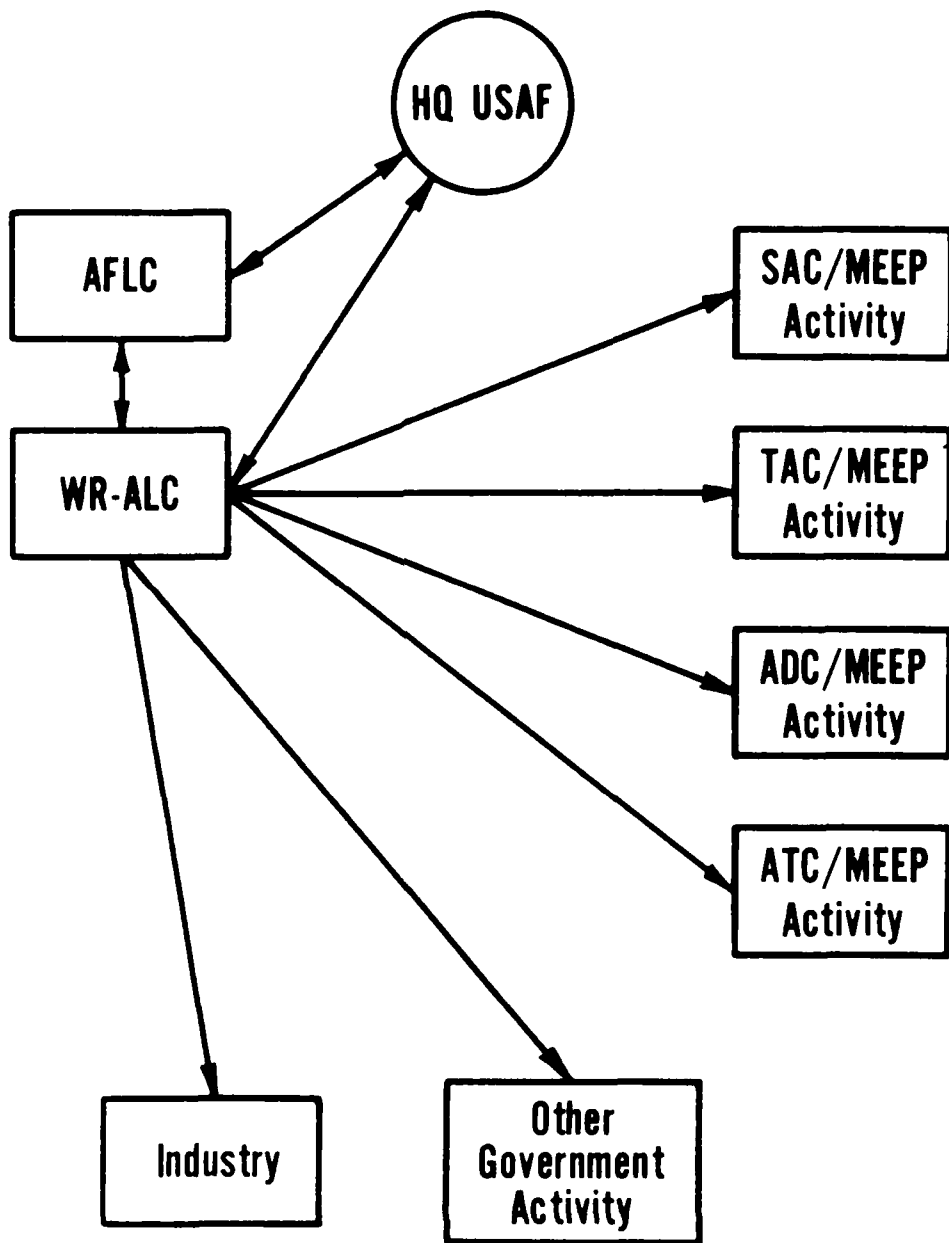


Figure 2. MEEP communication configuration.

## **Evaluation**

The evaluation process can be divided into four phases: groundwork, Phase I, Phase II, and Phase III. The MEEP Agency tracks all projects to insure they move through the phases smoothly without becoming stalled at any point.

### *Groundwork*

After receiving a proposal from a manufacturer, the MEEP Agency initiates a systematic search to fully define the problem and its scope. In some cases, the manufacturer already may have provided this information.

In the next step, the MEEP Agency checks operational requirements to define functions that could be impacted by acceptance of the proposed equipment. Stock lists, project files, and technical data for in-being materials and/or procedures are then researched. Other Government agencies also may be contacted to learn if they are familiar with the proposed item and prevent possible duplication of testing. Results of previous MEEP tests are then cross checked for duplication.

Finally, the MEEP Agency decides whether to initiate the evaluation process. If so, the next step is to propose the project to MEEP evaluating activities (through their MAJCOMs) and encourage them to participate in testing. If there is enough interest among the activities, the MEEP Agency makes the proposed project active.

Next, the MEEP Agency works with the manufacturer to establish an official in-bailment agreement. Appendix B is a sample in-bailment agreement. This document must include:

1. Description of item to be evaluated
2. Service test location
3. Exact address to which item shall be shipped
4. Duration of testing
5. Points of contact for both the MEEP Agency and manufacturer.

The manufacturer must deliver the item within 15 days after accepting the in-bailment agreement.

Next, the MEEP Agency writes and issues the official project directive. This directive is based on the data obtained previously and past experience; it determines what information is required to make a sound recommendation for acceptance or rejection of the item. Appendix C is an example of a project directive.

The directive includes some or all of the following information:

1. Item to be evaluated
2. Description of problem
3. Purpose of evaluation project

4. Work to be done
5. Guidelines
6. Authority for project
7. Priority assigned
8. Project duration
9. Technical publications
10. Technical assistance
11. Special funding instructions
12. Disposition of equipment
13. Project classification
14. Project monitor
15. Reporting requirements.

The MEEP Agency is especially careful to allow the evaluating activities enough latitude to develop their views, yet insure that the project gives useful results.

The project directive, when completed, is forwarded to the evaluating activity through the designated MAJCOM. This system gives the MAJCOM an opportunity to review the directive before the evaluating activity starts the project.

#### *Phase I*

This phase begins when the evaluating activity receives the project directive. Within 10 working days after its receipt, the evaluating activity must submit an acknowledgment using Format VIII (see Appendix D). When a project involves equipment, a copy of the receiving document is included (DD Form 250 or other). If the item has not been received, the DD Form 250 will be submitted immediately upon receipt. The original and one copy are to be sent to the MEEP Agency with one copy forwarded to MAJCOM HQ.

During the evaluation, the item's performance is compared with a similar item currently authorized for the same task. The test item is used to the greatest extent possible so that essential evaluation data can be accumulated for all potential applications.

The project monitor develops an appropriate data recording format. Data are recorded for the item with each use. As a minimum, the daily usage record must identify job(s) completed, any difficulty encountered, and specific remarks pertaining to the item's performance. In addition, evaluators must record the total hours that the item is used, any maintenance and repair costs, separate parts and labor costs, and out-of-commission time.

Manhours, equipment, and materials required for the job using the test item are compared with those of the authorized item. Adequacy of safety features also is determined. If additional safety features are required, they are recommended in detail.

Evaluators must prepare project status reports using Format IX (Appendix E) as of 30 April and 30 October each year to reach the MEEP Agency no later than the 15th of the following month. The original and one copy are to be sent to the MEEP Agency, with one copy sent to the MAJCOM HQ.

During a project evaluation, the MEEP Agency uses follow-up procedures to check the status of each project. In addition to almost daily contact with the evaluating activities, the MEEP Agency prepares status reports, visits the activities, and, when warranted, writes interim project reports. Appendix F contains two examples of status reports prepared by the MEEP Agency for different projects under active evaluation.

When the evaluation phase of a project is completed or terminated, the evaluating activity prepares a document called the "Project Phase I Completion Report." This report is extremely important since all actions to implement project results depend on its findings and recommendations. Format X (Appendix G) is used to prepare the report and should contain the following information:

1. Project title
2. Dates evaluation started and completed
3. Project description
4. Problem, purpose, and equipment to be evaluated
5. Discussion (history of test, guidelines, any proposed modifications, savings in money and/or time, and advantages and/or disadvantages found)
6. Conclusions
7. Recommendations
8. Requirements
9. Remarks.

The evaluator also lists any additional savings realized through comparative analysis of life-cycle costs for equipment, labor, materials, parts, repairs, support equipment requirements, and other relevant factors. For this purpose, Format VI, "MEEP Summary of Cost/Savings," must be prepared and submitted along with the report. Appendix H is a blank copy of Format VI; Appendix I shows an example of a Phase I Completion Report along with a completed Form VI.

Copies of the Project Phase I Completion Report are sent through the designated command to the MAJCOM HQ along with the original, which goes to the MEEP Agency.

#### *Phase II*

This phase begins when the MEEP Agency receives the Project Phase I Completion Report. The manufacturer must furnish return shipping instructions for the test item to

the MEEP Agency 10 days prior to expiration of the in-bailment period. The evaluated item(s) are returned to the manufacturer by either the evaluating activity or the MEEP Agency. Return transportation costs are collect. The manufacturer also has the option of having the item delivered to a company representative at a Government location specified in the in-bailment agreement. Other forms of disposal must be authorized in writing by the manufacturer.

Once the MEEP Agency receives completion reports from all participating activities, it begins a complete analysis and consolidation of results to arrive at a conclusion that can be supported and justified economically. In this phase, the MEEP Agency decides if the item should be adopted. If the answer is no, the project continues to Phase III.

If the decision is to adopt the item, the MEEP Agency submits recommendations to the action agency. The recommendations include the steps necessary to implement the actions.

Action agencies include technical services, engineers, and inventory managers. The action agency obtains a national stock number (NSN) for the item and has the item added to the appropriate table of allowance (TA). The agency then prepares a purchase description or specification through engineering to procure the approved item.

During Phase II, the MEEP Agency continues to follow up on each action and prepares project status reports. Appendix J contains two examples of status reports prepared by the MEEP Agency for projects that have been completed by the evaluation activities but are still under surveillance by the MEEP Agency.

### *Phase III*

This phase begins immediately after the MEEP Agency recommendations are implemented by action agencies or after the item is rejected. In Phase III, the MEEP Agency sends official closing notices to all agencies involved in the evaluation. The Agency also publishes detailed results of each project in status reports which are distributed throughout DOD. The status report indicates if the item was rejected, cataloged, authorized in a TA, and/or was selected to replace an item currently used by the Government. Appendix K shows samples of MEEP Agency status reports.

The manufacturer can request a summary of test results in the in-bailment agreement at the beginning of the project. If the report has been requested, the MEEP Agency sends it during Phase III. A sample summary of results is in Appendix L.

At this point, the MEEP evaluation project ends. Everyone concerned with the item evaluated knows the final outcome--i.e., whether or not it has been adopted. If so, the item will be purchased locally or nationally in the most economical way.

### 3 ECONOMIC BENEFITS TO AIR FORCE

MEEP has been instrumental in helping the USAF reduce the overall cost of purchasing and maintaining vehicles and equipment. MEEP projects saved an estimated \$29 million during the last 5 years.<sup>2</sup> These savings accrued in three categories:

1. Validated savings: the first-year savings that can be validated readily by auditors. There are other benefits downstream, but they are difficult to quantify.
2. Savings to user: savings that were realized during evaluation and documented in project reports.
3. Cost avoidance: savings that resulted from preventing the expenditure of funds. For example, say an IM or command initiated a MEEP project before purchasing a piece of equipment. MEEP evaluated the item under working conditions and found that it was not cost-effective and should not be purchased, thus saving the IM or command money by preventing a poor investment. Because test results are distributed DOD-wide, many other agencies also can save through cost avoidance. It is much more economical for one agency to evaluate an item and find that it does not work or that the Government cannot afford it than for several hundred installations to obtain the item and then discover its shortcomings.

Some major benefits of using MEEP as an evaluation program are that it:

1. Is specifically designed to improve working conditions in the field
2. Offers the mechanic, manager, or anyone experiencing a problem the opportunity to participate in developing a solution
3. Serves as a useful management tool for gathering essential facts about products on which to base a sound decision
4. Provides a positive way to determine the value of an item, system, or procedure to the USAF before any funds and/or manhours are spent for large-scale implementation; in other words, it allows you to "try before you buy"
5. Provides a proven system for expedient processing of test projects through the complete cycle to final USAF adoption and use of acceptable solutions
6. Establishes a system for reporting to all DOD agencies
7. Provides a central point for the exchange of test data among DOD agencies
8. Serves as an organized system for in-bailment of equipment from manufacturers, for test and evaluation at no cost to the Government
9. Provides a central access point for industry to introduce state-of-the-art equipment to USAF
10. Affords mutual benefit to the USAF and industry.

---

*United States Air Force Management and Equipment Evaluation Program (Robins Air Force Base, 1 September 1985).*

Based on USAF's successful experience, it is apparent that a program like MEEP could benefit the Army. The comparatively greater number of facilities maintained within the Army suggests that cost savings could exceed those of the USAF. To serve the Army's needs, a prototype MEEP structure and the steps necessary for implementing it are proposed in Chapter 4.

## 4 MEEP IN THE ARMY

### Organization

The proposed Army MEEP structure uses agencies that are the most closely related to those in the USAF. Figure 3 shows the proposed configuration.

#### *Headquarters, Department of the Army*

Policy covering acquisition, maintenance, and disposal of engineer equipment emanates from OCE. Thus, DAEN-ZCF would provide the DA-level guidance to the program. Responsibilities would be the same as those in Chapter 2 for HQ USAF and AFLC.

#### *Evaluating Activities*

Installation DEHs interested in participating in MEEP would serve as evaluating activities for the various products and be responsible for the tasks listed in Chapter 2 under *Designated Evaluating Activities*; the same organizations would be responsible for initiating the actions described under *Action Agency*. These actions would be completed using the Army's existing system for introducing changes to Table of Distributions and Allowances (TDA), assigning NSNs, and writing procurement specifications for equipment that requires no modification. If an evaluation recommends that an item of equipment be modified, the Army MEEP Agencies (see *MEEP Agencies* below) would write contracts for its modification.

#### *Designated Commands*

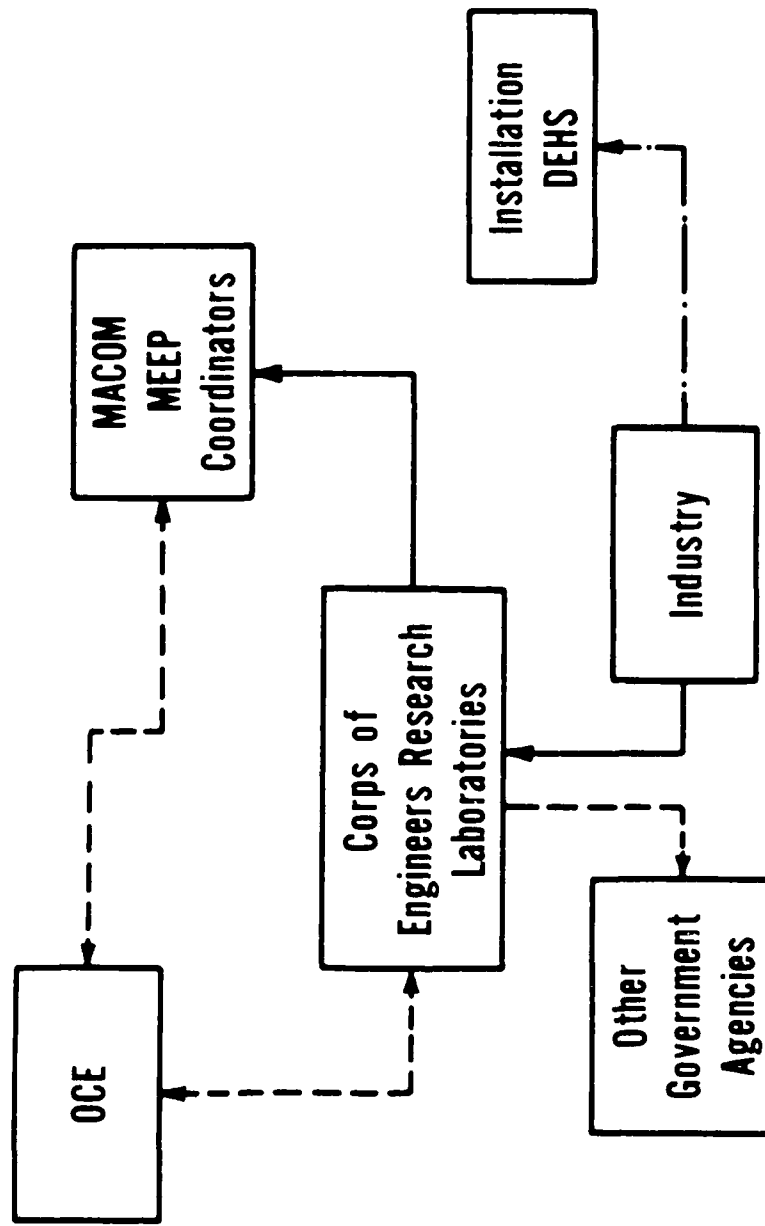
Each Army MACOM would appoint a MEEP Coordinator and would have the same responsibilities as those stated in Chapter 2 under *Designated MAJCOMs*.

#### *MEEP Agencies*

The U.S. Army Construction Engineering Research Laboratory would serve as the MEEP agency and would provide the primary point of contact with industry. The U.S. Army Cold Regions Research and Engineering Laboratory (CRREL) and the U.S. Army Waterways Experiment Station (WES) would become involved whenever their technical expertise is needed. This approach would take advantage of ongoing work at USA-CERL, CRREL, and WES related to facilities engineering. Some work is already in progress at USA-CERL to monitor developments in industry and identify items of possible use to the facilities engineer. USA-CERL would have the same responsibilities as those listed in Chapter 2 under *MEEP Agency at WR-ALC*.

### Implementation

OCE should appoint a MEEP Coordinator to initiate program development. The Coordinator should form a working group representing the MACOMs and the three laboratories to address several operational problem areas. These goals would include (1) development of draft regulations to authorize creation of the program within the Army based on AFR 77-5 and guidance from USAF MEEP Coordinators concerning their experience with the regulation; (2) development of an Army version of the in-bailment agreement; (3) funding; and (4) advertising existence of the program to industry and other



- Information, Reports, and MEEP Approval
- - - Information and Reports Only
- · - Proposed Item

Figure 3. Proposed Army MEEP structure

Government agencies. A good working relationship should be developed between Army and USAF MEEP Coordinators.

The working group should become familiar with the projects approved and disapproved by USAF during the past 3 years to create a good foundation for the Army program. Some of the rejected items may be of interest to the Army since disapproval may have reflected a unique USAF requirement. A process should be developed to insure communication between OCE headquarters and MEEP Coordinators.

#### *Funding*

The Department of the Army should fund USA-CERL to establish MEEP and allow time to perform the various duties. A suggested funding level is \$100K for each of the first 2 years. When expertise is required from WES or CRREL, an Inter Agency Order (DA Form 2544) will be used to transfer appropriate funds. Outyear funding could be projected from the response to the program over the first 2 years.

Since MEEP involves testing new technology, funding should be provided through the Facilities Technology and Applications Testing (FTAT) program.

#### *Field Testing*

Products should be field-tested by installation DEHs at no expense if they will be used to perform the on-going workload. If a more formal field test is indicated, funding may be required. However, it is recommended that no separate funding be provided for field testing during MEEP's first 2 years. Based on USA-CERL's past experience, DEH organizations are willing to test new products if there is a possibility of conserving resources or money.

## 5 CONCLUSIONS AND RECOMMENDATIONS

MEEP has been successful for the USAF and is well supported by industry. It provides a simple, systematic technique for evaluating new equipment and ideas at very little cost and affords an orderly system for industry to introduce new products to the USAF.

The Army could benefit from implementing a MEEP to serve the installation DEHs. The USAF has saved an estimated \$29 million over 5 years from using MEEP. Benefits to the Army can be expected to exceed those realized by the USAF considering the Army's greater number of facilities to be maintained.

The Army could benefit directly by reviewing MEEP projects and proposals already processed. Some items being considered for purchase could be approved or rejected based on USAF MEEP evaluation results without additional Army field tests.

The Army's organizational structure can easily accommodate MEEP without major changes.

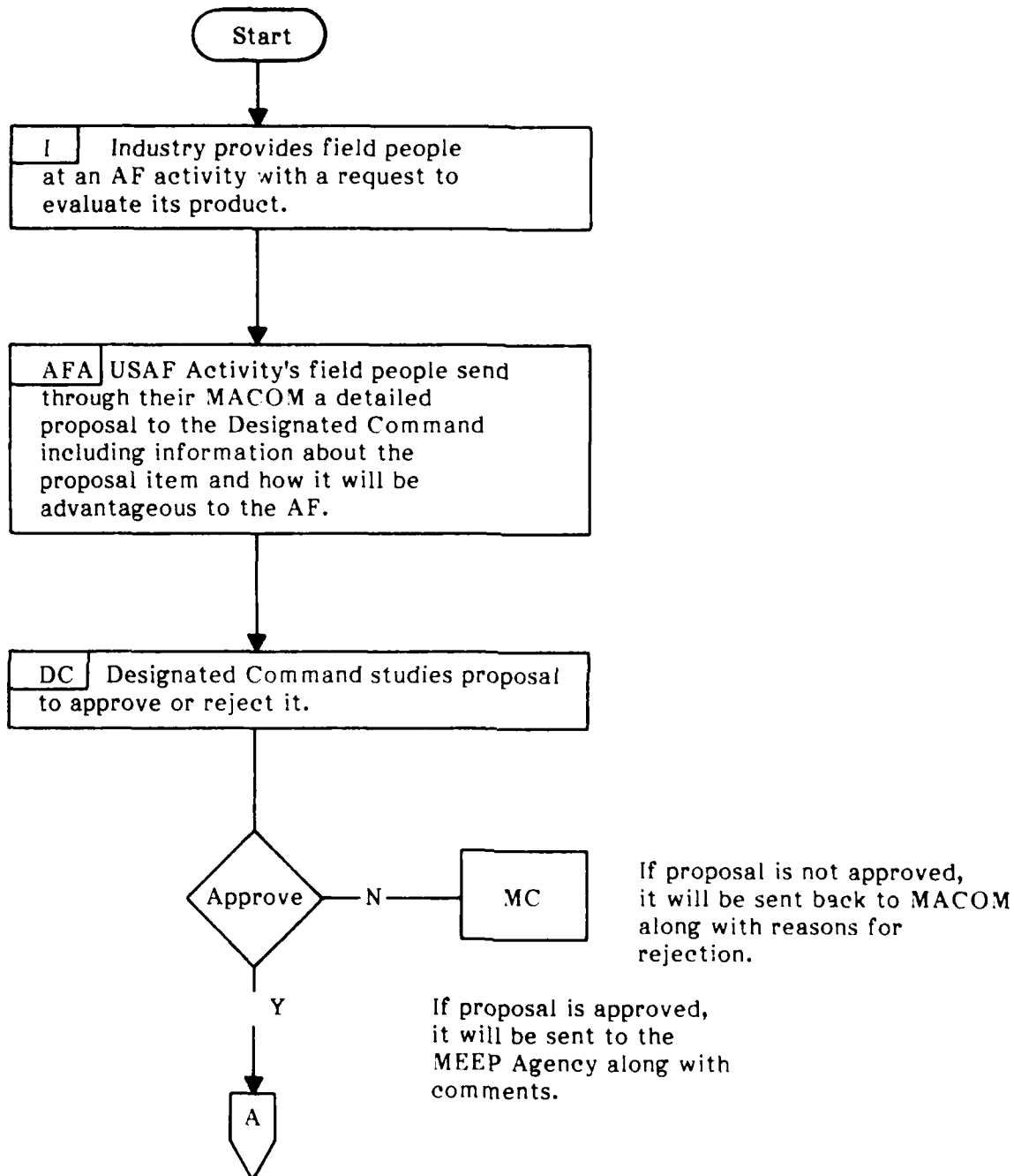
USA-CERL is well suited to serve as the MEEP Agency based on its long-term association with the MACOMs and installation DEHs and its commitment to reduce O&M costs while improving support to the Army.

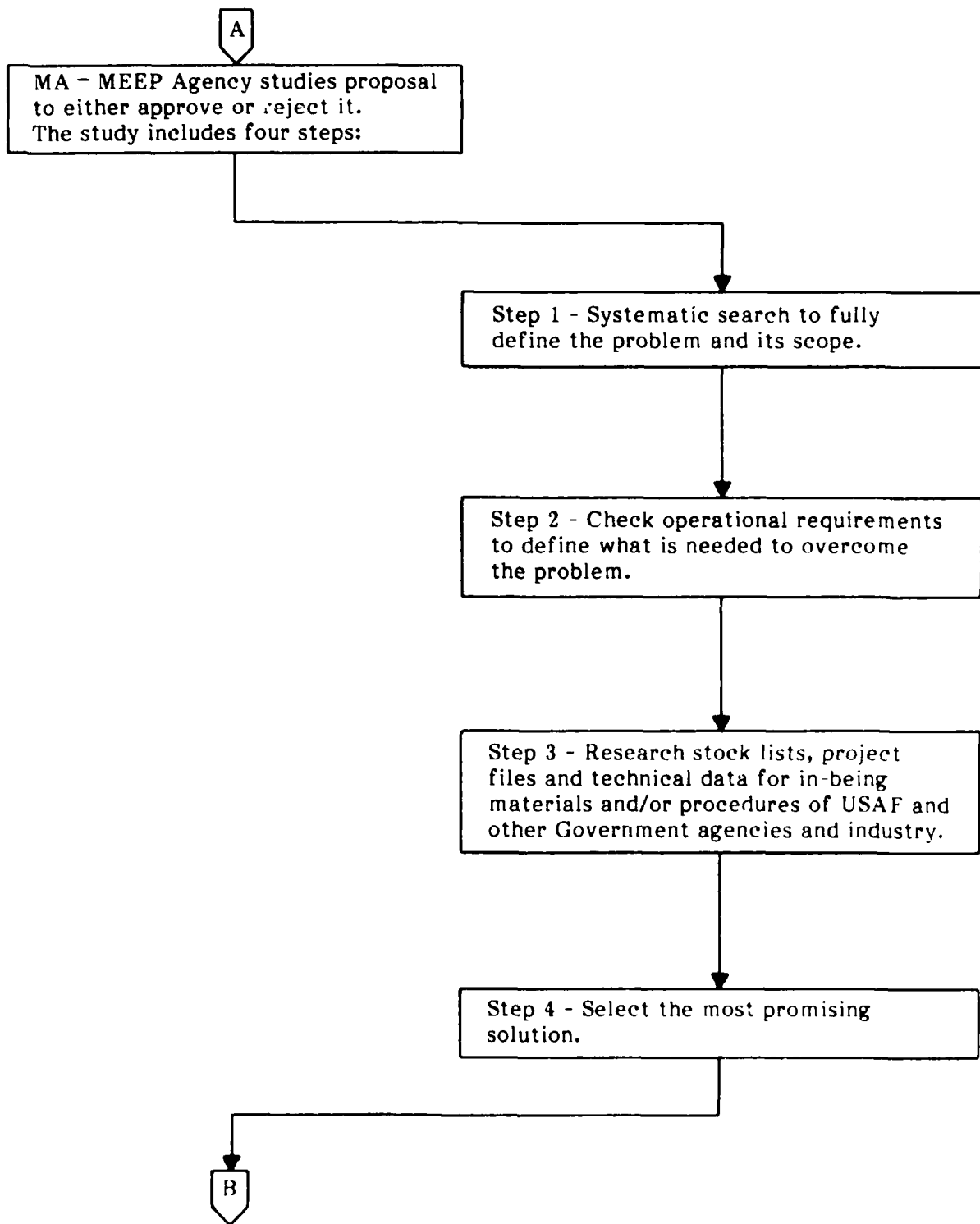
Based on these findings, it is recommended that the proposed MEEP concept for the Army be approved and implemented as soon as possible. USA-CERL should be designated as MEEP Coordinator.

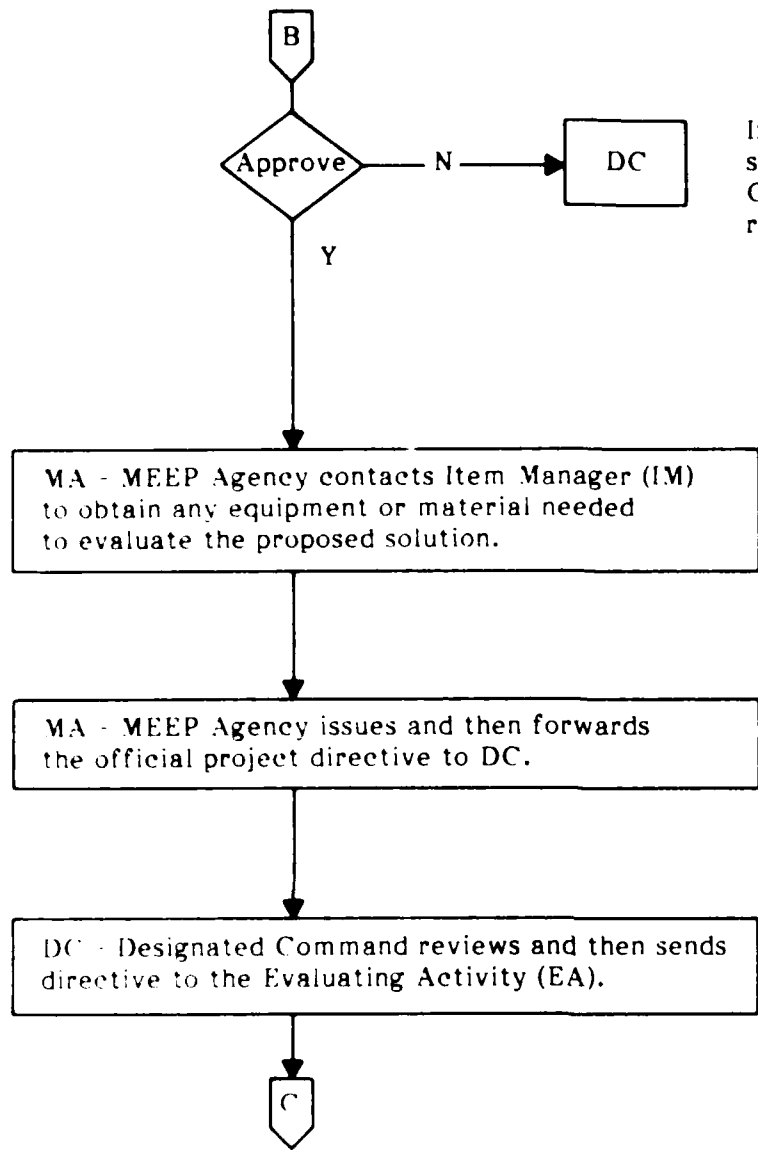
Funding should be provided to the laboratories to support MEEP; proposed starting level is \$100K per year for each of the first 2 years. This level should be adjusted later based on experience and predicted workload.

APPENDIX A:

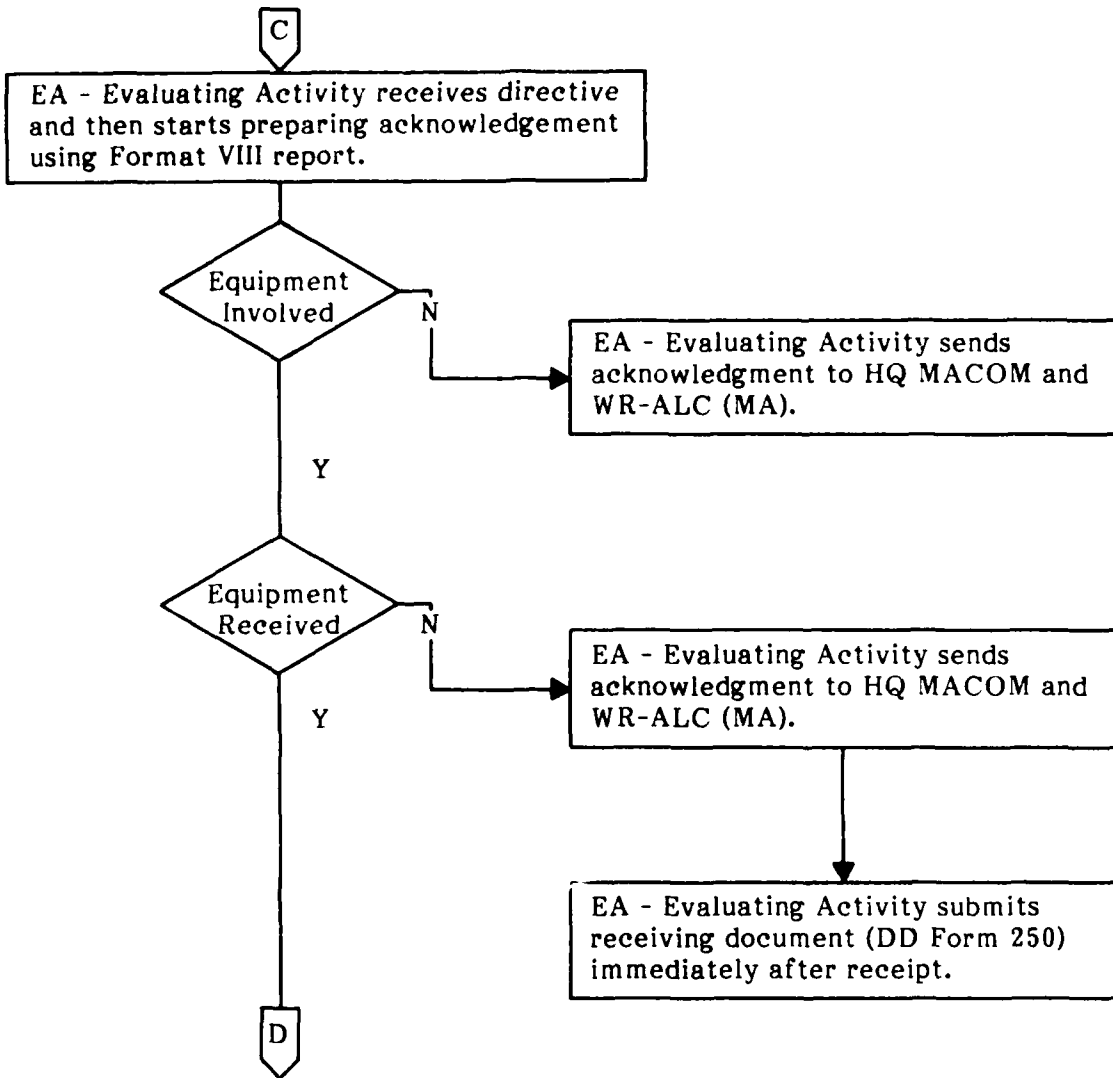
USAF MEEP PROCESS FLOWCHART

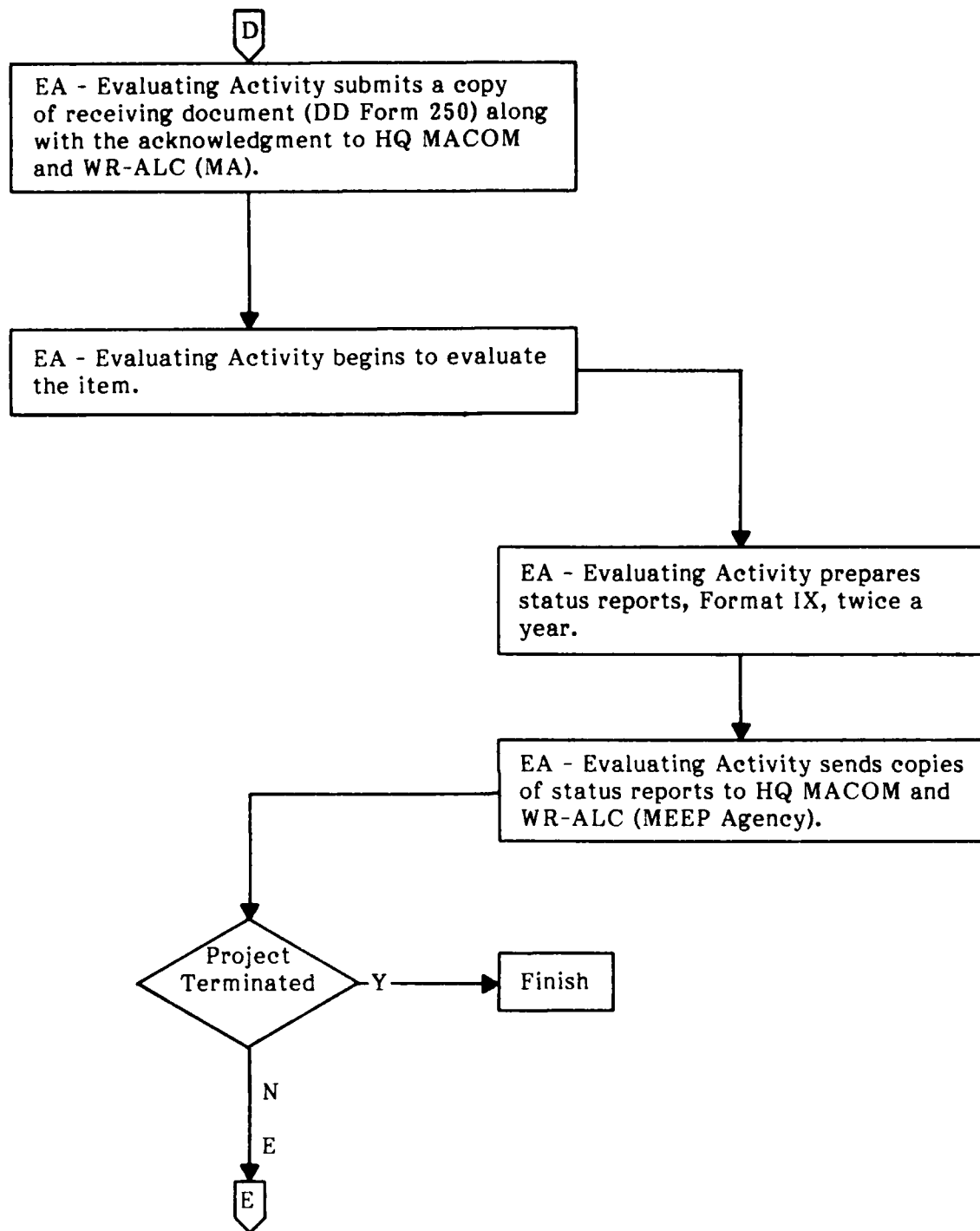


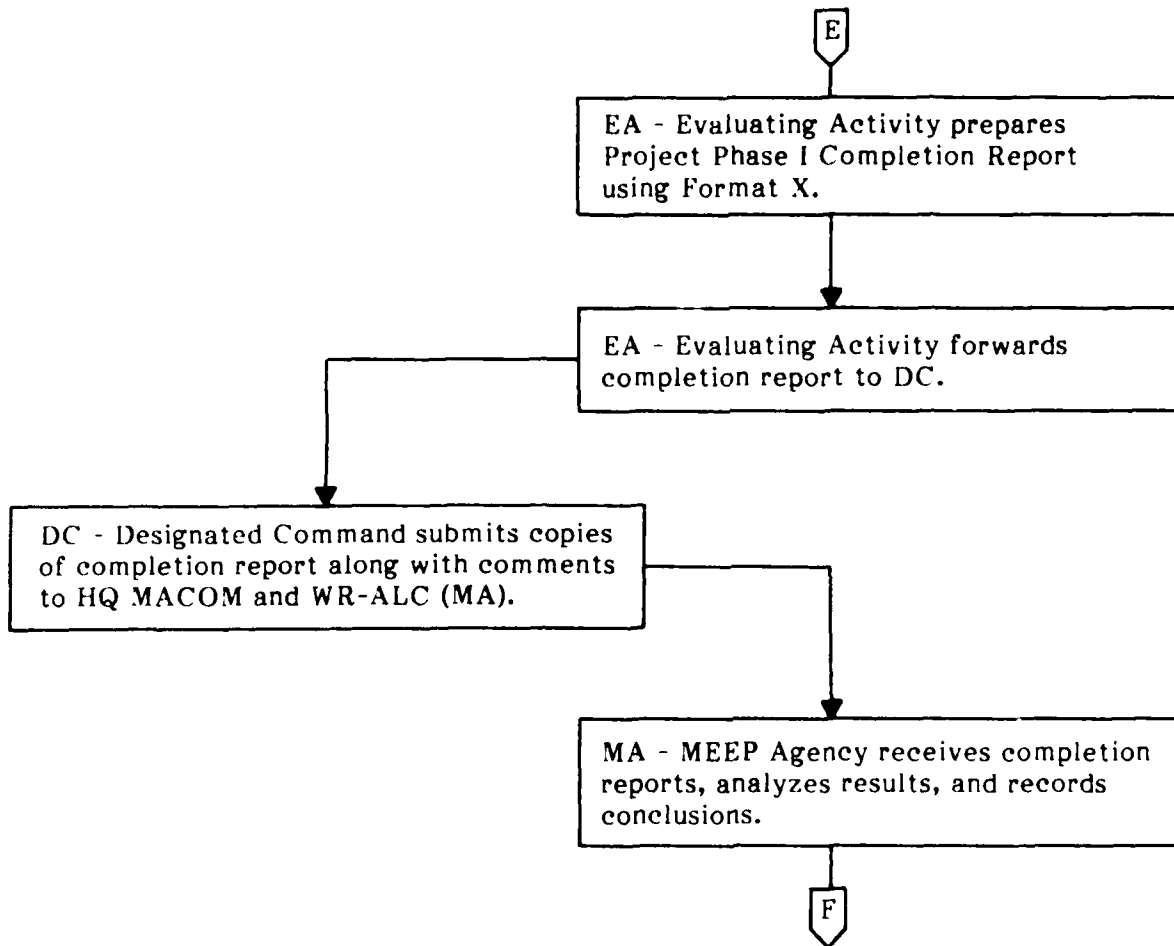


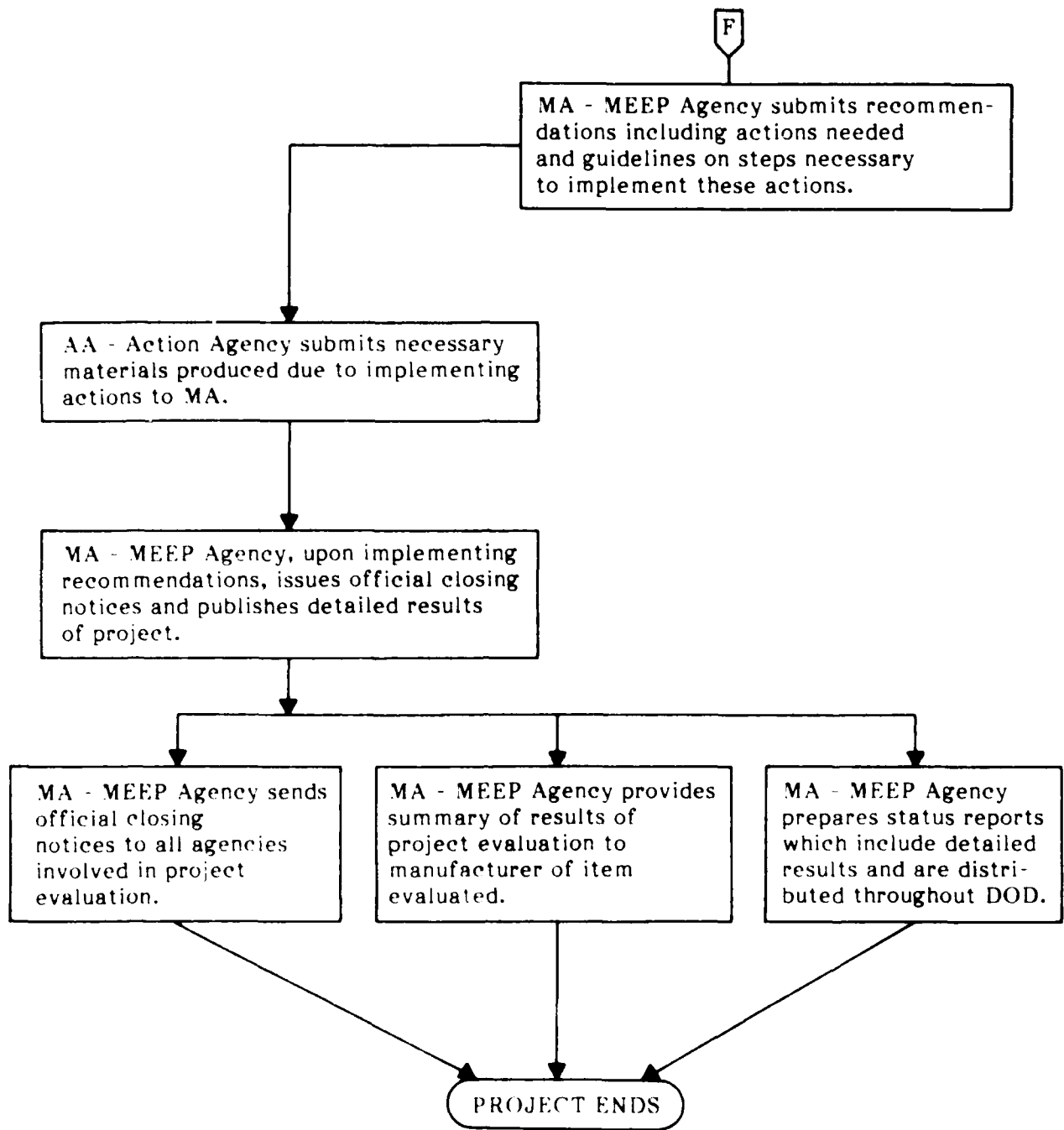


If proposal is not approved, send it back to Designated Command (DC) along with reasons for rejection.









**APPENDIX B:**

**SAMPLE IN-BAILMENT AGREEMENT**

CONTRACT NR F09603-86-H-0941

MEEP PROJECT NR H86-3D

IN-BAILMENT AGREEMENT

Between

UNITED STATES AIR FORCE

(BAILEE)

and

Marmon Transmotive  
3001 Governor John Sevier Highway  
P.O. Box 1511  
Knoxville, TN 37901

(BAILOR)

ADMINISTRATIVE OFFICE: Warner Robins ALC/PMWEC  
Robins AFB, GA 31098

BUYER: JEAN BENNETT/PMWEC/(912) 926-5396, Ext.  
2113

DELIVERY SCHEDULE: Within 15 days after contractor's acceptance time.

DURATION OF PROJECT: Six months

ESTIMATED VALUE: \$90,000.00

AUTHORITY FOR LOAN: AFR 77-5

MANUFACTURER'S REPRESENTATIVE: Mr. Jack W. Kennedy  
(615) 525-6224

CONTRACT NR FO9603-86-H-0941

IN-BAILMENT AGREEMENT

This agreement, Contract NR FO9603-86-H-0941 entered into as of \_\_\_\_\_ by and between the United States of America, hereinafter referred to as the "Government" or "Bailee," represented by the Contracting Officer executing this agreement, and Marmon Transmotive, organized and existing under the laws of the State of \_\_\_\_\_, hereafter referred to as the "Bailor."

WITNESSETH

WHEREAS the Government desired to perform service tests upon the property bailed hereunder; and

WHEREAS the Bailor wishes to bail such property to the Government in accordance with the terms and conditions hereafter set forth; and

WHEREAS the bailment of such property is for the mutual benefit of the parties hereto;

NOW THEREFORE, in consideration of the premises and of the mutual covenants and agreements herein contained and for other good and valuable consideration, the parties hereto agree as follows:

1. Bailer Property: The property bailed hereunder is listed in the attached schedule.

2. Purpose of Bailment: The property bailed hereunder is furnished to the Government for the purpose of performing certain service tests at the Maintenance Evaluation Activities at the locations set forth in the attached schedule.

3. Delivery and Return of Bailed Property:

(a) The bailed property shall be delivered to the Government, transportation costs prepaid, at the Government location designated in the attached Schedule.

(b) The bailed property shall be forwarded to the Bailor by the Government, return transportation costs collect, addressed to the Bailor at the location designated in the attached Schedule, or, at the option of the Bailor, shall be delivered to the Bailor's representative at the Government location specified in the Schedule, or otherwise disposed of as authorized in writing by the Bailor.

4. Costs: The bailment provided hereunder shall be at no cost to the Government and shall not be used as a basis for any claim against the Government, except as may be expressly provided herein.

5. Title: Bailor warrants that he is the owner of the bailed property. Title to such property shall at all times remain in the Bailor during this bailment.

6. Period of Bailment: The bailment provided for hereunder shall commence upon the date of delivery of the bailed property to the Government and shall continue for the

period set forth in the Schedule. Such period may be extended by agreement of the parties. Notwithstanding the foregoing, such bailment period may be terminated or reduced at the option of either party at any time upon fifteen (15) days written notice to the other party, and such period may be further extended by mutual agreement between the parties hereto.

7. Liability for Bailed Property: The liability of the Bailee for damage, loss or destruction of the bailed property shall be that of the Bailee under a mutual benefit bailment as defined by the common law rules of bailment liability, except as such liability is otherwise modified by the terms of this agreement. It is further expressly understood that the Bailee is not responsible, in any event, for damage, destruction, and undue wear or tear resulting from or incident to the testing of such equipment.

8. Responsibility for Personal Injuries and Property Damage: The Bailee shall not be responsible for personal injuries or property damage incurred by the Bailor, its employees or their invitees incident to the bailment or use of the bailed property; and the bailor agrees to indemnify the Bailee with respect to claims for any such damage or injuries.

9. Maintenance: The Bailee will not be responsible for the maintenance or repair of the bailed property during the period of bailment or thereafter. However, it is contemplated that such property will be utilized and maintained with reasonable care.

10. Subsequent Procurement: This bailment and the incidental service tests in no manner obligate the Government to procure the bailed property or items similar thereto, regardless of the success or failure of such tests.

11. Disclosures: The Bailee does not agree to safeguard and is not responsible for disclosures of any information of data embodied in or related to the bailed property, and the Bailor agrees to indemnify the Government against any claims based upon such disclosures.

12. Reports: In consideration for this bailment the Bailee shall, upon request, furnish a report to the Bailor of the results of the service tests performed upon the bailed property. The form and extent of such report shall be as determined by the Contracting Officer. The report, however, will avoid comparison of the bailed item with other commercial competing products. The Bailor agrees that it will not use the information contained in the report provided hereunder for advertising or sales purposes nor will it use for advertising or sales purposes the fact that the Bailee has selected its property for test purposes. Further, nothing in the report shall be construed as an endorsement by the Bailee of the equipment so tested.

13. Manufacturer's Representative:

Manufacturer's Representative required.      / / YES      / / NO

14. General Provisions: The following FAR clauses are incorporated herein by reference with same effect as though set forth in full text.

<u>FAR PARA</u>	<u>CLAUSE TITLE</u>	<u>DATE</u>
52.202-1	Definitions	1984 APR
52.233-1	Disputes	1984 APR
52.203-1	Officials Not to Benefit	1984 APR
52.203-5	Covenant Against Contingent Fees	1984 APR

15. Contractual Contents: This agreement consists of Clauses 1 through 15 inclusive on pages 1 through 4 inclusive and the Schedule attached.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the day and year first above written:

THE UNITED STATES OF AMERICA  
(Bailee)

\_\_\_\_\_  
Contracting Officer

\_\_\_\_\_  
(Bailor)

BY: \_\_\_\_\_  
(Type Name)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Address)

SCHEDULE

1. (See Clause 1) The following property is bailed hereunder:

One each Model 6000 Switchmaster

2. (See Clause 2) The service test location is: F.E. Warren AFB, WY

3. (See Clause 3) The bailed property shall be shipped or delivered by the Bailor to:

90 SMWCES/CE

Attn: Mr. Knutsen

M/F: Contract FO9603-86-H-0941

MEEP Project H86-3D

F.E. Warren AFB, WY 82001

The bailed property shall be returned to the Bailor unless otherwise notified by WR-ALC, Robins AFB, GA 31098-5320.

4. (See Clause 6) The duration of the bailment is 7 months.

## APPENDIX C:

### SAMPLE PROJECT DIRECTIVE

Management and Equipment Evaluation Program Project Directive NR B85-1D (AFR 77-5).

#### HQ TAC/LGTV

1. Equipment to Be Evaluated: Lee-Boy Asphalt Maintainer, manufactured by R. B. Lee, Denver, NC. This is a self-contained unit specially designed for repairing potholes and asphalt overlays. Power for the unit is provided by an air-cooled 65-HP gasoline engine. It is equipped with an adjustable heavy-duty hydraulic tongue that permits easy connection/disconnection from the towing vehicle. A rotary grinder with replaceable carbide bits allows the operator to grind out an area in need of repair. A propane-heated tack distributor with a hose, wand, and nozzle is provided. It is equipped with a propane-heated floating screed paver that telescopes from 38 to 62 in. This feature should simplify road edging. Hydraulic couplings are provided for operation of hydraulic tools, which should eliminate the need for an air compressor at jobsites. Dimensions of the unit are: length (in towing position), 12 ft, width, 8 ft 6 in., height 8 ft, weight approximately 8500 lb.

2. Problem: Currently, several pieces of equipment are required to make some types of asphalt repairs. This requirement is time-consuming and expensive.

3. Purpose: To determine, through field evaluation, if the Lee-Boy Asphalt Maintainer can be used successfully and economically by Civil Engineering Roads and Grounds personnel to repair paved surfaces. The objective is to improve pavement repairs with less equipment.

4. Work to Be Accomplished: The Lee-Boy Asphalt Maintainer will be evaluated by the 56th Civil Engineering Squadron at MacDill AFB, FL. The bailed unit will be used to patch the widest possible range of pavement. Patches will be placed on aircraft runways, taxiways, parking ramps, base streets, and sidewalks. Performance of the bailed unit will be compared with equipment currently authorized for patching. Maximum utilization of the bailed equipment is desired so that essential evaluation data can be accumulated for all potential uses. The project officer will develop an appropriate data-recording format. Data will be recorded for the bailed unit each time it is used. As a minimum, the daily usage record will identify job(s) accomplished, difficulty encountered, and pertinent remarks. The bailed unit will not be operated prior to arrival of the manufacturer's representative. Special instructions will be provided by the manufacturer's representative to the operator and maintenance personnel. After this training, the bailed unit will be operated and serviced by assigned personnel. The Phase I Completion Report will detail advantages/disadvantages of the bailed equipment compared with authorized patching equipment. All facts having a bearing on the project will be reported. A firm recommendation substantiated by evaluation data will be made for adoption or nonadoption of the bailed equipment.

5. Guidelines: To insure successful completion of the project, special emphasis will be placed on the following:

a. Identify by type and NSN the equipment currently used for patching small holes and spalled areas on paved surfaces.

- b. Identify by type and NSN the equipment used compared with the bailed unit.
- c. Compare differences in starting up and operating bailed and authorized pavement patching equipment.
- d. Compare support equipment required to complete patching between bailed and authorized equipment.
- e. Compare quality of patches made by in-bailed versus authorized patching equipment.
- f. Compare quantity and types of material required for cleanup when equipment is shut down.
- g. Compare ease of servicing and maintaining in-bailed and authorized equipment.
- h. Compare methods and time required for processing small amounts of asphalt paving material using bailed and authorized equipment.
- i. Compare manhours, equipment, and materials required for patching surfaces of equal size and type using bailed and authorized equipment.
- j. Determine adequacy of safety features. If additional safety features are required, make detailed recommendations.
- k. Obtain operator comments relative to total operation of bailed unit and authorized equipment.
- l. Record total hours that in-bailed unit is used, maintenance and repair costs, separate parts and labor costs, and time out of commission. Also, record approximate amount of material (in pounds) that was applied using the bailed unit.
- m. List any training necessary to operate and maintain the bailed unit.
- n. Record any information discovered during evaluation that has a bearing on the project.
- o. Based on project findings, make firm recommendations, substantiated by evaluation data, for adoption or nonadoption of the bailed asphalt maintainer.
- p. If adoption is recommended, record savings to be obtained by adoption of your recommendations. Explain your methods of computation. Retail price of the bailed asphalt maintainer is approximately \$26,000.
- q. Recommend which Table(s) of Allowance (TA) the bailed unit should appear in. Also, include your recommended Basis of Issue.
- r. Identify equipment by NSN and TA(s) which you recommend deleting or Basis of Issue reduced as a result of adopting the bailed unit for Air Force use.
- s. Determine adequacy/inadequacy of commercial data furnished with the bailed unit for Air Force use in operating and maintaining the unit.

t. Determine availability of spare parts through COPARS to maintain the bailed unit.

u. Request anticipated base/command buying requirements.

6. Authority for Project: AFR 77-5

7. Priority Assigned: II

8. Duration of Project: Completion date is 17 June 85. Completion report to arrive at WR-ALC no later than 8 July 85.

9. Technical Publications: Manufacturer's literature.

10. Technical Assistance: Will be provided by WR-ALC upon request.

11. Special Funding Instructions: None. Equipment will be bailed for purpose and duration of project.

12. Disposition of Equipment: Request for disposition will be forwarded to WR-ALC/PMWCB with information copy to MEEP.

13. Project Classification: Unclassified. Project may be discussed verbally with company representatives, but no written information will be released and no remarks will be made to obligate the USAF. No information will be released on another manufacturer's product. Advise commercial suppliers of in-bailed item(s) who desire a written evaluation report to address their request to WR-ALC/PMWCB.

14. Project Monitor: D. M. Graham. Alternate: J. F. Cronin, WR-ALC, Robins AFB, GA 31098, AUTOVON 468-2868.

15. Reporting: Will be accomplished in accordance with MEEP Field Reporting Instructions. All reports will be routed in reverse order of addressees.

**APPENDIX D:**

**FORMAT VIII**

HEADING

REPLY TO

ATTN OF: Evaluating Activity

SUBJECT: Project Directive/Change Notice\* Acknowledgment (as applicable),  
MEEP Project No. , AFR 77-5

TO: WR-ALC/MMIR

1. Project Title:
2. Accepted/Not Accepted by evaluating activity.
3. Concur/Nonconcur with contents of project directive/change notice. In case of nonconcurrency with specific items of project directive, cite paragraph, nature of objection, and recommendations.
4. Date Started:
5. Estimated Completion Date:
6. Operation Procedures: (Give resume of plan to be followed in accomplishing project).

FOR THE COMMANDER:

1 Atch  
Receiving Document

Cy to: MAJCOM

\*Change notices are issued by WR-ALC/MMIR to amend specific portions of the project directive.

**APPENDIX E:**

**FORMAT IX**

FORMAT IX

PROJECT STATUS REPORT

MOTOR VEHICLE-CIVIL ENGINEERING (as applicable)

REPORTING ACTIVITY

As of Date

SUBJECT	PROJECT NUMBER	STARTING DATE	ESTIMATED COMPLETION DATE
---------	----------------	---------------	---------------------------

Identify test sites and article/method now used for comparison evaluation. Explain method of evaluation.

Include status briefly, i.e.,

Hours/miles of operation

Features, modifications, problems

Other

**APPENDIX F:**

**SAMPLE STATUS REPORTS**

**PART I**

<b>SUBJECT:</b>	<b>PROJECT NUMBER:</b>	<b>STARTING DATE:</b>	<b>ESTIMATED COMPLETION DATE:</b>
VEHICLE, ASPHALT MAINTAINER	B85-1D	11 JAN 86	11 AUG 86

Lee-Boy Asphalt Maintainer Model 1200 is manufactured by B. R. Lee Industries, Inc., Denver, NC. Unit is a self-propelled paver designed to repair and patch asphalt surfaces/potholes, install overlays, or widen paved areas. Maintainer is equipped with a rotary grinder with replaceable carbide tips to grind out 24-in. wide areas for repair. Ground-up residue is shoveled into the hopper and mixed with cold or hot mix, crushed stone, sandy soils, and cold millings. Mixture is heated in 100-gal propane-fired tank. Hydraulic-powered pump allows for liquid asphalt (tack) spray with handheld 26-ft-long pressure hose wand and nozzle or automatic distribution in front of floating screed. Screed paver is also propane-fired and can pave an area 38 to 62 in. wide. Also included is an adjustable heavy-duty hydraulic tongue for attaching unit to truck for towing. Auxiliary coupling provides 2000 lb hydraulic pressure to operate tools such as jackhammers. (Need for air compressors is eliminated.) Optional bucket loader and shoulder widener attachment are available. Paving is done at speeds up to 100 ft/min. Vehicle dimensions are 12 ft long by 8-1/2 ft wide by 8 ft high. Maintainer weighs 8500 lb and costs \$26,000.

TAC Civil Engineer at MacDill AFB, FL, is conducting evaluations to determine applicability for road- and ground-paving operations.

PART I

SUBJECT:	PROJECT NUMBER:	STARTING DATE:	ESTIMATED COMPLETION DATE:
ANALYZERS, ON-BOARD COMPUTER	H85-2C	26 APR 85	20 NOV 85

*Project will evaluate various hand-held analyzers designed to test engine computer controls on standard general-purpose vehicles. Since 1980, vehicle manufacturers have incorporated on-board computerized controls. Test points for these controls are brought to a central diagnostic connector. This enables simplified test equipment to hook up to the connector for analysis and determination of condition of certain engine controls.*

*Four hand-held testers are included in this project:*

*Brainmaster Model 3215 Diagnostic Analyzer for GM computers, manufactured by Alltest Inc., Rolling Meadows, IL. Twenty-three (23) trouble codes/key functions are monitored. Unit costs \$300.*

*Monitor 85 Model 3485 analyzer for GM computers, manufactured by Owatonna Tool Co., Owatonna, MN. Forty-nine (49) tests can be performed and 15 codes programmed into tester for analyzing vehicle control systems. Unit costs \$385.*

*Hickok Star Tester Model 444K for EEC-IV and MCU computers, manufactured by Hickok Electronic Instrument Co., Cleveland, OH. In addition to nominal diagnostic tests, Star Tester performs special wiggle tests plus others. Unit costs \$250.*

*Hickok Diagnostic Readout Model 445C for Chrysler computers performs the checks required on current equipment as well as future planned engine controls. Unit costs \$250.*

*Each MEEP activity will evaluate one of the four model test analyzers.*

**APPENDIX G:**

**FORMAT X**

**HEADING**

REPLY TO

ATTN OF: Evaluating Activity

SUBJECT: Phase I Completion Report, MEEP Project No.

AFR 77-5

TO: HQ MAJCOM  
WR-ALC/MMIR  
IN TURN

Reference para 1.c. of Field Reporting Instruction.

- (a) Project Title:
- (b) Date Started:
- (c) Date Completed:
- (d) Description:
- (e) Work Accomplished:
- (f) Discussion:
- (g) Safety:
- (h) Advantages:
- (i) Disadvantages:
- (j) Tangible Savings:
- (k) Intangible Savings:
- (l) Recommendations:
- (m) Requirements:
- (n) Remarks:

Atch (as applicable)  
Project Directive  
Photo  
Safety, OSHA, EPA  
Test(s) Reports

**APPENDIX H:**

**FORMAT VI**

**MEEP SUMMARY COST/SAVINGS COMPUTATION PER JOB**

	A	B
	<u>PRESENT METHOD</u>	<u>NEW METHOD</u>
1. Identify End Item (NSN, Noun, Mfg, Mod. etc)	-----	-----
2. Unit Cost	-----	-----
3. Quantity Required Per Base	-----	-----
4. Life Expectancy (Years)	-----	-----
5. No. Jobs Per Year	-----	-----
6. Cost Per Job (2x3) + (4x5)	-----	-----
7. Identify Operational Materials Reg. (Fuel, Oil, Chemicals, etc.)	-----	-----
8. Unit Cost	-----	-----
9. Quantity Required Per Job	-----	-----
10. Cost Per Job (8x9)	-----	-----
11. Identify Operational Labor (Driver, Operator, etc.)	-----	-----
12. Manhours Per Job	-----	-----
13. Hourly Rate (Est Avg Std w/OH)	-----	-----
14. Cost Per Job (Line 12 x Line 13)	-----	-----
15. Identify Maintenance/Repair Labor	-----	-----
16. Manhours Per Job	-----	-----
17. Hourly Rate (Ext Avg Std w/OH)	-----	-----
18. Cost Per Job (Line 16 x Line 17)	-----	-----
19. Identify Repair Parts (Brakes, Motor, Drive Train)	-----	-----
20. Total Cost During Eval	-----	-----
21. No. Jobs During Eval	-----	-----
22. Cost Per Job During Eval (Line 20 - Line 21)	-----	-----
23. Identify Support Equipment Req (Compressor, Tow Veh, Trailer, etc.)	-----	-----
24. Prorate Cost Per Job (For single- purpose equip., use formula 2 thru 6)	-----	-----
25. Subtotal (Lines 6 + 10 + 14 + 18 + 22 + 24)	-----	-----

**ANNUAL COST/SAVINGS**

26. Cost/savings one job	±	=
Line 25, Col A	Line 25, Col B	Job Total
27. (a) Annual base cost/ savings when PM is deleted	x	=
No. Jobs Per Yr (Line 5)	Line 26, Job Total	Base Total

NOTE: Complete only when PM is deleted and old equipment is to be replaced.

OR

(b) Annual base cost/ savings when portion of PM is retained	(1)	Line 25, Col A	x	No. Jobs to Continue with PM	=	-----
	(2)	Line 25, Col B	x	No. Jobs with NM	=	-----
	(3)	(1)	-	(2)	=	Base Total

NOTE: Complete only when old equipment is retained and some jobs will continue to be done with present method.

28. Command Savings	Line 27 Base Total	x	No. Bases to Use	=	Command Total
29. Air Force Savings	Line 27 Base Total	x	No. Bases to Use	=	USAF Total

(Complete a separate form for each equipment comparison test.)

## APPENDIX I:

### SAMPLE PHASE I COMPLETION REPORT

LGTV (M.J. Gengron, 4410)

Phase I Completion Report, MEEP Project No. BJ85-ID (AFR 77-5)

#### HQ TAC/LGTV

1. Project Title: Maintainer, Asphalt Lee-Boy.
2. Date Started: 10 Dec 84.
3. Date Completed: 12 Aug 85.
4. Monitor: Mr. Melvin Gendron was the MEEP Monitor. Assistance was provided by 56th Civil Engineering and 56th Transportation personnel at MacDill AFB, FL.
5. Project Description:
  - a. Problem: Currently, several pieces of equipment are required to make some types of asphalt repairs. This requirement is time-consuming and expensive.
  - b. Purpose: To determine, through field evaluation, if the Lee-Boy Asphalt Maintainer can be used successfully and economically by Civil Engineering roads and grounds personnel for repairing paved surfaces. The objective is to improve pavement repairs with less equipment.
  - c. Equipment to Be Evaluated: Lee-Boy Asphalt Maintainer, manufactured by R.B. Lee, Denver, NC. This is a self-contained unit specially designed for repairing potholes and asphalt overlays (Atch 1 and 2). Power for the unit is provided by an air-cooled 65-HP gasoline engine. It is equipped with an adjustable, heavy-duty, hydraulic tongue that permits easy connection/disconnection from the towing vehicle. A rotary grinder with replaceable carbide bits is provided to allow the operator to grind out an area in need of repair. A propane-heated tack distributor with a hose, wand, and nozzle is provided and is equipped with a propane-heated, floating screed paver that telescopes from 38 to 62 in. This feature should simplify road edging. Hydraulic couplings are provided for operating hydraulic tools, which should eliminate the need for an air compressor at jobsites. Dimensions of the unit are: length (in towing position) 12 ft, width 8 ft-6 in., height 8 ft, weight approximately 8500 lb.
6. Discussion:
  - a. History of Test:
    - (1) The in-bailed equipment was delivered to MacDill AFB, FL, 12 Feb 85.
    - (2) A hands-on demonstration was conducted by the manufacturer's representatives 12-15 Feb 85.

(3) On 14 Apr 85, the drive chain for the front wheels broke. The company was called and they replaced both drive chains plus performed scheduled maintenance on the unit.

(4) The project was officially closed 12 Aug 85.

(5) Although the project was over, MacDill was given permission to continue using equipment in anticipation of purchasing it.

b. Guidelines:

(1) General guidelines were followed as closely as practical.

(2) No comparison equipment was identified as such as all previous repair work was done by hand or contracted out. The following equipment usually was used when the work was done in-house:

- |                           |                       |
|---------------------------|-----------------------|
| (a) Asphalt Repair Kettle | NSN: 3805-722-1417    |
| (b) Dump Trucks           | NSN: 2323-01-049-6070 |
| (c) Roller Steel Wheel    | NSN: 3895-00-763-1971 |
| (d) Concrete Saw          | NSN: 3895-00-185-4494 |
| (e) Front-End Loader      | NSN: 3805-01-073-0680 |

(3) The following equipment was used in conjunction with the in-bailed equipment:

- |                        |                       |
|------------------------|-----------------------|
| (a) Dump Truck         | NSN: 2320-01-049-0670 |
| (b) Roller Steel Wheel | NSN: 3895-00-763-1971 |

(4) Startup and cleanup are simple and take little time. Preheating the unit with several burners on board (LP gas) takes less time compared with the asphalt kettle. A separate tank mounted on the unit to hold diesel fuel makes cleanup easy and fast.

(5) The quality and quantity of work done with this machine was far superior to any work done by hand. This unit not only does an excellent job of laying asphalt, it also can repair previous patches by either grinding out the old patch and replacing it or, if the old patch is too high, the unit can grind it down level with the rest of the surface.

(6) Due to the simplicity of the in-bailed unit, only a minimum of training is required.

(7) All operator's comments were positive except that all stated the hose on the tack wand should be longer.

(8) No additional safety requirements are needed at this time.

(9) The equipment was operated a total 144 hr according to the hour meter. This does not include time for towing to and from work sites or to set up or clean equipment--only the time the machine was running.

(10) The capability of the Lee-Boy Asphalt Maintainer is outstanding. During this evaluation, over 1600 tons of asphalt were laid with no major problems.

(11) Based on premise that 1 ton will cover 81 sq ft at 4 in. thick, 1 ton will cover 324 sq ft at 1 in. thick (formula Civil Engineering uses to order asphalt). On this basis, CE laid 518,400 sq ft of asphalt (1600 x 324) at 1 in. thick.

(12) The local contractor quoted an estimate of \$0.50 per sq ft for 1-in.-thick asphalt. At this price, the 518,400 sq ft would have cost \$259,200 by contract.

(13) The cost to operate this machine, including all material and labor, is \$63.48 per ton (see Atch 3 and 4), or \$101,568 (\$63.48 x 1600 tons).

(14) The cost of support equipment was disregarded because the same basic support equipment was used, but to a lesser degree.

(15) Technical data were adequate for operation and maintenance.

(16) Spare parts should not be a problem because most are procurable locally.

c. Proposed Modification: Increase the tack hose length to enable the operator to spray farther in front of the machine and avoid slowing it down.

d. Savings:

(1) Monetary: The use of this machine saved a total of \$157,632 during this evaluation compared with the estimated contract cost (\$259,200 - \$101,568--see Atchs 4 and 5).

(2) Time: This equipment would save time by eliminating the time delay associated with bidding and awarding a contract.

e. Advantages/Disadvantages:

(1) Advantages:

- (a) In-house repair of asphalt surfaces when needed.
- (b) Incorporation of a grinder to smooth or remove uneven or deteriorated asphalt surfaces.
- (c) Ease of cleanup.
- (d) Ease of hooking up and towing to new work site.
- (e) Short time required to train an operator.

(2) Disadvantages: The only noted disadvantage was the short tack wand hose, see Para 6c.

## 7. Conclusions:

a. The Lee-Boy Asphalt Maintainer is a versatile piece of equipment that could be a great asset to the Air Force. Although this machine was designed to repair and maintain existing hard surfaces with some preplanning, it also can be used to make new roads, sidewalks, and parking lots. While at MacDill AFB, the machine was used to lay new roads, sidewalks, golf cart trails, and parking lots, plus repair and overlay existing hard surfaces. It was also used to widen roads and to build up the shoulder with gravel or other material, including asphalt. This capability emphasizes the machine's versatility, but it must be recognized that the unit is not designed to lay major roads or large parking lots.

b. The equipment itself is simple to maintain and operate as it is completely hydraulically driven, powered by a gasoline engine. The unit is heated by propane burners and heats up quickly, thus reducing startup time. The hydraulic tow bar makes it simple and easy to hook onto the towing vehicle and a towing speed of 45 mph makes it fast to move from one jobsite to another. Service and maintenance of this equipment should require no special training or tools.

c. In conclusion, this machine, if used correctly, could save the Air Force money and time and complete more work in less time.

## 8. Recommendations:

a. We recommend that the Lee-Boy Asphalt Maintainer, Model 1200, manufactured by R.B. Lee Industries, Inc., Denver, NC 28037, or its equal, be adopted for Air Force use.

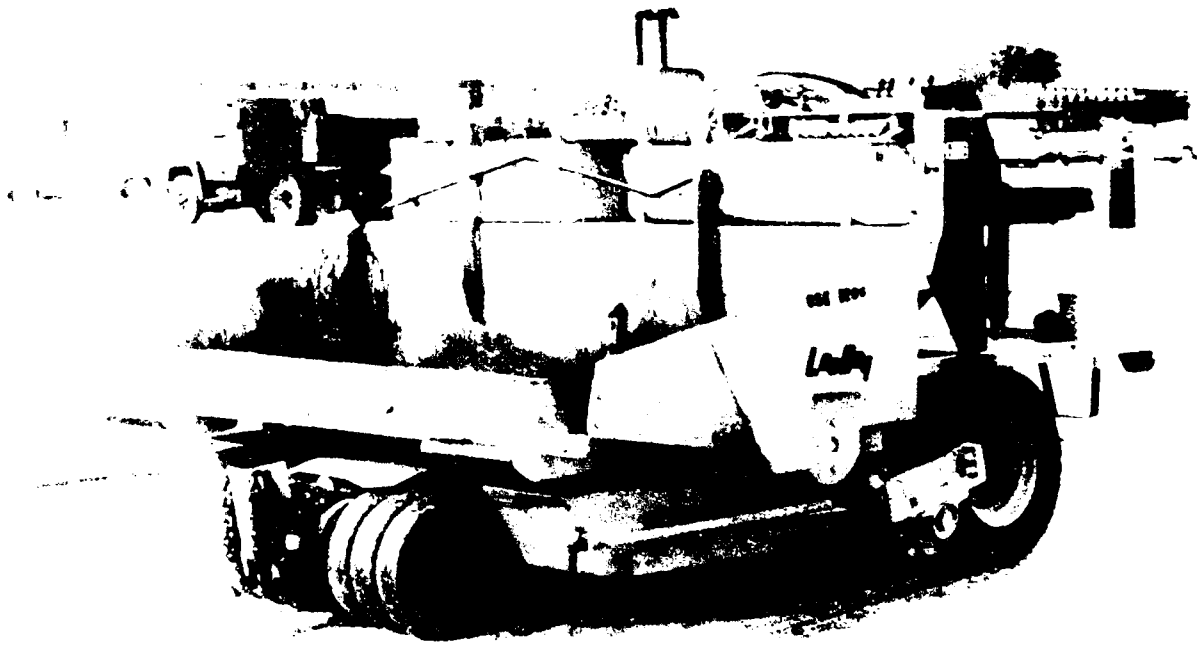
b. We recommend that the Lee-Boy Asphalt Maintainer be added to TA-008, Part B, with BOI of one per AFB.

WALTER A. PARRISH  
Chief, Management and Equipment  
Evaluation Program

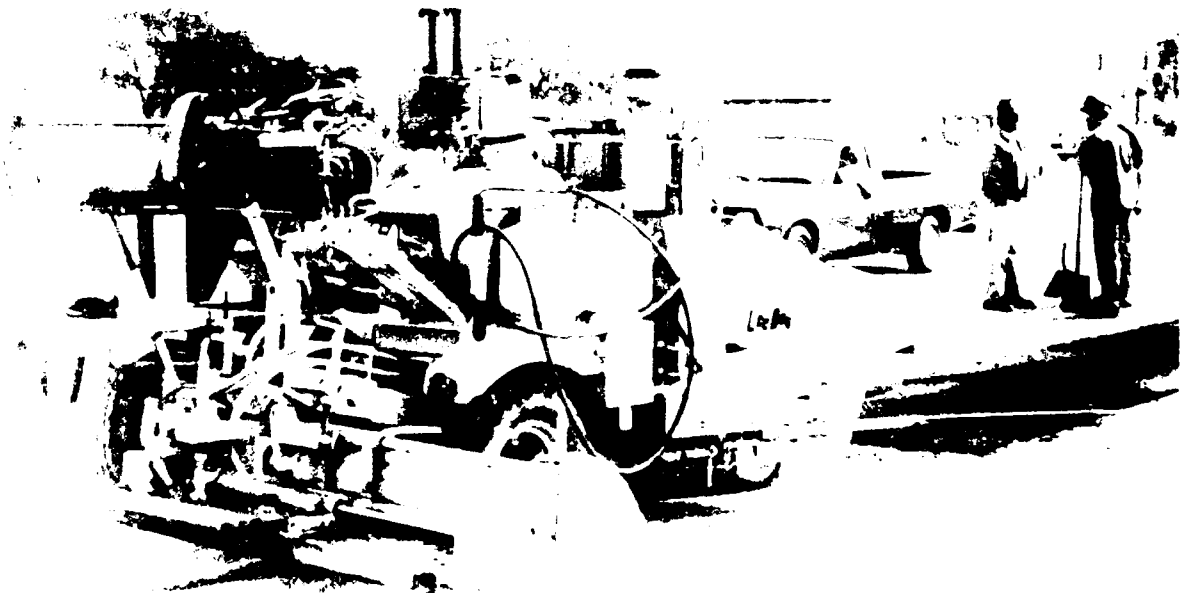
### 5 Atch:

1. Photo - Lee-Boy Asphalt Maintainer, View 1
2. Photo - Lee-Boy Asphalt Maintainer, View 2
3. Cost Data Sheet
4. Average Cost Per Ton
5. Cost Saving Analysis

cc: 4410 Trnsp Flt/CC wo Atch



ATTACHMENT 1.



ATTACHMENT 2.

ATCH 3

Cost Data Chart

	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
Hours (Eng Hr)	25	57	110	27	56	43	18	144 hr
Out of Comm.	0	0	8	0	0	0	0	8 hr
Manhours Lee-Boy	91	319	1120	411	337	480	18	2776 hr
Asphalt Tons	93	193	554	189	213	154	104	1600 ton
Cost	3069	6369	21582	6237	7029	5082	3432	\$52800
Limerock Tons			113					113 ton
Cost			1695					\$1695
Tack Gal	55	270	341	130	95	350	55	1296 gal
Cost	58	166	188	72	79	182	30	\$755
Fuel Cost	75	136	187	53	67	97	26	\$642

ATCH 4

Average Cost Per Ton to Lay Asphalt (Base)

Resources	Units	Units Used 6 Months	6-Month Cost of Each Resource	Av Cost Per Ton (Costs Divided by Tons of Asphalt)
Lee-Boy Depreciation	\$26,000 10-yr Life	1/20 or 5% Life Cycle	\$1300.00	\$0.81
Asphalt	\$33 Per Ton	1600 Tons	\$52,800.00	\$33.00
Tack	\$.55 Per Gal	1296 Gals	\$713.00	\$0.45
Fuel	Gas and Diesel		\$642.00	\$0.40
Manhours	\$16 Per Hr	2776 Hr	\$44,416.00	\$27.76
Limerock	\$15 Per Ton	113 Tons	\$1,695.00	\$1.06
Total Cost Per Ton to Lay Asphalt Using Lee-Boy Unit				\$63.48

Average Cost Per Ton to Lay Asphalt (Contract)

\$.50 sq ft 1 in. thick (Quote from local contractor)

1 Ton = 81 sq ft 4 in. thick

1 Ton = 324 sq ft 1 in. thick

@ \$.50 sq ft      One ton would cost      \$162.00

Comparison Cost Per Ton

Contract Cost Per Ton      \$162.00

Base Cost Per Ton      \$63.48

Saving Per Ton      \$98.52

Saving This Evaluation (6 months) (1600 x \$98.52)      \$157,632.00

ATCH 5

Cost Saving Analysis

Six Months

Cost to Lay Asphalt [6 months (1600 tons) contract] (1600 x \$162.00)	\$259,200.00
Cost to Lay Asphalt [6 months (1600 tons) base] (1600 x \$63.48)	\$101,568.00
Saving This Evaluation	\$157,632.00

One Year

Cost to Lay Asphalt [\$259,200.00 x 2 (Contract)]	\$158,400.00
Cost to Lay Asphalt [\$101,568.00 x 2 (Base)]	\$203,136.00
Saving One Year (Per Base)	\$315,264.00

TAC Annual Saving

Saving Per Base	\$315,264.00
Number of Bases in TAC	20
Savings Annually in TAC	\$6,305,280.00

Air Force Annual Saving

Savings Per Base	\$315,264.00
Number of Bases in Air Force	100
Savings Annually in Air Force	\$31,526,400.00

**APPENDIX J:**

**SAMPLE PHASE II STATUS REPORT**

**PART II**

<b>SUBJECT:</b>	<b>PROJECT NUMBER:</b>	<b>STARTING DATE:</b>	<b>ESTIMATED COMPLETION DATE:</b>
Loader, Track Type	B84 1D	11 Jun 84	25 Jan 86

Front-end tracked loader, Model 963, is manufactured by Caterpillar Company, Peoria, IL. Unit is powered by a 150-HP rear mounted diesel engine. The loader is equipped with a hydrostatic drive transmission, automatic bucket positioner, hydraulic track adjusters, sealed/lubricated track w/two piece master link, front and rear retrieval hitch, fuel-priming pump, 24-V electrical system, ROPs cab, back-up alarm, seat belt, rearview mirror, windshield washer/wipers, and operator panel. It has a 2-1/2 cu yd capacity bucket. Dump clearance is 9 ft 10 in. Loader operating weight is 29,500 lb. Dimensions are 20 ft 3 in. long by 17 ft 8 in. high by 7 ft 5 in. wide. Unit costs \$130,000.

Currently authorized loaders are not entirely satisfactory for all civil engineering applications. The project loader will be compared to current authorized equipment to determine if Model 963 outperforms from a productivity standpoint while reducing the need for maintenance.

The loader was delivered to Chanute AFB, IL, where ATC determined its effectiveness in handling jobs within the mission.

The completion report cited various advantages of Model 963 over authorized loaders. Recommendations compiled by this office show a need to revise specifications for 2 1/2 cu yd tracked loaders.

Action Agencies: WR-ALC/MMTR.

PART II

SUBJECT:	PROJECT NUMBER:	STARTING DATE:	ESTIMATED COMPLETION DATE:
T.O. 36-1 52 Update	H83-15C	13 Mar 84	1 Dec 85

Subject Technical Order (T.O.) review and update was initiated by LETN. T.O. 36-1-52 is titled "Preparation and Corrosion Treatment of Vehicles." Basic document has not been totally revised since 15 Jul 67. It incorporates various changes up to Change 8 dated 7 Jul 83. New processes, materials, and procedures have been made available since last major T.O. update. All MACOMS were invited to provide input in updating this T.O. Project objective is to identify new materials, procedures, or processes that will improve corrosion resistance and can be applied only to those vehicle(s) areas for which they will be cost-effective. Finalized draft should eliminate unnecessary ("nice-to-have") items and reflect only essential tasks.

Current Air Force (AF) policy on rustproofing new vehicles is as follows:

- a. New vehicles\* will be procured with only manufacturer's standard rustproofing.
- b. Decision for additional corrosion treatment will be made by the Base Vehicle Maintenance Officer.

FAC and SAC submitted completion reports and correspondence from MAC and PACAF was received as input. Reports from remaining participants were due 20 Oct 84. This office has begun finalizing T.O. update. A draft copy has been forwarded to USAF corrosion managers for their review, input, and/or concurrence.

A draft also was presented to MACOMS at the Maintenance Policies, Procedures, and Productivity Workshop during 4-8 Feb 85. As a result of workshop efforts, it was agreed to provide draft copies for MACOM response. Appropriate inputs have been incorporated into final draft based on MACOM response. AF corrosion managers/MACOM/Tech Service coordinated version will be forwarded for publication upon completion of typing.

Action Agencies: WR ALC/MMTR/MMTV/MMED.

\*Excludes aircraft, managerial, special purpose, construction, and material handling vehicles with the exception of Foreign Military Sales (FMS) and M series procured vehicles.

PART II

SUBJECT:	PROJECT NUMBER:	STARTING DATE:	ESTIMATED COMPLETION DATE:
Tires, Smooth Contour	H84-20-1TAC	29 Jun 84	20 Jun 85

This is a TAC-initiated project to evaluate 1200 by 20 special-purpose smooth contour pneumatic tires compared with same sized recapped tires currently used on R-5/R-9 refuelers. Project test tires are available from Types n Treads in Phoenix, AZ, and meet Specs ZZ-T-441F/416G. Manufacturer claims tires meet NTDRA/ARA specifications and that tires offer many advantages over those now used (i.e., lower cost, smooth ride, better stability, improved traction on wet/dry surface, and no stone pickup/sparking/bruises).

The 832nd AD at Luke AFB, AZ, evaluated smooth contour tire effectiveness when installed on R-5 refuelers and employed in mission use.

Project determined that smooth contour tires did not perform as claimed by manufacturer in that they required recapping before authorized tires and were not cost-effective. In addition, use off-base is unlawful since state and Federal 2/32-in. tread depth requirement is not met.

Recommendations to be prepared by this office.

Action Agency: WR-ALC/MMTV.

PART II

SUBJECT:	PROJECT NUMBER:	STARTING DATE:	ESTIMATED COMPLETION DATE:
Dolly, Towed Type	H84 23D	13 Sep 84	15 Aug 85

Model UH 300 Tow Dolly is manufactured by Dethmers Manufacturing Co., Boyden, IA. Dolly is a two wheel trailer-type unit designed to be towed by any vehicle equipped with a 2 in. ball hitch. Small vehicles are pushed, winched, or driven up ramps onto trailer and secured (to trailer) for towing long or short distances. Trailer dolly is equipped with front amber marker lights, rear stop/turn lights, and self storing ramps. Both front or rear drive vehicles can be safely towed without damage.

SAC at Offutt AFB, NE, conducted project evaluations on dolly's ability to retrieve vehicles (primarily front wheel) without damage to towed vehicles. Unit was compared with currently authorized equipment.

Completion report showed this type of dolly to have distinct advantages over authorized equipment and methods employed to retrieve most disabled standard size vehicles and smaller.

Recommendations for adoption to be prepared by this office.

Action Agency: WR ALC/MMTV.

**APPENDIX K:**

**SAMPLE MEEP AGENCY STATUS REPORTS**

PART III

SUBJECT:	PROJECT NUMBER:	STARTING DATE:	ESTIMATED COMPLETION DATE:
Analyzers, Diagnostic Engine Console	H80-10C	3 Sep 80	15 Jun 85

Fuel conservation considerations and constantly changing engine designs (which contribute to state of the art complexities) create the need for versatile, simple, accurate engine analysis to maintain Air Force vehicle fleets in peak operating condition.

Bailed equipment consisted of Sun Model 1215 analyzer and Model 1216 printer, both manufactured by Sun Electric Corp., Chicago, IL; Allen Model 25-190 analyzer and Model 93-100 printer, both manufactured by Allen Test Products Division of Allen Group, Northville, MI, and Snap On Model MT4666A manufactured by Snap On Tools Corp., Kenosha, WI, were added to the evaluation.

SAC and TAC MEEP activities compared bailed equipment with currently authorized items.

All completion reports were received. Recommendations were forwarded to OPR at SA ALC. OPR concurred with project recommendations and assigned NSNs as follows:

Sun Model 1215 4910 01 138 6853 Intended for those activities w/Dynos  
Sun Model 1216 4910 01 138 6833  
Snap On Model 4666A 4910 01 138 6816 Intended for smaller shops w/o Dynos.

All items were included in the TA 457 publication released 1 Sep 82.

For activities without dynamometer functional gauges, road horsepower (RHP), and miles per hour (mph) gauges are available in single-panel configuration. Part Number A28105 applies. Unit cost is \$754. Source of supply is:

Chrysler Manufacturing Co.  
PO Box 330  
Muskegon, MI 49734  
313-441-0151

No other report was submitted.

PART III

SUBJECT:	PROJECT NUMBER:	STARTING DATE:	ESTIMATED COMPLETION DATE:
Line-a-Bed and Truck Caddy, Pickup	H81 7H(B)	5 Mar 81	20 May 85

Majority of pickup carrying beds in Air Force inventory are made of steel or wood and are subject to corrosion, denting, splintering, breakage, and frequent repair/repainting. Tool boxes accumulate excessive moisture and, because they are of metal construction, both tools and boxes tend to corrode. The Line-a-Bed and truck caddy in this project are manufactured by Plastics Unlimited, Inc., Mt. Juliet, TN. Both items are constructed of a high impact, shock-resistant ABS plastic molded material. They are designed to insulate against all weather conditions and protect against dents, scarring, and excessive corrosion.

ATC, SAC, and TAC MEEP activities evaluated 32 Line-a-Bed liners and determined that this product can be used successfully by the Air Force. Line-a-beds can reduce corrosion, repainting, and excessive damage to truck beds, tools, and tool boxes. Truck caddies were never delivered for evaluation.

Evaluation showed use of Line a Bed improved bed appearance, made beds easier to clean and maintain, and prevented much of the damage. Cost-effectiveness varied from base to base, depending on mission and maintenance practices.

AF activities are authorized to obtain Line-a-Bed liners or equivalent on a local purchase basis and employ them as required on vehicle carrying beds. No stocklist action will be taken since numerous models of liners are required to fit each in-service pickup in the USAF fleet.

Final report submitted 20 May 85.

PART III

SUBJECT:	PROJECT NUMBER:	STARTING DATE:	ESTIMATED COMPLETION DATE:
Valve Control, Air and Hydraulic Anti-Lock Brake Devices	H81-15B	1 Dec 81	14 Feb 85

Safe-T-First pressure equalizing brake valve Model STF-100 for vehicles equipped with hydraulic brakes and Model STF-500 for vehicles equipped with air brakes are manufactured by STF Enterprises, San Francisco, CA 94109. Valves are designed to function as a fast-acting antiskid device to prevent single-wheel lockup across a braking axle by damping transient vibrations within the brake fluid. Manufacturer claims this damping action will result in safer vehicle braking, better brake reliability, and reduced brake wear/maintenance.

Project was conducted to determine if premature lockup of vehicle brakes can be eliminated or reduced during emergency braking to prevent vehicle skid/jackknife accidents and improve overall safety. Assessments were made to determine if brake wear and maintenance are reduced enough to warrant Air Force adoption of the devices.

SAC at Peterson AFB and ATC at Randolph AFB conducted service tests on the devices. They were installed on both hydraulic and air-brake systems.

Vehicles were scheduled for final teardowns and measurements. No decrease in stopping distances were observed. In fact, erratic skidding was reported on one station wagon equipped with valves. Field data acquired does not support USAF adoption of this item.

Overall test data accumulated from this project failed to demonstrate any clear advantages from use of Safe-T-First valves on USAF vehicles operated under normal field conditions and mission assignments. There are 40,808 candidate vehicles for installing these devices, so a cost avoidance of \$571,312 (based on 10 percent use) is realized.

Final report submitted 14 Feb 85.

PART III

SUBJECT:	PROJECT NUMBER:	STARTING DATE:	ESTIMATED COMPLETION DATE:
Automotive Fuel Economy Device Model ACD/PRAM-4-82	H82-3B	15 Apr 82	10 Apr 85

Subject device is modified version of item evaluated under MEEP Project H80-4D and PRAM R&D Project ACD/PRAM 4-82. Modifications include a belt-driven air pump (to replace scoops employed in previous version), change of filters, and rerouted connections. SAC at Peterson AFB installed the new version on two vehicles and accumulated O&M data. ATC at Randolph AFB installed them on three vehicles.

Additional modifications were required to eliminate engine backpressure problems created by the device's air pump. Newer modifications required issuance of a project change notice to extend the completion date. Modifications relieved backpressure problems on one vehicle and not the others.

Another modification added aspirators and other refinements. Aspirators caused oil to pump out of the dip stick. Replacement aspirators were provided. Latest project change notice extended project completion to 2 Feb 84.

Data for 5000 mi fuel consumption revealed test vehicles averaged similar mileage to baseline data. Field data remain inconclusive even though the device has been through numerous design changes. No consistent positive findings were obtained despite efforts to tailor each installation to the specific engine.

Based on these findings, Model ACD/PRAM-4-82 is not recommended for USAF adoption.

No final report will be submitted on this project.

PART III

SUBJECT:	PROJECT NUMBER:	STARTING DATE:	ESTIMATED COMPLETION DATE:
Tool, Air-Over- Hydraulic	H82-8B	12 Aug 82	11 Apr 85

Emerson Model 25 automatic air/hydraulic "all in one" tool is manufactured by Voss Industries, Emerson, NE. Multipurpose tool is designed to be used by a truck jack, power press, frame jack, universal pump, or tire bed breaker. Physically small, lightweight, and compact, the Model 25 requires a 100-psi air source to provide 25 ton lift/press/straightening capacity. Unit can be operated by hand or foot and is mounted on a two-wheel dolly. Assembled tool weighs 57 lb. Unit cost is about \$800.

SAC at Offutt AFB, NE, TAC at Langley AFB, VA, and ATC at Randolph AFB, TX, conducted project service tests to determine if the bailed Model 25 units could economically replace present authorized jacks or porta-power units and/or be feasibly employed at remote bases/sites.

All completion reports were received. Evaluation activities recommended adopting Emerson Model 25 with certain changes. Unit outperformed authorized jacks, while proving to be both maneuverable and reliable. Project monitor has insured that all necessary changes have been incorporated. OPR has taken action to stocklist item with Defense General Supply Center (DGSC-S9C).

NSN 4910-01-200-0870 was assigned to Model 25 jack or equivalent. Item was added to TA457 Sub Div A. BOI is A1, B1, C1, D1, E2, GO, HO. SOS is S9C. Unit price is \$944.

Final report submitted 11 Apr 85.

PART III

SUBJECT:	PROJECT NUMBER:	STARTING DATE:	ESTIMATED COMPLETION DATE:
Detector Set, Ultrasonic Leak	H82-9B	29 Oct 82	5 Oct 84

Ultrasonic leak detector set Model 101 is distributed by Ultraphonic-USA Equipment Company, Atlanta, GA, and manufactured in Munich, West Germany. Set consists of carrying case, receiver, transmitter, headphones, base plate, and locating unit (wand). Detector purportedly locates leaks by generating ultrasonic waves and converting received waves to an audible sound. As the sound intensity (loudness) increases, it is supposed to indicate that a leak has been discovered. Distributor Claims Model 101 is particularly suitable for discovering leaks in compressed air or vacuum systems, carbon dioxide/oxygen bottles, air brakes, compressor connections, and pressure tanks. Distributor also claims vehicle passenger/baggage compartment, window, ventilation, air-conditioning, door, underside (water leaks), and tire leaks down to size of pinhole or in the form of hairline crack can be found. Unit cost is about \$420.

SAC at Offutt AFB, TAC at Langley AFB, and ATC at Randolph AFB tested detector set effectiveness in routine vehicle maintenance activities.

All completion reports were received. Unit was not recommended for vehicle maintenance shops by evaluating activities, but may have application in other shops.

Recommendations resulted in NSN 6635-01-183-8948 being assigned to Model 101. This item has been added to TAs 404, 457, and 487.

Final report submitted 5 Oct 84.

PART III

SUBJECT:	PROJECT NUMBER:	STARTING DATE:	ESTIMATED COMPLETION DATE:
Tractor, Four-Wheel-Drive, Heavy-Duty	B83-2D	14 Feb 83	20 May 85

Project was established to obtain an improved, more economical type of vehicle for USAF bomb range maintenance. Present authorized tractor/dozer employed is not entirely satisfactory for range maintenance to clear bomb range ordnance/artillery items from terrains encountered. A John Deere Model 8650 tractor manufactured by Deere and Company, Moline, IL, was evaluated.

Test vehicle is a Four-wheel-drive, articulated design, farm-type tractor. It is powered by a six-cylinder (619 CID) 290 HP diesel engine. The tractor employs a constant mesh type quad-range transmission with 16 forward speeds (four in each of four ranges). A built-in hi-lo function permits on-the-go shift of speeds within speed range selected. Electro-hydraulic differential locks are provided for better traction of the eight each. Tires are six-ply 18.4-38. An additional fully independent, hydraulically engaged PTO with 1000-rpm drive is provided.

TAC compared Model 8650 with currently authorized vehicles at USAF Avon Park Bomb Range, FL.

TAC's completion report revealed that the Deere 8650 outperforms the authorized TW 70 and 830M tractors, is safer to operate, and costs less to run. Model 8650 with an attachment also performs well with the 74D 236 beach sanitizer. Test vehicle is highly recommended for use on bombing and gunnery ranges for disking, beachcombing, and magnetic sweeping.

Recommendations were submitted to adopt Model 8650 tractor or equal for USAF use and to assign an NSN. Also recommended that an 85-HP tractor for range use be authorized.

Item Managers have prepared Forms 1 and 761 to have engineering prepare/purchase specifications for both tractors. Two different sized tractors were adopted for bomb range use. NSN 2420-01-206-8055 applies to the 290-HP version and NSN 2420-01-205-8579 applies to the 85-HP tractor. Both will be authorized in TA010, Part A.

Final report submitted 20 May 85.

### PART III

SUBJECT:	PROJECT NUMBER:	STARTING DATE:	ESTIMATED COMPLETION DATE:
Scrubber, Pre-Sweep	B83-4D	1 Jul 83	15 Jun 85

Project was established to evaluate a new battery-powered, walk-behind unit designed to sweep up light debris, apply detergent solution, scrub the floor surface, and vacuum floor dry--all in one pass. Scrubber Model 432 ES is manufactured by Tennant Company, MI. Purpose of project was to compare capabilities of bailed scrubber with authorized scrubber NSN 7910-00-913-8489 and determine cleaning/scrubbing effectiveness and operational considerations.

Features of Model 432 ES are as follows:

- o Equipped with heavy-duty batteries and vacuum fan, vacuum wand attachment, and hour meter.
- o Capable of nonstop scrubbing for 2.5-hr period.
- o Employs 26.5-gal cap solution tank and 29.5-gal cap recovery tank. Water pickup is by vacuum and parabolk squeegee.
- o Squeegee is self-tracking, eliminates spillover and puddling (even on sharp turns), lifts automatically when unit is placed in reverse.
- o Two free-floating brushes are provided.
- o Down-pressure control allows operator to apply desired pressure on brushes for effective cleaning.
- o Controls consist of solution lever, squeegee lift switch, activator switch (for raise and cover brushes), and dual-speed brush switch.

Dimensions are 66-1/2 in. long, 37 in. wide, and 41 in. high. Scrubber weighs 1,116 lb. Unit cost with attachments is \$9150.

Project evaluation was conducted by WR-ALC/DST. Unit was employed in material processing section's central parking area (sealed concrete surface) to clean 50,000 sq ft. No equipment failures occurred and no major adjustments were required over 480 hr of operation. Use of Model 432ES scrubber resulted in nearly \$51 saving for each floor cleaning operation.

Recommendations were submitted to responsible segments to adopt scrubber for USAF use, to assign an NSN to Model 432ES, and include it in TA 006 with a BOI of one per 135,000 sq ft floor space requiring frequent cleaning.

NSN 7910-01 156-5306 applies. SOS-JGG, AAC-J, unit cost - \$7146.

Final report submitted 15 Jun 85.

PART III

SUBJECT:	PROJECT NUMBER:	STARTING DATE:	ESTIMATED COMPLETION DATE:
Suspension System	H84-4B	8 May 84	21 May 85

Model #40,000 suspension system is a patented device manufactured by Lifeguard Suspension Systems, Inc., San Antonio, TX. Device is a load leveling suspension control which is attached to a vehicle frame; purpose is to maintain a level load bed for shifting cargo or when cargo is not centered on the trailer bed. Service tests are to determine if use of Model #40,000 will improve stability of vehicles that have a high center of gravity, minimize structural distortion effects of vehicles prone to distortion in service, and protect cargo from damage on vehicles transporting sensitive equipment or easily damaged cargo. ATC at Randolph AFB and Brooks AFB will install systems on two 5 ton dump trucks rated at 23,000 to 40,000 GVW and collect vehicle performance data. Unit cost of system is \$1250.

Both systems were received during May 1984 and were installed on the two dump trucks. Preliminary data do not support claims that the load is equalized across the axle. The gain in stability is negligible.

Completion report revealed that, as a result of both static and dynamic tests performed, no measurable improvement in vehicle stability was detected to warrant USAF adoption of Lifeguard Suspension Systems.

Final report submitted 21 May 85.

PART III

PROJECT:	PROJECT NUMBER:	STARTING DATE:	ESTIMATED COMPLETION DATE:
MEEP Maintenance Service Tips	H84-5	1 Feb 83	15 Dec 84

Decision was initiated to insure the continued publication of *MEEP Maintenance Service Tips* (volume 84-1) (OWC) in accordance with WRS MEEP office decision to continue this publication in accordance with AFR 77-5.

Responsibility for the publication of this periodical will remain with 1091 TRNSS 1GTV under space control (SPCD). WR ALC MMTV will be responsible for publication/distribution of the periodical. A new project number will apply each year.

Service Tips Volume 84-1 was published/distributed 14 Jan 84, 84-2 on 29 Apr 84, 84-3 on 10 Aug 84, and 84-4 on 15 Dec 84. Addressees on distribution lists have been updated recently for a more current, compatible listing.

No completion report is required.



4910 00 255 8673	Tester, Manifold Vacuum and Fuel Pump Pressure	E-345
4910 01 012 1695	Tester, Charging System	VAT 33
**4910 01 133 1695	Tester, Timing Light	Model 7040
4910 01 200 0870	Jack, Air Over-Hydraulic	Model 25
5120 00 224 7330	Jack, Hydraulic, 20 Ton	N/L
6625 01 053 4186	Analyzer, Charging System	Model 7200
6625 01 147 6182	Multimeter, Digital	N/L
**6630 00 105 1418	Tester, Antifreeze/Electrolyte	Model 7181

PART III

SUBJECT:	PROJECT NUMBER:	STARTING DATE:	ESTIMATED COMPLETION DATE:
Vehicles, Winter Survival	H84 20 1ATC	9 Jun 84	12 Feb 85

ATC identified need to evaluate alternative vehicles for winter survival school. Two M1009 (utility version of CLCV) tactical vehicles were provided to ATC from TAC for evaluation. Vehicles were delivered to 3636 CCTW at Fairchild AFB, WA, on 9 Jul 84.

Upon receipt of the CLCVs, it was determined that the M1009 is not large enough to transport minimum cargo and passengers required. Project was discontinued on this basis.

No final report will be submitted on this project.

## APPENDIX I:

### SAMPLE EVALUATION SUMMARY

#### EVALUATION SUMMARY

#### ASPHALT MAINTAINER

CONTRACT F9603 85 0615

VEEP PROJECT B85 1D

Asphalt Maintainer Model 1200, manufactured by R. B. Lee Industries, Inc., Denver, NC, was evaluated by HQ TAC at MacDill AFB, FL. Period of evaluation was from 12 Feb 85 through 12 Aug 85. The unit was used for day-to-day maintenance of streets, roads, and grounds. It was operated for a total of 144 hr. During this period, over 1600 tons of asphalt were laid with no major problems. Startup and cleanup on the unit took considerably less time than with regular asphalt kettles. Quality and amount of work accomplished with this unit exceeded that of work done using currently authorized equipment, which was attributed to the new unit's ability to grind out damaged paved surfaces and completely repair them with very little or no hand labor involved. It also can grind down high spots, making them level with adjacent surfaces. All operator's comments relative to the Model 1200 Asphalt Maintainer were positive.

Based on project findings, the Model 1200 Asphalt Maintainer is considered suitable for Air Force use. However, a declaration of suitability does not guarantee purchase.

Cooperation of R. B. Lee Industries, Inc., in supplying the Model 1200 Asphalt Maintainer is appreciated. However, you are reminded that information contained herein is not to be used for advertising or sales purposes.



END

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DTIC