UNITED STATES
GENERAL ACCOUNTING OFFICE

Should Aircraft Depot Maintenance Be In-House Or Contracted? Controls And Revised Criteria Needed

Department of Defense

The armed services can improve their practices for distributing aircraft depot maintenance between in-house and contractor facilities. GAO recommends that conflicting directives be clarified and that better control be established to meet Defense goals of least cost and maintenance mobilization capacity.

FPCD-76-49

OCT. 20, 1976

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

FEDERAL PERSONNEL AND
COMPENSATION DIVISION

B-162832

The Honorable
The Secretary of Defense

Dear Mr. Secretary:

This report discusses policies and practices relating to distributing military aircraft depot maintenance between in-house sources and private enterprise. In view of the steadily increasing cost of manpower and the importance to both the public and private sectors of changes between in-house and commercial performance, we think that defense work distribution policies and practices should be continuously and thoroughly examined.

Since the Office of Management and Budget recently acted to strengthen the distribution policy of relying on the private sector as stated in OMB Circular No. A-76, the observations and recommendations in this report assume further importance. Defense distribution policies and practices may be strongly influenced by these actions, especially those relating to at least five additional functions to be identified for contractor performance and for changes in the bases used for cost comparisons.

This report contains recommendations to you on pages 4, 14, and 19. As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the House and Senate Committees on Government Operations not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

B-162832

We are sending copies of this report to the Director, Office of Management and Budget; the Chairmen of the House and Senate Committees on Government Operations, Appropriations, and Armed Services; and the Secretaries of the Army, the Navy, and the Air Force.

Sincerely yours,

H. L. Krieger
Director

Contents

ABBREVIATIONS

AFLC	Air Force Logistics Command
AVSCOM	Army Aviation Systems Command
DOD	Department of Defense
GAO	General Accounting Office
NAVAIR	Naval Air Systems Command

COMPTROLLER GENERAL'S REPORT TO THE SECRETARY OF DEFENSE

SHOULD AIRCRAFT DEPOT MAINTENANCE BE IN-HOUSE OR CONTRACTED? CONTROLS AND REVISED CRITERIA NEEDED
Department of Defense

D I G E S T

Most military aircraft periodically undergo depot maintenance by activities, with more extensive shop facilities and equipment and personnel of higher technical skill than available at flight organizations and intermediate field shops. Depot maintenance includes major overhaul, or complete rebuild, of parts, assemblies, subassemblies, and end items; and manufacture of parts, modification, testing, and reclamation as required.

Depot maintenance for all military equipment is estimated to cost between $5 and $6 billion annually, of which, half is due to aircraft maintenance. Although this report only addresses aircraft depot maintenance, GAO believes that many of its conclusions and recommendations are also applicable to depot maintenance for many other systems and components. (See pp. 4, 14, and 23.)

Depot maintenance workloads are distributed to in-house (organic) and contract sources. The Department of Defense has two series of policies relating to this distribution: the A-76 series and the mobilization base series.

GAO believes that the relationship between the two series is not clear and has resulted in a lack of consideration for economy in distributing depot maintenance. (See p. 1.)

The first series of DOD policies is guided by Office of Management and Budget Circular No. A-76 and endorses the Government's general policy of relying on the private enterprise system to supply its needs, except when the national interest compels using an organic activity. (See p. 1)

GAO says that two of the five circumstances outlined by the circular for justifying

organic activities are particularly applicable to depot maintenance. The circular states that a service may be provided by an organic Government activity when (1) needed for combat support or when (2) procurement from private enterprise will result in a higher cost. (See p. 1.)

The second series of DOD policies states that each military department should plan organic capacity to accomplish no more than 70 percent of its gross mission-essential workload. DOD says its purpose is to establish a depot maintenance base capable of expansion for mobilization and to split the base between contractor and organic facilities. GAO believes this guidance is unclear because it implies that, to the maximum extent feasible, all nonmission-essential workload and at least 30 percent of mission-essential workload should be performed by commercial sources. A far smaller share of the aircraft workload is performed commercially than this guidance implies. (See pp. 1 and 5.)

The military departments distribute depot maintenance aircraft workloads by first filling organic capacity, then contracting the remainder This distribution does not follow OMB Circular A-76, which emphasizes comparative costs, when the other circumstances do not apply, nor DOD policies, which emphasize the 70/30 split. New organic capacity is usually established to support new aircraft models. (See p. 5.)

GAO says that the Army and the Navy generally exceed the mission-essential, 70-percent organic limit while the Air Force stays within it. Contrary to DOD policy, a considerable part of the Navy and the Air Force nonmission-essential workload is organic. GAO could not determine if the Army was complying with the nonmission-essential policy because the Army considers all its aircraft (except trainers) mission essential, regardless of assigned missions. Among others, this includes administrative aircraft. (See p. 5 and 7.)

Even though the military departments distribute depot maintenance to contractor and organic activities, cost is rarely the determining factor. The services make few cost comparisons in

determining this distribution and when cost comparisons have been made, the indicated economic choice has not always been selected. GAO believes that cost must be considered before the initial source decision is made and before an organic capability is established. (See pp. 15 and 19.)

GAO recommends that the Secretary of Defense reconsider the 70/30 policy by developing and applying criteria for:

--Assessing time-phased needs for mobilization surge of depot maintenance requirements providing a goal for the minimum (floor) organic and contractor capacity to meet those requirements, and relating the status of this capacity to peacetime workload procedures.

--Determining what types of materiel should be supported by organic activities.

--Determining when to apply cost and when to apply mission essentiality for distributing depot maintenance between contract and organic sources. (See p. 4.)

GAO also recommends that the Secretary of Defense require the military departments to establish controls for following DOD's aircraft policies on

--planning organic capacity and

--distributing workload between contractor and organic sources. (See p. 14.)

GAO further recommends that the Secretary of Defense take action to insure that cost comparisons are made, when required, in determining where--in-house or contract--aircraft depot maintenance will be done and that the services consider cost effectiveness in determining distribution of aircraft depot maintenance workload. DOD agrees with the importance of such economy and expects to issue a revised policy on this subject shortly. (See p. 19 and 20.)

CHAPTER 1

DOD DEPOT MAINTENANCE DISTRIBUTION POLICIES ARE NOT CLEAR

The Department of Defense has two series of policies which relate to distributing depot maintenance workloads between organic[1] and contract sources. One series applies to all DOD commercial and industrial activities and the other applies specifically to DOD maintenance activities. The relationship between the two series is not clear and has resulted in a lack of consideration for economy in distributing depot maintenance.

The first series implements the Office of Management and Budget (OMB) Circular No. A-76 and is summarized by DOD Directive 4100.15 and DOD Instruction 4100.33. OMB Circular A-76 affirms the Government's general policy of relying on the private enterprise system to supply its needs, except when the national interest compels the Government to provide its own products and services. The circular establishes specific criteria to be applied by executive agencies in fulfilling this general policy.

Organic commercial or industrial activities must be justified under one of five circumstances outlined by the circular. Two of these circumstances are particularly applicable to distributing depot maintenance between organic and commercial sources. The circular states that a commercial or industrial product or service may be provided by an organic Government activity when (1) needed for combat support or retraining military personnel or to maintain or strengthen mobilization readiness, or when (2) procurement of the product or service will result in a higher cost. Thus A-76 recognizes a need for agencies to consider economy and mobilization readiness in deciding between organic and commercial sources.

DOD policies relating specifically to depot maintenance prescribe that maintenance of military weapons and equipment will be planned and accomplished by the combined use of contractual and organic sources to establish and sustain a maintenance mobilization base capable of expansion within a limited time frame. DOD Directive 4151.1, "Use of Contractor and Government Resources for Maintenance of Material," provides guidance on the amount of depot maintenance workload to be performed in organic facilities. It states that each military department should plan organic depot maintenance capacity to accomplish no more than 70 percent of its gross mission-essential workload. The guidance implies

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[1] Organic depot maintenance is performed by a military department using Government-owned or -controlled facilities and military or Federal civilian personnel.

that, to the maximum extent feasible, all non-mission-essential workload and at least 30 percent of mission-essential workload should be performed by commercial sources.

Under OMB Circular A-76, in-house performance of all mission-essential depot maintenance workloads could be justified on the basis of the need for a mobilization readiness base. However, DOD Directive 4151.1 denies the military departments unrestrained use of this justification by requiring that commercial sources be included in the maintenance mobilization base.

Thus, the primary difference between OMB Circular A-76 and DOD Directive 4151.1 is the basis for determining the distribution of workload between the two sources. The circular implies that the distribution should be based on relative cost and DOD Directive 4151.1, by limiting organic capacity, implies that a percentage distribution should be made.

OBJECTIVE OF DOD DISTRIBUTION POLICIES

The objective of DOD Directive 4151.1 is to establish a depot maintenance support base capable of maintaining military materiel in a state of readiness during peacetime and capable of expansion for mobilization. DOD's rationale for requiring that the maintenance base include both organic and commercial sources is expressed in a position paper prepared by the Office of the Assistant Secretary of Defense for Installations and Logistics. In summary, the rationale is that:

> Organic sources offer (1) the advantages of a controlled source of competence dedicated to maintaining in a state of readiness military weapons and equipment which will be used in direct support of our military forces in reaction to any contingency, (2) the assurance of a capability to sustain that equipment in an initial surge, and (3) provide a base for expansion.
>
> Contractor sources provide a broader maintenance support base capable of greater expansion in wartime. However, because there is normally a timelag between identifying a need for commercial maintenance support and the ability of commercial sources to respond, it is important that some part of mission-essential work be assigned to contractors in peacetime along with non-mission-essential workloads.

In discussing this rationale and the requirement that the services plan in-house capacity to accomplish no more than 70 percent of mission-essential workloads, DOD officials were unable to demonstrate that a 70/30 distribution would achieve the desired maintenance base objective. They said that the 70/30 split was a subjective determination intended as a guide.

The distribution policy discloses two potential problems. The policy provides no criteria for maintaining a minimum organic capacity. If organic capacity is continually adjusted to accomplish no more than

70 percent of the peacetime workload and peacetime requirements decrease, such as during recent years, a point may be reached when existing organic capacity is insufficient to meet initial surge requirements during mobilization.

The distribution policy could also result in inefficient and uneconomical use of existing organic capabilities. The policy, as written, implies that only mission-essential workload should be performed in-house and that all non-mission-essential workload should be contracted. On the basis of DOD's definition, determining mission essentiality depends on how the materiel is employed or used. That is, a particular aircraft may be both mission essential and nonmission essential depending on its use. For example, when an aircraft is used for training, administrative, or nontactical support, it is designated nonmission essential. However, when the same type of aircraft is assigned to support combat or combat-related missions, it is designated mission essential. Therefore, generally only a part of a given aircraft inventory is designated mission essential and the remainder is considered nonmission essential. If the policy were strictly followed, depot maintenance on aircraft assigned non-mission-essential roles should be performed by a commercial source even when a maintenance support capability exists in-house. Thus, the DOD policy of contracting all non-mission-essential workload is not clear, nor if carried out is not cost effective.

HOW SHOULD THE DISTRIBUTION BE MADE?

Although DOD policy requires that mission-essential workloads be distributed between organic and commercial sources, the guidance is not clear for determining what should be maintained in-house and what should be contracted. DOD Directive 4151.1 states that the maintenance of mission-essential military materiel will be accomplished with DOD organic resources when required to insure a controlled source of equipment support. However, no clear guidance is provided for determining what mission-essential materiel requires controlled-source support.

DOD Instruction 4151.15 provides additional guidance for determining the distribution of mission-essential workload requirements. This instruction directs the services to establish and sustain organic depot maintenance capacity on the basis of hardcore, mission-essential workload requirements and the part of the workload which exceeds this hardcore capacity should be accomplished by commercial sources. However, the instruction's definition of hardcore capacity does not provide any specific criteria for determining which weapon systems and equipment should be supported by such capacity.

Although the services are required to plan a 70/30 workload distribution, DOD has not established procedures for them to monitor compliance with this requirement. Both the Navy and the Army perform more than 70 percent of their mission-essential workload in-house and the Navy and the Air Force perform large percentages of their non-mission-essential work in organic facilities.

CONCLUSIONS

DOD Directive 4151.1 provides no criteria for establishing a minimum organic depot maintenance capacity.

Strict compliance with the directive's implication that non-mission-essential workloads be performed by commercial sources could result in uneconomical use of existing organic capacity.

The services do not receive clear guidance about the relative importance of cost and mission essentiality as factors in determining workload distribution. OMB Circular A-76 supports a distribution between the two sources on the basis of relative cost. However, DOD Directive 4151.1 directs the services to distribute mission-essential depot maintenance on the basis of workload percentages.

Further, DOD policy guidance regarding what mission-essential materiel should be maintained by organic resources is not clear.

RECOMMENDATIONS

We recommend that the Secretary of Defense reconsider the 70/30 policy by developing and applying criteria for:

--Assessing time-phased needs for mobilization surge of depot maintenance requirements, providing a goal for the minimum (floor) organic and contractor capacity to meet those requirements, and relating the status of this capacity to peacetime workload procedures.

--Determining what types of materiel should be supported by an organic maintenance source.

--Determining when to apply cost and when to apply mission essentiality as factors for distributing maintenance workloads between organic and contract sources.

CHAPTER 2

CONTRACT-ORGANIC DECISIONS

In planning the distribution of mission- and non-mission-essential workloads, the services first fill existing organic capacity, then contract the remainder. These practices are not consistent with OMB Circular A-76, which emphasizes comparative costs, nor DOD Directive 4151.1, which emphasizes workload percentages.

New organic depot maintenance capability is generally established to support new aircraft models. Pending the establishment of such capability, commercial maintenance sources are frequently relied on to provide interim maintenance support.

Although each service claims to consider cost in determining how to distribute depot maintenance workloads, we found that few cost comparisons are made before such determinations. (See ch. 3, pp. 15 to 20.)

The table on page 6 summarizes the services' major reasons for distributing workloads to organic and commercial sources.

FISCAL YEAR 1975 PLANNED WORKLOAD

Navy's planned aircraft depot maintenance program was approximately $638.4 million and represented a workload of about 37.9 million work-hours. The workload included 33.6 million work-hours of mission-essential requirements and 4.3 million work-hours of non-mission-essential requirements. The Navy-planned distribution of mission-essential workload was 77.8 percent to organic facilities, 19.8 percent to contractors, and 2.4 percent to other services. In addition to mission-essential workloads, organic Navy facilities were to accomplish 64.7 percent of non-mission-essential workload.

Air Force's planned aircraft depot maintenance workload was about 72.3 million work-hours and included 60.6 million work-hours of mission-essential workload and 11.7 million work-hours of non-mission-essential workload. The Air Force planned to accomplish 60 percent of the mission-essential workload organically, 38 percent by contract, and 2 percent at other service facilities. Although these percentages indicate the Air Force is complying with DOD's workload distribution policy, the compliance is necessitated by manpower ceilings. At the time DOD established the 70/30 workload distribution policy, the Air Force organic depot maintenance capacity, unlike the other services, was not sufficient to accomplish 70 percent of its mission-essential workload. Although the Air Force could have increased its in-house workload, the imposition of manpower ceilings prevented this expansion.

Army's planned aircraft depot maintenance program was approximately $234.1 million and represented a workload of about 8.5 million work-hours. The planned workload distribution was 63.7 percent organic, 30.5

Major Reasons Aircraft Depot Maintenance Is Performed In Organic and Contract Facilities

Organic	Contract
Mission essential	
The general policy is to establish and maintain organic capability/capacity to support mission-essential aircraft and related subsystems and components.	Aircraft which are similar in design to or which are modified versions of commercially operated aircraft are most often maintained by contract sources.
Nonmission essential	
Some non-mission-essential workload is performed in-house because it is similar or identical to some mission-essential workloads for which organic support capability has been established. Also, if organic non-mission-essential workload was contracted it would cause underutilization of existing organic capacity, cost more, and require a reduction-in-force affecting many people.	Organic support capability does not exist and the investment to establish such support would be excessive in relation to the volume and/or frequency of workload requirements. To provide interim support for new items until maintenance requirements are stabilized and organic capability is established. Systems which are reaching or have reached the end of their mission-essential status are put on contract to free organic capacity for support of new materiel. Existing contract by another service supporting similar or identical items.

percent contract, and 5.8 percent interservice. It was not possible to determine if the Army was complying with DOD's distribution requirements for mission- and non-mission-essential workloads. The Army, unlike the Navy and Air Force, does not distinguish its workloads in terms of mission and nonmission essential. Contrary to DOD's definition of mission essential, for purposes of 70/30 distribution, the Army considers all its aircraft (except trainers) mission essential, regardless of assigned missions. Among others, this includes administrative aircraft.

SOURCE DETERMINATIONS

To identify distribution criteria, we asked each service to provide specific information on source determinations for a selected workload.

Navy

From Navy's aircraft depot maintenance program we selected 16 different airframes and 7 different aircraft engines which, in aggregate, represented about 26 percent (in dollars) of the total planned workload for fiscal year 1975. For each airframe and engine we asked why it was maintained in-house or commercially. Naval Air System Command (NAVAIR) officials replied that all decisions had been made years ago and the files containing their rationale had been destroyed. However, they provided the following general information on the basis for source decisions.

The Navy normally decides to maintain an aircraft weapon system in-house or commercially after it leaves the development phase and before it becomes operational. Historically these decisions have been made on the basis of mission essentiality so that aircraft with exceptional mobilization requirements are maintained in-house. Non-mission-essential aircraft, along with aircraft nearing the end of their mission-essential life cycle, are candidates for contract depot maintenance. Decisions to transfer depot maintenance support for a particular aircraft from an organic to a contract source are generally based on the aircraft becoming nonmission essential and/or the need to make room in-house for new aircraft systems. NAVAIR officials said they did not normally move an established aircraft maintenance program in-house unless commercial capability became unavailable.

Inconsistencies

In comparing NAVAIR's actual workload distribution with its stated distribution policies, we found several inconsistencies. NAVAIR stated that mission-essential aircraft with exceptional mobilization requirements are maintained in-house. However, this policy is not always followed and some mission-essential aircraft are maintained by a commercial source.

Also, although NAVAIR officials stated that all non-mission-essential aircraft are candidates for commercial maintenance, most of these

workloads are accomplished in-house. As previously discussed, DOD Directive 4151.1 requires that not more than 70 percent of mission-essential workloads be planned for in-house and implies that non-mission-essential workloads be considered for contract. However, in fiscal year 1975, the Navy planned to accomplish in-house approximately 78 percent of its mission-essential workload and 65 percent of its non-mission-essential workload.

Regarding inconsistencies with DOD's policy, the Secretary of the Navy requires a written request justifying any Navy maintenance plans which deviate from DOD's workload distribution requirements. NAVAIR officials said that they had not prepared a formal written deviation request for their fiscal year 1975 planned program but that the request had been made and approved orally. However, they provided us copies of the deviation request for their fiscal year 1976 planned aircraft maintenance program. This program, like 1975's, also indicates that more than 70 percent of the mission-essential workload is to be accomplished in-house, along with over half the non-mission-essential workload.

The deviation request regarding the planned distribution of mission-essential workload stated, in part, that:

> "To meet the objective in DODD 4151.1 of accomplishing 70 percent of the mission essential workload organically the Naval Air Systems Command would have to reduce in-house workload by 4.5 million hours by FY 78. To accomplish this task would mean placing this workload on the commercial market. It would probably necessitate closure of a rework facility and would result in additional costs to the Navy of $155.5 million over a four-year period. In view of this, the Naval Air Systems Command does not plan to further adjust its workload distribution to accommodate the provisions of DODD 4151.1 as it is not cost effective." (underscoring supplied)

NAVAIR officials could not provide support for how they determined it would cost an additional $155.5 million to comply with DOD's workload distribution policy.

The deviation request to perform non-mission-essential workload in-house explains that the majority of this workload involves training aircraft being phased out and replaced by new training aircraft to be supported completely by commercial sources.

Air Force

The Air Force is developing a systematic (decision tree) approach for determining the distribution of aircraft depot maintenance between organic and contract sources. Basically this approach involves a step-by-step analysis of its mobilization workload for estimating requisite organic and contract support, the cost of providing such support, and critical resource (primarily skilled labor) shortages which may exist.

The Air Force, like the Navy, usually decides where new aircraft will be maintained before they enter operational status. Generally, first-line, mission-essential aircraft are maintained in-house and older aircraft are maintained on contract. First-line aircraft are those which the Air Force expects to be used first to perform a designated Air Force mission.

The amount of organic capacity established for each aircraft system varies as shown in the following table.

Planned Percentage Distribution of Depot Maintenance Workload for Selected Mission-Essential Aircraft During Fiscal Year 1975

Aircraft	Organic	Contract	Interservice
F-111A, D, E, F/FB-11	91.0	8.5	.5
C-5A	85.8	14.1	.1
B-52D, F, G, H	77.3	22.1	.6
F-4C, D, E	53.4	40.8	5.8
F-105B, D, F, G	47.7	50.1	2.2
C-130A, B, D, E	36.1	63.0	.9
KC-135A	24.8	74.3	.9
C-9A	3.1	96.4	.5

Depot maintenance for an aircraft system includes several maintenance categories, such as airframe, engine, electronics and communication, and component items. The overall mix between in-house and contract support for any aircraft system is the result of many decisions affecting maintenance categories.

Some of Air Force's many reasons for varying degrees of in-house support for aircraft--exemplifying policy inconsistencies--are:

--Depot maintenance for F-4s in Europe and Asia is accomplished by contractors, while in fiscal year 1975, those in the United States were maintained in-house.

--Contractor support of the F-105 depot maintenance program has been increasing in recent years because of (1) in-house capacity limitations and (2) Air Force's practice of shifting depot maintenance of older aircraft systems to contractors to free organic capacity to support newer, more essential systems.

--The large inventory of C-130 aircraft makes it possible to place part of the workload on contract and still retain an in-house repair capability.

--Although most of the KC-135A depot maintenance workload is accomplished by contract, the Air Force desires to retain an

organic repair capability for this aircraft system and, therefore, maintains special configurations in-house.

--The C-9 maintenance requirements are entirely satisfied by contract because the total inventory is relatively small and the aircraft is essentially a commercial (DC-9) type aircraft.

Non-mission-essential workloads

The Air Force planned to accomplish about 4.3 million work-hours (37 percent) of its non-mission-essential aircraft workload in-house during fiscal year 1975 as follows:

	Work-hours	Percent
Work performed on the part of mission-essential aircraft inventory assigned to non-mission-essential roles.	657,664	15.5
Work performed on aircraft designated as nonmission essential.	683,967	16.1
Work performed on aircraft-related items, such as ground support equipment.	1,068,390	25.1
Work performed on items common to more than one aircraft.	1,843,603	43.3
Total	4,253,624	100.0

The 16.1 percent of non-mission-essential workload, shown above, as not related to mission-essential aircraft, is the type of work that, under DOD policy, should be contracted to the maximum extent feasible.

Manpower ceilings

The constraint of manpower ceilings causes continuing changes in the Air Force maintenance work-load distribution. Following are examples of the effect of ceilings on workload distribution.

The J57-59 engine is used on the KC-135A, a mission-essential aircraft. Depot maintenance for this engine has been accomplished by contract repair sources since fiscal year 1969. Air Force Logistics Command (AFLC) officials stated that the primary reason this engine was transferred to a contract repair source was in-house manpower limitations. Officials said that they were operating under manpower ceilings which limited what could be accomplished in-house.

In reply to a congressional inquiry regarding this decision, AFLC stated that its manpower ceilings were established independent of the total workload requirement, and consequently it did not always have the latitude to implement the most cost effective means of depot maintenance support.

As of July 1975, AFLC was placing on contract the programed depot maintenance for F-4C aircraft in the United States. AFLC stated that because of manpower limitations and a buildup in F-4 modification workload, it did not have the in-house capability to accomplish all planned in-house F-4 depot maintenance requirements after fiscal year 1975. Consequently, AFLC solicited contractor bids for the F-4C programed depot maintenance and made a cost comparison to determine the most economical method of accomplishing this work. The cost comparison indicated considerable savings by contracting, and thus the work was placed on contract in 1976. Currently about 30 to 35 percent of the F-4 depot maintenance is accomplished in-house and about 65 to 70 percent by contract.

Army

The Army Aviation Systems Command (AVSCOM) develops the Army's 5-year aeronautical depot maintenance plan. The stated objectives of this plan are (1) to provide a definitive 5-year workload forecast for the total technical, industrial, and financial workload requirements and (2) to provide a balanced level of depot maintenance capability and capacity to maximize the readiness of each type of mission-essential equipment.

Army criteria regarding the workload distribution state that:

1. Current and projected organic capacity (manpower, facilities, and equipment) will be established and maintained at no more than 70 percent of the capacity required to accomplish peacetime workload for each type mission-essential aircraft.

2. In establishing organic capacity within the 70 percent limitation, assurance should be made that a capability exists to accomplish 100 percent of the first-line, mission-essential aircraft workload in-house.

3. Organic workloads in excess of a one-shift, peacetime capacity will be subjected to cost effective analysis, to the maximum extent practicable, to compare the alternatives of performance by commercial, interservice, or organic depot sources.

In comparing alternative maintenance sources, the analysis is required to consider the following factors:

--Comparative total cost.
--Expected duration of planned work.
--Minimum economic quantities of workload.

--Convertibility of existing or required facilities.
--Capital investments required.
--Quality assurance.
--Contract or performance records.

In addition to the foregoing criteria, AVSCOM's general distribution policies require that after workload requirements are determined, organic and interservice facilities be considered first and that after competitive commercial resources have been assessed the overflow be placed on contract. The policies also state that the economic use of existing mission-essential maintenance facility and equipment investments will be assured.

Army's policy (AR 750-1) concerning in-house depot maintenance is that an organic capability/capacity will be established and sustained to support all weapon systems and equipment essential to accomplishing the Army's primary roles and missions. The policy states that organic capability/capacity should be the minimum required to insure a ready and controlled source of technical competence and resources necessary to meet military contingencies.

In evaluating AVSCOM's implementation of depot maintenance policies, we selected parts of its workload and questioned why it was planned for in-house or contract accomplishment. The rationales given were not always consistent. For example, we were told that all T-53 engines were used on mission-essential aircraft and, therefore, require establishing and retaining an organic depot maintenance capability/capacity. However, we were told that OV-1 aircraft, which are also mission essential, were maintained by contract because (1) they were relatively low in density and (2) had undergone considerable changes to their mission equipment since introduction into the Army aircraft inventory. AVSCOM officials also said that since the main function of the contractor's facilities was modification and concurrent overhaul of aircraft, the OV-1 was regarded to be adequately covered for mobilization depot maintenance.

DOD MAINTENANCE MOBILIZATION BASE

As previously discussed (see pp. 2 and 3) the objective in requiring the services to use both commercial and organic sources in accomplishing depot maintenance is to establish and sustain a DOD maintenance mobilization base capable of expansion within a limited time frame.

To determine the extent to which commercial sources have been included in aircraft maintenance mobilization plans, we analyzed each service's planned distribution of the additional workload which it estimated would be generated during the first year of mobilization as shown below.

Planned Distribution of Additional Aircraft Workload Generated During First Year of Mobilization (note a)

	Work-hours of workload (millions)	Percent
Army:		
Total estimated increase (note b)	20.4	-
Planned distribution:		
Organic (note c)	13.9	68.1
Contract	6.5	31.9
Navy:		
Total estimated increase (note b)	14.9	-
Planned distribution:		
Organic (note c)	14.7	98.7
Contract	.2	1.3
Air Force:		
Total estimated increase (note b)	42.4	-
Planned distribution:		
Organic (note c)	33.5	78.9
Contract	8.9	21.1

[a]Excludes depot maintenance workloads for munitions, ships, and Navy strategic missiles, ground electronics, and communications.

[b]Increase over planned 1976 peacetime workload.

[c]Includes interservice workload.

The above data indicates the Navy plans to rely entirely on its in-house capability to accomplish a mobilization workload surge while the Army and Air Force plan to rely on both in-house and contractor capabilities. However, with respect to Army and Air Force plans to distribute part of their mobilization workload to contractors, it should be noted there is no guarantee that the necessary additional commercial capacity will be available. Commercial sources engaged in depot maintenance of military aircraft have established capacities to accomplish peacetime workloads, not mobilization workloads. While we recognize that powers may be granted to the President in an emergency that can assist the services in obtaining desired resource allocations, such resources may well be applied to aircraft production during a period of mobilization rather than to depot maintenance.

CONCLUSIONS

The services are not complying with DOD Directive 4151.1. Although the directive implies that non-mission-essential workloads be contracted, the Navy and the Air Force plan to accomplish substantial parts of their non-mission-essential aircraft workloads in-house.

The Navy is not complying with the directive's requirement that organic maintenance capacity be planned to accomplish no more than 70 percent of mission-essential workload. Further, the Navy does not intend to adjust its plans to meet the directive's requirement, claiming that it would cost an additional $155.5 million over 4 years. However, it could not support how this additional cost was calculated.

We could not determine if the Army was complying with DOD's workload distribution requirements because it made no distinction between mission and non-mission-essential workload.

The Air Force's distribution of mission-essential aircraft workload is within the requirements of DOD's Directive 4151.1. The Air Force's manpower ceilings are well under the force needed to accomplish 70 percent of its mission-essential workload in-house.

In deciding between organic and commercial maintenance sources for new aircraft, the services' primary consideration is mission essentiality. These decisions are made with little or no consideration of workload distribution balances or cost effectiveness. The Navy's policy of establishing an organic maintenance capacity to support mission-essential aircraft is not consistently followed. Some mission-essential Navy aircraft are supported entirely by commercial maintenance sources.

The objective of DOD Directive 4151.1 is to establish a depot maintenance mobilization base consisting of both organic and commercial sources. The Navy plans to accomplish essentially all of its mobilization workload surge in-house and thus has failed to meet the 4151.1 objective. Although the Army and Air Force plan to distribute part of their mobilization workload surge to contractors, they have no assurance that sufficient contractor capacity will be available to accomplish this workload.

RECOMMENDATIONS

We recommend that the Secretary of Defense require the services to develop procedures for obtaining assurance from commercial depot maintenance sources that needed workload capacity will be available in the event of mobilization.

We also recommend that the Secretary of Defense require the services to establish controls for following DOD's depot maintenance policy on

--planning organic capacity and
--distributing workload to organic and commercial sources.

CHAPTER 3

PERSPECTIVE OF COST COMPARISONS

OMB Circular A-76 requires that in the absence of certain circumstances, relative cost should be the determining factor in selecting between in-house and commercial sources for needed products and services. A formal cost comparison is required to disclose, as accurately as possible, the difference between the costs which the Government would incur under each alternative. However, the services make few cost studies in selecting between organic and commercial sources for aircraft depot maintenance, and, when cost comparisons have been made, the indicated economic choice has not always been selected.

Accomplishing aircraft maintenance workloads in organic facilities is most often justified on the basis of mission essentiality, rather than economy. However, since the services distribute mission-essential workload to both organic and commercial sources, it would seem appropriate that consideration be given to cost in selecting between alternative maintenance sources. Costs must be considered when the initial source decision is being made and before a capability is established. Once an organic maintenance source has been established for a specific workload, it is generally not possible for a commercial source to compete on a cost basis for the workload because of the large investment normally required in facilities and equipment. Similarly, it is not generally cost effective for the services to switch to organic sources once they have paid a contractor to establish a capability for a specific workload.

FEW COST COMPARISONS MADE

NAVAIR officials said that while they do not normally make formal cost comparisons in determining maintenance repair sources, they consider the relative costs of such sources in preparing alternative long-range depot maintenance plans.

However, when NAVAIR officials prepare alternative plans, they price commercial depot maintenance sources at 125 percent of estimated or actual in-house cost. They do not validate the 125 percent. They claim that their general objective is to achieve the maximum amount of workload possible within a given budget. The practice of costing commercial depot maintenance at 125 percent of in-house cost indicates to us that serious consideration is not being given to economy in distributing workload. We agree that cost should not be the only factor considered in distributing workload; but given the requirement that part of the mission-essential workload is to be contracted, an effort should be made to achieve an economical workload mix between in-house and commercial sources.

A type of depot maintenance in which cost can generally be a major factor (regardless of mission essentiality) in determining source is equipment modification. Aircraft modification programs--other than

critical safety changes--usually take several years to complete and involve the procurement and installation of modification kits.

In fiscal year 1975 NAVAIR planned to install aircraft modifications at a cost of approximately $84 million. About 74 percent ($61.8 million) of this workload was planned to be accomplished organically and 26 percent ($22.2 million) was to be done commercially. To determine the reasons for this distribution, we selected several modifications for review. NAVAIR identifies its modification programs by assigning them Operational Safety Improvement Program (OSIP) numbers. The table on page 17 lists the OSIPs we reviewed, their associated installation costs, and the reasons given by NAVAIR officials for performing the installation organically or commercially.

While the table indicates cost is occasionally a factor in determining whether modifications should be installed at organic or commercial facilities, NAVAIR officials said that cost studies were not regularly conducted in making such determinations. However, they believed more cost studies should be made.

The Air Force also makes few formal cost comparisons for depot maintenance workloads. AFLC officials identified the following cost comparisons.

Cost Comparisons Prepared by the Air Force
During Calendar Years 1973, 1974, and 1975

Year	Nature of work
1973	B-52D maintenance and modification (Rivet Plank)
1973	C-5A fiscal year 1975 maintenance and modification
1974	C-5A wing modification (Option H)
1974	F-111D/F maintenance and modification
1974	F/RF-4C maintenance
1974	J57-59 engine overhaul
1974	Minuteman missile maintenance
1975	F-4C maintenance
1975	C-135 modification
1975	C-141 modification

The B-52D and F-111D/F cost comparisons were made as the result of unsolicited proposals from the original aircraft manufacturers. The J57-59 comparison was prepared to determine what the in-house overhaul cost would be if the contractor who was doing this work could no longer do it.

Selected NAVAIR Modification Programs

OSIP No.	Estimated FY 1975 installation costs	Estimated total installation costs	Activity doing installation	Reason given by NAVAIR for installing modification at indicated activity
	(000 omitted)			
19-74	$ 2,700	$ 44,932	Commercial	Cost comparison indicated a $24 million savings by going commercial.
24-72	1,570	3,612	Commercial	Being done commercially because there was no in-house capability.
5-72	12,337	121,113	Commercial	This modification is being done commercially in conjunction with production aircraft. It was also determined to involve work far more extensive than in-house facilities are able to perform.
38-70	3,882	12,104	In-house	This is being done in-house concurrent with standard depot maintenance.
15-72	2,649	4,863	In-house and commercial	This is because emphasis is on the fastest possible installation and in-house facilities have been workloaded to the maximum.
90-69	1,298	1,462	In-house	This is being done concurrent with standard depot maintenance. Historic data does not indicate how the decision was reached.
30-74	4,018	13,934	In-house	In-house represented the least line of resistance for optimum time, volume, and economy to meet fixed deployment dates and training schedules.
12-71	11,214	30,335	In-house	A cost study indicated a significant cost savings if performed in-house.
	$39,668	$232,355		

Although few formal cost comparisons are made, Air Force officials said that less formal economic analyses are made continually in evaluating source of repair decisions. These analyses do not, however, follow the guidelines required by OMB Circular No. A-76.

COST COMPARISONS NOT ALWAYS FOLLOWED

Cost comparisons have been made, but the most economic choice has not always been selected. An example is the case of the Navy's H-46 helicopter.

In 1969, the Navy received an unsolicited proposal from a contractor to perform depot maintenance on H-46 helicopters during fiscal years 1970 and 1971 at fixed prices each year. At the time the Navy was performing this maintenance at its organic facilities. The Navy made a study to compare the contractor's cost with the in-house cost of reworking H-46 helicopters. The study indicated that it would cost approximately $1.3 million more if the contractor performed the work. However, because of pressure to maintain the contractor as part of the industrial base and save him from pending financial difficulties, a contract was awarded to rework 24 H-46 helicopters during fiscal year 1971. The work was performed on schedule but at a greater cost to the Navy than if the work had been done in-house.

In fiscal years 1972 and 1973 the contract was renewed even though the original justification no longer existed, since the contractor was no longer in financial danger.

In the Air Force, we found four cost comparisons indicating work could be performed more economically in-house but was either being performed by a contractor or was recommended or planned for contract.

Work Underway or Planned to be Done at Contract Repair Sources

Cost comparison	Indicated in-house savings (million)
B-52D maintenance and modification (Rivet Plank)	$ 24.2
C-5A fiscal year 1975 maintenance and modification	6.8
C-5A wing modification (Option H)	156.5
J-57-59 engine overhaul (note a)	1.4
Total	$188.9

[a]Cost comparison was not prepared for deciding where to accomplish the work but for determining the in-house cost if the work had to be shifted from the existing contract repair source.

The B-52D maintenance and modification workload was placed with a contract repair source to avoid the need for considerable growth of in-house personnel for a 2-year period.

The C-5A fiscal year 1975 maintenance and modification workload was split between in-house and contract repair sources to maintain contractor capability to provide future C-5A support.

Although a final decision has not been made as to whether the proposed C-5A wing modification will be done in-house or by contract, AFLC wants it done by contract. AFLC feels that in-house performance of this work would saturate its C-5A depot repair capability and limit its capability to meet sudden surge requirements. AFLC stated that because of manpower ceiling, sufficient personnel strength does not exist at its C-5A depot to accomplish this work. Consequently, if the modification program is done in-house, approximately 13.5 million work-hours of mission-essential work would have to be transferred to contract sources to make room for the program. AFLC officials were concerned that an undesirable personnel turbulence would be caused by such a transfer and by the precipitous drop in workload at the depot on completing the modification program.

The Army also, like the other services, only occasionally considers relative cost in selecting alternative maintenance support sources. However, Army officials stated they planned to make formal cost comparisons in selecting such sources in the future.

CONCLUSIONS

Despite the requirement stated in OMB Circular A-76, few formal cost comparisons were made in determining whether aircraft depot maintenance will be done organically or commercially.

The justification used for performing depot maintenance in-house is usually mission essentiality rather than relative cost. However, the validity of this justification is questionable since many mission-essential workloads are placed on contract. We recognize that it would be difficult for commercial sources to compete on a cost basis with aircraft depot maintenance workloads which have been established in-house for some time. However, we believe that cost comparisons are appropriate and should be considered when making maintenance source decisions for new mission-essential weapons, and for modifications to older weapons.

RECOMMENDATIONS

We recommend that the Secretary of Defense take action to insure that formal cost comparisons are made, when required, in determining where--in-house or contract--aircraft depot maintenance will be performed. We also recommend that the services give greater consideration to cost effectiveness in determining the distribution of aircraft depot maintenance workloads.

DOD COMMENTS

In commenting on our report, DOD agreed that economical considerations must be an important factor in deciding between organic and contract maintenance sources. It said the need for such considerations was a key factor behind the Assistant Secretary of Defense (Installations and Logistics) direction for a complete review of the policies expressed in DOD Directive 4151.1. DOD said non-mission-essential guidance will be evaluated in addition to other issues mentioned in our report.

CHAPTER 4

SCOPE OF REVIEW

We reviewed policy guidance from the Office of Management and Budget, DOD, and the Army, Navy, and Air Force. The guidance related to contract versus in-house decisions and depot maintenance planning. We examined each service's procedures and practices for distributing depot maintenance workloads between in-house and commercial sources.

We made our review at the following locations.

Department of Defense:

Office of the Assistant Secretary of Defense (Installations and Logistics)
Washington, D.C.

Department of the Navy:

Office of the Assistant Secretary of the Navy (Installations and Logistics)
Washington, D.C.

Headquarters, Naval Material Command
Arlington, Va.

Headquarters, Naval Air Systems Command
Arlington, Va.

Naval Air Systems Command--Atlantic Representative
Norfolk, Va.

Naval Air Rework Facility
Jacksonville, Fla.

Naval Aviation Supply Office
Philadelphia, Pa.

Department of the Air Force:

Office of the Assistant Secretary of the Air Force (Installations and Logistics)
Washington, D.C.

Office of the Deputy Chief of Staff for Systems and Logistics
Washington, D.C.

Headquarters, Air Force Logistics Command
Wright-Patterson Air Force Base, Ohio

Air Logistics Center
San Antonio, Tex.

Air Logistics Center
Sacramento, Calif.

Department of the Army:

Office of the Assistant Secretary of Army (Installations and Logistics)
Washington, D.C.

Office of the Deputy Chief of Staff for Logistics
Washington, D.C.

Army Materiel Command
Alexandria, Va.

Army Major Item Data Agency
Chambersburg, Pa.

Army Aviation Systems Command
St. Louis, Mo.

Army New Cumberland Depot
New Cumberland, Pa.

DEPOT MAINTENANCE MANAGEMENT

The objective of military materiel maintenance is to sustain weapon systems and equipment in a state of operational readiness.

Organizational level maintenance is performed by military units on their assigned equipment. It normally consists of inspecting, servicing, lubricating, adjusting, and replacing parts, minor assemblies, and subassemblies. Intermediate level maintenance is performed by designated maintenance activities for direct or general support of units. An intermediate maintenance activity usually supports more than one unit and has a greater capability in terms of facilities and technical skills than available at the units.

Depot-level maintenance activities support organizational and intermediate activities with more extensive shop facilities and equipment, and personnel of higher technical skill than available at the other levels. Depot maintenance includes major overhaul or complete rebuild of parts, assemblies, subassemblies, and end items, and manufacture of parts, modification, testing, and reclamation, as required.

Depot maintenance uses three sources--organic, interservice, and contract. Organic depot maintenance is performed by a military department using Government-owned or -controlled facilities and military or civilian personnel. Interservice depot maintenance is performed by one military service by its organic maintenance sources for another military service. Contract depot maintenance is performed under contract by commercial organizations on a one-time or continuing basis.

Depot maintenance of military materiel is estimated to cost between $5 and $6 billion annually, of which, half is due to the maintenance of military aircraft.

MILITARY MAINTENANCE ORGANIZATIONS, PROGRAMS, AND PLANNING

Each service has a different depot maintenance organizational structure. In the Air Force and Army, maintenance management is centralized while in the Navy it is decentralized. Depot maintenance planning and programing in the services is governed by DOD Instruction 4151.15, "Depot Maintenance Support Programming Policies." The instruction established concepts, criteria, and policy governing the establishment and use of a mechanized depot maintenance programing system to be uniformly applied by all DOD components with a depot maintenance mission or responsibility. The instruction requires each programing system to be oriented and alined with weapon and end item equipment as systems rather than relating to commodity groupings of items or purely a functional level of consideration. The programing systems also are to contain planning data for 5 fiscal years--the current (budget) year and the 4 succeeding years.

Navy

Naval Material Command (NMC) is responsible for Navy depot maintenance and in addition provides aeronautical maintenance support to the Marine Corps. All depot maintenance on aircraft the Marine Corps uses is performed in Navy facilities. NMC is organized into five systems commands, each having responsibility for planning, programing, and funding part of the total Navy maintenance program. Four of the systems commands have responsibility for specific weapon systems and equipment, and the fifth system is responsible for supply support and operates the Navy inventory control points. The four systems commands which operate field activities performing depot maintenance are the Air Systems Command, Electronic Systems Command, Sea Command, and the Facilities Engineering Command. The fifth systems command (Supply Systems) does not have direct control over maintenance activities.

Air Force

Air Force Logistics Command (AFLC) is responsible for Air Force depot maintenance. AFLC has five Air Logistics Centers (ALC), and the Aerospace Guidance and Metrology Center (AGMC). The ALCs have large maintenance activities which work on assigned aircraft systems and related equipment. The AGMC is a specialized maintenance activity primarily in support of missile guidance systems and aircraft inertial navigation systems.

While each ALC is responsible for computing maintenance workload requirements for assigned equipment systems, AFLC controls the depots' funds and workloads at the ALCs. In addition, each depot is assigned as the single Air Force point of repair for selected classes or groups of components or equipment end items.

Army

The Army Materiel Command (AMC) is responsible for Army depot maintenance. The command is also responsible for inventory control points, other centralized logistics support functions, and the administration of Army research and development programs.

Army depot maintenance is organized under a centralized management system. There are six subordinate commodity commands under AMC which accomplish materiel management and procurement planning functions for the particular commodity areas assigned to them--aviation systems, missiles, electronics, tank/automotive, troop support, and armament. AMC maintenance depots are centrally workloaded and funded through AMC's Major Item Data Agency. The depots report directly to the Commander, AMC, and have no direct command relationship with the commodity commands, which also report directly to the AMC Commander.

APPENDIX II

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D. C. 20301

INSTALLATIONS AND LOGISTICS

26 MAY 1976

Mr. H. L. Krieger, Director
Federal Personnel and
Compensation Division
U. S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Krieger:

We appreciate the opportunity to comment upon your draft report, "Should Aircraft Depot Maintenance Be In-House or Contracted? Controls and Revised Criteria Needed." (OSD Case #4302)

Quantitative guidelines for the planning of organic depot maintenance of mission-essential workloads were incorporated for the first time in DoD Directive 4151.1, "Use of Contractor and Government Resources for Maintenance of Materiel," in the June 20, 1970 revision. In retrospect the guidance has been helpful in maintaining a balanced workload distribution since 1970, a period when overall depot maintenance workloads have declined and organic depot maintenance capacity has been reduced.

[See GAO note, p. 26.]

We agree that economical considerations must be an important factor in these decisions. That need was a key factor behind the November 25, 1975 ASD(I&L) direction for a complete review of the policies expressed in DoD Directive 4151.1. Among other things, that review is designed to determine the feasibility and the desirability of establishing organic depot maintenance capacity based upon achievable utilizations during surge or wartime and balancing it with cost factors. Non-mission-essential guidance will be evaluated in addition to the other issues mentioned in your draft report. We expect to issue revised policy upon completion of the review in July 1976.

[See GAO note.]

Your continued assistance in improving the management of maintenance is appreciated.

Sincerely,

JOHN J. BENNETT
Principal Deputy Assistant Secretary of Defense
(Installations and Logistics)

GAO note: The deleted comments relate to matters discussed in our draft report but omitted from or modified in this final report.