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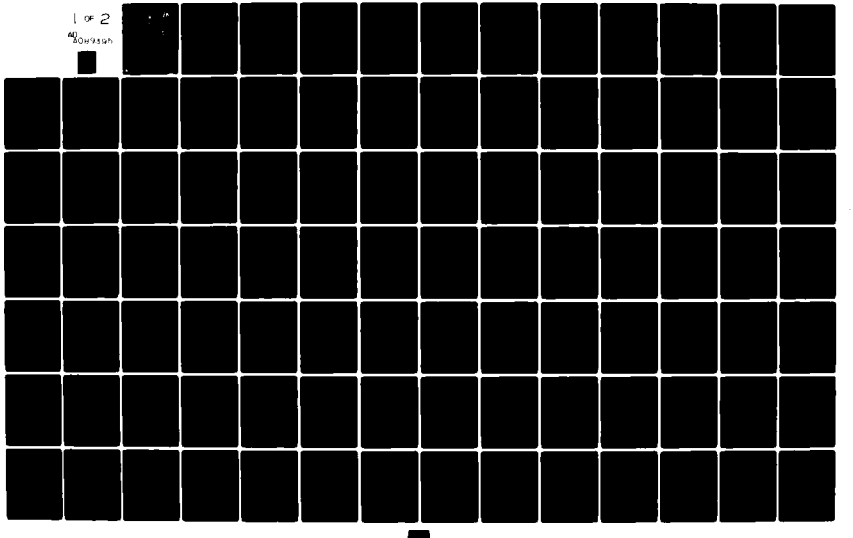

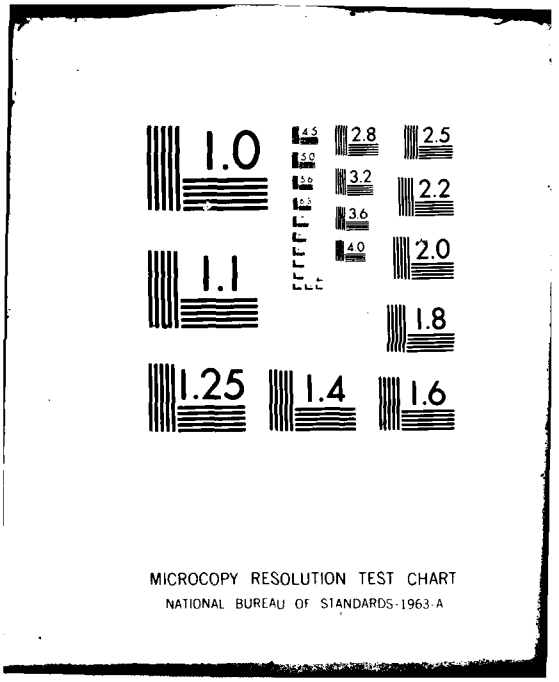
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(6) FEASIBILITY OF DIRECT FUNDING AS AN ALTERNATIVE TO THE CURRENT DOD CALIBRATION FUNDING METHODS.

(10) David R. Baker, GS-11
Danny C. Rehm, Captain, USAF

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A great amount of emphasis is being placed upon increased interservice calibration support and consolidation of duplicative calibration facilities and capabilities. This thesis examines the concept of directly funding the Army, Navy, and Air Force Metrology and Calibration Programs, from a single line item in the DOD Budget, in order to enhance interservice support and consolidation in the area of Metrology. Information gathered which formed the basis for this thesis was obtained through personal and telephone interviews with key people located throughout the operational spectrum of the three Services' Metrology and Calibration Programs. This thesis concludes that direct funding of these programs is not feasible without the establishment of a single DOD manager for Metrology and Calibration primarily because of the differences in the management structure of the three programs and the difficulty in allocating scarce resources between the Services.

LSSR 60-80

FEASIBILITY OF DIRECT FUNDING AS AN ALTERNATIVE TO THE CURRENT DOD CALIBRATION FUNDING METHODS

A Thesis

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the Requirements for the

Degree of Master of Science in Logistics Management

By

David R. Baker, BA
GS-11

Danny C. Rehm, BS
Captain, USAF

June 1980

This thesis, written by

Mr. David R. Baker

and

Captain Danny C. Rehm

has been accepted by the undersigned on behalf of the faculty of the School of Systems and Logistics in partial fulfillment of the requirements for the degree of

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CHAPTER I

INTRODUCTION

Statement of the Problem

The accuracy of measurements and measurement equipment within the Department of Defense (DOD) is assured by metrology and calibration systems which are independently maintained and operated by each military service. Because the Army, Navy, and Air Force manage their own metrology programs independently, there have been numerous duplications of DOD calibration facilities and capabilities.

The DOD has recognized that in some of these instances it may be possible to make more effective use of resources by eliminating redundant capabilities, consolidating facilities, and increasing interservice support (29:1; 30:1: 31:1; 32:1; 33:1).

Several DOD consolidation studies have pointed out that one of the factors which hinders consolidation efforts and interservice support is that reimbursement costs for obtaining calibration services vary widely among the DOD services (9). The variability of reimbursement costs has been credited largely to varying methods by which operating funds are provided to the calibration facilities (29:p.I-19; 30:p.IV-8; 31:p.E-9; 32:p.G-6; 33:174).

A method of funding is felt to be needed such that no reimbursement would be required between DOD agencies at the base or field level for calibration services received from different DOD agencies (10:1).

Review of the Literature

Metrology and Calibration Defined

On February 22, 1981, John Quincy Adams stated:

> Weights and measures may be ranked among the necessities of life to every individual of human society. They enter into the economical arrangements and daily concerns of every family. They are necessary to every occupation of human industry; to the distribution and security of every species of property; to every transaction of trade and commerce; to the labors of the husbandman; to the ingenuity of the artificer; to the studies of the philosopher; to the researcher of the antiquarian; to the navigation of the mariner, and the marches of the soldier; to all the exchanges of peace, and all the operations of war [19:6].

Metrology is defined as the "science of measurement [20:3]." It involves the development of measurement standards, systems, equipment, and techniques for making absolute and relative measurements (20:3).

Calibration is a term which is closely associated with metrology. Calibration is defined as:

> A comparison between a standard or measurement equipment instrument or items of equipment, one of which is a standard of higher accuracy, to detect, correlate, adjust and report any variation in the accuracy of the instrument or equipment being compared or tested [18:p.1-2].

Measurement standards are instruments, devices, or material with known performance characteristics that have

been established as authorized measures. These serve as the basic means by which the accuracy of precision measurement equipment is derived (18:p.1-2). National reference standards are measurement standards that have been established by the National Bureau of Standards (NBS) to serve as the basic measurement reference for use throughout the United States and the DOD (18:p.1-2). In the case of Precise Time and Time Interval measurements, the U.S. Naval Observatory is the established authority (18:p.1-2).

The Army, Navy, and Air Force employ individual measurement systems but each of these systems relies upon a hierarchy of measurement traceability. The hierarchy of measurement traceability

> . . . provides an organizational structure in which each echelon of measurement from bottom to top possesses increasingly more accurate measurement standards against which lower echelon standards can be calibrated [11:10].

The Army Metrology and Calibration System

Army Regulation 750-25 establishes a "single Department of the Army Metrology and Calibration System [24:2]." In order to maintain a central authority over the Army Metrology and Calibration System, the U.S. Army Metrology and Calibration Center (USAMCC) is maintained. The USAMCC, located at Redstone Arsenal, Alabama, exercises Army-wide technical control, supplies fundamental metrology and engineering support, assures logistic support for Army

calibration equipment, and provides overall monitorship of the Army Metrology and Calibration System (24:2).

Within the Army Metrology and Calibration System the Army Standards Laboratory, located at Redstone Arsenal, Alabama, maintains the Army's highest level of measurement standards and provides a direct measurement traceability link with the NBS and the U.S. Naval Observatory. The Army Standards Laboratories responsible for the measurement of nucleonics (support of atomic standards) are located at Lexington-Blue Grass Army Depot and Sacramento Army Depot (22:12).

Less accurate measurement standards are assembled into Secondary Reference Calibration Sets. These standards are distributed to Army Area Calibration Laboratories which are located at strategic points throughout the Continental United States (CONUS) as well as the European and Pacific theaters (22:11).

Another level of lesser accurate measurement standards is assembled into a mobile configuration called Secondary Transfer Set. Army Area Calibration teams operate these mobile calibration vans and provide on-site support to Army maintenance units (22:5).

The Army defines its calibration support into two levels. Level A support is the workload performed using calibrated standards to calibrate other standards and test, measuring, and diagnostic equipment (TMDE). Level C

calibration is that work which is performed using calibrated TMDE to maintain and calibrate other TMDE (22:12)

It is through this Army Metrology and Calibration System that the Army field maintenance activities are assured that the accuracy of the measurement capabilities of their TMDE is traceable to national measurement standards located at the NBS and the U.S. Naval Observatory.

The Navy Metrology and Calibration System

The Navy Metrology and Calibration System also maintains measurement traceability to the NBS and the U.S. Naval Observatory.

> The Navy's highest level standards laboratories are maintained at two locations. The two Type I laboratories are located at the Naval Weapons Engineering Support Activity, Washington D.C., and the Naval Air Rework Facility, Naval Air Station, North Island, San Diego, California [33:10].

These laboratories maintain the Navy's most accurate measurement standards except for Precise Time and Time Interval standards which are maintained by the U.S. Naval Observatory, Washington, D.C. The Type I laboratories calibrate standards, used by Type II Navy Standards Laboratories (37:4).

The Type II Navy Standards Laboratories provide the second highest measurement capabilities and services to activities within assigned geographical areas. The Type II laboratories provide calibration support and measurement traceability to the Navy's lower echelon calibration laboratories (33:10).

The Navy Reference Laboratories are shore-based laboratories. They are located at all Naval Shipyards, Ship Repair Facilities,and certain field activities located at San Diego, Great Lakes, New Orleans, and Puerto Rico. These reference laboratories have measurement capabilities similar to the Type II laboratories in areas of electrical, electronic,and radio frequency measurements (37:11).

The Navy also provides measurement traceability for the Marine Corps and more specific types of calibration support for shipboard requirements which will not be explored at this time (12; 37:5).

The Navy Metrology and Calibration System thus provides weapon system measurement traceability to the NBS through a systematic hierarchy of measurement standards and facilities.

The Air Force Metrology and Calibration System

The Directorate of Metrology, Aerospace Guidance and Metrology Center (AGMC), Newark Air Force Station, Newark, Ohio, is assigned the responsibility of technical manager for the Air Force Metrology and Calibration Program by AFLC Supplement 1 to AFR 74-2. The Air Force Measurements Standards Laboratory (AFMSL) is also located at AGMC. The AFMSL is the highest echelon standards laboratory in the Air Force and provides a direct link between the NBS, or the U.S. Naval Observatory in the case of Precise Time and

Time Interval, and the various Air Force precision measurement equipment laboratories (PMELs) located worldwide. The AFMSL is classified by the Air Force as a Type I Laboratory (18:p.1-1). Like the Army and Navy metrology systems, the Air Force also maintains a hierarchy of calibration laboratory capabilities which is comprised of Type II, Type III, and Type IV PMELs (18:p.1-1).

The Type II PMELs are further categorized as A, B, C or D laboratories. The Type IIA PMELs are designed to provide support to the Air Logistics Centers and/or certain geographical regions of the world and are operated by Air Force Logistics Command (AFLC) and theater support commands. The Type IIB PMELs are the base level laboratories which are primarily located at Air Force bases supporting aircraft, missiles, and ground systems. The Type IIC PMELs are normally operated under the direction of the Air Force Systems Command (AFSC) in support of research, development, test, and evaluation programs. The Type IID PMELs are tailored to satisfy specific missions and normally receive support from the Type I laboratory (18:p.1-1).

The Type III PMELs, like the Type IID PMELs, are designed to support particular missions. They normally receive calibration support from the Type II PMELs rather than the Type I laboratory (18:p.1-1).

The Type IV PMELs are designed to support specific missions in either a deployed or fixed location through the

use of a transportable measurement system. The Type IV PMELs obtain calibration support from the Type II PMELs (18:p.1-1).

The Air Force Metrology and Calibration System also assures measurement traceability to the national measurement standards through a structured hierarchy of measurement standards and facilities.

Summary of the Army, Navy, and Air Force Metrology and Calibration Systems

From the previous discussion of the three services' individual metrology and calibration systems, it can be seen that each service maintains a highly structured system to assure that tests and measurements performed on operational systems are accurate and traceable to national measurement standards. Figure 1 shows a composite matrix of the various levels of DOD calibration support. The focal point for measurement traceability for the three DOD metrology and calibration systems is the NBS and the U.S. Naval Observatory. The U.S. Army Standards Laboratory, the Navy's Eastern and Western Standards Laboratories, and the U.S. Air Force Measurement Standards Laboratory are the highest levels of measurement traceability within their respective metrology and calibration systems. The next lower level of measurement traceability is made up of the Army Area Calibration Laboratories, Navy Shipyard Reference

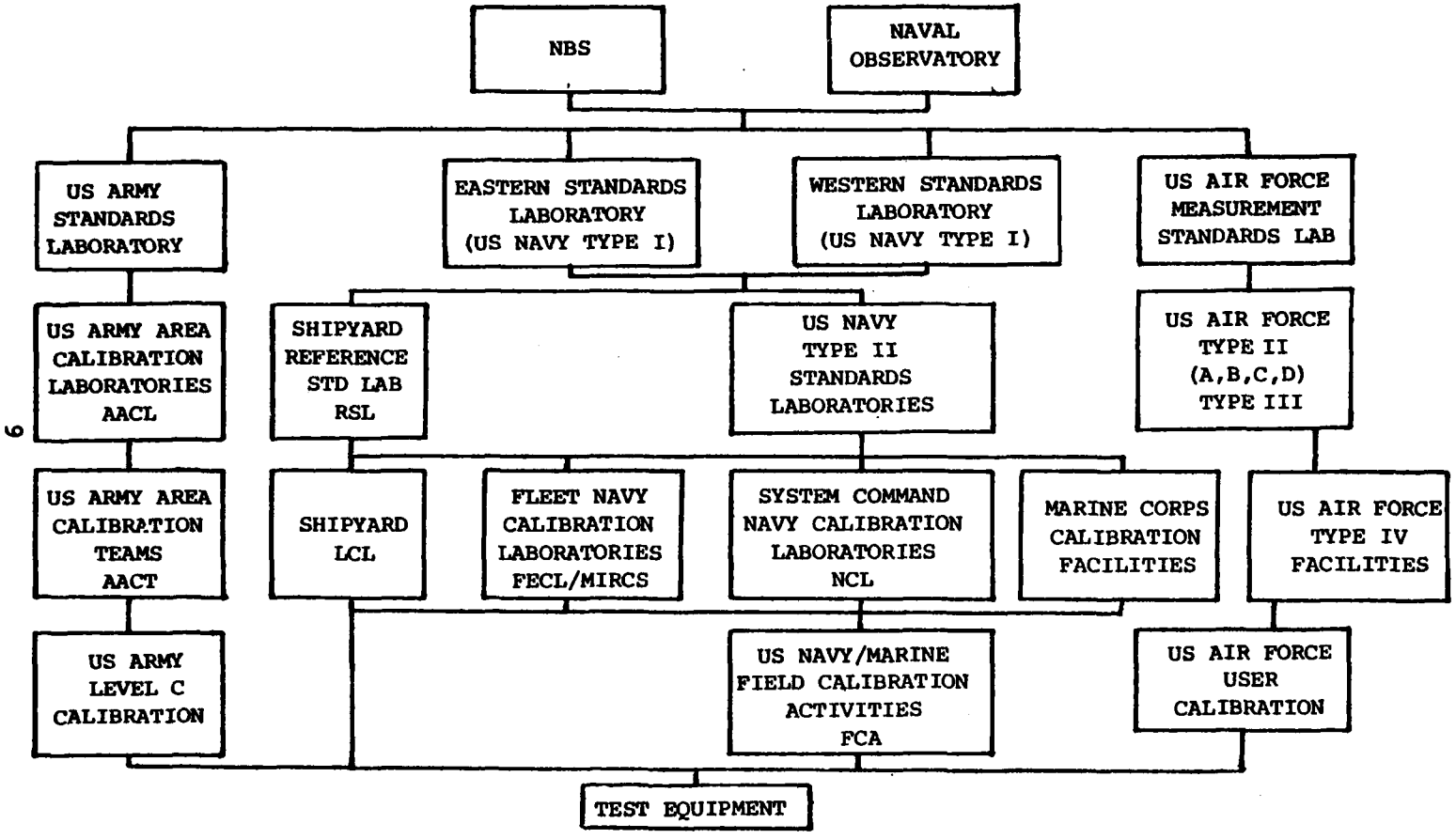

Fig. 1. Department of Defense Calibration Traceability [33:11]

Standards Laboratories, Navy Type II Standards Laboratories, and the U.S. Air Force Type II (A,B,C,D) and Type III PMELs. Below this level of measurement traceability, each service provides more specialized calibration services, capabilities, and facilities depending upon the specific mission being supported.

The user of DOD test equipment is therefore assured that he will receive the same level of measurement traceability regardless of which DOD service provides him with calibration support.

Joint Technical Coordinating Group for Metrology and Calibration

> The Joint Logistics Commanders (JLC) of the Army, Navy, and Air Force are the senior Department of Defense military personnel charged with the design, supply, and maintenance of military systems. They have established a program of scheduled meetings to resolve interservice support problems and to accomplish significant joint studies and tasks. One area, recognized early as warranting substantial interservice coordination, was metrology and calibration. A Joint Technical Coordinating Group for Metrology and Calibration (JTCG-METCAL), was established in September 1968 [27:11].

The purpose of the JTCG-METCAL group was to provide interservice coordination and make recommendations on:

1. Interservice calibration support
2. Calibration engineering
3. Calibration training
4. Calibration procedures
5. Measurement agreement audits
6. Calibration interval establishment

7. Calibration facilities resources

8. NBS calibration and engineering services (6:88)

Membership of the JTCG-METCAL is made up of staff personnel from the U.S. Army Material Development and Readiness Command, Naval Material Command, Air Force Systems Command, and Air Force Logistics Command (9). Figure 2 represents the JTCG-METCAL Organizational Structure and Chain of Command.

Consolidation of Calibration Services (COCS) Subgroup

The Consolidation of Calibration Services Subgroup was chartered on June 5, 1975, by the JTCG-METCAL. It was established because the Joint Services were becoming increasingly aware that in many geographical areas there were DOD calibration facilities located near other DOD calibration facilities. This resulted in duplication of capabilities and wasted resources. The primary mission of the COCS subgroup is to

> . . . identify geographical locations where consolidation of DOD calibration services is feasible and could result in improved operational readiness and/or greater overall cost effectiveness [27:1].

Following the establishment of the COCS Subgroup, the Consolidation Review Team East (CRT(E)) and the Consolidation Review Team West (CRT(W)) were also chartered to perform consolidation studies. The COCS, CRT(E), and CRT(W) subgroups perform consolidation studies within geographic regions assigned by the JTCG-METCAL.

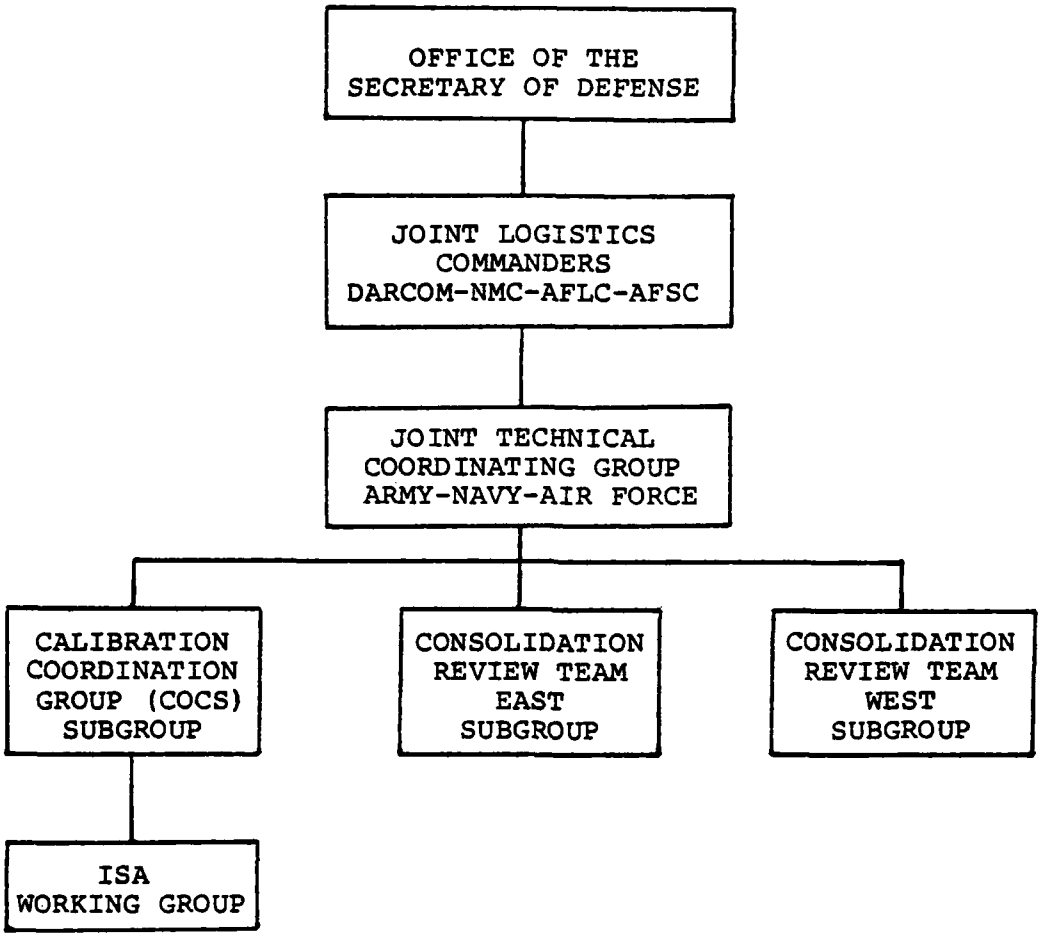

Fig. 2. JTCG-METCAL Organizational Structure (9; 10:1; 13)

Interservice Support Agreement (ISSA) Working Group

The ISSA Working Group was chartered 23 November 1976 as a subgroup to the COCS subgroup. The primary objectives of the subgroup are to

> . . . identify potential locations or areas wherein ISSA's for calibration services are desirable and will result in improved operational readiness and/or greater overall cost effectiveness. To assist in the establishment, review, analysis, revision, and coordination of ISSA's for calibration services . . . [34:1].

Members of the Working Group are provided by the Army, Navy, and Air Force who report their findings to the Chairman of the COCS subgroup.

Justification for Research

Through the consolidation studies a problem was identified which is having an adverse effect upon implementing recommended consolidations and increasing interservice support. The problem is that reimbursement costs vary widely from one calibration facility to another. One reason for the variation in calibration costs is that reimbursement costs are often calculated based upon the method by which the calibration facility obtains its operating funds (12). It is not uncommon for owners of DOD test equipment, needing calibration, to obtain support from distant DOD calibration facilities rather than a nearby facility in order to obtain a lower reimbursement rate (11).

Recognizing this problem, the JTCG-METCAL developed a charter to have a study performed evaluating the feasibility of directly funding the DOD calibration laboratories. Under this concept, reimbursement would not be required between DOD services for interservice calibration support. To date, the members of this study group have not been designated and the study has not been started (9).

Research Objective

The objective of this thesis is to evaluate the feasibility of directly funding the DOD calibration laboratories. This would be accomplished by establishing a separate line item in the DOD Budget to cover the funding requirements for all DOD calibration laboratories, and thus eliminate reimbursement for calibration services between DOD agencies.

Research Questions

1. What are the current DOD funding methods for obtaining operating funds for calibration services?

2. What influences do the various funding methods have upon reimbursement costs?

3. What economic gain can be realized by changing to a method of direct funding?

4. What controls would be necessary to account for the funds?

5. Who would be responsible for obtaining and administering the funds?

6. What operational gains could result through direct funding?

7. What operational limitations would be imposed as a result of direct funding?

8. Do manpower ceilings at base, major command, and/or service level preclude/hinder Interservice Support Agreements?

CHAPTER II

METHODOLOGY

Scope of the Study

The scope of this study encompasses the investigation into the feasibility of establishing direct funding as an alternative method of providing operating funds for DOD calibration laboratories. Under this concept, a separate line item would be established in the DOD budget for each Service's (Army, Navy and Air Force) Metrology and Calibration Program. The funds would be distributed directly to the metrology and calibration laboratories through command channels within their respective Service. It is not within the scope of this study to develop a cost analysis of implementing such a system but rather to examine the practicability and feasibility of such a funding system for the DOD Metrology and Calibration Program.

The motivation for this study stems from the desire of the researchers to evaluate a uniform method of funding DOD calibration laboratories in such a manner that the complexities associated with funding, consolidation of DOD laboratories, and interservice calibration support would be reduced.

A clearer understanding of the scope of this study may be achieved by examining the elements of organization within the study. The organizational elements which were studied are the Metrology and Calibration Headquarters (Army, Navy, and Air Force), the major operating commands of each Service, the calibration laboratories within each Service, the DOD customers of interservice calibration support, and the budgeting and funding procedures of each Service. Each of these organizational elements was studied in terms of the impact that direct funding would have on the organizational elements individually and then conclusions are drawn as to the total effect upon the organizational elements as a corporate body.

The intent of this study is not to evaluate the effectiveness of each Service's metrology and calibration program, but to determine the feasibility of directly funding the entire DOD Metrology and Calibration Program.

Kinds of Information Needed

In order to determine the feasibility of directly funding for DOD Metrology and Calibration, it was necessary to examine each Service's program and determine how each of the organizational elements interrelate to each other.

As pointed out in Chapter I of this study, each of the Services operates and manages its metrology and calibration programs independently of the other Services.

However, if the Services begin to become more dependent upon one another for support, either through interservice support or consolidation of facilities and capabilities, it may be necessary for a more coordinated effort between the Services in order to operate in a more homogeneous environment. It was therefore necessary to obtain information relative to the operation of each organizational element. For example, if a significant shift in DOD calibration workload took place, so that an Air Force laboratory lost a significant workload to an Army Laboratory, simply because of the elimination of reimbursement costs, the Air Force and the Army would be faced with a decision of how they would react to a potential change in manpower authorization requirements at their respective laboratories. The Air Force laboratory would have a potential excess of personnel while the Army laboratory would have a potential shortage of personnel. Given a second scenario; two DOD calibration laboratories are recommended for consolidation of facilities and personnel. The laboratories belong to different Services and both have substantial workloads that by consolidating the two laboratories, personnel from both laboratories must be retained and integrated into the single consolidated laboratory. Because one of the laboratories is manned by military personnel and the other is manned by civilian personnel, a conflict arises over what equipment the military technicians may work on opposed to

what equipment the civilians may work on because of funding differences between the Services. Once again, it was necessary to obtain information relative to how the organizational elements can function within and between their respective Services.

Other types of information which were needed are identified below:

1. The amount of interservice support provided by each Service.

2. The funding method employed by each Service.

3. Reimbursement procedures used by each Service.

4. Budgeting procedures used by the calibration laboratories and the interservice support customers.

5. Traceability of reimbursed funds for interservice support provided.

6. Interservice support customer inputs relative to their motivation to obtain interservice support from one DOD laboratory in lieu of selecting another laboratory.

Data Sources

Much of the published literature concerning DOD Metrology and Calibration is of a scientific or technical nature and does not address organizational management, interaction, and funding of the three metrology and calibration programs, assuming that they were operated under a single direct funding method. There has been some dialogue

within the DOD concerning this topic as mentioned in the previous chapter of this study but very little data was available as an existing data base for this study. Therefore, much of the information obtained through this study is primary data in terms of the affect upon organizations. This type of information is only available from four basic sources. Those sources are the metrology headquarters of each Service, the major operating commands of each Service, the various calibration laboratories within each Service, and the DOD customers of interservice support.

Method of Solution

General

The Research Question approach was the method of solution used for this research. A thorough, subjective evaluation of the emergent facts is presented in Chapter IV and conclusions presented in Chapter V are based upon the results of that evaluation.

In order to answer the research questions which were formally stated in Chapter I, it was necessary to subdivide the research into eight tasks.

First. Explore the organization of the three Services' metrology headquarters to determine the level of involvement and authority that each has in the operation and management of the laboratories within their respective Service.

Second. Determine what various funding methods are currently being employed to provide DOD calibration laboratories operating funds and then determine the differences of those methods as compared to the direct funding method. In addition, evaluate the effects upon reimbursement rates.

Third. Identify potential areas where economic gains might be realized by converting to a direct funding method.

Fourth. Survey the major operating commands of each Service to establish their involvement in obtaining operating funds for their respective calibration laboratories as well as their level of participation in interservice support negotiations with their field and base level laboratories.

Fifth. Survey the calibration laboratories of the Navy and Air Force to determine the impact upon their operation if direct funding were to be implemented. Identify changes in accounting requirements, billing procedures, negotiation arrangements, and level of interservice support (current and anticipated).

Sixth. Identify what economies of operating efficiency could be achieved as a result of implementing direct funding.

Seventh. Analyze the impact upon customers of DOD calibration laboratories if the requirement for reimbursement of costs was eliminated. Also identify the primary motivating factors of interservice support customers in selecting one support laboratory over other support laboratories.

Eighth. Identify the budgeting procedures used by both calibration laboratories and interservice support customers in order to determine if certain calibration services are being budgeted for more than once.

Data Gathering

Since there was not a sufficient amount of published information available from which to obtain the necessary data required to complete this study, the researchers employed interview techniques to build a data base.

The original intent of the researchers was to conduct personal interviews with key personnel at each of the Army, Navy, and Air Force Metrology Headquarters. Additionally, the researchers intended to interview, via telephone, key personnel at the various Metrology Operating Commands within each Service as well as fifteen calibration laboratory superintendents (five from each service). Finally, the researchers intended to interview fifteen DOD customers currently receiving interservice calibration support from DOD calibration laboratories. The various organizations included in the original survey are identified in Appendix B.

With regard to the DOD Metrology Headquarters, the researchers were able to obtain personal interviews only with the Army and Air Force. Due to time constraints and limitations on travel funds, the researchers obtained their

data from the Navy via telephone interview. The researchers feel, however, that the data provided by the Navy is as qualitative as the data obtained from the Army and Air Force. The fact that it was obtained via telephone should not be construed as being any less significant than the data collected by personal interviews.

With regard to the interviews with the Services' Major Operating Commands, the researchers were able to obtain interviews with seven Air Force Major Command PMEL Monitors located within CONUS (one personal interview and six telephone interviews). Since the Army METCAL Program is now operated by the Department of the Army Readiness Command (DARCOM) Major Command, through Redstone Arsenal, the questions relative to the Army's Major Command involvement in metrology operations were addressed by Army Metrology and Calibration Center personnel. The researchers were requested, by the Navy, to limit their survey of Navy organizations to Metrology Headquarters, Major System Commands, and laboratories, and to address all questions to a single focal point established at the Naval Material Command (35). This constraint limited the researchers' ability to ascertain the opinions of those individuals, working at Navy Major System Command and Laboratory levels, in terms of their perception of how interservice calibration support might be improved or degraded through centralizing funding of the DOD METCAL Programs.

As mentioned previously, the researchers were requested not to interview Navy laboratory personnel. However, the researchers did obtain interviews with laboratory superintendents at three Army laboratories and five Air Force laboratories. The researchers originally contacted five Army laboratories for possible interviews but two of the five later declined to respond after they received their interview guides.

A total of nine interservice support customers were surveyed and provided the researchers with telephone interviews. Four of the customers received support from Army laboratories and five received support from Air Force laboratories.

The researchers also interviewed personnel within the three services who were employed in the areas of budgeting and funding. Most of the personnel interviewed in this area were also provided copies of the appropriate interview guide, prior to the interviews, to allow them sufficient time to formulate their responses.

Since the researchers neither had the time nor the resources for any audit of the responses to the interviews, the validity of the data collected is based solely upon the honesty and integrity of the respondents. Further, since much of the information obtained from the respondents was of a subjective nature, the validity of the data was further predicated upon the actual experience of the respondents

and their perceptions and interpretations of their respective regulations, instructions, command policies, and local operating procedures.

During the data gathering process the respondents provided additional insights to very relevant issues that were not directly addressed by the interview guides. These issues will also be addressed during the presentation and evaluation of the data in Chapter IV.

Assumptions

In order to maintain a maximum level of objectivity, the only initial assumption that was made is that of political feasibility. Should the research efforts show substantial economic or operational effectiveness gains from converting to a direct funding method, it was assumed that the conversion would be acceptable by the President and the Congress.

Limitations

This study is basically descriptive and interpretive in nature, and the conclusions reached are based upon critical interpretation of data obtained by the researchers. It is not a practical consideration for the researchers to realistically model or establish an experimental design of the DOD Metrology and Calibration Program in a direct funding mode of operations because of the following items:

1. Impact upon DOD Budget.

2. The DOD Planning, Programming, and Budgeting Process.

3. The large number of organizations involved.

4. The potential mission impact of DOD Metrology and Calibration programs.

5. The time constraints.

Thesis Organization

Chapter I. The introductory chapter provides a statement of the problem, a review of the available literature, a discussion identifying the justification for the research, a statement relative to the objective of the research, and the research questions formally stated.

Chapter II. This chapter outlines the methodology by which the researchers will conduct their research effort. It outlines the scope of the study, the kinds of information needed, the data sources, method of solution, data gathering process, and the thesis organization.

Chapter III. This chapter presents an overview of the current methods employed by each service in providing interservice calibration support including management of the organizations and funding of the metrology programs.

Chapter IV. This chapter presents a report of the research findings and a critical analysis of the effects upon the various organizations involved in the DOD

Metrology and Calibration Program if direct funding of the overall program were implemented.

Chapter V. This chapter formally concludes this study and presents the conclusions and recommendations of the researchers. Recommendations for further or related studies are also identified.

CHAPTER III

MANAGEMENT AND OPERATION OF METCAL PROGRAMS

In Chapter I, a discussion of the Army, Navy, and Air Force Metrology and Calibration (METCAL) Programs was presented. This was necessary to establish the premise that each Service provides measurement traceability to national measurement standards for all measurements that they perform. Therefore, any DOD activity requiring interservice calibration support, can be assured that equipment which is serviced by any DOD calibration facility will be calibrated and certified with calibration standards which are, in turn, traceable to the same national measurement source or authority.

The measurement traceability hierarchy is highly structured and very similar among the Services. However, there is dissimilarity in the manner in which the three DOD METCAL programs are managed and operated.

The purpose of this chapter is to discuss the management and operation of the three METCAL programs in order to provide a better understanding of how interservice support is provided by the three Services. It should also provide a basis for understanding the analysis of the data as presented in Chapter IV. As presented in Chapter I,

each Service will be discussed separately. The discussion will include four main areas. First, an exploration of the three Services' metrology headquarters to determine the level of involvement and authority that each has in the operation and management of the laboratories within their respective Services. The second main area to be covered will be the involvement of the major operating commands within each Service. The purpose of this discussion is to establish their involvement in obtaining operating funds for their respective calibration laboratories as well as their level of participation in inter-service support negotiations with their field/base level laboratories. The third area to be covered will be a discussion of the various funding methods used to provide operating funds to the laboratories. The fourth area covered will be a discussion of the concepts of support provided by each Service. This discussion will evaluate concepts of both calibration and repair services provided by the three Services.

It should be pointed out that the intent of this chapter is <u>not</u> to evaluate or compare the management structures of the three METCAL programs for the purpose of identifying which Service has the "best" structure or organization. It is presented to simply establish a basis for understanding how the programs function and as a guide to a better understanding of the analysis as presented in Chapter IV.

Management of the Army METCAL Program

DOD Directive 4155.1 provides broad metrology and calibration policy (34:p.1-4). Within the Army, the DOD Directive is implemented by AR 750-25-1 which, in turn, implements the Department of the Army METCAL Program (25:p.1-1). Figure 3 illustrates the Army command structure and lines of authority in the operation and management of the Army METCAL Program.

Management Structure

The Army is currently undergoing a massive reorganization of their METCAL management structure (8). Implementation of the reorganization will be accomplished through reorganization of support operations in three phases, based on geographic areas. The geographic areas involved are the European theater, the Western Pacific area, and Conus areas.

> The first phase involves establishment of the U.S. Army Material Development and Readiness Command's (DARCOM), US Army TMDE Support Activity, Europe (USATESAE), to provide test measuring and diagnostic equipment (TMDE) support within the USAREUR and 7th Army logistic support area. The second phase involves establishment of the DARCOM Area TMDE Calibration and Repair Center (ACRC) in Korea to provide TMDE support within the Western Pacific (WESTPAC) logistic support area. The third phase will involve implementation by the Army National Guard (ARNG) and the reorganization of DARCOM calibration facilities in CONUS into ACRC's to provide TMDE support within CONUS [25:p.1-1].

The estimated completion dates for each phase of implementation are as follows:

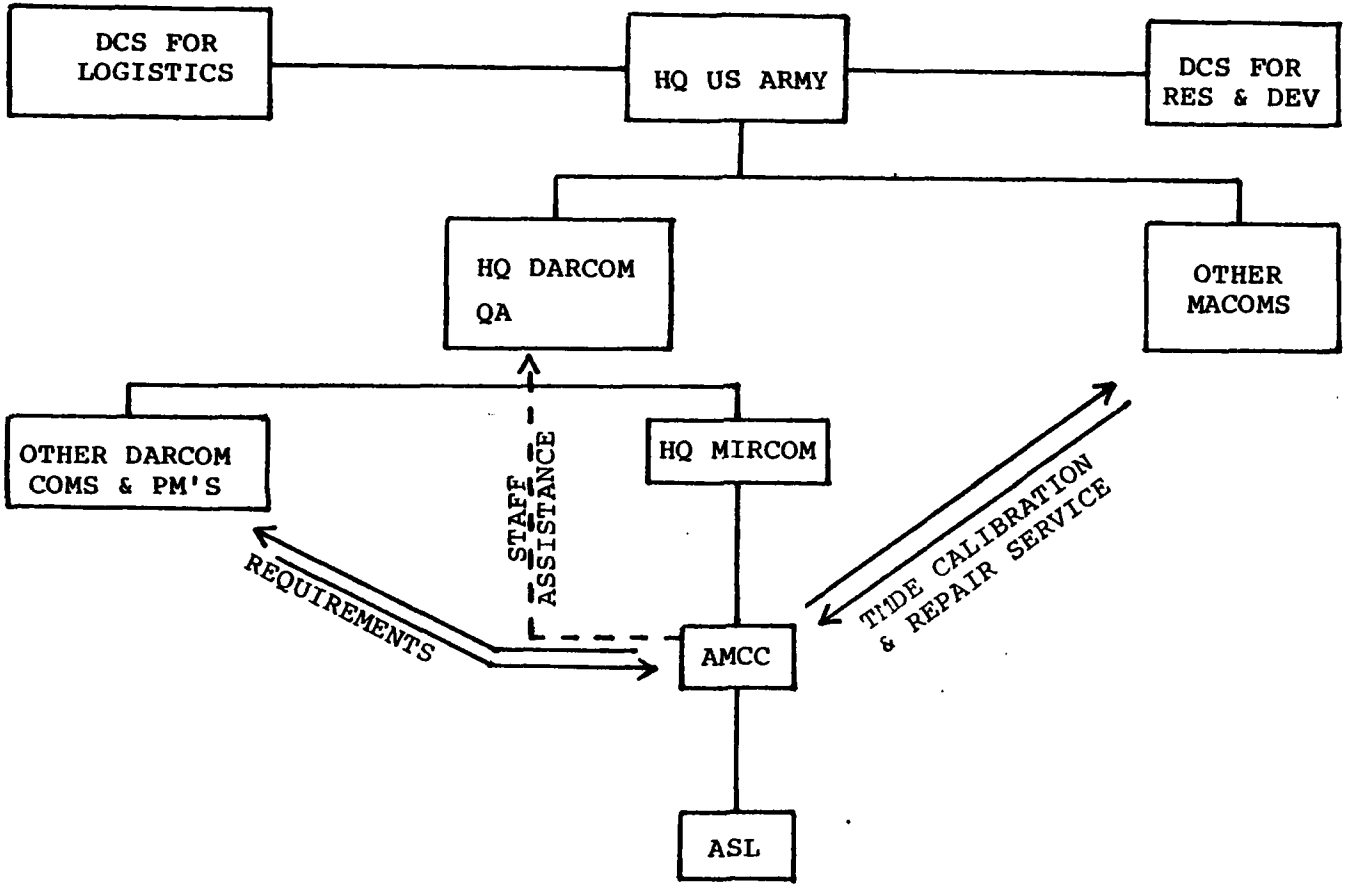

Fig. 3. U.S. Army Command Structure [34:I-6]

1. USAREUR Logistic Support Area implementation was estimated to be effective by 1 October 1979 (25:p.1-2).

2. Eighth U.S. Army (EUSA) Logistic Support Area implementation was estimated to be effective by 1 October 1979 (25:p.1-2).

3. USAR-J, WESTCOM, CONUS, and ARNG implementation is estimated to be effective by the end of calendar year 1981 (8).

Insofar as the new Department of the Army (DA) concept is in the process of being implemented, the presentation of the management of the Army METCAL Program, in this thesis, is as though total implementation were complete.

Figure 3 provides an illustration of the Army's command structure. The responsibilities of organization, as they relate to this study, are as follows:

1. The Deputy Chief of Staff for Logistics (DCSLOG) is responsible for approval and promulgation of Army policy as it relates to the Army METCAL Program in coordination with the Deputy Chief of Staff for Research, Development, and Acquisition. DSLOG is also responsible for General staff supervision of implementation of Department of the Army policies by the major Army and field commands (25:p.1-4).

2. The Deputy Chief of Staff for Research, Development, and Acquisition (DCSRADA) is responsible for approval and promulgation of Army policy applicable to TMDE and

measurement standards research, development, and acquisition, in coordination with the Deputy Chief of Staff for Logistics (25:p.1-4).

3. HQ DARCOM is assigned management, command, and control of the Army-wide METCAL program. DARCOM will manage and operate U.S. Army Area TMDE Calibration and Repair Centers in CONUS and OCONUS (25:p.1-12).

4. The U.S. Army Missile Material Readiness Command (MIRCOM) is responsible for providing support such as funding personnel, contracting, facilities, etc., for the Army Metrology and Calibration Center (34:I-4).

It can therefore be seen that although DARCOM will be working in concert with the other major commands within the Army, it will exercise line authority and management over the total Army METCAL Program from a centralized concept.

Funding

The method of funding the Army METCAL Program is currently not standardized for all laboratories.

> Funding for calibration services within DARCOM falls primarily in two categories: the level 4[1] program, which is basically direct funded, and the internal mission programs, which are funded from the mission the calibration activity supports [23:p.2-97].

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[1]The Level 4 program used in this context relates to funding terminology used by the Army and does not relate to levels of calibration support.

The six level A CONUS calibration area support depots applicable functions of the U.S. Army Metrology and Calibration Center, and the 95th Service Company are direct funded from Operations and Maintenance Army (OMA) appropriation 732207L funds under Army Industrial Fund reimbursement procedures (23:p.2-97). Level C laboratories, on the other hand, are normally funded out of the internal mission programs, such as the operation and maintenance funds, of the activity which the laboratory supports (3).

The Army Standards Laboratory funding requirements are administered by the Plans, Program and Administrative Office of the U.S. Army Metrology and Calibration Center. Equipment hardware is procured with Other Procurement Army (OPA) funds. Support charges from Redstone Support Activities are Base Operation funded through the Army Industrial Fund (34:I-26).

After total implementation of the Department of the Army Concept for reorganization, all of the Army metrology laboratories (Level A and Level C) will be funded under the OMA appropriation 732207L except a small number of Internal TMDE Calibration and Repair Centers (ICRC). These ICRCs will be the responsibility of the applicable Major Army Command for funding. However, most of the funding for the Army METCAL Program will be accomplished through OMA appropriation 732207L funds under the direction of DARCOM (3).

Interservice Support

The Army Metrology and Calibration Center will serve as the Army's focal point for Interservice Support Agreements (ISSAs) under the new DA concept (25:p.2-7). In keeping with DOD policy that ISSAs should be negotiated at the lowest command level possible, the Army Standards Laboratory and the Army Calibration and Repair Centers are responsible for developing, negotiating, and consumating agreements that pertain to the support of equipment within their assigned mission area. However, potential ISSAs will be developed and evaluated in coordination with the Army Metrology and Calibration Center to determine the appropriateness of such agreements (26:p.4-34). The Army Metrology and Calibration Center will therefore have total visibility of all calibration interservice support work being performed by the Army (8).

Concept of Services Provided

Under the new DA concept, the Army will be operating under a calibrate and repair concept. That is to say both calibration and repair are available to the customer, provided that the required support is within the capability of the laboratory.

The Army provides support from both fixed calibration facilities as well as mobile calibration vans. The mobile calibration vans, AN/GSM 256 visit customers remotely

located from fixed calibration facilities on a scheduled basis. The mobile vans operate out of the depot level labs and support geographic regions of the country.

Army calibration support is therefore provided to customers who are capable of transporting equipment to fixed calibration locations as well as those customers who are remotely located from the fixed facility.

Management of the Navy METCAL Program

Naval Material Command Instruction (NAMATINST) 4355.67A defines policy and assigns responsibility for management and operation of the Navy Metrology and Calibration (METCAL) Program. Figure 4 presents a broad illustration of the Navy METCAL management structure under the direction of the Chief of Naval Operations.

Management Structure

The Deputy Chief of Naval Material (Operations and Logistics) is assigned the management responsibilities for the Navy METCAL Program for the Chief of Naval Material. His responsibilities include:

1. Providing general instruction and technical direction.

2. Coordination of total program requirements.

3. Approval of establishing, disestablishing, or major change in Navy calibration laboratories.

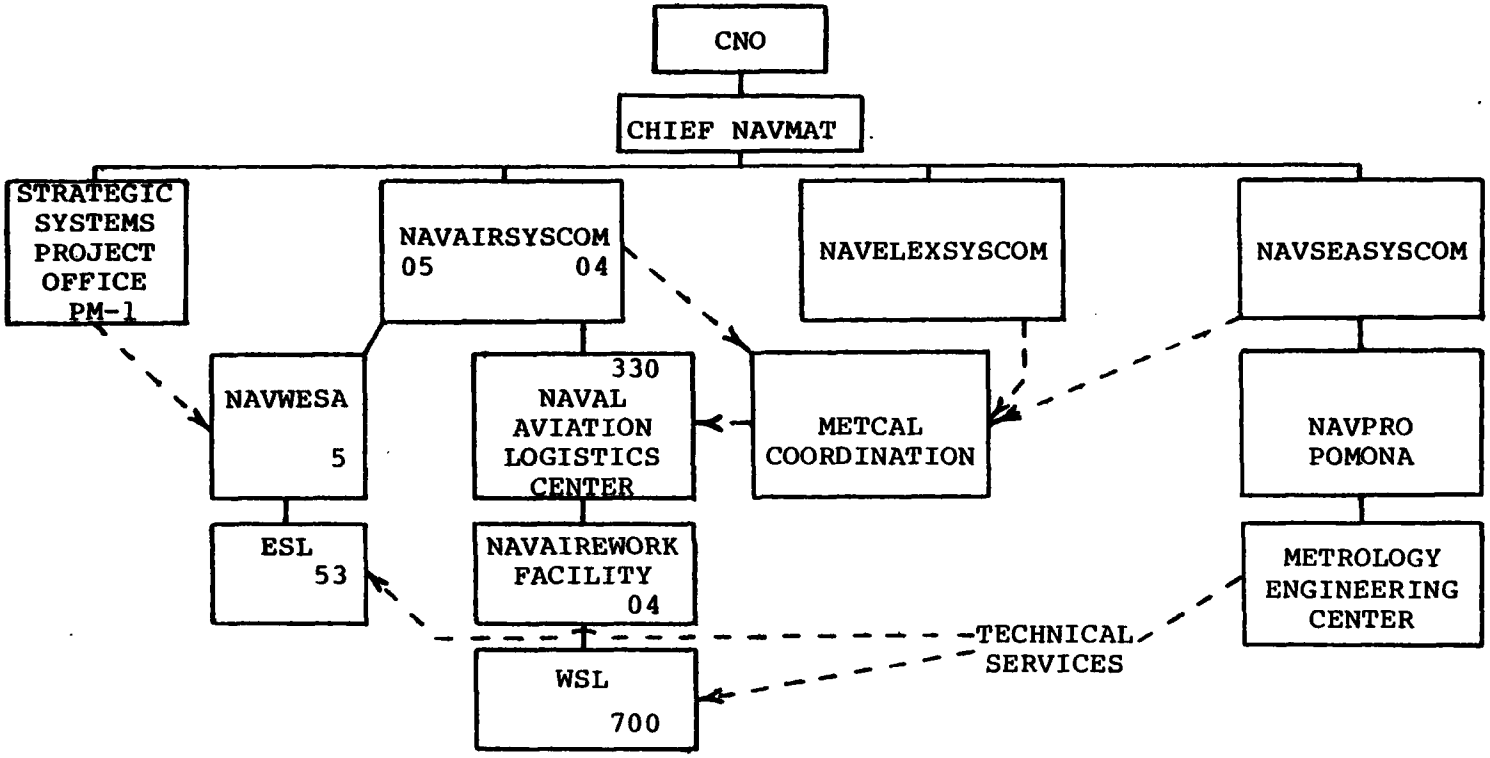

Fig. 4. Navy Organizational Structure for Metrology Program [34:I-28]

4. Serving as the Navy point of contact for all METCAL policy matters (36:4).

The Systems Commanders (AIR, SEA, Electronics (ELEX)) and the Project Managers are responsible for the following:

1. Operation of assigned standards and calibration laboratories.

2. Budgeting and funding for:

a. Procurement, calibration and repair of metrology standards required to support operating forces.

b. Calibration and incidental repair of fleet ashore and afloat test and measuring equipment beyond the calibration capability and capacity of the operating forces.

c. Calibration of metrology standards and ancillary equipment which requires calibration by higher echelon laboratories.

d. Services required by the National Bureau of Standards and the Metrology Engineering Center (36:4).

The Metrology Engineering Center (MEC) is designated as the lead scientific and technical agent for the Navy METCAL Program and is under the administrative command of the Naval Plant Representative Office (NAVPRO), Pomona, California. It also receives management direction from NAVSEA Command (40:p.3-4). It does not, however, exercise any line authority or management over the operations of

the Navy metrology laboratories. Operational authority is exercized by the local commander of each facility under the guidance provided by their respective command instructions.

Funding

As mentioned previously, the Major Systems Commands budget and fund for their respective programs and also provide funds to the Eastern and Western Standards Laboratories, as well as the Metrology Engineering Center, for various services (40:p.3-2).

The Navy's Eastern and Western Standards Laboratories receive funds from a number of sources. To a large extent they are direct funded through the Naval Aviation Logistics Center (NAVAVNLOGCEN). It is through this activity that funding from the AIR, SEA, and ELEX System Commands is funneled to the Navy Type I laboratories. Funding from the Naval Air Systems Command is received by NAVAVNLOGCEN and provided to the laboratories on a single funding document. Direct funds are received from other activities for specific services including approved Navy contractors (34:I-39).

The Metrology Engineering Center was funded, during FY 78, from basically five sources; the Naval Air Systems Command, Naval Sea Systems Command, Naval Electronics Systems Command, Strategic Systems Project Office and the

Marine Corps. However, from these five sources, the total funding was provided through ninety-two separate funding documents. Funds for the MEC are provided through Work Requests, Project Orders, Allotments, and Requests for contractual procurement (34:I-39).

From this discussion, it can be seen that the Navy uses a decentralized method of funding for its METCAL Program. The Major System Commands individually fund for laboratories within their respective commands and the Type I laboratories and the MEC operate on basically a level of effort reimbursement basis. However, the Naval Material Command does function as a central focal point for Navy METCAL funding matters.

Interservice Support

The Navy has stated, as a policy, that it encourages utilization of interservice support arrangements with other DOD components, to obtain maximum utilization of available calibration facilities and to eliminate unnecessary duplication (38:2). Most of the interservice calibration support is provided by the land based laboratories. Only on rare occasions do shipboard laboratories provide support to other agencies (14). Interservice Support Agreements (ISSAs) are negotiated at the various laboratories where the work is to be performed. Only when problems arise that cannot be resolved at the laboratory level or when the

interservice workload is expected to be a significant portion of the laboratories' total workload (approximately 20 percent) do the Major Systems Commands become directly involved in resolving interservice support issues.

Concept of Services Provided

The Navy performs services on a calibrate and incidental repair basis. Incidental repair is defined as

> . . . those repairs found necessary during calibration of operable equipment to bring it to within its specified tolerances, including the replacement of parts which have changed value sufficiently to prevent calibration but do not otherwise render the equipment inoperative [39:2].

This basically means that the Navy will only service equipment which is believed to be operational when delivered to the laboratory for service. If during the calibration, a problem is discovered such that repair is required, the necessary repairs will be performed. However, if an item of equipment is delivered to a Navy calibration laboratory in an inoperable condition, it will not be accepted for servicing. After the owner of the item obtains the necessary repairs such that the equipment is operable the laboratory will calibrate it. Navy policy is that the owner/user is responsible for maintenance and upkeep of equipment (14).

Most of the calibration support provided from land based Navy laboratories is performed at the fixed facility. The Navy has only limited mobile calibration capabilities.

They do have mobile jet engine test stands that are used to perform on-site support to jet engine test cells. However, all other support is provided from the fixed facility (14).

Management of the Air Force METCAL Program

Overall policy in support of metrology and calibration stems from DOD Directive 4155.1 (34:I-59). Within the Air Force, the DOD Directive is implemented by AFR 74-2. Figure 5 illustrates the command structure and lines of authority in the operations and management of the Air Force METCAL Program.

Management Structure

The responsibility of establishing overall policy for managing and operating the Air Force METCAL program is assigned to HQ USAF/LEY (17:2).

Air Force Logistics Command (AFLC) is assigned the responsibility as lead command for implementing and providing a single integrated METCAL Program, Air Force-wide, and for operating the Air Force Metrology Standards Laboratory. AFLC, through coordination with each major command, selects bases where PMELs will be located (17:2).

Most of the AFLC responsibilities identified in AFR 74-2 are assigned to the Directorate of Metrology (ML) located at AGMC by AFLC Supplement 1 to AFR 74-2. It is

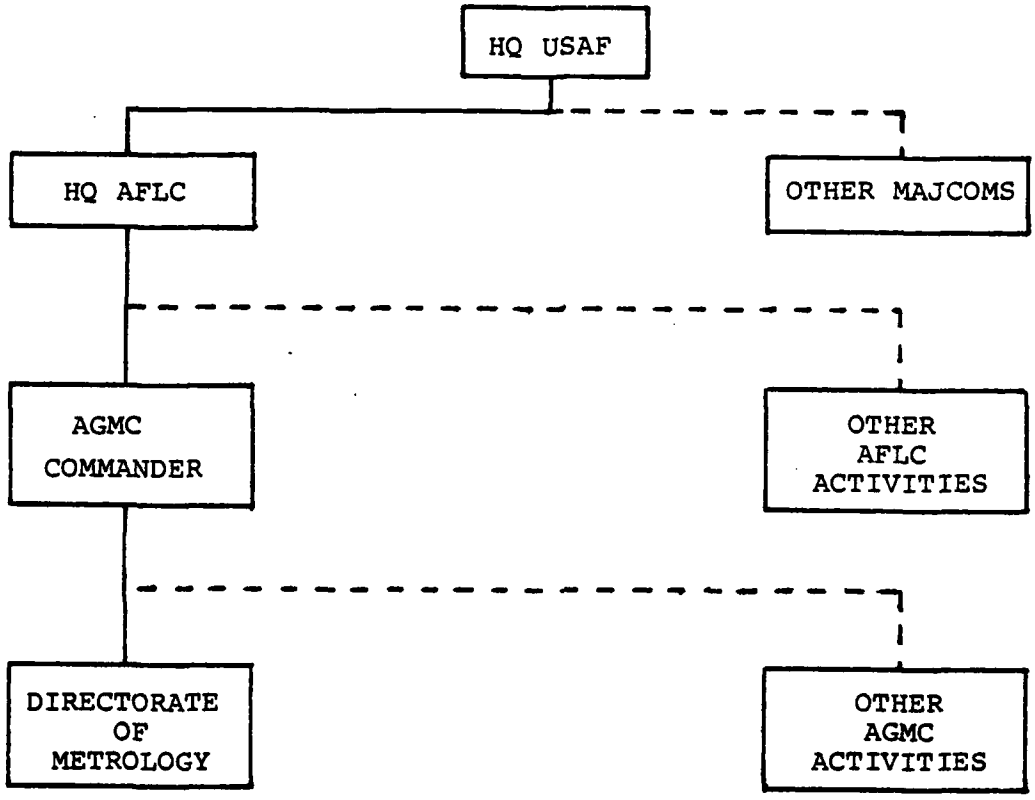

Fig. 5. U.S. Air Force Command Structure [34:I-60]

through this supplement that AGMC/ML is tasked with the responsbility of having "technical direction and management of the Air Force METCAL Program and for operation of the Air Force Measurement Standards Laboratory [34:I-59]."

Each Major Command is tasked, by AFR 74-2, to establish an office of primary responsibility to coordinate the implementation of the METCAL Program within their respective command (17:p.3-4). AFR 74-2 identifies six specific responsibilities which are assigned to the Major Operating Commands which are as follows:

1. Maintains and operates, at selected bases and installations, a PMEL to perform normal support functions.

2. Establishes, within other maintenance activities, an effective program to provide support to equipment that is not supported by the PMEL.

3. Sets up and maintains a maintenance quality assurance program, as specified in AFR 66-14 for all calibrating work centers.

4. Operates an effective program for equipment scheduling and maintenance data collection.

5. Obtains technical advice and assistance from the designated AFLC activity on developing projects for PMEL facilities.

6. Submits statements of work and amendments to them for contractor operated PMELs to the designated AFLC

activity (AGMC/ML) after the contract has been awarded (17:p.3-4).

From this discussion, it can be seen that although AGMC is responsible for technical direction and management of the METCAL Program, the Major Operating Commands provide ownership and line authority over the PMELs within their respective command. It should also be pointed out that AGMC maintains a very influential position in the decisions made by the major operating commands in terms of the operations of the PMELs. The major operating commands, however, exercise final authority and responsibility for the management and operations of PMELs within their command. For example, AGMC periodically evaluates the performance of each PMEL, based upon criteria outlined in T.O. 00-30-14, to determine the technical competence of the laboratory. Based upon the results of that evaluation, AGMC can take three basic actions. The first action is to certify the laboratory's operation without limitations. This means that the laboratory is operating within the guidelines as specified in T.O. 00-20-14. The second action which can be taken is to provide certification with limitations. This means that the PMEL is deficient in one or more areas but not sufficiently deficient to warrant total withdrawal of the laboratory's certification. The third action that can be taken is to totally withdraw the laboratory's certification. This means that the results of the

evaluation determined that the laboratory is not capable of performing adequately. When deficiencies are found and/or decertification is recommended, AGMC provides these findings and recommendations to the responsible Major Operating Command. It is the Major Operating Command's decision as to whether the laboratory will continue operating while corrective action is being taken or whether the laboratory will shut down operations until corrective action has been completed. AGMC does not possess the management authority to close a PMELs' operation (2).

Interservice Support

The Major Operating Commands within the Air Force do not become directly involved in negotiating ISSAs between PMELs and customers requesting calibration support on a routine basis. DOD policy is that "Interservice Support Agreements delineating specific responsibilities will be executed at the lowest practicable command level [16:A-3]." Only when disagreements or rejections of requests cannot be resolved at the lowest level, are requests for assistance in resolving the disagreement forwarded through higher command channels for resolution. The Director of Metrology at AGMC and the Air Logistic Centers (ALC) will also participate with other DOD agencies to determine the feasibility of establishing interservice

support agreements (18:p.2-9). This, however, is also done on a limited and exception basis (13).

Funding

The method of funding for the operation of Air Force PMELs is not standardized. At least three different methods were identified during this study. The method of funding PMELs, that are primarily operated with military manning, was found to be through the base operations and maintenance funds. At PMELs located at the ALCs and AGMC, it was learned that the Depot Maintenance Industrial Fund is the primary funding method used. The third method identified was the funding of at least one of the Air Force Systems Command PMELs with Research and Development funds (3600 series) (7).

The Directorate of Metrology at AGMC receives appropriations directly from AFLC by one of two methods; excluding receipts from a program office of Foreign Military Sales. Funds for civilian/military pay, TDY transportation, rentals, contract maintenance, and supplies come from operation and maintenance funds. Funds for hardware procurement are received under Budget Program Account Codes (BPAC) 84101 and 84102. One of the BPAC fund lines is used to procure hardware for the Air Force Measurement Standards Laboratory at AGMC and the other fund line is used to procure equipment for all other Air Force PMELs (34:I-74).

Concept of Services Provided

Air Force PMELs operate on a calibrate and repair concept. That is to say that both calibration and repair are provided to the customer, assuming that the support required is within the PMEL's support capability. It is normally the responsibility of the customer receiving support from the PMEL to assure safe transportation and handling of equipment to and from the laboratory.

The Air Force also provides mobile calibration capability, from approximately thirty-two of its PMELs, through the use of Transportable Field Calibration Units (TFCU). The TFCU consists of working standards, precision measuring equipment and accessories which are mounted in shock-proof transportable cases that serve as equipment racks during operation and provide protection during transit (18:p.2-6; 21:2). This mobile capability allows established Air Force and DOD agencies remotely located from a host-base PMEL to obtain on-site support from those PMELs possessing mobile calibration capabilities.

Summary

This chapter provided an overview of the methods by which the METCAL Programs of the Army, Navy, and Air Force are managed and funded. Also discussed were the levels of management involvement in support negotiations and support concepts used by each program.

In the area of management of the METCAL Programs, it can be seen that upon completion of the implementation of the new DA concept, the Army will have a more vertical management structure. They will therefore be capable of exerting more line authority over the operation of their respective calibration laboratories from a single headquarters than the Navy or the Air Force. The Navy and Air Force calibration laboratories are owned and operated by their respective Major Commands. The Metrology Headquarters of the Navy and Air Force do not exercise direct control over the operation of their respective laboratories. The Navy Metrology Headquarters does have the authority, however, to close any Navy laboratory if it fails their laboratory evaluation. The Air Force Metrology Headquarters can only make recommendations to the responsible Major Operating Command for corrective action should an Air Force laboratory fail an evaluation.

In the area of funding, none of the three Services has a single funding method; however, the Army will be extremely close to implementing a single funding concept following implementation of their DA concept through their OMA 7322076 appropriations. The Air Force laboratories are funded primarily through the Major Operating Commands to the base level where support requirements are budgeted based upon mission support requirements. The land based Navy laboratories are funded jointly by the Major System

Commands. They also receive a significant proportion of their funds directly, based upon levels of effort in the form of work requests, project orders, allotments and requests from contractors.

All three Services subscribe to the philosophy that ISSAs are useful and should be implemented wherever practical. They also encourage the negotiations of ISSAs to take place at the lowest management levels. The Metrology Headquarters and Major Operating Commands of each Service become involved in ISSA negotiations on an exception basis only and leave the routine negotiations to the base or field level managers.

The Army and Air Force both provide similar support concepts. They both provide calibrate and repair services to their customers. They also provide mobile calibration support to remotely located customers or where maintenance concepts require on-site support. The Navy maintains a calibrate and incidental repair service. This concept requires that customers be more responsible for obtaining maintenance support for their test equipment from sources other than Navy calibration laboratories. The Navy also provides a lesser amount of on-site support than the Army or Air Force due to the fact that they only provide on-site support to jet engine test cells.

Once again, the authors wish to emphasize, that the intent of the information provided in this chapter is not

to evaluate or compare the merits of the three DOD METCAL Programs in order to judge which one is best, but only to help the reader better understand the analysis of the data presented in Chapter IV.

CHAPTER IV

DATA ANALYSIS

The purpose of this chapter is to present a report of the research findings as a result of this study. This will be accomplished by examining each of the research questions as stated in Chapter I, and evaluating each question, individually, based upon regulatory documents and the results of the interviews conducted by the researchers. Final conclusions and recommendations, based upon the analysis of the data, will be presented in Chapter V.

Research Questions

Research Question Number One

"What are the current DOD funding methods for obtaining operating funds for calibration services?"

A discussion of the funding methods currently in use by the three DOD Services for operation of their respective METCAL Programs was provided in Chapter III. From that discussion it can be seen that the Services each employ individual funding methods which were tailored to meet their specific needs or goals and these methods were consistent with the respective Services' management structure. Because of the individual tailoring of funding methods, it was clear that the three DOD METCAL Programs

were not structured toward a centralized or consolidated method of obtaining their METCAL operating funds.

Research Question Number Two

"What influences do the various funding methods have upon reimbursement costs?"

Two major funding methods were used primarily by the various calibration laboratories involved in reimbursements. These methods were Industrial Funds and Operations and Maintenance Funds. Research and Development funding was used in one instance, but this facility did not provide any reimbursable services and therefore will not be discussed.

Industrial funds are designed to provide a more effective means for controlling the costs of goods and services required to produce or maintain a product. They are also designed to encourage more cross-servicing among the military departments with the aim of obtaining more economical use of facilities. In order for the Industrial Fund to maintain solvency it must charge customers based on rigid guidelines placed on it by DOD directives. These directives require such charges as; direct labor costs, indirect labor costs, fringe benefits, leave costs, with-in shop overhead, base operations (guards, electricity, heat, water), and indirect maintenance expense. These charges are computed into hourly rates and billed to the customers.

Industrial Fund organizations surveyed in this study were primarily manned by civilian personnel.

The Operations and Maintenance method was funded by a budget which was acquired and controlled by the parent organization on the installation where the respective laboratory was located. The laboratory was provided with the funds necessary for the normal operation of the facility. The Laboratory also budgeted for additional funds in amounts needed to provide services to interservice support customers. The customers were charged for parts needed for repair and for civilian labor. Military labor was not charged to the customers. These reimbursement procedures were consistent with DOD policies. Manning for the Operation and Maintenance Funded laboratories, surveyed in this study, was primarily military personnel.

The Industrial Funded facilities appeared to have a higher reimbursement rate because of the numerous charges made to the customers. This observation was not based upon statistical conclusions drawn from this study since the sample size was relatively small compared to the total population. This observation was supported, however, by the Los Angeles/San Diego area study performed by the Consolidation of Calibration Services ad hoc study group (32:G-6).

Research Question Number Three

"What economic gain can be realized by changing to a method of direct funding?"

This question was directed primarily to the Metrology Headquarters of the three Services and to the Program Manager for Precision Measurement Test Equipment within the National Bureau of Standards (NBS). Managers within the three METCAL Programs and NBS were not able to quantify specific economic gains that might be realized as a result of centralized funding. This was due primarily to the broad scope of the task and the lack of studies that had been done in this specific area. However, there are three areas that were identified from which centralized funding could contribute toward economic gains.

The first area was the increased willingness by ISSA customers to make use of the closest DOD calibration facility. The idea that ISSA calibration customers did not always obtain support from the closest DOD calibration facility was partially supported by the survey results of this study. Of the nine customers surveyed, one customer did not use the closest facility. Another customer was not certain whether the laboratory from which he obtained support was in fact the closest one to his operation. A third customer was in the process of attempting to move his workload from a nearby laboratory to a laboratory approximately 140 miles away (15). The first two, ISSA calibration

customers mentioned, obtained support from distant DOD calibration laboratories because those laboratories provided on-site support and not because of economic factors such as reimbursement rates or procedures. The third customer, however, was an Army customer currently being supported by an Air Force PMEL. In this case the Army customer was in the process of attempting to cancel their ISSA with the supporting Air Force PMEL because the reimbursement rate being charged was $32.00 per hour. The Army customer was willing to obtain support from an Army laboratory located 140 miles away primarily because the support would be provided on a nonreimbursable basis.

The researchers do not infer any statistical significance to the fact that three of the nine customers surveyed did not obtain support from the closest DOD calibration laboratory. It should be noted, however, that the DOD calibration customers had flexibility in their choice of supporting laboratories and could be motivated in making their selection based upon at least two factors; available service and reimbursement rates.

The second area of potential economic gain, through direct funding, was the possibility of enhancing the consolidation of DOD calibration laboratories. Although the DOD consolidation teams had identified several thousand dollars worth of potential savings through various laboratory consolidations, the researchers of this study were not

able to verify that these consolidations would take place, and thus achieve the estimated savings, as a direct result of centralized funding of the DOD METCAL Programs (29:19; 30:7; 31:51; 32:12; 33:8).

The third area identified, as a possible economic benefit, was the possibility that more accurate accounting of DOD METCAL costs could be achieved. This would permit managers at the DOD level to identify exactly what costs were being incurred to provide DOD METCAL support and possibly provide them an opportunity to develop more efficient uses of DOD METCAL funds. The researchers were not able to validate any specific costs, or cost savings, that could be associated with increased efficient management of funds as a result of direct funding of the DOD METCAL Programs. However, several areas were identified that might contribute to potential economic efficiency. Three of these areas were standardization of labor time standards, standardization of calibration intervals, and consolidation of laboratory equipment acquisitions (41).

From the survey conducted through this study, all three Services and the NBS agreed that there are potential economic benefits that could be realized as a result of direct funding. However, those benefits would be difficult to quantify and the realization of achieving some of the benefits were predicated upon the implementation of events such as consolidation of laboratories, which was

not directly or totally dependent upon direct funding as a prerequisite for fulfillment.

Research Question Number Four

"What controls would be necessary to account for the funds?"

This question was primarily addressed to personnel within the Army, Navy, and the Air Force who were employed in the areas of funding and accounting and finance. These personnel were located primarily at the metrology headquarters level but the researchers also received comments relative to this question from a few personnel at the laboratory level.

The Army was capable of identifying and accounting for metrology and calibration funds through the element of expense 732207.L funding code for all Army METCAL laboratories except those internal laboratories which had been excluded from the new Department of the Army Concept of METCAL operation. These internal laboratories were considered an integral part of the maintenance function of the facility at which they were located. They were funded and accounted for their funds based upon the major force program which they supported. The Army laboratories at the depot level had complete visibility, through their accounting procedures, of the resources that they were expending for support of any customer regardless of Service (5).

Therefore, without consideration of these internal laboratories, the Army would not have been greatly impacted in terms of their ability to account for the funds under a direct funded concept (3).

Funds for the Navy shore based calibration laboratories were funneled through the Naval Materiel Command (NAVMAT) for distribution. Also, NAVMAT received and reviewed all of the shore based laboratory budgets and was fully cognizant of the various expenditures that occurred at that level for METCAL support (14). Therefore, the Navy possessed accounting systems that were adequate to account for the funds.

The Air Force also maintained accounting systems which were adequate to account for operating funds. However, the METCAL funding procedure for the Air Force was not centralized as the other two Services. Precision Measurement Equipment Laboratories (PMELs) within the Air Force were basically funded through their major command from appropriations approved for the function which they supported. Most of the Air Force PMELs with the exception of those within Air Force Logistics Command (AFLC) and Air Force Systems Command (AFSC) were funded from Air Force Operations and Maintenance Funds. Within AFLC, the PMELs located at the Air Logistics Centers were funded primarily through the Depot Maintenance Industrial Fund (DMIF). The operation of at least one PMEL within AFSC was found,

through this study, to be funded from Research and Development funds. Although the funds for PMEL operation within the Air Force were an integral part of the operating funds authorized to the local commander for operation of his base, the Air Force maintained accounting systems which could account for funds that were directly authorized for PMEL operation. In order to accommodate an additional fund line, a new Operating Base Account Number (OBAN) would need to be established at each installation hosting a PMEL. Operating funds for the PMEL would then be managed out of this account (1).

If reimbursement were no longer required between DOD calibration laboratories and their DOD ISSA customers as a result of directly funding the DOD METCAL Programs at the DOD level, it was felt that calibration workload within all three Services would sharply increase. This opinion was shared by virtiually all of the laboratory superintendents that were surveyed in this study. It was felt by these superintendents that if owners of support equipment were held accountable for the maintenance of their equipment through the management of financial resources, the owners would take better care of their equipment. Therefore, although reimbursement might not be required, there would still be a need to negotiate the ISSA so that both the laboratory and the customer understand the financial constraints imposed upon the amount of service that can be

provided. Also, provisions would have to be established for the customer to obtain support if his need for calibration support exceeded the agreed-to level of support in the ISSA. Therefore, the responsibility of the laboratory superintendent would not be diminished in monitoring his available funds because he would have to continue to negotiate the ISSAs and maintain a total awareness of his available operating funds. As a result, the administrative process of managing ISSAs would remain the same or possibly increase as a result of direct funding and the elimination of reimbursement for ISSAs.

Research Question Number Five

"Who would be responsible for obtaining and administering the funds?"

Within the Army, the Department of the Army Defense Readiness Command (DARCOM) obtained and administered the Army METCAL funds under the Army's new METCAL concept. Within the Navy, the Major Systems Commands obtained the operating funds for the shore based laboratories and funneled them to NAVMAT for control and distribution. The Air Force PMELs obtained their operating funds primarily through the operating funds of the installation which they supported. It can therefore be seen that the funds within each Service for METCAL support lost their identity by the time they were integrated with other appropriations and

were not uniquely supported or defended as a separate fund line at the DOD level.

There was no single agency that was chartered with responsibility for obtaining and administering DOD funds for the total DOD METCAL support. Therefore, the decision makers that would be assigned the responsibility of allocating funds to the three Services for operation of their METCAL Programs would have to be at very high levels in the DOD management structure. Any organization empowered with such a responsibility (budget appropriations) would have to be granted authority, not only to negotiate for the three Services' METCAL Programs but also allocate funds across major operating commands within their own respective Service. This responsibility would therefore have to rest at a very high level such as the Joint Chiefs of Staff. This was not a reasonable level of management at which to place this type of responsibility. Further, the administration of these funds would not be simply a once a year task. It would require constant supervision and management.

It was therefore the opinion of the researchers that the only effective way to obtain and administer these funds, under these circumstances, would be through an agency established at the DOD level that had management authority over the Services' METCAL Programs. This concept was consistent with the opinions expressed by the General Accounting Office (GAO) in a report titled "A Central

Manager is needed to Coordinate the Military Diagnostic and Calibration Program" dated May 31, 1977. This GAO report basically stated that there were many duplicative functions performed by the three Services' METCAL Programs that could have been more economically managed if they were under the control of a single manager (4:11). It is this type of single manager concept through which direct funding could be implemented. It should be pointed out that although the GAO was an advocate of such a management concept, there had not been any in-depth studies performed that address the entire spectrum of implications at all levels of management within the Services' METCAL Programs. Such a study was beyond the scope of this thesis. Additionally, without the results of such a comprehensive study, the researchers could not place judgement either for or against such a concept.

Research Question Number Six

"What operational gains could result through direct funding?"

From the viewpoint of the DOD calibration customers surveyed in this study, direct funding would not have had a significant impact upon their operation even if reimbursement for services was eliminated. One customer indicated a potential savings of $28,000 in overhead costs but no other cost savings or substantial operating efficiencies

were quantified by any other customers. Two customers indicated that less time would be required for administration of funds and one customer indicated that they could operate on a lower budget or have slightly more funds available for purchase of additional test equipment.

The response to this question by superintendents of DOD calibration laboratories was mixed. Some felt that administration of funds would be reduced. One laboratory superintendent felt that it would simplify his supply procedures because he could order parts through one fund account rather than the four accounts which he worked with. However, none of the superintendents were able to provide quantifiable cost savings as a result of more efficient operations due to direct funding of the laboratory operations.

The overall response by the Major Operating Commands and the Metrology headquarters indicated that they were not aware of substantial operational gains to be realized at the laboratory level. However, one Air Force PMEL Command Monitor indicated that, in some instances, direct funding could possibly alleviate a problem of Air Force laboratories using their local funds to purchase parts not available through normal supply channels for support of ISSA workload.

The NBS had conducted limited studies which showed that labor time standards, for calibrating similar items of

equipment, varied significantly between the three Services (41). The average available work hours, per man year, also varied among the three services. The Army and Navy estimated the availability of their military technicians to be 50 percent of normal duty time and the Air Force estimated the availability of their technicians to be approximately 70 percent of the normal duty time (28). Therefore, the NBS believed that there were some operational gains to be achieved if the METCAL Programs were directly funded and centrally managed.

Research Question Number Seven

"What operational limitations would be imposed as a result of direct funding?"

Responses relative to this question were provided primarily from the METCAL headquarters, the Major Operating Commands and the calibration laboratory superintendents.

The first area of concern expressed was over the level of workload at the DOD calibration laboratories. Managers and some laboratory superintendents within the three DOD METCAL Programs felt that if direct funding were implemented and reimbursement was no longer required, ISSA workload from DOD customers would increase. Neither the METCAL managers nor the laboratory superintendents could estimate the amount of anticipated increase but felt that some increase was inevitable without some build-in controls.

The Air Force and Army laboratories would have been particularly vulnerable to increases in repair workload because of their "calibrate and repair" concept of operation as noted in Chapter III. The Navy laboratories, due to their concept of "incidental repair," would probably not have been as adversely affected due to increased repair workload but would still have been subjected to potential increases in calibration workload. In order to avoid this potential increase in unscheduled workload it would have been necessary for the calibration laboratories and the DOD customers to continue to negotiate ISSAs so that each party was fully aware of their respective responsibilities and limitations. This would have had a tendency to negate or offset potential savings that would be anticipated through reduced administration of ISSAs at the laboratory level. Further, it might have required more involvement at the command or headquarters level in resolving negotiation differences or expanding manpower requirements.

The second area of concern expressed by the three Services was the potential affect of a budget reduction by Congress. If the DOD METCAL Programs were directly funded at the DOD level, any budget cut would have a more serious impact upon the METCAL programs than the current situation. Not only would the available appropriation for METCAL operation be directly cut, but it was feared that

priorities for performing work would be established, either formally or informally, that would result in potentially reduced service to ISSA customers.

A related issue expressed by the Services was the idea that by centralizing the funding of the DOD METCAL Programs, a certain amount of the local commander's flexibility in managing his base operating funds would be reduced. Where the local commander had some flexibility in allocating funds to operational units under his command, funds for operating the calibration laboratory would not be under his control if the DOD METCAL Programs were direct funded.

Research Question Number Eight

"Do manpower ceilings at base, major command, and/or Service level preclude/hinder Interservice Support Agreements?"

Manpower ceilings appeared to be a very crucial issue preventing increased interservice support, particularly within the Navy. The Navy was turning away interservice work because of the lack of personnel. The fact that the customer had the funds to pay for the service was of little importance since the Navy could not increase its manpower level. The other Services were experiencing the same problems and if their interservice workload increased by a significant amount they would have also been forced

to turn away workload for lack of personnel. One problem that continued to perpetuate this situation was that ISAAs were not justification for increased personnel ceilings. This policy, in effect, caused substantial pressure for not increasing support agreements.

A possible solution to the manpower problem would have been to shift personnel between the Services in order to enhance consolidation and increase support agreements. This was found to be a very difficult task due to the management level to which the personnel transfer decisions had to be elevated (9). As a result of these personnel ceilings and transfer problems, the Navy has been forced to use more and more contract support to meet its demand for ISSA calibration workload (14).

Summary

This chapter has addressed each research question using an analysis of the data collected and regulatory documents. Chapter V will address the authors' recommendations and conclusions based upon the information gained from the data used in answering the research questions.

CHAPTER V

RECOMMENDATIONS AND CONCLUSIONS

Overview

This chapter presents the conclusions and recommendations of the researchers. Recommendations for further and related studies are also presented.

The purpose of this study was to evaluate the feasibility of establishing a single line item in the DOD Budget for financing the operations of the DOD Metrology and Calibration Programs. The hypothesis underlying this funding concept was that by centralizing the funding of the DOD METCAL Programs, reimbursement for ISSA calibration support between DOD agencies could be eliminated and thus interservice calibration support could be provided and obtained more efficiently and economically. Additionally, it was felt that by centralizing the funding of the DOD METCAL Programs the implementation of recommended laboratory consolidations could be enhanced.

Conclusions

The general conclusion of the researchers was that direct funding of the DOD METCAL Programs was not feasible under the current management structure of the three METCAL Programs. This should not be construed to mean that such

a funding arrangement might not be feasible under different circumstances. The primary reason why the researchers drew this conclusion was because of the lack of uniformity of management structure and support philosophies among the three METCAL programs and the absence of an authoritative body or agency established to manage and administer such a funding arrangement. Further, any agency, established for the expressed purpose of controlling the funds of the METCAL Program, would also have to be empowered with the authority to apportion the fund appropriation among the three METCAL Programs based upon its perception of the needs of the national defense. This type of authority lends itself to total centralized DOD management of the three METCAL Programs under the direction of a single manager. The evaluation of this concept was beyond the scope of this study.

A second reason for the researchers' conclusion was based upon existing logistics policy. The three DOD METCAL Programs were established and maintained to support weapon system requirements. As such, they were individually structured and managed to meet unique Service requirements. Interservice support, as a matter of policy among the three Services, was provided whenever it was economically feasible to do so and when such support would not adversely impact upon the primary support function of the supporting laboratories. In this regard, it should be noted that all of the laboratories surveyed in this study, except one,

reported that ISSA workload comprised less than 10 percent of their total workload. Further, according to a Defense Retail Interservice Support computer listing titled "Interrogation of DRIS Master Support Category as, by Supplier" dated October 16, 1979, the average reimbursable cost to ISSA calibration customers was $4387.86 per interservice support agreement. Of significance, was the fact that of the 278 laboratories reporting their reimbursable charges, the standard deviation was $12,249.08 per ISSA. While total reimbursable costs, for DOD interservice calibration support, were $1.2 million dollars, the large standard deviation indicated that a large number of very small (insignificant) ISSA customer charges, with a few very large ISSA charges, caused the average value of an ISSA to rise above $4000. Therefore, the dollar value of the average ISSA, obtained from evaluating the data in this computer listing, does not in itself present a realistic view of the value or distribution of ISSA calibration workload. To cause a major revision to the management of the DOD METCAL Programs, based upon a small portion of the total workload, that was incidental to the primary mission of the affected laboratories, seemed unreasonable. The issue can only be pursued based upon an undocumented perceived ISSA demand.

A third factor that bears on the conclusion of the researchers was the issue of manpower. The biggest problems that metrology managers faced in providing increased

interservice calibration support, were the lack of laboratory technicians, the imposition of manpower ceilings, and the difficulty in the movement of technicians among the Services to balance ISSA workload and labor capacity. It was felt by the researchers that, apart from placing the Services' METCAL Programs under a single DOD manager, increased cooperation among the Services was the most reasonable approach to the resolution of the aforementioned problems.

As an example, through increased cooperation, the Services could establish standard procedures for negotiating the movement of personnel equivalents between Services to accommodate increased ISSA workload. The procedures should also include provisions for return of the respective personnel equivalents to their original Service upon termination of the ISSA workload, that generated the need for personnel changes.

Recommendations

In addition to consolidation of DOD calibration facilities, increased interservice support seems to be a fertile area for achieving cost savings. In this regard, it is the opinion of the researchers that maximum effort should be placed upon identifying current and potential interservice support workload. Additionally, more emphasis should be placed upon providing counseling assistance to

interservice support customers concerning optimal methods and procedures for obtaining ISSA calibration support within the existing METCAL structure. The researchers recognize that the Joint Technical Coordinating Group for Metrology and Calibration (JTCG-METCAL) chartered the Interservice Support Working Group to perform some of those functions. However, conversation with members of that group as well as other personnel at the Services' METCAL headquarters indicated that the group is relatively inactive. One reason for this inactivity, is perceived by the researchers to be the lack of management visibility. The Interservice Support Working Group has been subordinated to the Consolidation of Calibration Services (COCS) Subgroup which reduces its visibility to management. Because of this lack of visibility, little emphasis has been placed upon goal achievement by the group. Therefore, the researchers feel that the ISSA Working Group should be placed at the same organizational level as the COCS Subgroup in order to achieve more visibility to management and the JTCG-METCAL.

Another observation, made by the researchers during this study, was that the various subgroups established by the JTCG-METCAL for studying DOD METCAL problems are comprised of existing personnel at the metrology centers. Because no additional manpower spaces are provided to conduct the business of these study subgroups, the work is performed on a part-time basis as time permits. As a

result of these work assignments being considered incidental to the prime function of the organization, they are extremely vulnerable to reductions in travel funds. For example, lack of travel funds has adversely influenced the ability of the ISSA Working Group to meet at six-month intervals in accordance with their charter (13). The researchers therefore recommend that the JTCG-METCAL assist the metrology centers in obtaining travel funds for the express purpose of conducting the DOD METCAL studies.

The United States General Accounting Office (GAO) has performed brief studies concerning the establishment of a central manager for the DOD METCAL Program. As a result of their studies, in 1977 they recommended to the Secretary of Defense that he "establish a central manager for the entire diagnostic and calibration program [4:11]." The Program Manager for Federal Precision Measurement Test Equipment located at the National Bureau of Standards shares the feelings of the GAO concerning centralized management of the DOD METCAL Programs. Additionally, a study prepared by the Aerospace Guidance and Metrology Center, Newark, Ohio, in 1976 indicated a potential cost savings of 16 million dollars annually and an additional cost avoidance of 30 million dollars as a result of consolidating the DOD METCAL Programs under a single manager. Because these three independent agencies each support the establishment of a

central manager concept, the researchers feel that the JTCG should pursue additional studies in this area. The primary factor missing from the aforementioned studies is the proposed management structure and the impact of such a consolidation upon the readiness of the supported military forces and the national defense. Therefore, any future study concerning the central manager concept should consider DOD mission readiness as a primary consideration as well as potential cost savings to be achieved.

Recommended Future Study

A potential for future study lies in the area of labor hour standards as used in the calibration of similar equipment. As pointed out above, labor hour standards vary among the Services' METCAL Programs. Additionally, the Air Force no longer publishes labor standards in their calibration index Technical Order 33K-1-100 due to the variability of labor production hours just within the Air Force. This study would be valuable in the sense that it is generally felt that the experience level of technicians in the DOD calibration laboratories is declining. This declining experience level is thought to be causing the variability and possibly a general increase in the amount of time required to calibrate DOD equipment. If this is true, imposed manpower ceilings or manpower cuts may have a more drastic affect than management realizes upon the

future ability of the DOD calibration laboratories to meet workload requirements. Additionally, such an impact could potentially affect consolidation of the DOD METCAL Programs under a single DOD manager.

Another area of potential study is investigating the feasibility of establishing an increased percentage of civilian technicians in DOD calibration laboratories. The purpose of this study would be to determine if the experience level in the calibration laboratories could be raised, or stabilized, by increased use of civilian technicians. The value of the study could potentially identify an optimum combination of military/civilian manning levels where experience levels remains constant, or increase, and military manning commitments and constraints are satisfied.

A third area for further study concerns the calibration services performed through Host Tenant Support Agreements. A study in this area could facilitate the identification of potential DOD ISSA workload. One of the observations made by the researchers while gathering data for this thesis was that there is work being performed through Host Tenant Support Agreements that might be more efficiently performed at other facilities under ISSAs. Data needed to conduct and support this type of study is not currently available for host tenant support provided by the Army and Navy but is available from the Air Force for work performed by Air Force PMELs. If the results of this study indicate

that a significant amount of host tenant support could be more efficiently provided through ISSA, not only would the potential ISSA workload be more accurately assessed but it might also present sufficient justification for recommending stricter DOD policy guidelines for selection of host tenant and interservice support facilities. It should be noted that in arriving at total DOD calibration workload, Host Tenant Support Agreements and ISSAs cannot be studied in isolation. Only through integrated studies, of workload provided under these two support concepts, can total DOD METCAL workload be identified and optimum workload distribution models be developed.

The last area recommended for further study is the documentation and location of DOD calibration facilities in the form of a user's handbook or directory. Such a handbook would be used by DOD calibration superintendents in counseling prospective and existing ISSA customers concerning the most efficient method of obtaining required calibration support as well as helping the customer select the closest facility to his operation.

Summary

The purpose of this thesis was to evaluate a concept of direct funding for the DOD Metrology and Calibration Programs. This concept was evaluated in terms of establishing a single line item in the DOD Budget to fund for the

operation of the three Services' Metrology and Calibration Programs. The primary benefits that could have potentially been realized through this funding concept were more effective utilization of ISSAs and enhancement of DOD calibration consolidation efforts. The conclusion of the researchers was that this funding concept was not feasible due to the lack of an administrative body at the DOD level to obtain, control, and administer the funds. It was also concluded that it was not feasible because of the impact such a funding program would have upon the different management structures of the three Services' METCAL Programs. The researchers felt that there were areas that could be addressed in terms of improving ISSA support within existing program structures and those areas were provided as recommendations. There were also areas identified where further study could highlight some valuable information. These areas were also addressed and recommended for further study.

APPENDICES

APPENDIX A

INTERVIEW GUIDES

Interview Guide for Metrology Headquarters

1. What role does the metrology headquarters play in the management and operation of your service's calibration laboratories?

2. What is the extent to which the metrology headquarters is involved in Interservice Support Agreements at the field or base level laboratories in terms of providing assistance in negotiations, funding, providing calibration standards, and establishing personnel authorizations?

3. What organizations at the metrology headquarters are involved in the management of interservice support policy?

4. What potential benefits could be achieved by establishing a separate line item in the DOD budget for directly funding the DOD calibration programs?

5. What potential problem areas would arise, in terms of managing the metrology and calibration program at the headquarters level, if reimbursement for interservice calibration support was no longer required between DOD customers and calibration laboratories?

6. What would be the organizational and functional impact upon the metrology headquarters if it were to take on the responsibility of obtaining, distributing, controlling,

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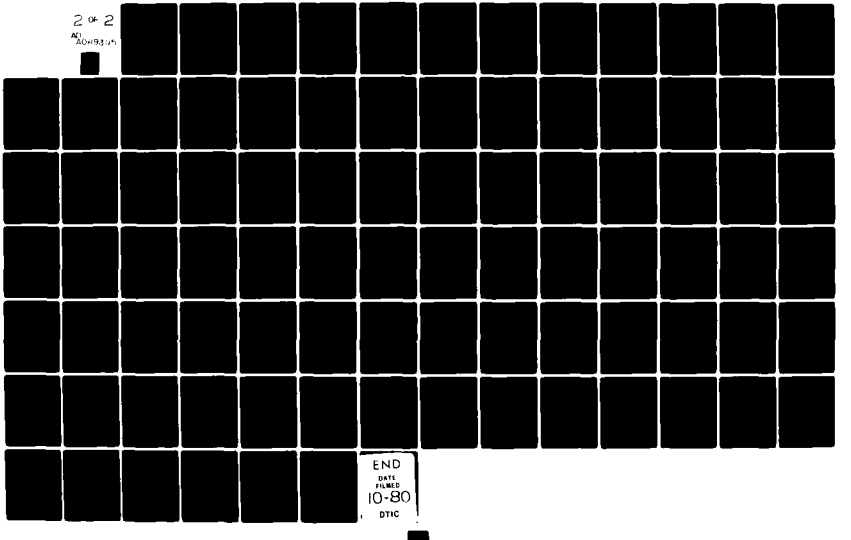

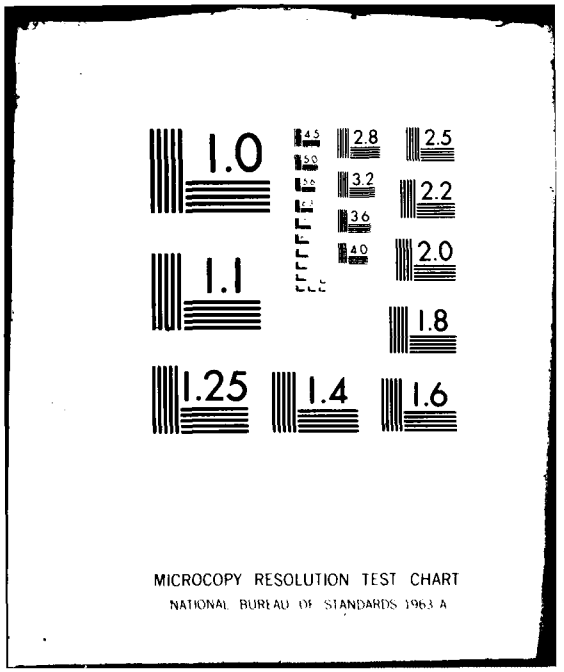
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and monitoring all of the funds for the entire metrology and calibration program for its particular service?

7. What are the major problem areas which restrict calibration laboratories, within your service, from increasing support to DOD customers through Interservice Support Arrangements?

Interview Guide for Major Command Calibration Monitor

1. To what extent does the Major Command become involved in Interservice Support Arrangements at the base or field level in areas such as funding, allocation of personnel, and providing assistance in negotiating the arrangements?

2. What are the various methods by which operating and maintenance funds are provided to the base and field level calibration laboratories?

3. Do you exercise any control over the distribution of funds to the individual calibration laboratories within your command?

4. What would be the organizational impact, at the command level, if the DOD Metrology and Calibration Program was directly funded at the DOD level?

5. What would be the impact upon your command if a shift in interservice support workload took place such that laboratory personnel authorizations were affected and laboratories within your command found that they had either an excess or shortage of personnel?

6. Has the level of interservice support provided by your command ever affected the personnel authorizations for laboratories within your command?

7. What are the major problem areas that have restricted laboratories within your command from providing increased interservice support to other DOD customers?

8. What are the major problem areas that have restricted DOD customers from obtaining interservice support from calibration laboratories within your command?

Interview Guide for Calibration Laboratories

1. How many individual Interservice Support Agreements does your laboratory currently support? With what service are they associated?

2. Have you recently discontinued support to any DOD customer with which you had a negotiated Interservice Support Agreement? If so, was the reason for discontinuance due to any of the following reasons?

a. The workload ceased to exist because of a change in the customer's mission.

b. The customer elected to use a calibration facility located closer to his base of operation.

c. The customer elected to obtain calibration support from a laboratory with a lower reimbursement rate.

d. The customer felt that better equipment service times could be obtained from another laboratory.

e. The customer felt that more equitable priorities could be obtained from another laboratory.

f. The customer felt that a better quality of service could be obtained from another laboratory.

g. Your laboratory no longer had the capability to provide the required support due to one of the following reasons:

(1) Lack of funds

(2) Lack of proper calibration standards

(3) Lack of adequate skilled personnel

(4) Personnel ceiling (lack of adequate number of personnel)

3. Have you recently obtained additional interservice support workload that had previously been accomplished by another DOD calibration laboratory? If so, are any of the reasons for the customer changing to your laboratory for support listed below?

a. The laboratory previously supporting the customer was closed and is no longer in operation.

b. Any of the reasons listed in Question 2.

4. What is the reimbursement rate charged by your laboratory for interservice support to DOD customers of other services? What are the cost elements that are included in this rate?

5. Through what method of funding does your laboratory receive its operating funds?

6. Does your laboratory become directly involved in billing DOD customers for interservice support?

7. Does your laboratory include, in its annual budget, the cost of resources expected to be used in providing interservice support?

8. How many personnel are assigned to your laboratory? How many are military and how many are civilian?

9. What is the average grade of the military and civilian technicians working in your laboratory?

10. What would be the impact upon your laboratory if reimbursement was no longer required for DOD customers of interservice support?

11. Do you provide support to any DOD customers on a nonreimbursable basis? If so, approximately how many times per year do you support?

Interview Guide for DOD Interservice Support Customers

1. When preparing your annual budget, do you include the annual reimbursement costs incurred from interservice calibration support?

2. Is the DOD calibration laboratory, from which you obtain support, the closest one to your installation?

3. If you receive interservice support from a laboratory other than the closest one to your facility, is the reason for patronizing the more distant laboratory among the following reasons?

a. The reimbursement rate was more favorable at the distant laboratory.

b. The quality of work is better at the distant laboratory.

c. The service time is better at the distant facility.

d. The distant facility provides a more equitable workload priority system.

e. The closer laboratory does not have the capability to support the workload.

f. The closer laboratory could not accept additional workload because of personnel authorization limitations.

4. Have you, as a customer, had to help the supporting laboratory finance the procurement of new equipment in order for them to have an adequate capability to support your workload?

5. What are the various cost elements, which make up the reimbursement rate for interservice calibration support?

6. Have you ever terminated an Interservice Support Agreement for calibration support from a DOD calibration laboratory? If so, was the termination for any of the reasons listed below?

a. High reimbursement rate

b. Poor service (turnaround) time

c. Poor quality of calibration service

d. Nonresponsiveness to priority work

e. Other reasons not listed here

7. If the requirement for reimbursement of costs for interservice calibration support was eliminated, what would be the impact upon your organization?

8. What are the major problem areas which restrict or inhibit the use of interservice calibration support?

9. If the requirement for reimbursement of costs for interservice calibration support was eliminated, would you select a different calibration laboratory from the one that currently provides your support?

Interview Guide for Accounting and Finance

1. How do the local calibration laboratories receive their operating funds?

2. When the local calibration laboratory prepares its annual budget, does it include a request for funds which are expected to be expended to provide support for interservice support customers or does it budget for only those expenses necessary to provide service to customers of its own service?

3. When the local laboratory performs services under the provisions of an Interservice Support Agreement, where reimbursement is involved, are any of the reimbursed funds credited to the operation of the local calibration laboratory, or are the reimbursed funds credited to a general fund?

4. What would be the major impact upon accounting if the local calibration laboratory was set up on a direct funding basis and reimbursement for calibration services provided to other DOD services by the laboratory were no longer required?

APPENDIX B

ORGANIZATIONS SOLICITED FOR INTERVIEWS

Metrology Headquarters

Army -- Army Metrology and Calibration Center
DRSI-MX (Mr. Keith/Mr. Cobb)
Redstone Arsenal, Alabama 35809

Navy -- Headquarters Naval Material Command
04T2/JED (Mr. Siedlecki)
Washington D.C. 20360

Air Force -- Headquarters Aerospace Guidance and Metrology Center
AGMC/MLT (Mr. Santos/Mr. Price/Mr. Rickey)
Newark AFS
Newark, Ohio 43055

Major Command

Army -- Commander
U.S. Army Material Development and Readiness Command (DARCOM)
DRCQA-PC (Mr. Rivers)
5001 Eisenhower Avenue
Alexandria, Virginia 22333

Navy -- Commander
Naval Material Command (Mr. Siedlecki)
Washington D.C. 20360

Air Force -- Headquarters AFLC/MAQ (Mr. Leonard)
Wright-Patterson AFB, Ohio 45433

-- Headquarters AFSC/LQMUM (Major Murtaugh)
Andrews AFB, Maryland 20331

-- Headquarters ATC/LGME (Senior Master Sergeant McKensie)
Randolph AFB, Texas 78148

-- Headquarters MAC/LGMA (Senior Master Sergeant Patten)
Scott AFB, Illinois 62225

-- Headquarters SAC/LGMA (Master Sergeant Rauscher)
Offutt AFB, Nebraska 68113

-- Headquarters TAC/MGMA (Senior Master Sergeant Albrecht)
Langley AFB, Virginia 23665

-- Headquarters USAF/LEYE (Major Criscimagma)
Washington D.C. 20330

-- NGB/LGM (Major Tollefson)
Washington D.C. 20310

Metrology Laboratories

Army

* -- Commander (Mr. Kessler/Mr. Flory)
Letterkenny Army Depot
SDLE-QC
Chambersburg, Pennsylvania 17201

-- Commander (Mr. Hammer)
Lexington Bluegrass Army Depot
SDSSR-LQC
Lexington, Kentucky 40511

-- Commander (Mr. Hopper)
Pueblo Army Depot
STSDE-PUC
Pueblo, Colorado 81001

* -- Commander (Mr. Griffin)
Sacramento Army Depot
SDSSA-QMD
Sacramento, California 95813

-- Commander (Mr. Cavaleri)
Tobyhanna Army Depot
SDSTO-QT
Tobyhanna Army Depot, Pennsylvania 18466

Navy -- N/A

Air Force

-- 3415 CMS/MAAL (Chief Master Sergeant Riley)
Lowry AFB, Colorado 80230

-- 56 CRS/MACL (Senior Master Sergeant Polenske)
MacDill AFB, Florida 33608

-- Det 1, Hq Michigan ANG/MAAP (Mr. Strassburg)
Selfridge AFB, Michigan 48045

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*Nonparticipant in interviews.

-- 4787 MATS/MGMEP (Senior Master Sergeant Gallaway)
Duluth AFB, Minnesota 55814

4950 AMS/MADE (Mr. Swink)
Wright-Patterson AFB, Ohio 45433

Interservice Calibration Support Customers

Customer	Supporting Service
1 CSMS (Mr. Kroll) Camp Ripley P.O. Box 288 Little Falls, Minnesota 56345	Air Force
Commander (Mr. Riley) Watervliet Arsenal SARWVQAL Watervliet Arsenal, New York 12189	Army
Commander (Mr. Sorrels) 3450th TCHTG/TTMYM/Army Lowry AFB, Colorado 80320	Air Force
Coast Guard Air Station (AT1 Weihermiller) Clearwater, Florida 33520	Air Force
*Commander (Mr. Kessler) Letterkenny Army Delpt SDLE-QC Chambersburg, Pennsylvania 17021	Air Force
*Camp Mabry (Command Sergeant Major Berggren) P.O. Box 52181 Austin, Texas 78704	Army
Superintendent Naval Post Graduate School Code 62E1 (Mr. Donat) Monterey, California 93940)	Army
Det 1/MC (Mr. Flatt) 1973 Communications Squadron Arnold AFS, Tennessee 37389	Army
Commander (Lieutenant Schultz) Naval Security Group Detachment Sugar Grove, West Virginia 26815	Army

*Nonparticipant in interviews.

APPENDIX C

RESPONSES TO INTERVIEW GUIDE QUESTIONNAIRES

Metrology Headquarters Responses

Question

1. What role does the Metrology Headquarters play in the management and operation of your Services' calibration laboratories?

Service	Comments
Air Force	No line authority. Primary involvement is development of policies.
Army	Following implementation of the new DA concept, the Army will take management control of the laboratories and personnel. Under Missile Command and USAMCC phased implementation. Will have rotation authority of Military.
Navy	Primarily policy and direction from a command level. Assists in development of priorities. Supports laboratories at budget table to higher authority. Other commands Naval Air, Sea and Elex manage labs on day to day basis. Operates as a focal point for Naval Materiel Command.

Metrology Headquarters Responses

Question
2. What is the extent to which the metrology headquarters is involved in Interservice Support Agreements at the field or base level laboratories in terms of providing assistance in negotiation, funding, providing calibration standards, and establishing personnel authorizations?

Service	Comments
Air Force	AGMC becomes involved only in cases where agreement cannot be reached at the base level and then the involvement is in an advisory capacity. Normally, calibration standards are not provided by AGMC to PMELs solely in support of ISSAs. AGMC does not become involved in establishing manpower authorizations of manning.
Army	All ISSAs will be reviewed and approved at Redstone. Negotiated at base level.
Navy	Minimal involvement. Endorses ISSAs - negotiated at lowest level except where manpower authorizations are involved. When manpower authorizations are involved the Headquarters NAVMAT becomes involved in elevating manpower authorization requests.

Metrology Headquarters Responses

Question
3. What organizations at the metrology headquarters are involved in the management of interservice support policy?

Service	Comments
Air Force	Within AFLC, AGMC/MLTO, Operations Branch of the Systems Division.
Army	USAMCC (DRSMI-MF) Field Operations Division
Navy	No headquarters group that manages ISSA for Navy METCAL.

Metrology Headquarters Responses

Question
4. What potential benefit could be achieved by establishing a separate line item in the DOD budget for directly funding the DOD calibration programs?

Service	Comments
Air Force	1. More willingness by ISSA customers to use closest DOD calibration facility. 2. Possiblity of more DOD laboratory consolidations. 3. Better identification of metrology costs to the DOD.
Army	1. Might facilitate consolidation.
Navy	If METCAL program were reasonably well funded it could provide guarantee of funding based upon level of effort but risks associated with this type of funding could totally offset any benefits.

Metrology Headquarters Responses

Question
5. What potential problem areas would arise, in terms of managing the metrology and calibration program at the headquarters level, if reimbursement for interservice calibration support was no longer required between DOD customers and calibration laboratories?

Service	Comments
Air Force	No impact at Headquarters level.
Army	- The Army Standards lab and the Navy's Western Standards Laboratory used to perform work for each other on a non-reimburseable basis. No major impact or problems as a result of that arrangement but that is a rather isolated instance. - Generally, people are more responsible for equipment if they are responsible for its maintenance and have to pay for its upkeep. - Potential for extreme increase in workload at laboratories. Some control would have to be maintained. - Problem in establishing workload priorities. Host laboratory's workload may get top priority over ISSA customer's workload.
Navy	- Separates activity with requirement from funding responsibility. - Little flexibility in working with funds. - No person or activity at DOD level capable of allocating resource priorities between Services. - Everyone is dollar and people constrained. - Navy is turning away ISSA customers because of limitations on manpower. The facilities are adequate but without adequate manpower, the money doesn't make any difference.

Metrology Headquarters Responses

Question

6. What would be the organizational and functional impact upon the metrology headquarters if it were to take on the responsibility of obtaining, distributing, controlling, and monitoring all of the funds for the entire metrology and calibration program for its particular service?

Service	Comments
Air Force	Impact on manning level at AGMC to absorb additional responsibilities. Exact impact not known.
Army	Small impact because the structure will already be in place as a result of DA concept implementation. Possible small impact for surge requirements.
Navy	Minimal impact. All budgets and funds are funneled through NAVMAT already. They monitor and control any changes to budgets.

Metrology Headquarters Responses

Question
7. What are the major problem areas which restrict calibration laboratories, within your service, from increasing support to DOD customers through Interservice Support Arrangements?

Service	Comments
Air Force	1. Experience level of technicians is not stable. 2. Manpower availability.
Army	1. Implementation stage of DA concept. a. Manpower will start out on the conservative side and thus labs may not be able to take on quite as much ISSA workload until the new program gets settled in and problems worked out. These will be less of a problem in European Theater where technicians are primarily military opposed to civilian.
Navy	Allocation of manpower resources. Navy is experiencing ceiling restrictions. Also they are facing 10% manpower authorizations.

Major Command Monitor Responses

Question

1. To what extent does the Major Command become involved in Interservice Support Arrangements at the base or field level in areas such as funding, allocation of personnel, and providing assistance in negotiating the arrangements?

Monitor	Comments
HQ SAC	Don't get directly involved--personnel comes out of Major Commands.
HQ ATC	Very limited involvement - Bases responsible for Budget and negotiation of Host Tenant agreements and ISAs. Then after agreement is worked out it is sent to the Command for approval or disapproval.
HQ MAC	Our main involvement is providing guidance. We review the agreement to ensure statements of reimbursement are included and correct. Also, we ensure that the support requested can be provided by the PMEL. Many agreements are not coordinated with the PMEL prior to putting them in print. We are not involved in negotiating the arrangements.
HQ TAC	Limited Involvement - Responsibility rests with local Deputy Commander for Maintenance (DCM). Major Command only becomes involved if disputes arise. They then will intercede to settle the dispute.
HQ USAF	N.A.
HQ AFSC	Limited Involvement.

Question 1--Continued

Monitor	Comments
HQ AFLC	Limited to None. In the case of AFLC contract or operated laboratories, the Acting Contracting Officer (ACO) negotiates the ISSAs.
National Guard Bureau	Labs put in financial plan which is input into NGB Budget. Don't get involved in personnel allocations. NGB has to approve the ISA. They do not provide assistance in negotiations.

Major Command Monitor Responses

Question
2. What are the various methods by which operating and maintenance funds are provided to the base and field level calibration Laboratories?

Monitor	Methods and Comments
HQ SAC	Funds come from Individual Squadrom O & M. The O&M funds each PMEL expends are obtained from the O&M funds of their owning AMS or FMS squadrons.
HQ ATC	No control either operating funds out of Depot or operating funds for Squadrons.
HQ MAC	We do not get involved with funds management.
HQ TAC	Not involved in funds management.
HQ USAF	N.A.
HQ AFSC	No budget involvement.
HQ AFLC	Primarily through Depot Maintenance Industrial Funds and Operation and Maintenance Funds.
National Guard Bureau	O&M Fund cites 44809 & 43105 Industrial Funds

Major Command Monitor Responses

Question
3. Do you exercise any control over the distribution of funds to the individual calibration Laboratories within your command?

Monitor	Comments
HQ SAC	None whatsoever.
HQ ATC	No involvement.
HQ MAC	No.
HQ TAC	No.
HQ USAF	N.A.
HQ AFSC	No involvement.
HQ AFLC	No.
National Guard Bureau	Only on a marginal basis--just for special projects. Everything is usually based on a historical budget.

Major Command Monitor Responses

Question
4. What would be the organizational impact, at the command level, if the DOD Metrology and Calibration Program was directly funded at the DOD level?

Monitor	Comments
HQ SAC	No impact that I am aware of.
HQ ATC	Minimum Impact - fewer audit reports to prepare.
HQ MAC	I do not foresee any impact as long as the funds are adequate to support the mission of the PMEL. At present, if the PMEL expends all of the funds that were programmed for it, additional monies can be transferred (at base level or Command level) to continue operation.
HQ TAC	No impact.
HQ USAF	N.A.
HQ AFSC	N.A.
HQ AFLC	Concept of Force Program or centralized funding has two major drawbacks. 1. It provides instant visibility of the METCAL Program at Congressional levels and would be subject to direct cuts in the budget. 2. Removes flexibility of base commander in using his financial resources.
National Guard Bureau	Would effect their decision making as to which labs they would use. Presently they are not using some labs for service because of the high rates.

Major Command Monitor Responses

Question
5. What would be the impact upon your command if a shift in interservice support workload took place so that Laboratory personnel authorizations were affected and laboratories within your command found that they had either an excess or shortage of personnel?

Monitor	Comments
HQ SAC	Any excess or shortages would be rectified during the required annual price out. Any major changes could be addressed at any time by tasking XPM personnel to perform a study and price out.
HQ ATC	Minimum impact - due to current impact of workload.
HQ MAC	Every 2 to 3 months I review the authorizations in each PMEL and their workload. If any PMEL has a change in requirements of 2 or more authorizations I request a change in authorizations. I cannot increase the total number of authorizations in the command; just make zero balance changes.
HQ TAC	Minimum impact. DCM must be able to handle ISSA work within manpower authorizations or turn down work.
HQ USAF	N.A.
HQ AFSC	Minimim impact.
HQ AFLC	Additional ISSA workload is not sufficient justification for increased manpower or additional facilities. The Navy is currently making more use of contractor support because their manning level is not sufficient to accommodate additional ISSA workload.

Question 5--Continued

Monitor	Comments
National Guard Bureau	Try and reprogram personnel between the labs.

Major Command Monitor Responses

Question
6. Has the level of interservice support provided by your Command ever affected the personnel authorizations for Laboratories within your command?

Monitor	Comments
HQ SAC	Certainly, laboratory manning is based on total workload supported. The larger the percentage of total workload that is interservice, the greater the impact.
HQ ATC	Columbus Miss. - NG - workload transferred from Columbus lab to Maxwell lab; agreement allowed Columbus to lose three personnel and Maxwell to pick up three.
HQ MAC	Yes. Scott AFB PMEL doubled its workload when AFCC moved here from Richards-Gebaur AFB, Mo. Authorizations were transferred with the workload. Kirtland AFB has been increasing their workload/authorizations for the past 2 years because of changes in the Air Force Weapons Laboratory at Kirtland.
HQ TAC	No.
HQ USAF	N.A.
HQ AFSC	Not within recent past.
HQ AFLC	No.
National Guard Bureau	Had to add personnel.

Major Command Monitor Responses

Question
7. What are the major problem areas that have restricted laboratories within your command from providing increased interservice support to DOD customers?

Monitor	Comments
HQ SAC	The only problem I am aware of, is the PMEL facility being physically too small to handle the additional workload.
HQ ATC	- erratic pickups and deliveries--space requirements for items. Disrupts workload. - cost of transportation - distance
HQ MAC	We have had PMELs refuse to accept additional work through ISSA because of the time lag between getting the authorizations and getting the bodies. The delay in getting additional authorizations and bodies has always been a problem.
HQ TAC	Having authorized equipment - TA 734 is the basic Table of Allowance for PMEL equipment. If Army or Navy equipment requires other equipment, the PMEL can't support the workload. Calibration forms intervals and technical data are different. (This is apparently a problem but T.O. 00-20-14 states that flexibility is permitted. Pg 2-8 paragraph 2-10). Labs sometimes have to use local funds to buy repair parts for other DOD workload. Facilities sometimes a problem.
HQ USAF	N.A.
HQ AFSC	N.A.

Question 7--Continued

Monitor	Comments
HQ AFLC	Manpower constraints. The shift of people is difficult between services to meet workload balance.
National Guard Bureau	Unable to get manpower authorizations.

Major Command Monitor Responses

Question
8. What are the major problem areas that have restricted DOD customers from obtaining interservice support from calibration laboratories within your command?

Monitor	Comments
HQ SAC	Same as #7 Facilities
HQ ATC	Restriction of space - limiting factor Personnel could also be a factor.
HQ MAC	Same as Item 7.
HQ TAC	Same as Item 7.
HQ USAF	N.A.
HQ AFSC	N.A.
HQ AFLC	Same as Item 7 Manpower constraints
National Guard Bureau	Unable to get manpower authorizations.

Calibration Laboratory Responses

Question
1. How many individual Interservice Support Agreements does your Laboratory currently support? With what service are they associated?

Laboratory	# Supported	Service Supported	Comments
MacDill AFB Florida	4 1 2 2	Navy USMC USCG Army	
Selfridge AFB Michigan	1 3 2	Navy Army AF Reserve	
Duluth AFB Minnesota	4		
Lowry AFB Colorado	1 1 1	Army Navy Marine Air Reserves	
Tobyhanna Army Depot	7 4 1	Army Marine Reserve FAA	This is for the Area Calibration Labs and the Army Area Calibration Teams (AACT).

Question 1--Continued

Laboratory	# Supported	Services Supported	Comments
Lexington	1 3 1 1	Navy Depart. of Justice (Prison) Air Force DOD Memphis, Tenn.	
Letterkenny Army			Nonrespondent
Sacramento Army			Nonrespondent
Pueblo	4	Dept. of Trans. Dept. of Energy Ft. Bliss - Support of Japan & Germany test range (FMS) FAA	
Wright-Patterson AFB	0 All non-AFSC work performed through Host Tenant Support Agreement		

Calibration Laboratory Responses

Question
2. Have you recently discontinued support to any DOD customer with which you had a negotiated Interservice Support Agreement? If so, why?

Laboratory	Yes or No	Comments
MacDill AFB Florida	No	None
Selfridge AFB, Michigan	No	None
Duluth AFB Minnesota	Yes	With the FAA they claim that they could calibrate themselves but suspected that the reimbursement rate was too high.
Lowry AFB Colorado	No	None
Tobyhanna Army Depot	Yes	The customer elected to use a calibration facility located closer to his base of operations. The customer elected to obtain calibration support from a laboratory with a lower reimbursement rate.

Question 2--Continued

Laboratory	Yes or No	Comments
Lexington	No	
Letterkenny		Nonrespondent
Sacramento		Nonrespondent
Pueblo	No	
Wright-Patterson AFB	No	

Calibration Laboratory Responses

Question
3. Have you recently obtained additional interservice support workload that had previously been accomplished by another DOD Calibration Laboratory? If so, Why?

Laboratory	New Customers (Yes/No)	Comments
MacDill AFB, Florida	No	
Selfridge AFB, Michigan	No	
Duluth AFB, Minnesota	Yes	In the process of obtaining two new ones. One is completely new and the other has been receiving their calibration someplace else. One is coming to them because they are closer. Lag time was too long. Army reserve outfit.
Lowry AFB, Colorado	No	
Tobyhanna Army Depot	No	
Lexington	No	

Question 3--Continued

Laboratory	New Customers (Yes/No)	Comments
Letterkenny		Nonrespondent
Sacramento		Nonrespondent
Pueblo	No	
Wright-Patterson AFB	No	

Calibration Laboratory Responses

Question
4. What is the reimbursement rate charged by your Laboratory for interservice support to DOD customers of other services? What are the cost elements that are included in this rate?

Laboratory	Rate Charged	Cost Breakdown	Comments
MacDill AFB Florida		Labor-Free	Note: Coast Guard and Non-DOD charged for parts plus labor. Labor is for Pay grade performing task plus PCS Std. Rate (.19¢)
Selfridge AFB Minnesota	$13.70	Base pay and 29% Benefits	
Duluth AFB Minnesota		Parts - Civilian Labor	129% of WG II pay they furnish the accounting and finance with the # of hours that were used. They don't get personnally involved in the Billing. Don't get into parts charges either.

Question 4--Continued

Laboratory	Rate Charged	Cost Breakdown	Comments
Lowry AFB Colordado		Parts Civilian over-time	Civilian overtime when utilized, at WG 12-5 rate. So far civilian overtime has not been expended on ISA workload. Whatever the cost of part through supply.
Tobyhanna	$21.15	A. The Current Direct Labor man-hour rate is $21.15. B. The cost elements included in this rate are: (1) Average Labor rate consisting of the basic Labor Rate, fringe benefits, and Leave rate. (2) Indirect rate consisting of the within shop, above shop and base operations rates. (3) General administration rate. C. AACT support would also include travel (mileage and perdiem) for on-site calibration.	
Lexington	Total $28.14	$11.26 Basic Labor Rate .96 Fringe Benefit $13.49 1.27 Leave 14.65 $13.49 $28.14 $ 2.53 Within Shop Overhead 1.85 Above Shop Overhead 9.19 Base oper (Guards, Elec. Heat, Water, etc.) 1.08 G&A (ADP) $14.65	

Question 4--Continued

Laboratory	Rate Charged	Cost Breakdown	Comments
Letterkenny			Nonrespondent
Sacramento			Nonrespondent
Pueblo	$33.02	- IME (Indirect Maint Expense) - In shop - Above shop - Direct Labor - Indirect Labor	
Wright-Patterson AFB	$13.28	Direct Costs (Labor + 42.8% Labor) Customer arranges and provides his own transportation of equipment coming into the Lab.	

Calibration Laboratory Responses

Question
5. Through what method of funding does your Laboratory receive its operating funds?

Laboratory	Method	Comments
MacDill AFB Florida	O&M Funds	
Selfridge AFB Michigan	O&M	Lab funded through the ANG. O&M appropriations for both Direct and Reimburseable funds.
Duluth AFB Minnesota	O&M	Supply finance with the amount of Time and parts and they budget for that amount. Only allowed so much on interservice work. Give a quarterly figure to finance for interservice items and then they are given the money needed. Can require customer to set up Supply Account Code.
Lowry AFB Colorado	Annual Budget O&M	Forecast in advance, but seldom receive what is forecasted.

Question 5--Continued

Laboratory	Method	Comments
Tobyhanna	Army Industrial Funding	a. Reimburseable customers cite appropriate accounting classification of funds available to Cdr, US Army Depot System Command (DESCOM); DESCOM generates through the automated data processing system (ADP) a procurement request order number (PRON) to this performing depot/laboratory. Incurred production and cost data is transmitted through the ADP system to DESCOM. DESCOM accomplishes monthly customer billings as well as reimbursement to this depot/laboratory through appropriate revenue collection. b. Billing for customers other than DOD (FAA Dept of Transportation) is accomplished by the Finance and Accounting Division of this depot.
Lexington	Army Industrial Funding	
Letterkenny		Nonrespondent
Sacramento		Nonrespondent

Question 5--Continued

Laboratory	Method	Comments
Pueblo	Industrial Funding	
Wright-Patterson AFB	Research & Development Funds (3600 Series)	

Calibration Laboratory Responses

Question
6. Does your Laboratory become directly involved in billing DOD customers for interservice support?

Laboratory	Yes	No	Comments
MacDill AFB Florida	X		Monthly manhour/parts consumption provided to base Finance office.
Selfridge AFB Michigan		X	Billing is sent to comptroller, and DOD customers are "billed" direct from accounting and finance.
Duluth AFB Minnesota	X		They furnish the information to Accounting and Finance Office.
Lowry AFB Colorado	X		By identification of agency to Supply Wing account code.
Tobyhanna Army		X	
Lexington		X	Billing is performed by Depot Systems Command (DESCOM)

Question 6--Continued

Laboratory	Yes	No	Comments
Letterkenny			Nonrespondent
Sacramento			Nonrespondent
Pueblo		X	Don't get involved
Wright-Patterson AFB		X	

Calibration Laboratory Responses

Question
7. Does your laboratory include, in its annual budget, the cost of resources expected to be used in providing interservice support?

Laboratory	Yes	No	Comments
MacDill AFB Florida		X	
Selfridge AFB Michigan	X		Through reimburseable Funding
Duluth AFB Minnesota	X		
Lowry AFB Colorado		X	
Tobyhanna Army	X		
Lexington	X		
Letterkenny			Nonrespondent

Question 7--Continued

Laboratory	Yes	No	Comments
Sacramento			Nonrespondent
Pueblo	X		
Wright-Patterson AFB	X		

Calibration Laboratory Responses

Question
8. How many personnel are assigned to your Laboratory? How many are military and how many are civilian?

Laboratory	Number Assigned	Military	Civilian	Comments
MacDill AFB Florida	20	20	0	
Selfridge AFB Michigan	25	0	25	
Duluth AFB Minnesota	19	15	4	
Lowry AFB Colorado	46	36	10	Authorized 27 Military 10 Civilian
Tobyhanna Army	26	0	AACL-11 AACT-14	
Lexington	46	0	46	

Question 8--Continued

Laboratory	Number Assigned	Military	Civilian	Comments
Letterkenny				Nonrespondent
Sacramento				Nonrespondent
Pueblo	57	0	57	45 in the calibration division 12 in the laboratory
Wright-Patterson AFB	78	0	78	Civilian Grades are: WG-13 WG-12 WG-11

Calibration Laboratory Responses

Question
9. What is the average grade of the military and civilian technician working in your Laboratory?

Laboratory	Military	Civilian	Comments
MacDill AFB Florida	E-5		
Selfridge AFB Michigan		WG-10	
Duluth AFB Minnesota	6 Staffs 1 Sgt 1 Sr A Staff	GS-11	
Lowry AFB Colorado	E-4	WG-12	
Tobyhanna Army		GS-09	
Lexington		GS-09 Step 4	

Question 9--Continued

Laboratory	Military	Civilian	Comments
Letterkenny			Nonrespondent
Sacramento			Nonrespondent
Pueblo		GS-09	
Wright-Patterson AFB		WG 11.5	

Calibration Laboratory Responses

Question
10. What would be the impact upon your Laboratory if reimbursement was no longer required for DOD customers of interservice support?

Laboratory	Comments
MacDill AFB Florida	Less administration time lost for maintaining records
Selfridge AFB Michigan	Could not support DOD customers other than AF without reimbursement
Duluth AFB Minnesota	$4000 which is ten percent of total budget. Do not expect an increase in customers if rates are done away with.
Lowry AFB Colorado	If funding was increased it would simplify supply procedures. We would order parts through one supply account instead of four.
Tobyhanna Army	None
Lexington	Those DOD customers would not be supported unless appropriate funds were identified and made available to the Laboratory (by someone or some other source).

Question 10--Continued

Laboratory	Comments
Letterkenny	Nonrespondent
Sacramento	Nonrespondent
Pueblo	Workload would increase
Wright-Patterson AFB	Minimum to none. The Laboratory does not support any ISSA customers on a reimburseable basis.

Calibration Laboratory Responses

Question
11. Do you provide support to any DOD customers on a non-reimbursable basis? If so, approximately how many items per year do you support?

Laboratory	Yes	No	# of Items	Comments
MacDill AFB Florida		X		Manhours are not reimburseable--only parts.
Selfridge AFB Michigan		X		
Duluth AFB Minnesota	X		2	only a couple of items a year.
Lowry AFB Colorado		X		
Tobyhanna Army		X		
Lexington		X		
Letterkenny				Nonrespondent

Question 11--Continued

Laboratory	Yes	No	# of Items	Comments
Sacramento				Nonrespondent
Pueblo		X		All customers reimbursed.
Wright-Patterson AFB	X		200	Only under Host Tenant Support Arrangements

Interservice Support Customer Responses

Question
1. When preparing your annual budget, do you include the annual reimbursement costs incurred from interservice calibration support?

Customer	Yes	No	Comments
3450th Lowry		X	No budget. Don't enter into the ISA-Army Equipment that is Air Force Maintained.
Camp Ripley Minnesota		X	Do not prepare budget at this level.
Waterveliet Arsenal	X		
Arnold AFS Tennessee	X		
Naval Sec Gp	X		$35.8 K/annum
Coast Guard Clearwater, Florida	X		

Question 1--Continued

Customer	Yes	No	Comments
Naval Post Graduate School	X		
Camp Mabry			Nonrespondent

Interservice Support Customer Responses

Question
2. Is the DOD Calibration Laboratory, from which you obtain support, the closest one to your installation?

Laboratory	Yes	No	Comments
3450th Lowry	X		On the installation, Pueblo does the work that Lowry can't handle. Army Unique equipment.
Camp Ripley Minnesota	X		Most support done by Lexington Field Calibration Team that comes to Ripley every 120 days. The items that they cannot calibrate are sent to Duluth Air Force Base, 150 miles away.
Waterveliet Arsenal New York	X		
Arnold AFS Tennessee	X		Lexington Bluegrass Army Depot VIA a Mobile unit at Nashville.
Naval Sec Gp			We do not know, however, Letterkenny is the nearest facility that offers "Back door service," that will fully support our needs.

Question 2--Continued

Laboratory	Yes	No	Comments
Coast Guard Clearwater, Florida	X		
Naval Post Graduate School		X	Closest is 140 miles Use one that 180 miles away Distant one has van that comes directly to activity.
Camp Mabry			Nonrespondent

Interservice Support Customer Responses

Question
3. If you receive interservice support from a laboratory other than the closest one to your facility, what is your reason for patronizing the more distant laboratory?

Customer	Yes	No	Reason and Comments
3450th Lowry			Not Applicable
Camp Ripley Minnesota	X		(e) the closer Laboratory does not have the capability to support the workload.
Waterveliet Arsenal New York			Good service out of Tobyhanna
Arnold AFS Tennessee			Not Applicable
Naval Sec Gp	X		(c) The service time is better at the distant facility. Service is both more timely and more complete from the Laboratory which we are presently utilizing.

Question 3--Continued

Customer	Yes	No	Reason and Comments
Coast Guard Clearwater, Florida			Not Applicable
Naval Post Graduate School	X		C. The service time is better at the distant facility. D. Provides more equitable workload priority system G. (other) More distant provides van that comes to the school.
Camp Mabry			Nonrespondent

Interservice Support Customer Responses

Question
4. Have you, as a customer, had to help the supporting laboratory finance the procurement of new equipment in order for them to have an adequate capability to support your workload?

Customer	Yes	No	Comments
3450th Lowry		X	The Army furnishes the items to the Air Force. Now the Air Force more or less owns them. AF must maintain. In the past have offered to buy equipment but AF did not accept. Army does loan some of equipment.
Camp Ripley Minnesota		X	
Waterveliet Arsenal New York		X	Don't supply any funding.
Arnold AFS Tennessee		X	
Naval Sec Gp		X	They have fully supported our installation.

Question 4--Continued

Customer	Yes	No	Comments
Coast Guard Clearwater, Florida		X	
Naval Post Graduate School		X	
Camp Mabry			Nonrespondent

Interservice Support Customer Responses

Question
5. What are the various cost elements, which make up the reimbursement rate for interservice calibration support?

Customer	Cost Elements	Comments
3450th Lowry	None	
Camp Ripley Minnesota	N/A	Reimbursement rates are not computed at this level. Red River Army Depot makes our Interservice Support Agreements.
Waterveliet Arsenal New York	Not Certain	Per item basis - they found them consistent from year to year except for inflation.
Arnold AFS Tennessee	$910 per year EEIC 591	
Naval Sec Gp		We reimburse them via MIPR (Military Interservice Project Reimbursement) though Naval Security Group Command Headquarters. We are a Detachment of that Command.

Question 5--Continued

Customer	Cost Elements	Comments
Coast Guard Clearwater, Florida	Man hours Parts	
Naval Post Graduate School		# of trips that the van makes; hourly rates for salaries and overhead; amount of per diem; and amount of time spent at the site.
Camp Mabry		Nonrespondent

Interservice Support Customer Responses

Question
6. Have you ever terminated an Interservice Support Agreement for calibration support from a DOD calibration laboratory? If so, why?

Customer	Yes	No	Reasons and Comments
3450th Lowry			Not applicable
Camp Ripley Minnesota		X	
Waterveliet Arsenal New York		X	
Arnold AFS Tennessee	X		Local contractor PMEL gained capability for calibration of MO 83 which was previously calibrated by Lexington.
Naval Sec Gp.	X		Poor quality and inadequate support.
Coast Guard Clearwater, Florida	X		Poor Turnaround Time Non-responsiveness to priority work Distance to facility to great

Question 6--Continued

Customer	Yes	No	Reasons and Comments
Naval Post Graduate School		X	Never terminated one.
Camp Mabry			Nonrespondent

Interservice Support Customer Responses

Question
7. If the requirement for reimbursement of costs for interservice calibration support was eliminated, what would be the impact upon your organization?

Customer	Comments
3450th Lowry	No impact.
Camp Ripley Minnesota	We would ship the items that Duluth AFB is calibrating to Lexington to be calibrated.
Waterveliet New York	Savings of approx. $28,000 in overhead cost. They do ship 40 or 50 stds to Tobyhanna.
Arnold AFS Tennessee	Slight impact
Naval Sec Gp.	Save time expended in justifying and accounting for funds.
Coast Guard Clearwater, Florida	We would be able to operate at a lower budget or have more money to spend on test equipment or electronic parts.

Question 7--Continued

Customer	Comments
Naval Post Graduate School	Less time used for administration of support program.
Camp Mabry	Nonrespondent

Interservice Support Customer Responses

Question
8. If the requirement for reimbursement of costs for interservice calibration support was eliminated, would you select a different calibration Laboratory from the one who currently provides you calibration support?

Customer	Yes	No	Comments
3450th Lowry			Not applicable
Camp Ripley Minnesota	X		We would contact a PMEL Laboratory at Grand Forks, North Dakota.
Waterveliet Arsenal New York		X	Laboratory is only 180 miles away. They ship UPS.
Arnold AFS Tennessee		X	
Naval Sec Gp		X	Service from Letterkenny has been extremely satisfactory.
Coast Guard Clearwater, Florida		X	

Question 8--Continued

Customer	Yes	No	Comments
Naval Post Graduate School		X	Presently satisfied with good turn around time and good work.
Camp Mabry			Nonrespondent

Interservice Support Customer Responses

Question
9. What are the major problem areas which restrict or inhibit the use of interservice calibration support?

Customer	Problems
3450th Lowry	None. PMEL fails to recognize unique items as their responsibility - fails to fix rapidly.
Camp Ripley Minnesota	We have very little problems with our agreement. We have a $1000 quarterly limit on repair parts. We order the parts if it exceeds that amount.
Waterveliet Arsenal New York	Timeliness of one of a kind items Manufacturing unit and R.&D. at Waterveliet NY
Arnold AFS Tennessee	Distance
Naval Sec Gp	No problems at the present time.
Coast Guard Clearwater, Florida	Time Ability to calibrate all the equipment Parts

Question 9--Continued

Customer	Problems
Naval Post Graduate School	1. Distance excessive to closest 2. Workload for closest activity is such that our activity has a lower priority.
Camp Mabry	N/A

Accounting and Finance Responses

Question
1. How do the local Calibration Laboratories receive their operating funds?

Organization	Comments
AGMC Newark AFS Newark, Ohio	Primarily through Operations and Maintenance Funds. Funds for investment equipment are budgeted through the Base Program Account Code 884080 at AGMC.
Army Metrology and Calibration Center Redstone Arsenal Alabama	Army receives funds direct (Direct Army Funds) down through Comptroller channels. Depots operate under Workload Program Status Report System. They budget based upon "level of effort" for anticipated workloads. After FY 82 depots will not be funded through DESCOM. They will all be funded through Redstone. Redstone is taking over worldwide mission of Army TM&DE (General) calibration and repair. Internal calibration laboratories will not come under control of Redstone. They will remain under control of Depot Commanders. Funds for Army Metrology will come under Program 732207L Funds. The "L" identifies calibration.
Commander Lexington Bluegrass Army Depot Lexington, Kentucky	Program notices are sent to each lab from parent command based upon their 5-Year Plan. Program notices are provided for each of the reimbursable customers. Based upon the estimated number of calibrations to be performed, the budget is prepared. For the reimbursable customers, an account is established at the headquarters level which the lab draws from when performing ISSA work

Question 1--Continued

Organization	Comments
Naval Material Command Washington, D.C.	Naval Material Command budget for calibration services does not include manpower resources required for fleet (shipboard) calibration support. Only the shore based labs. Funds for Navy shore based labs are all channeled through Naval Material Command Headquarters for distribution monitoring and controlled if any changes are required. The various Systems Commands provide funds for support of their operation
4950th TW/PG Wright-Patterson AFB Ohio	Through Research and Development funds (3600 Series)

Accounting and Finance Responses

Question
2. When the local calibration laboratory prepares its annual budget, does it include a request for funds which are expected to be expended to provide support for interservice support customers, or does it budget for only those expenses necessary to provide service to customers of its own service?

Organization	Comments
AGMC Newark AFS Newark, Ohio	The budget includes estimates of what resources will be used for ISSA support and that figure comes out of the total obligation authority. The station then reconciles the ISSA account through a reimbursement authority.
Army Metrology and Calibration Center Redstone Arsenal Alabama	Budget does not include amounts necessary to provide interservice support. The Army Labs Budget only for Direct Army Funds. You do not budget for reimbursements. Additionally, reimbursables are not reported through regular reporting system.
Commander Lexington Bluegrass Army Depot Lexington, Kentucky	The budget includes request for funds for all customers including interservice support customers. The budget is then reconciled with the sources for the reimbursable funds.

Question 2--Continued

Organization	Comments
Naval Material Command Washington, D.C.	Budgets are developed based upon a form of "level of effort" for work performed under ISSAs.
4950th TW/PG Wright-Patterson AFB Ohio	Yes.

Accounting and Finance Responses

Question

3. When the local laboratory performs services under the provisions of an Interservice Support Agreement, where reimbursement is involved, are any of the reimbursed funds credited to the operation of the local calibration laboratory, or are the reimbursed funds credited to a general fund?

Organization	Comments
AGMC Newark AFS Newark, Ohio	The reimbursed funds are not directly credited to the laboratory function but are credited to a general fund. Close monitoring of budget estimates and actual expenditures is maintained at base and command level. Monthly status reports are provided to HQ AFLC based upon "Filled Orders, Unfilled Orders, and Anticipated Orders" so that the budget and expenditures can be reconciled and funds adjusted to account for excesses or shortages of funds.
Army Metrology and Calibration Center Redstone Arsenal Alabama	The funds are credited to the operation of the performing laboratory with obligation authority to spend the funds.
Commander Lexington Bluegrass Army Depot Lexington, Kentucky	Funds are credited directly to the operation of the local calibration laboratory.

Question 3--Continued

Organization	Comments
Naval Material Command Washington, D.C.	N.A.
4950th TW/PG Wright-Patterson AFB Ohio	N.A.

Accounting and Finance Responses

Question

4. What would be the major impact upon accounting if the local calibration laboratory was set up on a direct funding basis and reimbursement for calibration services provided to other DOD services by the laboratory were no longer required?

Organization	Comments
AGMC Newark AFS Newark, Ohio	Minor impact upon accounting for the funds. At each base, where a PMEL was located, a new Operating Budget Accounting Number (OBAN) would have to be established but it would create a minimal additional workload requirement to account for the funds. There would probably be less flexibility afforded to the base commander in the use of the funds allocated for PMEL use. A problem might arise because the distribution/allocation of funds would have to be made by a high authority such as the JCS.
Army Metrology and Calibration Center Redstone Arsenal Alabama	Minimum impact. Army laboratories are already set up for direct funding. Elimination of the requirement for reimbursement would facilitate negotiation of small or insignificant ISSAs that consume a lot of time.
Commander Lexington Bluegrass Army Depot Lexington, Kentucky	Minimum impact. All the responsibility for managing the ISSA workload would fall on the lab superintendent to justify needed resources.

Question 4--Continued

Organization	Comments
Naval Material Command Washington, D.C.	N.A.
4950th TW/PG Wright-Patterson AFB Ohio	Minimum impact.

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