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REPORT BY THE
Comptroller General
OF THE UNITED STATES

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DOD's Real Property Maintenance And Repair Backlog RELEASED



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The Department of Defense and the military services have not been able to cut the growth of the backlog of real property maintenance and repair work. The backlog has more than doubled to over \$2 billion from fiscal year 1973 to the end of fiscal year 1978. This amount exceeds the actual expenditures reported by the services. DOD cites the following reasons as the chief causes of the growth:

- Budget constraints.
- Inflation.
- Continued deterioration of work identified but not corrected.
- Increased emphasis on identifying the backlog.
- Redefinition of what work should be included.

At the request of the Senate Committee on Appropriations, GAO is providing a historical view and recent trends of the backlog.



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AUGUST 31, 1979



COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-163500

The Honorable Warren G. Magnuson
Chairman, Committee on Appropriations
United States Senate

Dear Mr. Chairman:

This report is in response to the request your Committee made in its report No. 95-1264 dated October 2, 1978, that we review the Department of Defense's backlog of real property maintenance and repair projects.

The Committee report asked that we review the historical development and recent trends in the backlog, management policies and philosophies, uniformity (or lack thereof) in application of policies and standards or criteria, reliability of cost estimating and accounting systems, and results of previous reviews and audits. Because of the scope of the request, the Committee expected that the review would be done in phases over the next 2 or 3 years.

This report presents information developed in the first phase of our review.

On the basis of the results of our review, it appears that Defense and the military services have not been able to prevent significant growth in the size of the backlog. It may be that a new management approach to the problem is needed. These observations will be further evaluated in the next phase of our review when we will explore the validity of the backlog and evaluate its reliability as an indicator of real property condition.

We have discussed this report with Defense officials and included their comments where appropriate.

As arranged with your office, copies of this report are being sent to the Director, Office of Management and Budget; the Chairmen, House Committees on Appropriations and on Government Operations; Senate Committee on Governmental Affairs; and Senate and House Committees on Armed Services.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Thomas R. Staats".

Comptroller General
of the United States

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ABBREVIATIONS

BMAR	backlog of maintenance and repair
DOD	Department of Defense
GAO	General Accounting Office
POM	program objective memorandum

COMPTROLLER GENERAL'S
REPORT TO THE COMMITTEE
ON APPROPRIATIONS
UNITED STATES SENATE

DOD'S REAL PROPERTY
MAINTENANCE AND REPAIR
BACKLOG

D I G E S T

The Department of Defense (DOD) and the military services have been unable to hold down the growth of the real property maintenance and repair backlog even after they

- refined the definition of "backlog;"
- spent billions of dollars to maintain and repair facilities;
- implemented numerous directives, instructions, and regulations; and
- received several congressional mandates to hold the line or reduce the backlog.

For example, at the end of fiscal year 1973, the backlog for the operation and maintenance appropriations was \$900 million, but it more than doubled to over \$2 billion at the end of fiscal year 1978, exceeding the actual expenditures reported by the services. (See p. 41.)

Concern over the growth in the backlog and its indication of possible deterioration of DOD real property has resulted in the following congressional actions to contain this growth:

- A statutory floor of funds to be used only for maintaining real property facilities was established in fiscal year 1963 and subsequent years in each service's operation and maintenance appropriation.
- Additional funds above those the services requested were provided in an attempt to contain the backlog. (See pp. 5 and 6.)

Despite these actions, DOD estimates that the services' backlog at the end of fiscal year 1980 will increase by an additional \$131 million above the 1978 backlog. (See p. 41.)

Over the years, managers and reviewers within DOD have discussed the credibility and validity of the backlog. As a result, DOD has devised new methods of programing, budgeting, and managing real property maintenance. These include a program control system for the accounting and reporting and the submission of annual plans for funding real property maintenance. (See pp. 7 to 11 and ch. 6.)

During fiscal years 1973 through 1978, the services' actual expenditures exceeded the statutory floor for maintenance by an average of \$371 million per year. In addition, these expenditures have generally exceeded those that the services have programed in their budget requests. But the services' reports supporting budget requests indicate that total maintenance and repair requirements significantly exceed the actual expenditures. If these requirements are valid the backlog cannot be reduced under current funding because the new requirements indentified annually exceed the funds available. (See pp. 12 to 14.)

In a prior report, GAO noted that the maintenance and repair backlog increased from \$286 million to \$677 million during the 8-year period, fiscal years 1965 through 1972. This was an increase of \$391 million, of which \$384 million was applicable to the military services. Since that report, the services' backlog has increased by an additional \$1,513.7 million at the end of fiscal year 1978. (See p. 15.)

The Army accounted for over \$1 billion of the increase. In addition, its backlog in Europe was \$801 million, or 65 percent of the Army's total backlog at the end of fiscal year 1978. (See p. 17.)

According to service officials, in addition to fiscal constraints, other causes of the growth in the backlog are inflation, increased emphasis on identifying the backlog, continued deterioration of previously identified deficiencies not corrected, and DOD's redefinition of the backlog term. (See p. 18.)

In regard to the proper size of the backlog, DOD provided guidance to the services which included a plan for reducing the backlog to a manageable level by fiscal year 1984, except for the U.S. Army in Europe. The services' estimate of funds needed in fiscal year 1980 to attain the 1984 level is greater than the amount requested in their budget requests. Service officials indicated that overall budget constraints prevented them from obtaining the estimated funding needed to reduce the backlog. (See pp. 23 and 24.)

Each service used a different method to determine what a manageable level of backlog should be.

--The Army established a manageable level at 20 percent of annual recurring maintenance requirements.

--The Navy believed that there should not be any backlog of non-deferrable maintenance and repair deficiencies at the end of the year.

--The Marine Corps used a percentage of current plant value as its manageable level.

--The Air Force considered a manageable level to be \$60 to \$100 million of maintenance and repair projects by contract. (See pp. 24 to 26.)

A recent DOD study, while stating that the trend was toward a more accurate reporting of the backlog and that the most accurate to date was fiscal year 1977, concluded that non-reported projects were substantial, the backlog was understated, and total identification and reporting of the backlog is an unattainable goal. (See pp. 36 to 38.)

Currently, the backlog is being treated as a service problem rather than as a DOD problem. There appears to be a need for improving central control, setting priorities, and monitoring from the DOD level. Even though DOD has defined backlog, what each service identifies as backlog and what DOD reports to the Congress appears to differ from the uniform definition.

Rather than continuing to manage the program as it has up to now, perhaps DOD should try a new approach. The scope of GAO's work in this phase precluded firm conclusions and recommendations concerning a new approach. Further work is needed and two key points to be addressed in this regard are the validity of the backlog and its reliability as an indicator for management's use in making decisions. (See p. 40.)

DOD representatives generally agreed with the information presented in this report.

CHAPTER 1

INTRODUCTION

In an October 2, 1978, report (S. Rept. No. 95-1264, 95th Cong., 2d sess.), the Senate Committee on Appropriations expressed concern over the continued growth in the Department of Defense's (DOD's) backlog of maintenance and repair work for real property. The Committee noted that the over \$2 billion backlog represented the equivalent of over 1 year's worth of the funds currently provided for the maintenance and repair of real property from the operation and maintenance appropriation, and in spite of increases in funding, the backlog continued to increase. The Committee requested us to review the program in phases over the next 2 to 3 years. This report is the first in response to that request and provides the Committee with:

- The historical view and recent trends in the backlog of work.
- DOD's management policies and criteria for identifying the backlog.
- Descriptions of the military services' management systems for determining the backlog of maintenance and repair.
- The results of previous internal reviews and audits of the reported backlog.

BACKGROUND

In DOD's report on real and personal property, the original cost of real property controlled by the military services as of September 30, 1977, was \$46 billion, of which \$39.8 billion was located in the United States.

	<u>Total cost</u>	<u>U.S.</u>	<u>Foreign/U.S. possessions</u>
	----- (billions) -----		
Army	\$14.1	\$12.9	\$1.2
Navy (including Marine Corps)	13.9	11.6	2.3
Air Force	<u>18.0</u>	<u>15.3</u>	<u>2.7</u>
Total	<u>\$46.0</u>	<u>\$39.8</u>	<u>\$6.2</u>

In the fiscal year 1979 hearings on its operation and maintenance appropriations, DOD reported that the actual expenditures 1/ by the military services in fiscal year 1977 for the maintenance of real property facilities was \$2.6 billion, of which \$1.7 billion was funded from the military services' operation and maintenance appropriations.

Expenditures from Appropriations

	<u>Total</u>	Operation and maintenance (<u>note a</u>)	Other appropriations (<u>note b</u>)	<u>Percent funded from operation and maintenance</u>
------(millions)-----				
Army	\$ 910.4	\$ 607.9	\$302.5	66.8
Navy (including Marine Corps)	794.3	399.8	394.5	50.3
Air Force	<u>885.1</u>	<u>706.2</u>	<u>178.9</u>	79.8
Total	<u>\$2,589.8</u>	<u>\$1,713.9</u>	<u>\$875.9</u>	66.2

a/The expenditures shown for the services' operation and maintenance appropriations include the expenditures for the Reserves and the National Guard.

b/Other appropriations include those such as research, development, test and evaluation, family housing, and industrial funds.

These expenditures covered maintenance, repair, and minor construction. DOD Directive 7040.2 defines maintenance as:

"The recurrent, day-to-day, periodic, or scheduled work, required to preserve or restore a real property facility to such condition that it may be effectively utilized for its designated purpose. Includes work undertaken to prevent damage to a facility which otherwise would be more costly to restore."

1/In this report expenditures refer to obligations.

The directive defines repair as:

"The restoration of a real property facility to such condition that it may be effectively utilized for its designated purposes, by overhaul, reprocessing or replacement of constituent parts or materials which have deteriorated by action of the elements or wear and tear in use and which have not been corrected through maintenance."

The maintenance and repair expenditures include applicable expenses incurred by such organizations as building trades shops, construction units, grounds and pavements units, machine shops, construction equipment units, and real property management, engineering, and administrative offices. Minor construction projects financed under operation and maintenance appropriations consist of expenses for the erection, installation, or assembly of a new real property facility; the addition, expansion, extension, alteration, conversion, or replacement of an existing facility; or the relocation of a facility from one installation to another.

The Congress has been concerned for many years over the level of real property maintenance and repair performed by DOD on its extensive real property holdings. In budgetary messages to the Congress each year, DOD has reported the backlog of maintenance and repair projects at the end of the year. This backlog is recognized as a key indicator of the adequacy of the yearly maintenance and repair funding. Increased congressional concern about possible deterioration of the property caused the Congress to establish an annual statutory floor for maintenance. The dollar amount comprising the floor was initially established at the level of planned expenditures by the services in their budget submissions to the Congress. Recently, this amount was set slightly below the level of intended expenditure. (See ch. 2 for further details.)

The backlog, as reported by DOD, has been redefined over the years to improve the identification and reporting aspects of the backlog and its credibility as an indicator of the condition of real property. Generally, any maintenance and repair work remaining at the end of the fiscal year on an installation's work plans which cannot be accomplished due to lack of resources is reported by the installation as its backlog of maintenance and repair (BMAR). It is not inconceivable that the definition of backlog will again be changed.

For fiscal year 1978, the floor amounts, the military services' planned and actual expenditures, and BMAR follow:

	<u>Army</u>	<u>Navy</u>	<u>Marine Corps</u>	<u>Air Force</u>	<u>Total</u>
	------(millions)-----				
Planned expenditures	\$ 527.2	\$291.6	\$ 88.8	\$547.9	\$1,455.5
Maintenance floor	490.0	275.0	86.7	509.0	1,360.7
Actual expenditures	591.0	368.1	97.8	697.9	1,754.8
BMAR	1,241.2	536.0	105.9	299.9	2,183.0

SCOPE OF REVIEW

The Senate Committee on Appropriations asked us to perform a phased review of the DOD backlog of real property maintenance and repair projects. We confined the first phase of our review to obtaining a historical view and recent trends of the backlog, DOD's management policies for identifying and managing the backlog, the military services' implementation of DOD policies and criteria, and the results of prior internal audits or reviews of the backlog.

Review emphasis was placed on obtaining data covering fiscal years 1965 through 1978. We made the review at the headquarters levels of the DOD, Army, Navy, Marine Corps, and Air Force. We reviewed the policies and procedural guidance provided to the services by DOD and the military services headquarters' implementation of the guidance. We obtained information pertinent to the statutory maintenance floor, the operation and maintenance and other appropriation funding and related budgetary data on real property maintenance and repair activities, and the backlog of maintenance and repair projects. During this phase of the review we did not evaluate the accuracy or validity of the data obtained. We also interviewed various officials responsible for managing the real property maintenance program.

DOD representatives responsible for this area have reviewed this report and generally agreed the information was factually correct.

CHAPTER 2

HISTORICAL PERSPECTIVE

ESTABLISHMENT OF THE STATUTORY FLOOR FOR MAINTENANCE OF REAL PROPERTY FACILITIES

In an April 13, 1962, report (H. Rept. No. 1607, 87th Cong., 2d sess.), the House Committee on Appropriations expressed concern that funds justified to the Congress for physical plant maintenance were being diverted to operational requirements. To remedy this situation, a statutory floor of funds available only for maintaining real property was established for each operation and maintenance appropriation in the fiscal year 1963 DOD Appropriation Act (Public Law 87-577, Aug. 9, 1962). This provision has been repeated in subsequent appropriation acts.

The House Committee indicated in its report that it wanted separate appropriations for the maintenance of real property facilities by dividing each of the operation and maintenance appropriations into two: one for operations and one for the maintenance of real property facilities. The House would also have granted specific authority to transfer funds from the operation account to the maintenance account. Although DOD shared the concerns of the Congress, it stated that splitting the appropriations in two would result in the loss of flexibility at the installation level to transfer funds into the maintenance account. An installation would be unable to transfer funds from the operation account into the maintenance account to meet its needs without approval from the Bureau of the Budget (currently the Office of Management and Budget) and the Treasury. DOD proposed that to preclude the delays and unnecessary administrative work of separate appropriations, the operation and maintenance appropriation should not be split and that it should be allowed to carry out the intent of the Congress by placing limitations on the amount of funds each installation would have to spend on the maintenance of real property. As a result, the Congress essentially approved this proposal by establishing the statutory floor provision in the appropriation act.

At the time the floor amounts were initially established, the military services reported information to the Congress on the dollar amounts of expected expenditures for the maintenance of real property facilities. For fiscal year 1963, the Congress established the floor amount in each service's appropriation at this level of expected expenditures. No further definition of what would be included in the floor expenditures was stated in the DOD appropriation act.

To comply with the intent of the Congress, DOD issued general guidelines to the military services for identifying, measuring, and compiling the expenses to meet the floor. This guidance provided that the term "maintenance of real property facilities," included maintenance, repair, and minor construction which were funded from the operation and maintenance appropriation. This guidance was based on the congressional reports accompanying the fiscal year 1963 DOD Appropriation Act.

From fiscal year 1964 to 1972, DOD proposed in budget submissions to the Congress, the floors at the dollar amounts of estimated expenditures for the maintenance of real property facilities from each military service's operation and maintenance appropriation. Over these years the Congress approved the amounts as proposed by DOD. For fiscal year 1972, however, the Army and Air Force proposed floors lower than the estimated expenditures and the Congress enacted these amounts.

All of the services requested floors lower than the estimated expenditures to maintain real property facilities for fiscal year 1975. The Congress expressed concern over this practice in considering the floors for the fiscal year 1975 appropriations. In an August 1, 1974, report (H. Rept. No. 93-1255, 93d Cong., 2d sess.), the House Committee on Appropriations expressed concern that in prior years the services had requested the setting of a floor much lower than the request for funds for maintenance purposes, which in effect, had allowed the services to reprogram funds for maintenance to other operations while still having sufficient funds available to meet the floor requirement. To remedy this situation, the floor amounts available only for maintaining real property were established slightly below the amounts requested by the services for maintenance purposes in fiscal year 1975.

In fiscal year 1978, the Congress increased the level of DOD-proposed real property maintenance and repair funds and increased the floor proportionately in an attempt to check backlog growth and keep it at the 1977 level. In spite of this, the backlog increased. In fiscal year 1979, the Congress again increased the proposed level of funding and raised the floor. The conference report on DOD appropriations for fiscal year 1979 (H. Rept. No. 95-1764, 95th Cong., 2d sess.) directed that the 1978 backlog become a baseline and not be exceeded in the future.

EVOLUTION OF THE BACKLOG CONCEPT AND REPORTING

The current definition of BMAR and its related reporting requirements have evolved over the years beginning in 1960. It appears that the process of refining the definition of BMAR will continue.

Prior definitions and reporting

DOD Instruction 4150.9, dated March 1, 1960, established a requirement for the services to submit an annual report to DOD on costs incurred for real property maintenance activities. The purpose of the report was to provide information for use in performance evaluation and management analysis of the real property maintenance program. This instruction required the reporting of the backlog of essential maintenance deferred at the end of the fiscal year and defined essential maintenance as:

- "1. The routine recurring work required to keep a facility (plant, building, structure, ground facilities, utilities systems, or any real property) in such a condition that it may be continuously utilized at its original designed capacity and efficiency, for its intended purpose.
- "2. The restoration of a facility to a condition substantially equivalent to its original or designed capacity and efficiency by replacement, overhauling, or reprocessing of constituent parts or materials."

It is interesting to note that what is being defined as "essential" is very similar to the general definitions of maintenance and repair. (See pp. 2 and 3.) Therefore, the key factors at this time were that the work was deferred at the end of the fiscal year and "essential."

In June 1963 the instruction was revised. Among the changes was a new definition for the backlog of essential maintenance and repair:

"* * * those items of maintenance and repair as defined in DOD Dir. [Directive] 7040.2 over \$10,000 which cannot be accomplished during the current fiscal year due to lack of resources. An item is considered essential when delay for inclusion in a future program will impair the military readiness and capability, or will cause significant deterioration of real property facilities."

The limitation of \$10,000 was established to ensure that items included in the backlog were readily identifiable and precluded the inclusion of items easily funded at the installation level. In addition, an item was defined as essential whenever military readiness and capability would be impaired by not doing the work or facility deterioration would take place.

A DOD Real Property Maintenance Council was established in 1962 as a forum to exchange ideas and information for the improved management of real property maintenance activities. The Council is composed of senior management executives of DOD, the military services, and defense agencies. In 1970 the Council was formalized under a charter to provide a fully participatory body for monitoring, evaluating, and recommending programs and policies for the management of the real property maintenance program. In the past the Council has sponsored 3-day management conferences known as Real Property Maintenance Management Conferences. Since its inception, the Council has sponsored four such conferences.

One of the major topics discussed at three of these conferences was the effectiveness of backlog reporting. The final report on the first (1964) conference stated that the backlog was considered to be excessive, but the validity of the total backlog, particularly with respect to its essentiality, was questioned. The conferees' opinion was that the definition of essential maintenance and repair was overly restrictive and subject to varying interpretations and should be broadened to include other factors, such as priority, morale, health, and safety. In response to recommendations made by the conference, a DOD group reviewed the definitions and visited a number of military installations. DOD concluded that the definition in the instruction was adequate and the reported backlog was generally valid with only minor exceptions.

In the second conference held in 1969, two topics discussed relating to the backlog were the (1) development and presentation of total real property maintenance activities requirements, including the backlog and (2) effectiveness of the backlog reporting. The conference recommended that the importance of the backlog system be reemphasized at service level to ensure that it could withstand scrutiny. The conference also recommended that the system should not be considered as the prime or sole indicator of maintenance requirements, but it should be considered in conjunction with a recap of other known maintenance requirements.

A conference panel noted that the backlog definition (see p. 7) did not include those deficiencies under \$10,000, nor did it include deficiencies which could not be labeled essential. The conference recommended that the backlog be the summation of all maintenance and repair requirements factually known to exist at the time of reporting.

In consonance with the conference's recommendations, DOD and the military services developed a program control system which revised accounting policy to (1) identify total requirements for real property maintenance activities including the identification of all unfinanced backlogs of work, (2) provide a 5-year defense plan and fiscal guidance visibility, and (3) permit the evaluation of program performance. A draft of the proposed instruction implementing the system was provided for consideration to the third conference held in 1971.

The third conference considered the draft instruction and recommended that it be technically reviewed and then fully staffed. The conference also considered the need for redefining backlog, which had been previously considered in the 1969 conference. It recommended that the definition be revised and that either the term be changed or eliminated during DOD's review of the proposed program control system.

The program control system was implemented in August 1973 by DOD Instruction 4165.58, which cancelled DOD Instruction 4150.9.

Current definition and reporting

The current DOD Instruction 4165.58 redefined the backlog to reflect all unfinanced maintenance and repair backlog. The new definition deleted the word essential and the \$10,000 limitation and defined the term as:

"* * * The Backlog of Maintenance and Repair (BMAR) is the end of fiscal year measurement of maintenance and repair work remaining as a firm requirement of the installation work plans prescribed by DOD Directive 4165.2 * * * but which lack of resources prohibit accomplishment in that fiscal year."

After the establishment of the program control system, there were other efforts within DOD to improve the methods for programming, budgeting, and managing its real property maintenance activities. In January 1975 DOD established a

joint service program and budget working committee to undertake a study of the then existing real property maintenance management system to determine what actions could be taken to better portray requirements and budget estimates to DOD. The committee recommended that:

--DOD require the inclusion in each component's program objective memorandum (POM) of a meaningful analysis of the component's real property maintenance activities requirements. This analysis should include information on the condition of the real property and the probable impact on missions which would result from the funding level planned over the 5-year defense plan period.

--DOD Directive 4165.2 be revised to describe the appraisal process.

--Defense Comptroller budget submission reports for real property maintenance activities be utilized in place of the annual reports required under DOD Instruction 4165.58.

In response to these recommendations, DOD revised Directive 4165.2 in February 1976 to place emphasis on the POM and on the requirement to measure condition of real property against mission impact. DOD Instruction 4165.58 was revised in October 1976 to require the use of the Defense Comptroller's budget submission reports.

Possible redefinition?

Subsequent to the above revisions, the DOD Real Property Maintenance Council considered a proposal for a definition change for BMAR. The definition proposed:

"The Backlog of Maintenance and Repair (BMAR) is the dollar value of those maintenance and repair projects which needed to be accomplished in a previous fiscal year but for which insufficient obligational authority was available for accomplishment in that year, and the project work is still a current valid requirement. Also, BMAR projects must meet at least one of four additional criteria:

- a. Be cost effective.
- b. Affect readiness.
- c. Be required by law * * *.
- d. Affect safety or health."

During discussion of the Council, the service members could not agree on how the backlog term should be used. Although the DOD instruction is not actively under review, we were informed it will have to be revised in the near future. It is not inconceivable that the definition of backlog will again be changed.

CHAPTER 3

GROWTH OF THE BACKLOG

DESPITE SIGNIFICANT EXPENDITURES

During fiscal years 1973 through 1978, expenditures for maintenance of real property exceeded the statutory floor by an average of \$371 million a year. In addition, these expenditures generally exceeded the planned expenditures that the services submitted to the Congress in support of their budget requests. Even though actual expenditures have exceeded the statutory floor and planned expenditures, the services' reports supporting budget requests indicate that total maintenance and repair requirements significantly exceed actual expenditures. Further, the services' backlog of maintenance and repair projects, as reported by DOD, increased from \$669 million at the end of fiscal year 1972 to \$2,183 million through fiscal year 1978. The breakdown of the fiscal year 1978 backlog is as follows:

<u>Service</u>	<u>Backlog</u>	<u>Percent</u>
	(millions)	
Army	\$1,241.2	56.9
Navy	536.0	24.6
Marine Corps	105.9	4.8
Air Force	<u>299.9</u>	13.7
Total	<u>\$2,183.0</u>	

Appendix I provides annual data starting with fiscal year 1965, showing planned expenditures, maintenance floor, actual expenditures, and the backlog for each military service.

According to service officials, some causes of the growth in the backlog are fiscal constraints, inflation, increased emphasis to identify the backlog, continued deterioration of previously identified deficiencies not corrected, and DOD's redefinition of the backlog term.

EXPENDITURES AGAINST FLOOR AND RELATIONSHIP TO BACKLOG

Total expenditures by the services for the maintenance and repair of real property have exceeded the statutory floor by an average of \$371 million a year during fiscal years 1973 through 1978. In addition, these expenditures have exceeded

the services' planned expenditures, as submitted in support of budget requests to the Congress, for the same period by an average of \$239 million.

Average Expenditures--Fiscal Years 1973-1978

	<u>Above floor</u>		<u>Above planned</u>	
	<u>Amount</u>	<u>Percent</u>	<u>Amount</u>	<u>Percent</u>
	(millions)		(millions)	
Army	\$ 93.3	25.7	\$ 31.1	7.3
Navy	61.7	30.7	42.2	19.2
Marine Corps	10.5	18.2	7.7	12.6
Air Force	<u>205.4</u>	61.9	<u>157.8</u>	41.6
Total	<u>\$370.9</u>	38.9	<u>\$238.8</u>	22.0

Actual expenditures exceeded the floor in each of the 6 years. With the exception of 2 fiscal years, all of the services' actual expenditures exceeded the planned expenditures in every fiscal year during the 6-year period. In fiscal year 1976, the Army spent \$33.2 million less than the planned expenditures of \$446.3 million, and in fiscal year 1975 the Navy spent \$1.9 million less than the planned expenditures of \$274.5 million.

Although average actual expenditures have exceeded the floor and planned expenditures during the 6-year period, the services' total maintenance and repair requirements have not been met. In support of budget requests, DOD requires each service to submit reports that show total requirements and funding. For fiscal year 1978, the services' reports indicated total requirements, including the previous year's backlog, significantly exceeded actual expenditures as follows:

	<u>Army</u>	<u>Navy</u>	<u>Marine Corps</u>	<u>Air Force</u>
	------(millions)-----			
Backlog (end of 1977)	\$1,154.5	\$486.0	\$ 89.9	\$219.1
Recurring maintenance and repair, major repair projects	484.4	434.5	102.4	179.2
Other adjustments (note a)	<u>71.1</u>	<u>14.5</u>	<u>9.9</u>	<u>21.8</u>
Total require- ments	\$1,710.0	\$935.0	\$202.2	\$420.1
Funding	-537.2	-399.0	-94.3	-120.2
Other adjustments (note b)	<u>68.4</u>	<u> </u>	<u>-2.0</u>	<u> </u>
Backlog (end of 1978)	<u>\$1,241.2</u>	<u>\$536.0</u>	<u>\$105.9</u>	<u>\$299.9</u>

a/Other adjustments reflect continued deterioration, and increase resulting from inflation growth of the backlog.

b/Other adjustments reflect projects dropped from the backlog, recurring requirements which are not backlog projects, changes in cost estimates because of change in scope of work or new estimate, and reduction of projects associated with use of military personnel.

If these requirements are valid, then the backlog cannot be reduced under current funding because the new requirements identified annually exceed the funds available.

According to service officials, major commands and installations are responsible for setting priorities for funding maintenance and repair projects, except for the Marine Corps (see p. 31). The funded projects include not only the backlog of maintenance and repair projects from the previous year but also new requirements occurring during the fiscal year.

GROWTH IN THE BACKLOG OF MAINTENANCE AND REPAIR

In a previous report, 1/ we noted that the maintenance and repair backlog, as reported by DOD, increased from \$286 million to \$677 million during the 8-year period, fiscal years 1965 through 1972. This was an increase of \$391 million, of which \$384 million was applicable to the military services. (The remainder was for other defense agencies.) Since that report, the services' backlog has increased by an additional \$1,513.7 million at the end of fiscal year 1978 as follows:

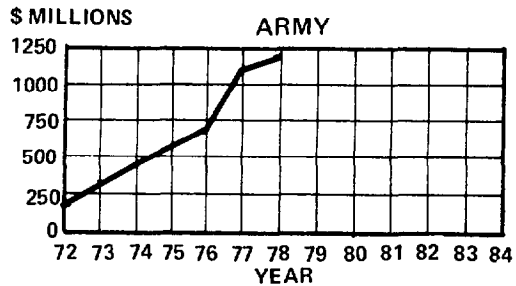
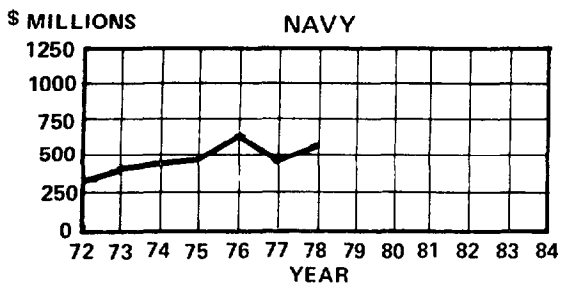
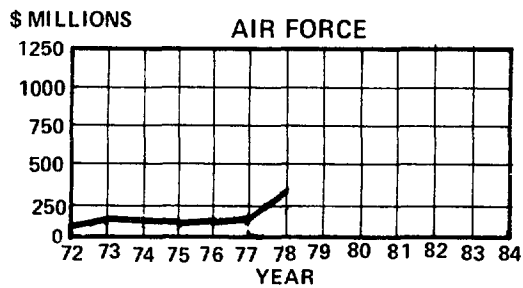
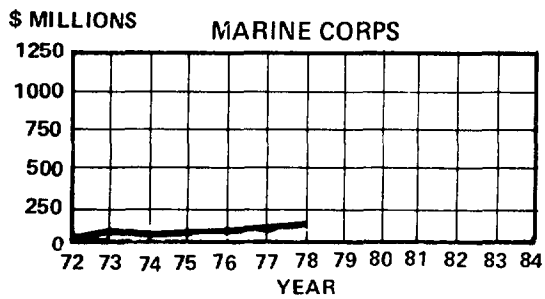
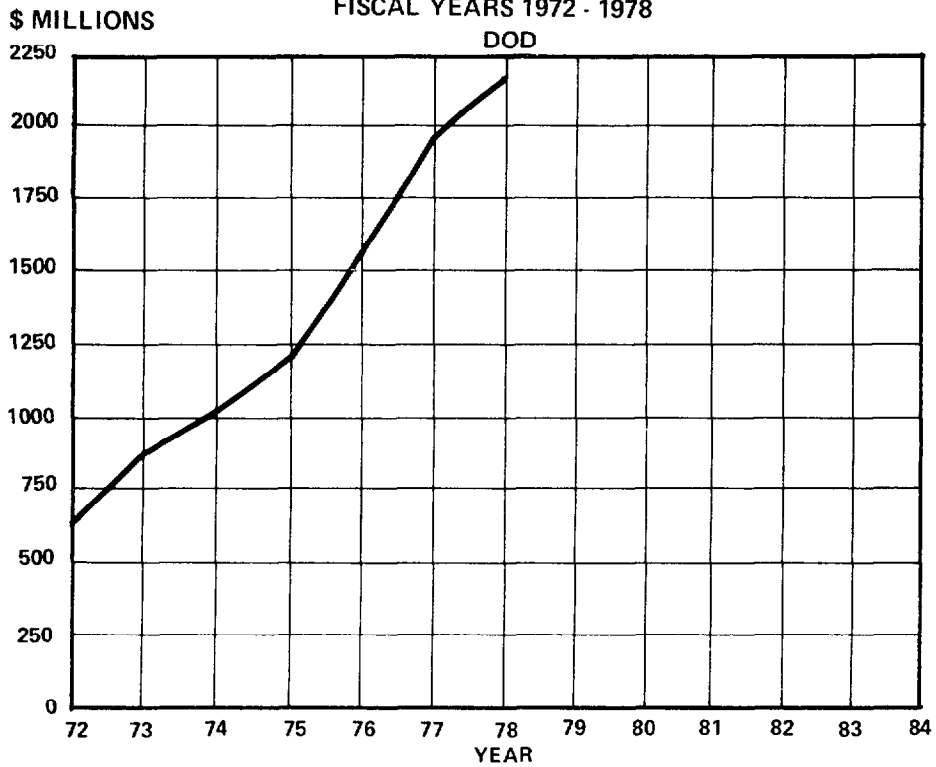
	<u>Backlog of Maintenance and Repair</u>					
	<u>1972</u> <u>(note a)</u> (millions)	<u>Percent</u> <u>of total</u>	<u>1978</u> (millions)	<u>Percent</u> <u>of total</u>	<u>Increase</u> (millions)	<u>Percent</u> <u>of total</u>
Army	\$222.6	33.3	\$1,241.2	56.9	\$1,018.6	67.3
Navy	345.0	51.5	536.0	24.6	191.0	12.6
Marine Corps	19.7	2.9	105.9	4.8	86.2	5.7
Air Force	<u>82.0</u>	12.3	<u>299.9</u>	13.7	<u>217.9</u>	14.4
Total	<u>\$669.3</u>		<u>\$2,183.0</u>		<u>\$1,513.7</u>	

a/Prior to fiscal year 1973 the definition of the term backlog excluded those maintenance and repair deficiencies under \$10,000.

The relative rate of increase for each service and DOD total is depicted on the graphs on the following page.

1/Letter report to the Secretary of Defense (B-163500, June 28, 1973).

**GRAPHIC COMPARISONS OF RELATIVE
INCREASES IN DOLLAR VALUE OF BACKLOGS
FISCAL YEARS 1972 - 1978**



As noted on the graphs, the Army has experienced the largest increase in backlog. Most of this increase has occurred at overseas installations. On the basis of information provided by the Army, overseas installations accounted for \$708 million of the \$1 billion increase, or 70 percent. In addition, most of the overseas backlog is located at Army installations in Europe. At the end of fiscal year 1978, the Army's backlog in Europe was \$801 million of the total overseas backlog of \$842 million, or 65 percent of the Army's total backlog.

The most significant increase in the Army's backlog during this period came during fiscal year 1977 when the backlog increased by \$458 million. An Army official told us that this increase was the result of the Army's efforts to identify and validate the backlog reported by installations through the major commands. The Chief of Engineers initiated this effort in 1975 when letters with additional guidance were provided to major commands to assist them in identifying and validating reportable backlog. This guidance provided for (1) a complete survey by installation engineers to identify all reportable backlog, (2) validation by major commands, and (3) further verification by Army headquarters. The Army's Annual Summary of Operations for fiscal year 1976 stated that the inspection program and the emphasis on validation by facilities engineering managers at all levels resulted in the Army's backlog doubling to \$1.2 billion during the period from July 1975 through September 1976.

Although the Navy's backlog has increased by \$191 million over the same period, the increase would have been greater if the Navy had not changed its definition on what was to be reported as backlog in fiscal year 1977. Previously, the Navy reported as backlog all maintenance and repair deficiencies, but in fiscal year 1977 it reported only those deficiencies which should not be deferred because they (1) involved safety problems, (2) had an adverse economic impact resulting from accelerated deterioration, or (3) adversely affected the mission of field activities. (More detailed information as to how each service identifies and accounts for its backlog is contained in ch. 5.) If the backlog definition was not changed, the Navy would have reported its backlog as \$714.7 million instead of \$486 million at the end of fiscal year 1977. At the end of fiscal year 1978, the backlog would have been about \$896 million instead of the reported \$536 million.

Service officials told us that other reasons for the growth in the backlog were

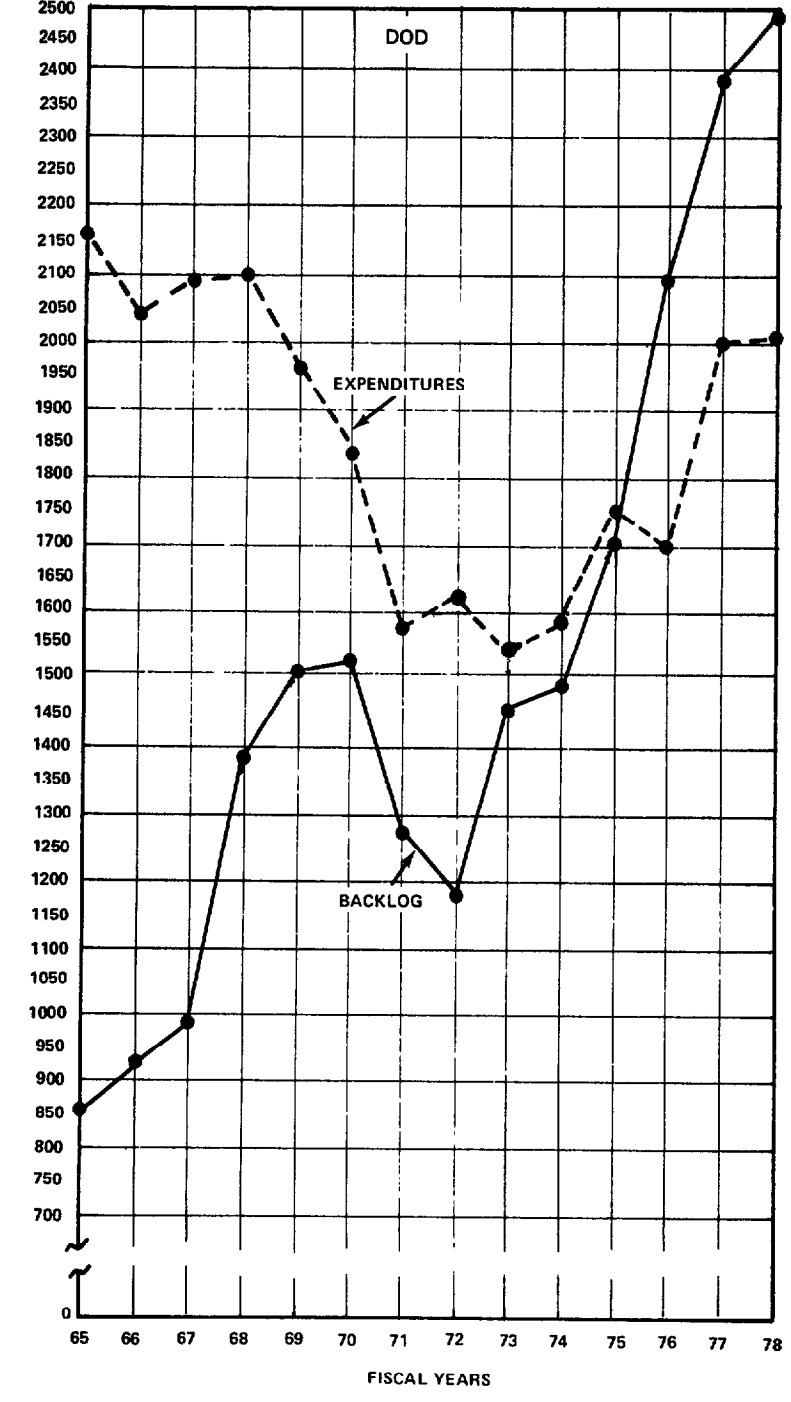
- increased emphasis on identifying the backlog of maintenance and repair projects;
- priority of competing programs and overall fiscal constraints, resulting in insufficient funding to accomplish annual maintenance and repair requirements and to reduce the previously identified backlog;
- increased growth due to inflation;
- continued deterioration of previously identified deficiencies; and
- redefinition of the backlog term in 1973 to eliminate the \$10,000 limitation which resulted in more projects being counted.

Constant dollar comparison

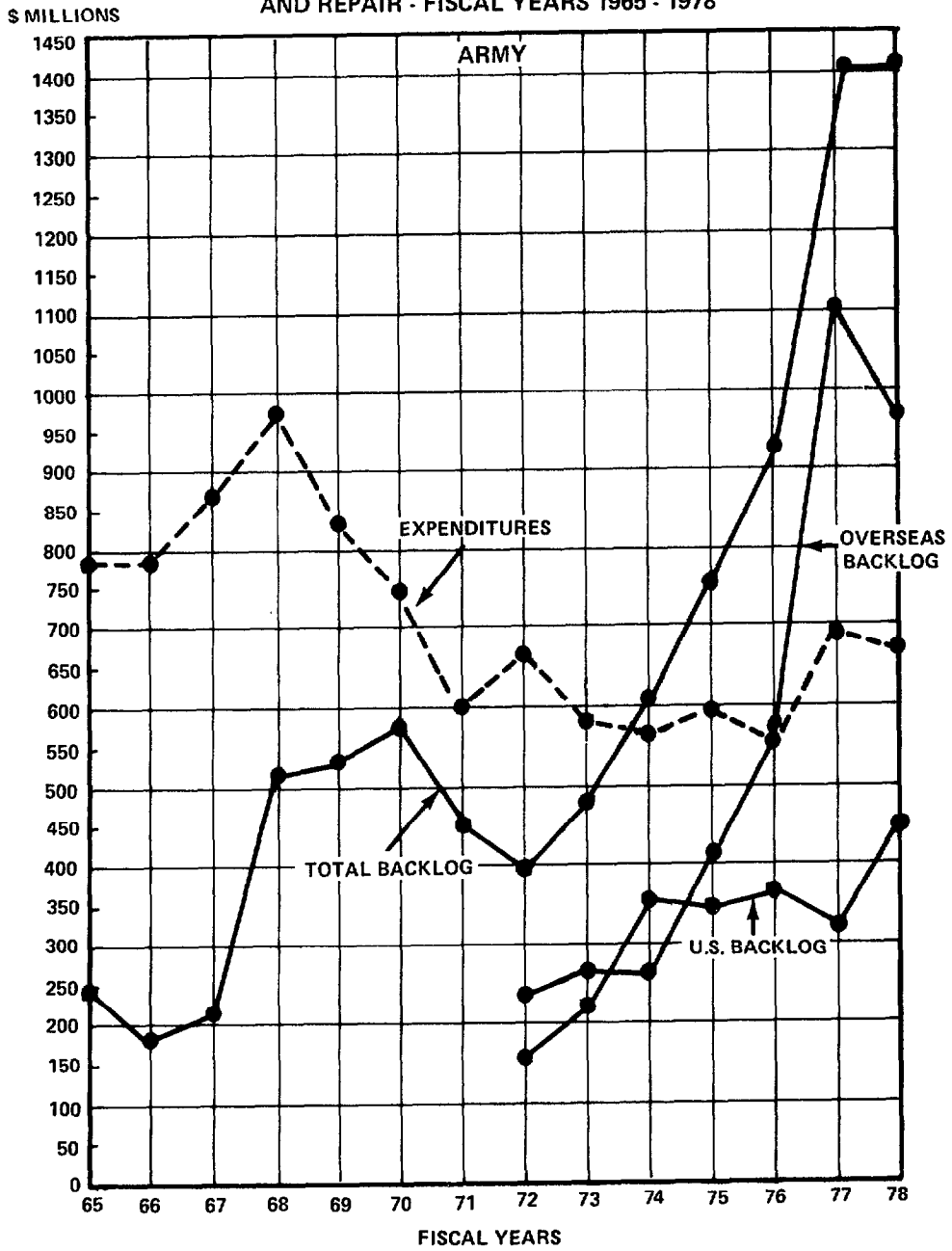
Since part of the increase in the backlog was attributed to inflation, we obtained from DOD deflators applicable to real property maintenance and repair to show the growth in the backlog and actual expenditures in constant dollars. The deflators are used for military construction and convert the current dollars for each fiscal year into constant fiscal year 1980 dollars.

On pages 19 through 22 we present in graphic form the patterns of the actual expenditures and backlogs for fiscal years 1965 through 1978. These graphs show that the backlog has increased in constant 1980 dollars while expenditures are lower than in fiscal year 1965. Only the Marine Corps shows an increase in funding for the program over this period. Appendix II shows the constant 1980 dollar comparison of actual expenditures and backlog of maintenance and repair by service for fiscal years 1965 through 1980.

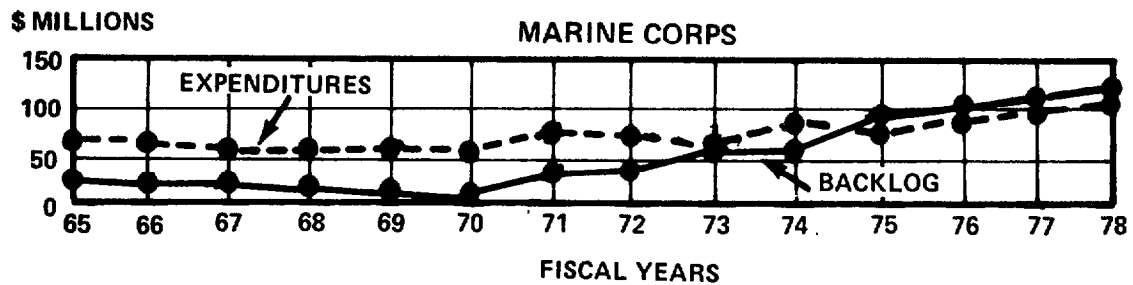
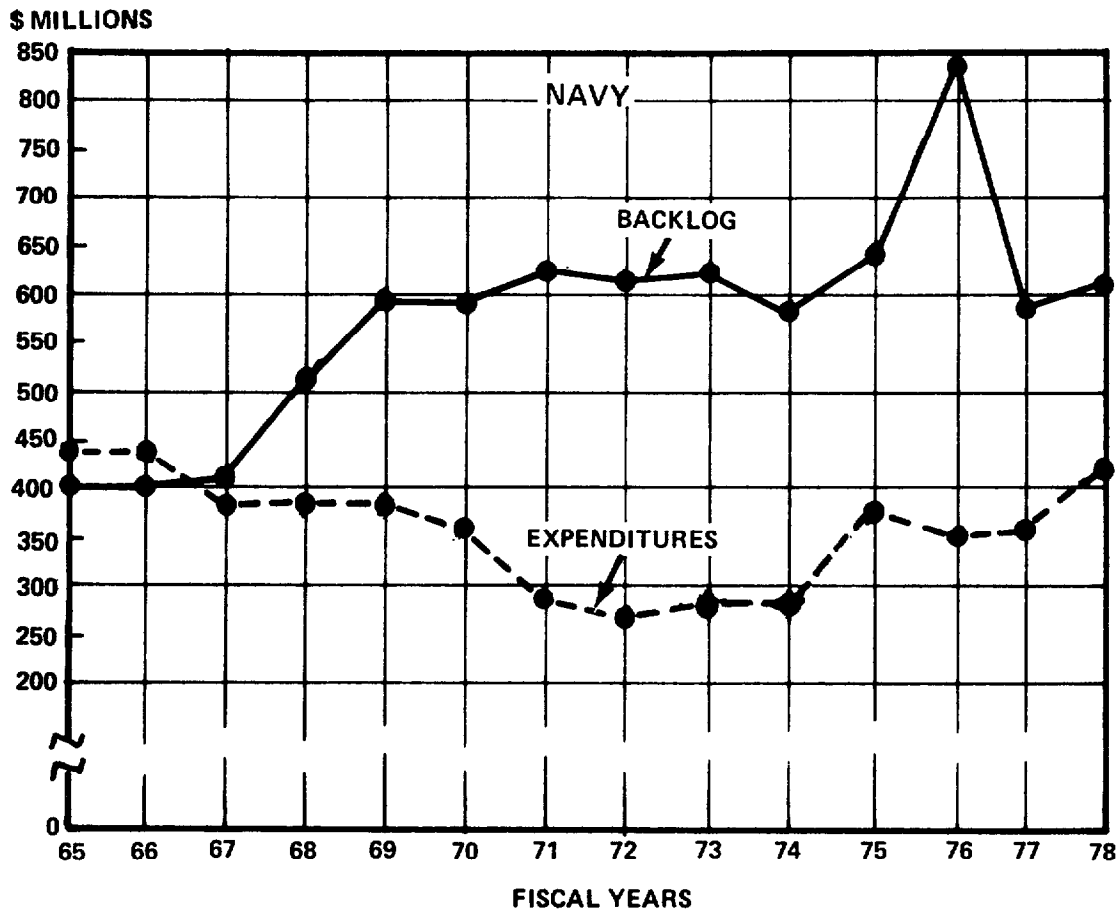
GRAPHIC CONSTANT FISCAL YEAR 1980 DOLLARS
 COMPARISON OF EXPENDITURES AND BACKLOG OF MAINTENANCE
 AND REPAIR - FISCAL YEARS 1965 - 1978



**GRAPHIC CONSTANT FISCAL YEAR 1980 DOLLARS
COMPARISON OF EXPENDITURES AND BACKLOG OF MAINTENANCE
AND REPAIR - FISCAL YEARS 1965 - 1978**

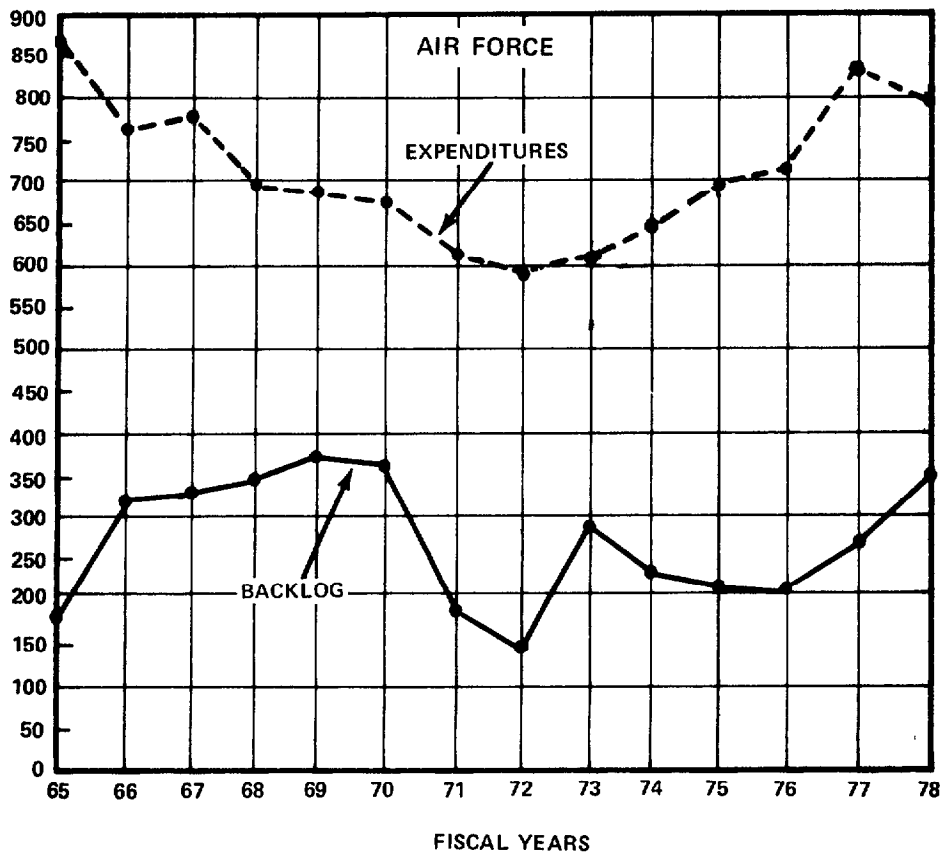


**GRAPHIC CONSTANT FISCAL YEAR 1980 DOLLARS
COMPARISON OF EXPENDITURES AND BACKLOG OF MAINTENANCE
AND REPAIR – FISCAL YEARS 1965-1978**



**GRAPHIC CONSTANT FISCAL YEAR 1980 DOLLARS
COMPARISON OF EXPENDITURES AND BACKLOG OF MAINTENANCE
AND REPAIR - FISCAL YEARS 1965 - 1978**

\$ MILLIONS



CHAPTER 4

VIEWS ON WHAT IS A

MANAGEABLE LEVEL OF BACKLOG

In testimony before the Subcommittee on Defense, House Committee on Appropriations, on fiscal year 1979 appropriations, the Deputy Assistant Secretary of Defense (Installations and Housing) stated that in regard to a manageable level of backlog, the current program and fiscal guidance is to fund for maintenance and repair to balance yearly requirements and to reduce outstanding deficiencies to a more manageable level in equal annual increments by the end of fiscal year 1984, except for the U.S. Army in Europe. Although all services estimated in their 5-year plans the funds needed to attain the manageable level, their fiscal year 1980 budget requests are less than those estimates in the plans. We did not attempt to evaluate the adequacy of the estimates, but we did note that each service used a different method to determine what a manageable level should be at end of fiscal year 1984.

FIVE-YEAR DEFENSE PLAN ESTIMATES TO REDUCE THE BACKLOG TO A MANAGEABLE LEVEL

DOD Directive 4165.2 provides that the effective management of real property maintenance activities, particularly maintenance and repair, requires planning of effort and programming of resources over the period of the 5-year defense plan. It further requires that the planned level of effort and associated resources required should be identified in the annual POM of each military service within the guidelines provided in the Secretary of Defense Planning and Programming Guidance. This analysis should include an assessment of the condition of the real property and the probable effect on the mission which would result from the funding level proposed over the period.

For the POM covering the 5-year period from fiscal year 1980 to 1984, DOD provided guidance to the services to reduce the maintenance and repair backlog to a manageable level by fiscal year 1984, except for the U.S. Army in Europe. The target year for Europe was fiscal year 1991. The services estimated in their POMs the total funds needed to attain the manageable level of backlog of maintenance and repair by the end of fiscal year 1984. However, in the services' fiscal year 1980 budget requests to the Congress for maintenance and repair, the amounts requested are less than those estimated to attain the manageable level as shown below:

	Fiscal year 1980			
	POM		Budget request	
	<u>Funding</u>	<u>End of year backlog</u>	<u>Funding</u>	<u>End of year backlog</u>
	------(millions)-----			
Army	\$ 675.0	\$1,050.0	\$ 448.2	\$1,245.2
Navy	497.4	475.0	420.5	525.0
Marine Corps	136.0	94.0	102.5	143.6
Air Force	<u>681.0</u>	<u>266.0</u>	<u>666.3</u>	<u>400.4</u>
Total	<u>\$1,989.4</u>	<u>\$1,885.0</u>	<u>\$1,637.5</u>	<u>\$2,314.2</u>

Service officials told us that overall budget constraints prevent them from obtaining the estimated funding indicated in the POMs to reduce the backlog to the manageable levels at the end of the 5-year period. Although we did not attempt to evaluate the adequacy of the estimates, we did note that each service used a different method in its POM to determine what a manageable backlog level should be at the end of fiscal year 1984.

The Army has established a manageable backlog level at 20 percent of its annual recurring maintenance requirements, which the Army defines as the day-to-day cyclic performance of work required to prevent incipient failures and to accomplish minor maintenance to preserve and prevent deterioration of a facility. An Army official told us that the level, based on the Army's contact with private industry, indicated the industry used a manageable level of one-fifth of its yearly requirements. According to the Army POM, the manageable level in 1984 should be \$594 million. This would only be \$56 million more than the backlog as of fiscal year 1975.

Navy officials told us that the Navy's interpretation of DOD's backlog definition indicates there should not be any backlog of non-deferrable maintenance and repair deficiencies at the end of any given year. These deficiencies are those maintenance and repair projects which cannot be deferred beyond the end of the fiscal year because of operational needs or adverse economic impact. The Navy does not currently report in its backlog those maintenance and repair projects which are unfunded and deferrable. According to the Navy POM, the manageable level of backlog in 1984 should be \$0.

The Marine Corps recognized in its POM a manageable backlog level of one-half of one percent of the current plant value. A Marine Corps official told us that the percentage of current plant value was previously used by the Navy. The official said that currently a manageable level would be about 1 year's program for major repair projects and 30 to 60 days recurring work for repair shops. The backlog envisioned in the POM for fiscal year 1984 is \$42 million.

The Air Force considers a manageable backlog level to be between \$60 to \$100 million in constant fiscal year 1979 dollars for maintenance and repair projects by contract. According to an Air Force official, this amount represents the lead-time (6 to 9 months) required of base engineers and contract staff to design and award a contract. The Air Force reports as its backlog those projects required in prior fiscal years that were deferred at year end because of lack of funds. It does not include any backlog of maintenance and repair work by its in-house work force.

The difference between the manageable backlog levels at the end of fiscal year 1984, as estimated by the services in the POMs, and the services' reported backlog at end of fiscal year 1978, indicates that the backlog would have to be reduced by about \$1,447 million to attain the 1984 goals.

End of the Year Backlog

	<u>Actual 1978</u>	<u>POM level 1984</u>	<u>Difference</u>
	------(millions)-----		
Army	\$1,241.2	a/\$594	\$ 647.2
Navy	536.0	0	536.0
Marine Corps	105.9	42	63.9
Air Force	<u>299.9</u>	<u>b/100</u>	<u>199.9</u>
Total	<u>\$2,183.0</u>	<u>\$736</u>	<u>\$1,447.0</u>

a/\$72.8 million of the total \$594 million is the manageable level for all major commands, except for the U.S. Army in Europe. The \$521.2 million remaining backlog for Europe must be reduced by \$494.4 million to attain the fiscal year 1991 manageable level.

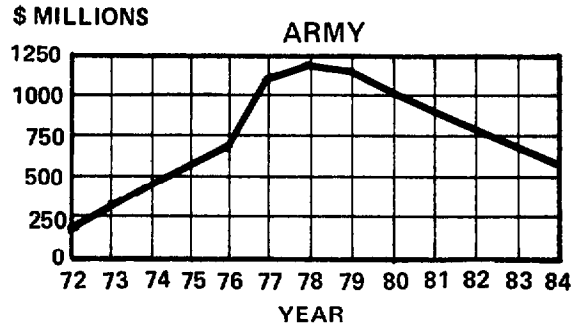
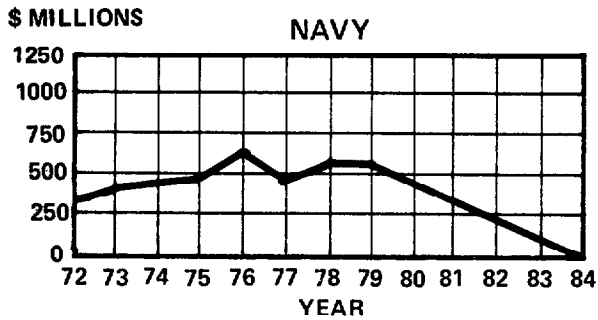
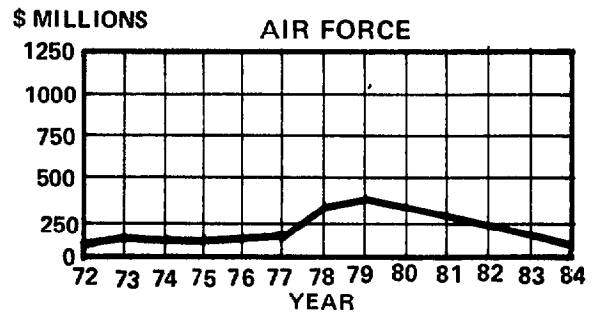
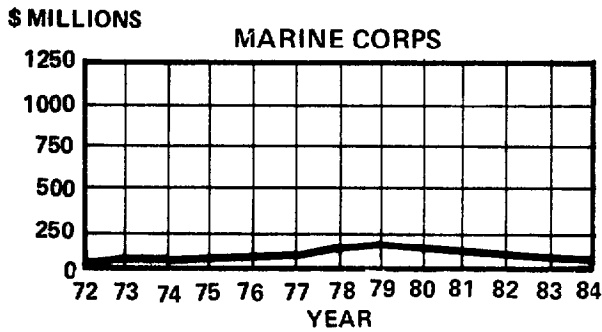
b/For comparison purposes, we used the higher amount of the Air Force's estimate which is a range of \$60 to \$100 million.

The above reduction would be in addition to satisfying annual maintenance and repair requirements and any further escalation of an established backlog through inflation and deterioration. It also assumes that all valid backlog projects have been identified and are included in the current backlog total. However, a recent DOD study stated that the extent of non-reported deficiencies was substantial. (See ch. 6 for information on the results of the study.)

We noted several earlier 5-year plans to reduce the backlog to a manageable level beginning with a plan approved in January 1970. However, none of these earlier 5-year plans were ever accomplished because, apparently, budgeting constraints prohibited funding at the required levels.

On page 16 of this report, we present in graphic form the increases in the backlogs for fiscal years 1972-1978. To show in as simple a form as possible the effect funding envisioned in the POMs would have, we extended our graphic presentation through fiscal year 1984 and drew a straight line, as shown on the next page.

**EFFECT OF PROPOSED POM
FUNDING ON DOLLAR VALUE OF BACKLOGS**



CHAPTER 5
BRIEF OVERVIEW OF
MANAGEMENT SYSTEMS FOR THE IDENTIFICATION
AND CONTROL OF THE BACKLOG

DOD

DOD Directive 4165.2 sets forth the objectives of DOD's Real Property Maintenance Activities Program. One specific objective is to formulate and conduct a maintenance and repair program which is supported by approved military plans and derived from installation annual and long-range work plans. These plans must accurately reflect unconstrained requirements, related to or based on the missions, tasks and functions supported, facilities condition, assigned priorities, and on DOD-prescribed criteria and standards. The directive provides that management information systems supporting the program must provide complete, accurate, and timely information concerning all resources which are required, available, and used for maintenance and repair. The directive provides for decentralized management of the program by assigning the responsibility for the development, execution, validation, and evaluation of the program to the engineering element within the services.

DOD Instruction 4165.58 implements the accounting and reporting policies of the directive by providing the services with concepts to be used in the development of an integrated DOD-wide program control system for real property maintenance activities. The instruction prescribes uniform definitions and cost accounting standards to be used by all DOD components. The systems developed by the services are supposed to assist in formulating and conducting the overall program by bringing together (1) the validated work plans portraying unconstrained work requirements, (2) submissions to support the annual budget requests, and (3) performance reporting on accomplishment of the program.

Because of DOD's decentralized management of the program, each service has developed different management systems to identify and control the backlog from its major commands and installations.

ARMY

The Army's current implementation of the program control system is contained in Army Regulation 420-16, dated

January 27, 1977, instructing major commands and installations to compile and submit annually to the Office of Chief of Engineers two facilities engineering reports--technical data reports and the unconstrained requirements reports. The technical data reports are designed to provide data on cost elements, performance factors, work force, and the backlog of maintenance and repair as a basis for performance evaluation, management analysis, and technical studies. The other report is designed to provide information on total requirements for real property maintenance and repair requirements and the backlog for the fiscal year. The unconstrained requirements reports are used to formulate and conduct the program and to support budget requests.

The responsibility for the accuracy, completeness, and timeliness of information on the unconstrained requirements reports is assigned to the military command in control of the real property. This responsibility includes forwarding adequate implementing instructions to all installations and enforcing compliance with the reporting instructions. According to an Army official, the major commands are responsible for validating the reported backlog of maintenance and repair at installations.

The installation's reported backlog is the end of the fiscal year measurement of maintenance and repair work remaining as a firm unconstrained requirement, but which lack of resources prohibited accomplishment in the fiscal year. The backlog at the end of the fiscal year is the result of the following installation actions during the year:

- Identifying maintenance and repair requirements.
- Placing priorities on the requirements for work accomplishment.
- Funding the work according to the priorities.
- Identifying from the work requirements not funded at the end of the year those which qualify for backlog reporting.

NAVY

Within the Navy, the Chief of Naval Operations was responsible for developing the program control system. Naval Operations implemented the system through the issuance of Chief of Naval Operations Instructions 11010.23D, dated March 15, 1977, and 11010.34, dated June 21, 1977. Instruction 11010.23D provides the Navy's management concept for

real property maintenance activities and Instruction 11010.34 provides instructions for the preparation of annual inspection summary reports.

These reports are the primary document used by the Navy to formulate and conduct its maintenance and repair program and to develop the backlog of maintenance and repair. Each year all Navy activities responsible for the funding of maintenance and repair submit to their commands a list of unfunded facilities deficiencies as of March 1. The deficiencies are supposed to be identified from inspections performed by technically qualified personnel at the activities. From the list of deficiencies, the activities identify those which cannot be deferred beyond the current year because of operational needs or economic impact.

The inspection reports listing the total deficiencies and those which cannot be deferred are reviewed and validated by the intermediate commands. By May 1 each command submits a summary report and an estimate of the backlog of maintenance and repair at the end of the fiscal year to the Chief of Naval Operations. The backlog is determined by selecting only non-deferrable facility deficiencies from the activity annual inspection reports as of March 1 and adjusting for (1) inflation, backlog deterioration, and non-deferrable deficiencies expected to occur between March 1 and September 30 of the current year and (2) the estimate of maintenance and repair funds to be obligated on non-deferrable projects listed on the reports between March 1 and September 30.

The intermediate commands submit summary reports which include an assessment of the condition of the facilities and an evaluation of the mission impact of that condition. The Office of the Chief of Naval Operations makes an analysis of this information and meets with the intermediate commands to discuss the relative importance of the deficiencies. From the assessments, goals are established which identify facilities categories requiring increased maintenance and repair effort to reduce the backlog. The commands may utilize these goals to execute the current year major repair program.

MARINE CORPS

Within the Marine Corps, the Office of the Deputy Chief of Staff for Installations and Logistics has the responsibility for consolidating the overall Corps' backlog of maintenance and repair. This office has provided to field activities guidance to implement the requirements of the DOD Directive 4165.2 and Instruction 4165.58. The guidance for the reporting of the backlog is contained in Marine Corps Order P11000.7A, dated November 13, 1975, which provides for

the submission of annual inspection reports from activities and districts having real property facilities supported with funds from the operation and maintenance appropriation. These reports are used by the Office of the Deputy Chief of Staff for determining the backlog.

All Marine Corps real property facilities are supposed to be inspected by qualified personnel at least once a year. On the basis of these inspections, each activity prepares and submits by January 1 a report showing unfunded facilities deficiencies which were planned to be corrected during the current fiscal year but could not be because of lack of resources. The reports identify the backlog by (1) projects estimated to cost over \$25,000, (2) projects estimated to cost less than \$25,000, and (3) those projects for the demolition of excess facilities.

The Office of the Deputy Chief of Staff reviews these reports and purges those projects which should not be classified as backlog. During the last quarter of the fiscal year, this office provides the activities with a copy of the report for updating. This consists of adjustments, such as (1) projects funded during the period, (2) price changes resulting from firm contractor bids, (3) projects deleted, and (4) new projects identified since the January report. The updated report is submitted to the Office of the Deputy Chief of Staff in October for final review and the calculation of the backlog of maintenance and repair.

For projects estimated to cost over \$25,000, a survey team consisting of one representative from Marine Corps headquarters and one or more representatives from the installation is supposed to validate the projects during the third quarter of the fiscal year. This validation includes rating the project's effect on the installation's mission, expected deterioration, increased maintenance cost if the deficiency remains uncorrected, and the effect on personnel safety, morale, and welfare. The higher the rating, the more critical the project.

According to Marine Corps officials, their headquarters is responsible for approving the funding of major repair projects over \$25,000, and minor construction projects more than \$15,000. Major repair projects are funded on the basis of the validated rating and not on the size or location of the facility. The field activities are responsible for approving funding for projects under \$25,000, and minor construction projects less than \$15,000.

AIR FORCE

The Air Force has implemented a maintenance, repair, and minor construction reporting system for depicting the current status of projects validated for accomplishment by contract. The guidance for the reporting is contained in Air Force Regulation 86-1, dated August 6, 1976, which provides for the submission of monthly status reports from installations to major commands and Air Force headquarters. These reports provide the Air Force with the identification of the backlog of maintenance and repair projects which is used to support budget estimates and financial plans.

The Air Force concept of the backlog is limited to those maintenance and repair projects by contract required in prior fiscal years but which were deferred at year end because of lack of funds. According to Air Force officials, the Air Force does not include any backlog of maintenance and repair work by its in-house work force because any backlog that does accumulate in-house would ultimately be accomplished by contract.

Projects included in the reporting system are supposed to be based on documented work requirements and must be validated by the installation's facilities board. These boards decide whether a project is to be accomplished by the installation's in-house work force or by contract and designate the priority and time frame for the project's completion. When the board approves a project for contract, the project is entered into the reporting system and generally will remain in the system until the project either is accomplished, deleted, or determined to be an invalid requirement. At the end of a fiscal year, each installation is supposed to identify all contract projects in its reporting system which will not be done because of lack of funds. These projects are the backlog of maintenance and repair.

According to an Air Force official, major Air Force commands are responsible for verifying projects entered into the system by installations. This verification may involve a complete inspection of proposed maintenance and repair projects or spot checks.

CHAPTER 6

PREVIOUS INTERNAL AUDITS AND REVIEWS

Since an Air Force internal audit in 1969, only one interservice audit and one DOD study have been made of the backlog of maintenance and repair.

AIR FORCE INTERNAL AUDIT - 1969

The Air Force audit organization made an audit of the validity of backlog projects reported by 14 Air Force bases from July through September 1969. A report was issued on December 24, 1969, concluding that the projected June 30, 1970, backlog inventory of \$283.9 million reported by the Air Force was overstated and that the \$32.9 million reported growth in the inventory was also overstated since it derived from the basic inventory. The report recommended that (1) accurate backlog requirements be obtained and that a reliable plan to reduce the backlog be developed, (2) guidance necessary for more effective reporting, planning, and budgeting for backlog be developed, and (3) major commands be required to establish an effective verification and validation program for the backlog. Management concurred with the recommendations and stated that a total programming concept then being implemented would result in an accurate backlog requirement.

INTERSERVICE AUDIT REPORT

In response to a request from the Deputy Assistant Secretary of Defense (Installations and Housing), the Office of the Deputy Assistant Secretary of Defense (Comptroller), in coordination with the internal audit organizations of the Army, Navy, Air Force, and Defense Supply Agency (now Defense Logistics Agency), audited selected aspects of the management of the real property maintenance and repair program. The primary purpose of the audit was to determine the validity of the BMAR to be funded from the Operation and Maintenance Appropriation at the end of fiscal year 1974. A summary report was issued on December 31, 1975. It concluded that the DOD components needed to improve the accuracy and reliability of their reported BMAR. The report disclosed that the \$1 billion backlog reported for fiscal year 1974 was overstated and understated on a project basis. Audit tests showed that 31 percent of the reported BMAR was invalid and the estimated costs for 14 percent of the valid projects were not supported. All participating audit groups also found evidence that some valid projects were understated and others had not been reported.

The summary report also included highlights from the servicewide reports issued by the Army, Navy, and Air Force audit organizations which are discussed below.

Army

Army auditors reviewed BMAR projects valued at \$50 million in the United States. They concluded that \$10 million of these were valid, \$23 million did not represent valid BMAR projects, and the validity of the remaining \$17 million could not be established because supporting documentation did not exist. The auditors concluded that Army regulations needed to be revised and clarified to improve BMAR identification and support.

Navy

Navy auditors concluded that identification and reporting of BMAR needed improvement. They stated that the validity of the reported Navy BMAR of \$400 million as of June 30, 1974, was questionable. Review of \$25.8 million of the BMAR disclosed that about \$9.1 million was invalid because of errors by field activities in preparing figures and because funding actions after preparation of BMAR data were not considered. Conversely, documented projects of about \$3.4 million were not reported, values of reported projects were based on outdated estimates, and still other projects were unreported because of an inadequate inspection and work planning program.

Marine Corps

The Marine Corps BMAR of \$41.1 million reported as of June 30, 1974, appeared to be understated by at least \$5.3 million because of an inadequate inspection program at some activities, failure to update earlier estimates, clerical errors in accumulating and reporting deficiencies, and non-reporting of deficiencies because funding appeared unlikely. In addition, annual and long-range planning to correct deficiencies had not been fully implemented at all Marine Corps activities.

Air Force

The Air Force auditors stated that the real property maintenance and repair function was effectively managed. However, there were several areas that needed management attention.

The maintenance, repair, and minor construction reporting system at 15 randomly selected bases contained requirements that were invalid, underpriced, or improperly identified. As a result, there was a \$3 million net overstatement of BMAR at the 15 bases. On the basis of statistical analysis, the Air Force auditors concluded that the backlog of \$198 million reported to Air Force headquarters at June 30, 1974, was overstated by \$11 to \$56 million. However, Air Force headquarters reduced the \$198 million by \$39 million and reported a reasonable \$159 million to the Office of the Secretary of Defense. The auditors also found

- 93 of the 556 projects reviewed did not have supporting evidence of the facilities boards' validation;
- 106 of 196 projects exceeding the installation commander's approval authority had not received major command approval because uniform procedures for obtaining this approval had not been established;
- 196 of the 556 projects reviewed were not appropriately documented because directive guidance did not clearly specify the documentation required;
- 334 of the 556 projects did not have any evidence of onsite inspections of work requirements;
- base-level procedures had not been established for determining and reporting obligations against the real property maintenance floor, but Air Force headquarters was reporting annual obligations against the floor through a process of prorating operation and maintenance obligations; and
- the major commands funded 63 percent of all funded projects during fiscal year 1974 at the 15 bases in the fourth quarter, which adversely affected the efficient and economic accomplishment of the base-level real property maintenance mission.

In addition to the servicewide reports highlighted above, the service audit organizations issued 27 reports covering matters of local interest to 6 Army, 6 Navy, and 15 Air Force installations. The summary report stated that matters in need of improvement were discussed with responsible installation personnel. Commands generally concurred with suggestions or recommendations made and indicated that appropriate corrective actions would be taken.

DOD STUDY TO ASSESS
FISCAL YEAR 1977 BACKLOG

During the period January through March 1978 three members of the Office of Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics) visited 22 service installations/activities (3 Army, 12 Navy, 5 Air Force, and 2 Marine Corps) to evaluate the accuracy of the fiscal year 1977 BMAR. The 22 installations/activities had an aggregated BMAR of \$140 million. On the basis of an approximately 32-percent sampling of this BMAR, the survey team concluded that the above-mentioned audit report of December 31, 1975, finding that the services needed to improve the accuracy and reliability of their BMAR remained valid, but to a lesser degree due to significant improvements over the prior 2 years.

The survey team's methodology of assessing the fiscal year 1977 BMAR was made based on a physical examination of randomly selected deficiencies considered representative of the whole, with the extent of the sampling dependent upon the dispersal of facilities and time available at each site. Primary attention was to be given to high-value deficiencies.

On the basis of the limited physical sampling stated above, plus discussions with personnel responsible for identifying and reporting BMAR, the survey team considered the following conclusions and recommendations they developed to be reasonably applicable servicewide.

Survey team conclusions

The survey team concluded that:

- The trend is towards increased accuracy and reliability in the development and reporting of BMAR.
- The fiscal year 1977 BMAR is the most accurate to date. The services' continued efforts to inspect and develop BMAR will be reflected in an even more accurate reporting (higher) of fiscal year 1978 BMAR and, probably, fiscal year 1979 BMAR.
- The extent of construction and deferrable deficiencies in BMAR is negligible.
- The extent of non-reported valid deficiencies is substantial and has resulted in general understatement of fiscal year 1977 BMAR by all services. The Army BMAR

is more understated than that of the other services. Estimated ranges of understatement are as follows: Army--20 to 30 percent, Navy and Marine Corps--10 to 15 percent, and Air Force--about 15 percent.

- Total identification and reporting of deficiencies constituting BMAR is an unattainable goal. Limited resources available for inspecting and identifying deficiencies, occasional inaccurate cost estimating, non-reporting of minor deficiencies, and the extent of "unseen" deficiencies will perpetuate understatement of BMAR.
- Air Force contention that its installations have no in-house BMAR is essentially correct, since scheduled work which cannot be accomplished within available staff hours is placed in the installation's contract program. Therefore, the Air Force's interpretation of BMAR, as basically representing project size deficiencies requiring contract accomplishment, is reasonable.
- BMAR is not uniformly interpreted in the field. Several intermediate commands included deferrables in their reporting. A major command fiscally constrained BMAR reporting. Various installations and activities did not uniformly consider resolution of the Occupational Safety and Health Act and statutorily dictated environmental deficiencies in terms of BMAR.

Survey team recommendations

The team recommended, among other things, that the services:

- Evaluate the adequacy of current resources being applied to the identification, reporting, and validation of BMAR to determine if BMAR's development can be enhanced through applying further resources, or if the point of diminishing return has already been reached.
- Evaluate the interpretation of BMAR at major and intermediate command level to ensure its uniform interpretation.
- Evaluate the services' implementation of BMAR and issue necessary guidance to ensure compliance with DOD Directive 4165.2. Particular attention should be given to

the proper consideration, as BMAR, of safety and health deficiencies and those deficiencies generated as a consequence of statutory deadlines established by Federal, State, and local environmental standards. Also, attention should be given to ensure that the reporting of BMAR is not fiscally constrained.

The survey team also recommended that:

- Reports of BMAR be carefully screened at installation and activity level to ensure correct reporting of deficiencies and validation teams of the major and intermediate commands be cognizant of the potential for erroneous reporting.
- The Deputy Assistant Secretary of Defense (Installations and Housing) continue to aggressively support, through consolidated guidance, the programming of sufficient funds to consciously reduce BMAR and gain support for the budgeting of such amounts.

The DOD Real Property Maintenance Council considered the survey team's evaluation in a May 25, 1978, meeting. A memorandum on the meeting indicated that the general perceptions gained from the limited analysis of BMAR were considered sufficiently valid to apply servicewide. The Council accepted the perceptions that the fiscal year 1977 BMAR was the most accurate reporting to date and that it was understated to varying degrees among the services due to incomplete identification of non-deferrable deficiencies, especially underground utilities systems and subsurface waterfront elements.

CHAPTER 7

OBSERVATIONS

A recent DOD study, while stating that the trend was toward a more accurate BMAR and that the most accurate to date was fiscal year 1977 (as of early 1978), concluded that non-reported projects were substantial, BMAR was understated, and total identification and reporting of BMAR is an unattainable goal.

It appears, therefore, that DOD and the military services have been unable to hold down the growth of the real property maintenance and repair backlog even after they

- refined the definition of the term "backlog;"
- spent billions of dollars to maintain and repair facilities;
- implemented numerous directives, instructions, and regulations; and
- received several congressional mandates to hold the line or reduce the backlog,

The most frequently heard reasons for the inability to reduce BMAR are the lack of adequate funds or the failure to channel available funds to combat the rising backlog. We have not dealt with these matters in this report except to pass along data provided to us. However, the question arises that if one is not able to adequately maintain and repair needed facilities because of a lack of funding, how can one hope to fund an additional facility which, no doubt, would add to the maintenance and repair costs? Or, is it really just a matter of where "management" decides to spend available funds?

The Congress has provided additional funds to help control the climbing backlog, and the military services have provided POMs covering fiscal years 1980 to 1984 to DOD with their estimates of funds needed to reduce backlog to "manageable levels." Neither approach will achieve its objective based on current data. As shown on page 27, funding to achieve the manageable levels would completely invert the climbing backlog trend line.

Currently, the backlog is being treated as a service problem rather than a DOD problem. There appears to be a need for improving central control, setting priorities, and monitoring from the DOD level. Even though DOD has defined backlog, what each service identifies as backlog and what DOD reports to the Congress appears to differ from the uniform definition. Rather than continuing to manage the program as it has up to now, perhaps DOD should try a new approach.

The scope of our work in this phase precluded firm conclusions and recommendations concerning a new approach. Further work is needed and two key points to be addressed in this regard are the validity of the backlog and its reliability as an indicator for management's use in making decisions. We are initiating the next phase of our effort which is to determine how the intermediate commands and the installations implement backlog guidance.

CONSTANT DOLLAR COMPARISON (note a) OF
ACTUAL EXPENDITURES AND BACKLOG OF MAINTENANCE
AND REPAIR (OPERATION AND MAINTENANCE APPROPRIATION)

	BY FISCAL YEAR												1979 (note b)	1980 (note b)			
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976			1977	1978	
(millions)																	
Army:																	
Actual expenditures	\$ 782.2	\$ 782.4	\$ 873.6	\$ 971.5	\$ 832.4	\$ 747.5	\$ 599.6	\$ 667.7	\$ 589.5	\$ 563.0	\$ 594.1	\$ 551.5	\$ 693.4	\$ 675.0	\$ 657.7	\$ -	
Backlog	242.0	180.1	216.9	519.2	537.2	570.7	440.2	395.2	480.1	605.8	757.0	930.3	1,416.9	1,417.7	1,259.5	1,245.2	
Navy:																	
Actual expenditures	449.4	448.8	386.1	380.4	386.4	366.1	296.6	276.6	276.7	295.6	383.3	352.6	364.0	420.4	422.8	-	
Backlog	406.3	414.5	415.0	510.5	596.9	596.0	629.7	612.5	621.6	589.2	646.9	841.1	596.5	612.2	571.6	525.0	
Marine Corps:																	
Actual expenditures	61.5	60.6	57.8	56.4	54.2	51.9	76.4	78.1	71.2	82.6	79.9	90.6	108.1	111.7	123.4	-	
Backlog	23.9	17.1	18.7	12.5	13.9	7.2	29.0	35.0	69.9	59.7	91.4	103.2	110.3	121.0	125.4	143.6	
Air Force:																	
Actual expenditures	864.9	756.1	775.4	699.9	685.3	671.1	607.8	593.1	600.4	647.1	694.0	714.3	838.0	797.1	704.3	-	
Backlog	179.3	320.2	334.7	347.0	366.3	362.5	179.0	145.6	287.6	234.6	211.4	216.3	268.9	342.5	377.5	400.4	
Total:																	
Actual expenditures	2,158.0	2,047.9	2,092.9	2,108.2	1,958.3	1,836.6	1,580.4	1,615.5	1,537.8	1,588.3	1,751.3	1,709.0	2,003.5	2,004.2	1,908.2	-	
Backlog	851.5	931.9	985.3	1,389.2	1,514.3	1,536.4	1,277.9	1,188.3	1,459.2	1,489.3	1,706.7	2,090.9	2,392.6	2,493.4	2,334.0	2,314.2	

a/Converted to constant fiscal year 1980 dollars based on Defense deflators for military construction.

b/Expenditures and backlog for fiscal years 1979 and 1980 are estimated.

(945354)

SUMMARY DATA
ON MAINTENANCE OF REAL PROPERTY
FACILITIES (OPERATION AND MAINTENANCE APPROPRIATION)

	BY FISCAL YEAR										1979 (note a)	1980 (note a)				
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974			1975	1976	1977	1978
(Millions)																
Army:																
Planned expenditures	\$236.0	\$221.9	\$259.8	\$280.0	\$280.0	\$225.4	\$220.0	\$258.0	\$325.8	\$308.4	\$414.7	\$446.3	\$532.4	\$527.2	\$578.1	\$510.8
Maintenance floor	236.0	225.0	264.3	280.0	280.0	225.0	220.0	240.0	231.0	246.0	334.5	400.0	480.0	490.0	580.2	-
Actual expenditures	261.8	273.7	326.3	389.2	359.5	351.2	308.5	376.1	367.5	382.2	422.5	413.1	565.0	591.0	615.5	-
Backlog	81.0	63.0	81.0	208.0	232.0	268.1	226.5	222.6	299.3	411.3	538.3	696.8	1,154.5	1,241.2	1,178.8	1,245.2
Navy:																
Planned expenditures	133.7	141.0	142.7	154.0	155.6	147.5	126.9	124.7	135.5	138.2	274.5	222.8	258.7	291.6	378.4	446.6
Maintenance floor	133.7	141.0	142.7	154.0	155.6	147.5	126.9	124.7	135.5	138.2	221.3	200.0	243.0	275.0	380.3	-
Actual expenditures	150.4	157.0	144.2	152.4	166.9	172.0	152.6	155.8	172.5	200.7	272.6	264.1	296.6	368.1	395.7	-
Backlog	136.0	145.0	155.0	204.5	257.8	280.0	324.0	345.0	387.5	400.0	460.0	630.0	486.0	536.0	535.0	525.0
Marine Corps:																
Planned expenditures	19.0	20.5	20.5	22.2	22.7	22.4	31.0	37.3	38.0	44.5	51.9	59.2	82.5	88.8	113.9	106.1
Maintenance floor	19.3	20.5	20.5	22.2	22.7	22.4	31.0	37.3	37.5	44.5	50.0	55.0	74.0	86.7	107.5	-
Actual expenditures	20.6	21.2	21.6	22.6	23.4	24.4	39.3	44.0	44.4	56.1	56.8	67.9	88.1	97.8	115.5	-
Backlog	8.0	6.0	7.0	5.0	6.0	3.4	14.9	19.7	43.6	40.5	65.0	77.3	89.9	105.9	117.4	143.6
Air Force:																
Planned expenditures	230.0	258.0	250.0	250.0	250.0	250.0	250.0	276.0	265.1	288.1	356.8	394.5	423.4	547.9	635.3	709.6
Maintenance floor	230.0	258.0	250.0	250.0	250.0	250.0	250.0	250.0	216.7	215.0	330.0	340.0	380.0	509.0	592.2	-
Actual expenditures	289.5	264.5	289.6	280.4	296.0	315.3	312.7	334.1	374.3	439.3	493.5	535.0	682.8	697.9	659.2	-
Backlog	60.0	112.0	125.0	139.0	158.2	170.3	92.1	82.0	179.3	159.3	150.3	162.0	219.1	299.9	353.3	400.4
Total:																
Planned expenditures	618.7	641.4	673.0	706.2	708.3	645.3	627.9	696.0	764.4	779.2	1,097.9	1,122.8	1,297.0	1,455.5	1,705.7	1,773.1
Maintenance floor	619.0	644.5	677.5	706.2	708.3	644.9	627.9	652.0	612.2	643.7	935.8	995.0	1,177.0	1,360.7	1,660.2	-
Actual expenditures	722.3	716.4	781.7	844.6	845.8	862.9	813.1	910.0	958.7	1,078.3	1,245.4	1,280.1	1,632.5	1,754.8	1,785.9	-
Backlog	285.0	326.0	368.0	556.5	654.0	721.8	657.5	669.3	909.7	1,011.1	1,213.6	1,566.1	1,949.5	2,183.0	2,184.5	2,314.2

a/Floor expenditures and backlog for fiscal years 1979 and 1980 are estimated.
Source: Planned expenditures are the estimated obligations in DOD exhibits supporting the original budget requests for real property maintenance for each fiscal year. Other data obtained from DOD reports dated May 1973 and January 1978 and fiscal year 1980 budget exhibits.

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