

GAO

Report to the Chairman, Subcommittee
on Defense, Committee on
Appropriations, House of
Representatives

June 2004

AIR FORCE DEPOT MAINTENANCE

Improved Pricing and Cost Reduction Practices Needed



G A O

Accountability * Integrity * Reliability



Highlights of GAO-04-498, a report to the Chairman, Subcommittee on Defense, Committee on Appropriations, House of Representatives

Why GAO Did This Study

The Air Force depot maintenance activity group in-house operations generate about \$5 billion in annual revenue principally by repairing aircraft, missiles, engines, and other assets. In doing so, the group operates under the working capital fund concept, where customers are to be charged the anticipated costs of providing goods and services to them. The group's average price for in-house work almost doubled between fiscal years 2000 and 2004 from \$119.99 per hour to \$237.84 per hour. GAO was asked to determine (1) what factors were primarily responsible for the price increase, (2) if the prices charged recovered the reported actual costs of performing the work, and (3) if the Air Force has taken effective steps to improve efficiency and control the activity group's costs.

What GAO Recommends

GAO is making recommendations to the Air Force to (1) set prices so that the depot maintenance activity group recovers all estimated costs and (2) control the activity group's costs and improve the coordination and information on initiatives. GAO is also making a recommendation to the Department of Defense to reduce excess cash in the Air Force Working Capital Fund. GAO is also suggesting that the Congress consider taking action to reduce the amount of excess cash in the Air Force Working Capital Fund if DOD does not adequately reduce the cash balance. DOD concurred with all the recommendations.

www.gao.gov/cgi-bin/getrpt?GAO-04-498.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Gregory D. Kutz at (202) 512-9505 or Kutzg@gao.gov or William M. Solis at (202) 512-8365.

AIR FORCE DEPOT MAINTENANCE

Improved Pricing and Cost Reduction Practices Needed

What GAO Found

GAO identified five primary factors that showed why the Air Force depot maintenance activity group's average price increased from \$119.99 per direct labor hour of work in fiscal year 2000 to \$237.84 per hour in fiscal year 2004. An increase in material costs accounted for about 67 percent of the total increase and was by far the most significant factor. The Air Force has identified some of the causes of the higher material costs such as aging aircraft, but has yet to complete an effective and comprehensive analysis of material cost increases. As a result, it (1) cannot quantify the extent to which individual causes contributed to higher costs and (2) does not know if it has identified all of the major causes.

GAO's analysis of the other four factors showed that (1) the increase in labor costs was due largely to events beyond the group's control, such as annual salary increases, (2) the increase in business operations costs was due partly to costs related to implementing a new accounting system, (3) a surcharge intended to recoup anticipated losses on work carried over from the previous fiscal year may have been unnecessary, and (4) a surcharge intended to generate additional cash in fiscal year 2004 for the Air Force Working Capital Fund was unnecessary. GAO's analysis showed that due in part to these surcharges (1) the Air Force Working Capital Fund, which includes the depot maintenance and several other activity groups, had a \$2.5 billion cash balance as of January 31, 2004 and (2) this balance was more than \$1.3 billion higher than the maximum level allowed by DOD policy. Either the Office of the Secretary of Defense or the Congress could use this unneeded cash to satisfy other requirements. DOD officials told us that they are exploring options on what to do with the excess cash.

GAO's analysis of the group's financial reports showed that prices charged customers were not set high enough to recover about \$1.1 billion of the group's reported costs for fiscal years 2000 through 2003. The activity group is required by DOD policy to set prices to recoup the cost of doing work. However, Air Force officials informed us that the prices were artificially constrained to help ensure that the group's customers would be able to get needed work done with the amount of funds provided to them through the budget process. The Air Force changed its sales price development philosophy to bring prices charged customers in fiscal year 2004 more in line with operating costs. In addition, the Air Force allowed out-of-cycle price increases in fiscal years 2002 and 2003 to alleviate projected losses.

Further, the Air Force Materiel Command has not been successful in its efforts to control costs. Although several promising initiatives are underway, the Command has not (1) developed a successful methodology for analyzing the reasons for the rapid material cost increase and (2) effectively utilized an established data repository for sharing cost-saving ideas among the three air logistics centers on process improvements and to demonstrate whether its cost savings initiatives have been successful.

Contents

Letter

Results in Brief	1
Background	2
Factors Causing Prices to Increase	4
Prices Charged Customers Were Not Set High Enough to Recover Costs	6
Air Force Depot Maintenance Needs More Systematic and Effective Processes for Controlling Costs	18
Conclusions	21
Matter for Congressional Consideration	27
Recommendations for Executive Action	27
Agency Comments and Our Evaluation	28

Appendixes

Appendix I: Scope and Methodology	31
Appendix II: Comments from the Department of Defense	33
Appendix III: GAO Contact and Staff Acknowledgments	36
GAO Contact	36
Acknowledgments	36

Tables

Table 1: Factors Responsible for the Increase in the Air Force Depot Maintenance Activity Group's Composite Hourly Sales Price between Fiscal Years 2000 and 2004	8
Table 2: Air Force Depot Maintenance Activity Group's Budgeted Labor Expense Rates for Fiscal Years 2000 through 2004	13
Table 3: Activity Group's Reported Losses and Additional Funds Received to Recoup Losses from Fiscal Years 2000 to 2003	18
Table 4: Air Logistics Centers' Revised Fiscal Year 2003 Sales Prices for Selected Workloads due to Out-of-Cycle Price Increases	20

Figure

Figure 1: Comparison of the Air Force Depot Maintenance Activity Group's Budgeted and Reported Actual Material Expense Rates for Fiscal Years 2000 through 2004	9
---	---

This is a work of the U.S. government and is not subject to copyright protection in the United States. It may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.



United States General Accounting Office
Washington, D.C. 20548

June 17, 2004

The Honorable Jerry Lewis
Chairman, Subcommittee on Defense
Committee on Appropriations
House of Representatives

Dear Mr. Chairman:

The Air Force depot maintenance activity group supports combat readiness by providing services necessary to keep Air Force units operating worldwide. The group's in-house operations¹ generate about \$5 billion in annual revenue principally by repairing and overhauling a wide range of assets, including fighter aircraft such as the F-15, intercontinental ballistic missiles such as the Minuteman and Peacekeeper missiles, jet aircraft engines, electronics, avionics, software, and inventory items for the military services, other government agencies, and foreign governments. For example, in fiscal year 2002, the Air Force reported that the depot maintenance activity group's three air logistics centers' in-house operations performed major modifications on 852 aircraft, overhauled 515 aircraft engines, and repaired 352,995 inventory items. In doing so, the group operates under the working capital fund concept, where customers are to be charged for the anticipated full cost of goods and services. The group performs its in-house operations primarily at the three air logistics centers—the Oklahoma City Air Logistics Center, Tinker Air Force Base, Oklahoma; the Ogden Air Logistics Center, Hill Air Force Base, Utah; and the Warner Robins Air Logistics Center, Robins Air Force Base, Georgia.

The activity group's average price for in-house work almost doubled between fiscal years 2000 and 2004. Specifically, according to the activity group's budget documents, the average price per direct labor hour of work accomplished (composite sales rate)² increased from \$119.99 per hour for

¹In providing goods and services to customers, the Air Force depot maintenance activity group performs work in-house at its depots using federal employees or through contracts with private industry or other government agencies. The Air Force is removing the contract portion of the activity group from the working capital fund.

²The composite sales rate is the average price that customers must pay for a direct labor hour of work and is used for budgeting purposes. The average price includes labor, material, and overhead costs. For actual work performed, the activity group develops individual sales prices, such as the price per hour to perform repair work on the F-15 aircraft, and bills customers based on those individual prices.

fiscal year 2000 to \$237.84 per hour for fiscal year 2004, or about 98 percent.³ Because the activity group's customers are expected to request about 20.8 million hours of in-house work in fiscal year 2004, this means that customers will have to pay about \$4.9 billion for work that they would have paid about \$2.5 billion in fiscal year 2000.

As requested and agreed to with your office, this report discusses three issues related to this large price increase. Our objectives were to determine (1) what factors were primarily responsible for the price increase, (2) if the prices charged customers during fiscal year 2000 through fiscal year 2003 recovered the reported actual costs of performing the work, and (3) if the Air Force has taken effective steps to improve efficiency and control the activity group's costs. Our review was performed from June 2003 through April 2004 in accordance with U.S. generally accepted government auditing standards. Most of the financial information in this report is budget data obtained from official Air Force budget documents. The accounting data used in this report was obtained from official Air Force accounting reports. Although we did not validate the accuracy of the underlying transactions that made up the summary level data, the budget and accounting information is used by the Air Force, the Department of Defense (DOD), and congressional committees to make decisions regarding the amount of funds customers receive to purchase goods and services from the depot maintenance activity group. Further details on our scope and methodology can be found in appendix I. We requested comments on a draft of this report from the Secretary of Defense or his designee. Written comments from the Deputy Comptroller for Program Budget are reprinted in appendix II.

Results in Brief

Our work showed that the sales price increase was due primarily to the following five factors, in descending order of significance: (1) higher material costs, (2) higher labor costs, (3) higher business operations costs (non-labor, non-material overhead costs), (4) a surcharge intended to recoup anticipated losses on work carried over from the previous fiscal year (carryover surcharge), and (5) a surcharge to generate additional cash (cash surcharge). By far the most significant of these factors was higher material costs, which accounted for about 67 percent of the total increase.

³Using the Gross Domestic Product price index updated in January 2004, if the fiscal year 2000 composite sales rate is converted to fiscal year 2004 dollars, the composite sales rate would be \$128.53, and the increase would be 85 percent.

Air Force depot maintenance officials provided anecdotal evidence to show that the higher material costs were caused at least partly by (1) the need to replace component parts more frequently because of both safety concerns and the aging of aircraft and engines and (2) increases in the prices that the depot maintenance activity group must pay its suppliers for component parts. However, because Air Force depot maintenance officials have yet to complete an effective and comprehensive analysis to determine the underlying causes of why material costs have increased, they cannot fully quantify the impact of the causes that they have identified and do not know if they have identified all of the major causes.

Our analysis of the other four factors showed that (1) the increase in labor costs was caused largely by things that were beyond the activity group's control, such as annual salary increases and health care costs for federal employees, (2) the increase in business operations costs was for such things as the repair and modernization of equipment and facilities and costs related to the implementation of a new accounting system, (3) the fiscal year 2004 carryover surcharge was probably too high and may have been unnecessary, and (4) the fiscal year 2004 cash surcharge was unnecessary. Our analysis also showed that due in part to these surcharges, the Air Force Working Capital Fund—which includes the depot maintenance activity group and several other activity groups—had a cash balance of \$2.5 billion as of January 31, 2004, which was more than \$1.3 billion higher than the maximum level allowed by DOD policy. Either the Office of the Secretary of Defense or the Congress could use this unneeded cash to satisfy other requirements.

Our analysis of the activity group's financial reports also showed that prices charged customers were not set high enough to recover about \$1.1 billion of the group's reported costs for fiscal years 2000 through 2003. The activity group, like other working capital fund activities, is required by DOD policy to set the prices it charges customers to recoup the cost of doing the work. However, Air Force officials informed us that the prices were artificially constrained to help ensure that the activity group's customers would be able to get needed work done with the amount of funds provided to them through the budget process. In part, because the sales prices were set too low during this period, the activity group lost \$1.1 billion. To recoup the losses, customers paid about \$1 billion of their existing funds (primarily operation and maintenance funds) during fiscal years 2000, 2001, and 2002. The \$1 billion was billed and collected by the activity group and was not included in the prices. The Air Force changed its sales price development philosophy in 2002 in an effort to bring prices

charged customers in fiscal year 2004 more in line with operating costs. In addition, the Air Force allowed out-of-cycle price increases in fiscal years 2002 and 2003 to alleviate projected losses.

The Air Force has not taken effective steps to control the activity group's costs. Although several promising initiatives are underway, our analysis showed that the Air Force Materiel Command has been unable to develop an effective methodology for identifying and analyzing the reasons for material cost increases. In addition, the Command has also not effectively utilized the data repository established to enable the three centers to share cost-saving ideas and to demonstrate whether its cost saving initiatives have been successful.

We are making a recommendation to the Secretary of Defense to take action to reduce the amount of excess cash in the Air Force Working Capital Fund. We are also making recommendations to the Air Force to (1) follow DOD's requirement to set prices so that the depot maintenance activity group recovers all estimated costs, (2) develop and complete a viable, systematic methodology for analyzing material cost variances, and (3) enter all process improvement initiatives and related data into the data repository so that the Air Force can track the costs and savings associated with the initiatives to determine whether they have been effective. We also suggest that the Congress consider taking action to reduce the amount of excess cash in the Air Force Working Capital Fund if DOD does not reduce the cash balance to the 7 to 10 day requirement. In its comments on a draft of this report, DOD concurred with all the recommendations. DOD has reduced the excess cash in the Air Force Working Capital Fund by transferring \$1.1 billion of the excess cash out of the Fund in April 2004. However, the Air Force Working Capital Fund still had about \$400 million of excess cash as of the end of April 2004. We still suggest that the Congress continue to monitor the working capital fund cash balances and take action to reduce the amount of excess cash if the balances continue to be in excess of amounts necessary.

Background

The Air Force depot maintenance activity group is part of the Air Force Working Capital Fund, a revolving fund that relies on sales revenue rather than direct congressional appropriations to finance its operations. DOD policy requires working capital fund activity groups to (1) establish sales prices that allow them to recover their expected costs from their customers and (2) operate on a break-even basis over time—that is, not make a profit nor incur a loss. DOD policy also requires the activity group to establish its

sales prices prior to the start of each fiscal year and to apply these predetermined or “stabilized” prices to most orders received during the year—regardless of when the work is actually accomplished or what costs are actually incurred. For the depot maintenance activity group, DOD policy also requires the group to recoup unbudgeted losses of \$10 million or more in the year in which they occurred. In the case of losses that occur in the fourth quarter, the losses are to be recovered in the first quarter of the next fiscal year.

Developing accurate prices is challenging since the process to determine the prices begins about 2 years in advance of when the work is actually received and performed. In essence, the activity group’s budget development has to coincide with the development of its customers’ budgets so that they both use the same set of assumptions. To develop prices, the activity group estimates (1) labor, material, overhead, and other costs based on anticipated demand for work as projected by customers, (2) total direct labor hours for each type of work performed, such as aircraft, engines, and repairable inventory items, (3) the workforce’s productivity, and (4) savings due to productivity and other cost avoidance initiatives. In order for an activity group to operate on a break-even basis, it is extremely important that the activity group accurately estimate the work it will perform and the costs of performing the work. Higher-than-expected costs or lower-than-expected customer demand for goods and services can cause the activity group to incur losses. Conversely, lower-than-expected costs or higher-than-expected customer demand for goods and services can result in profits. With sales prices based on assumptions that are made as long as 2 years before the prices go into effect, some variance between expected and actual costs is inevitable.

The Activity Group’s Financial Reports Are Not Accurate

We have previously reported that DOD has had long-standing problems in preparing accurate working capital fund financial reports. The DOD Inspector General and/or the Air Force Audit Agency have not been able to express an opinion on the reliability of the working capital fund’s financial statements for fiscal years 1993 through 2003. The auditors reported that the financial information was unreliable and financial systems and processes, as well as associated internal control structures, were inadequate to produce reliable financial information. The Air Force recognized that the existing legacy depot maintenance accounting systems that were designed in the 1960s and 1970s did not produce usable, complete, reliable, timely, consistent, and auditable information. According to the Air Force, among other things, these systems (1) were not

transaction driven, (2) did not capture costs at the task level, and (3) did not produce accurate financial statements.

To help improve the depot maintenance activity group's financial management operations, in January 1998, the Assistant Secretary of the Air Force for Financial Management approved the implementation of the Depot Maintenance Accounting and Production System—which includes an accounting system called the Defense Industrial Financial Management System (DIFMS) that originally belonged to the Navy—at the depots located at the air logistics centers. According to the Air Force, this system is designed to provide the accurate task-level cost data that are needed to support (1) financial analysis and cost management and (2) the development of prices that more accurately reflect the cost of providing goods and services to customers. The Air Force is in the process of implementing this system and plans to complete the implementation during fiscal year 2004.

Factors Causing Prices to Increase

We identified five factors that accounted for about 95 percent of the sales price increase from \$119.99 per direct labor hour⁴ in fiscal year 2000 to \$237.84 per hour in fiscal year 2004.⁵ By far the most significant of these factors was material costs, which accounted for about 67 percent of the total increase. Air Force depot maintenance officials have yet to complete an effective and comprehensive analysis to determine the underlying causes of the material cost increases. Our analysis of the other four factors identified a variety of underlying causes, some of which were beyond the activity group's control, such as rising health care costs and maintenance and modernization of equipment and facilities. However, our analysis of the two factors that involved surcharges determined that the carryover surcharge (based on anticipated losses on work carried over from the previous fiscal year) was probably too high for fiscal year 2004 and may have been unnecessary, while the fiscal year 2004 cash surcharge was

⁴Unless otherwise indicated, the use of the term "direct labor hour" in this report will refer to a direct product standard hour, which is the amount of acceptable quality work that can be accomplished in 1 hour by a qualified worker, following prescribed methods, working at a normal pace, and experiencing normal fatigue and delays.

⁵Using the Gross Domestic Product price index updated in January 2004, if the fiscal year 2000 composite rate is converted to fiscal year 2004 dollars, the composite rate would be \$128.53 and the increase would be 85 percent.

unnecessary and should not have been added to the depot's composite hourly sales price. Details on the five factors follow.

- Higher budgeted material costs accounted for about 67 percent of the total increase in the composite hourly sales price. Air Force depot maintenance officials provided anecdotal evidence to show that the higher material costs were caused at least partly by (1) the need to replace component parts more frequently because of both safety concerns and the aging of aircraft and engines and (2) increases in the prices that the depot maintenance activity group must pay its suppliers for component parts. However, because Air Force depot maintenance officials have not completed a comprehensive analysis to determine the underlying causes of why their material costs have increased, they cannot quantify the impact of the identified causes and are unsure if they have identified all of the major causes.
- Higher budgeted labor costs accounted for about 10 percent of the increase in the activity group's composite hourly sales price. Our analysis showed that the higher labor costs were caused largely by factors beyond the activity group's control, such as annual salary increases for federal employees and rising health care costs.
- Higher non-labor, non-material overhead costs, which the Air Force calls business operations costs, accounted for about 8 percent of the total increase. Our analysis showed that the primary causes were (1) costs related to the implementation of a new accounting system and (2) the fact that the fiscal year 2004 budget provided significant increases in several areas where expenditures had been constrained for several years, such as the maintenance and modernization of equipment and facilities.
- An increase in the surcharge included in the composite hourly sales prices to recoup anticipated losses on work carried over from the previous fiscal year (carryover surcharge) accounted for about 7 percent of the total increase in the sales price. Our analysis showed that the fiscal year 2004 carryover surcharge was probably too high and may have been unnecessary.
- An increase in the surcharge included in the composite hourly sales prices to generate additional cash (cash surcharge) accounted for about 3 percent of the total increase in the sales price. Our analysis also showed that the fiscal year 2004 cash surcharge was unnecessary

because the Air Force Working Capital Fund's \$2.5 billion cash balance as of January 31, 2004, was already more than \$1.3 billion higher than the maximum level allowed by DOD policy. Either the Office of the Secretary of Defense or the Congress could use this unneeded cash to satisfy other requirements.

Table 1 shows the impact these factors had on the group's composite sales price. As table 1 also shows, about 5 percent of the price increase was due to factors we either did not identify or could not quantify.

Table 1: Factors Responsible for the Increase in the Air Force Depot Maintenance Activity Group's Composite Hourly Sales Price between Fiscal Years 2000 and 2004

Factor	Impact on the composite sales price	Percent of total
Higher material costs	\$78.50	67
Higher labor costs	11.86	10
Higher business operations costs	9.64	8
Higher carryover surcharge	8.00	7
Higher cash surcharge	3.55	3
Other	6.30	5
Total increase	\$117.85	100

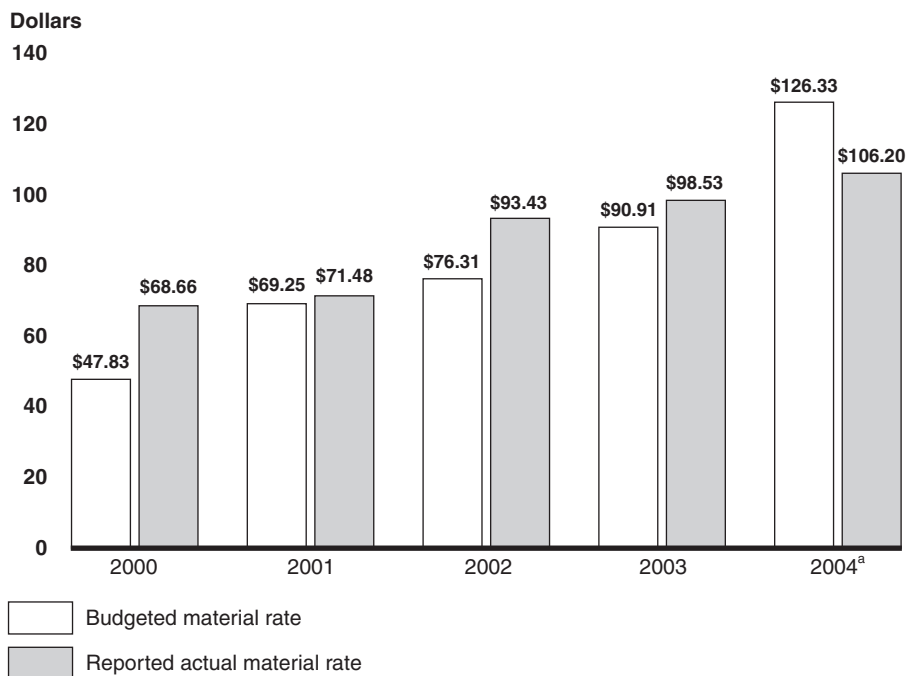
Source: Air Force Materiel Command.

Spiraling Material Costs Are Primary Cause of Price Increases, but Further Analysis Is Needed to Fully Identify Underlying Causes

As shown in table 1, although many factors contributed to the increase that occurred in the composite hourly sales price for fiscal years 2000 through 2004, higher budgeted material costs were, by far, the most significant. Further, our analysis showed that higher budgeted material costs had an even greater impact on some workloads. For example, the sales price for the repair of E-3 airborne warning and control system (AWACS) aircraft increased from \$119.69 per hour in fiscal year 2000 to \$330.06 per hour in fiscal year 2004, about 176 percent, and the price for the repair of F108-100 engines used in the KC-135 aircraft increased from \$183,240 per engine in fiscal year 2000 to \$1,214,124 per engine in fiscal year 2004, about 563 percent. Figure 1 shows the activity group's budgeted and reported actual material costs per direct labor hour of work accomplished (material expense rate) for fiscal years 2000 through 2004. While Air Force depot maintenance officials can provide anecdotal evidence on why the activity group's overall material costs have increased, they have yet to complete an

effective and comprehensive analysis to determine why material costs have increased.

Figure 1: Comparison of the Air Force Depot Maintenance Activity Group's Budgeted and Reported Actual Material Expense Rates for Fiscal Years 2000 through 2004



Source: GAO.

Note: Based on Air Force Materiel Command data.

^aReported actual material expense rate for fiscal year 2004 is as of December 31, 2003.

The Air Force Has Identified Some of the Causes of Material Cost Increases

Air Force depot maintenance officials believe the activity group's higher material costs can be attributed, to a large extent, to increased material usage that has been caused by (1) the aging of the Air Force's aircraft and engine inventory and (2) safety concerns. Further, they can provide anecdotal evidence to support their views. For example:

- Material costs related to the F-15 aircraft, which is more than 30 years old, have increased significantly over the past several years, in part, due to its age. For example, the Air Force is in the process of replacing the

aircraft's structural surfaces with a material—called gridlock—that is more expensive than the material that was used in the past to make structural repairs. According to Air Force officials at the air logistics center making the repairs, the new material is not prone to the problems that plagued the old material. As a result, the new material should allow for longer intervals between structural surface repairs and reduce structural repair costs in the future. For fiscal year 2003, the gridlock material added \$24.5 million to the estimated cost of material to be used to repair the F-15 and \$20.47 to the hourly rate charged customers for maintenance work on the aircraft.

- Due primarily to actions taken in response to safety concerns, the depot maintenance activity group raised the sales price for the repair of F101-GE-102 high-pressure turbine rotor assemblies from \$144,464 in fiscal year 2003 to \$261,872 in fiscal year 2004, an increase of \$117,408 or 81 percent. From 1999 through 2002, three F-16 aircraft crashed due to engine failures caused by metal fatigue on the engine's high-pressure turbine rotor. To address this safety problem, the Oklahoma City air logistics center began replacing the rotors on similar aircraft engines more frequently and started using more expensive rotors that were made of a stronger, more heat resistant metal alloy.

Depot maintenance officials have also determined that another major cause of their higher material costs is price growth. The activity group pays various suppliers for component parts⁶ that it uses to repair aircraft, engines, and other items. Depot maintenance officials stated that their analysis showed that the amount they had to pay for repairable component parts in fiscal year 2003 was about 9 percent higher than the price they had to pay for the same component parts in fiscal year 2002. Similarly, the activity group's fiscal year 2004 budget and, in turn, its fiscal year 2004 prices were based on the assumption that the prices it would have to pay its suppliers for repairable component parts would increase an additional 14 percent.

Another major cause of the activity group's higher material costs relates to the workloads that were transferred from two closing air logistics centers

⁶The Air Force depot maintenance activity group uses two types of component parts: (1) repairable items which are generally managed by the Air Force supply management activity group and include parts that are repaired when they become broken and (2) non-repairable items which are discarded when they become broken and which are generally managed by the Defense Logistics Agency.

(Sacramento and San Antonio) to the three remaining centers (Ogden, Oklahoma City, and Warner Robins) in the late 1990s. Depot maintenance officials acknowledged that when workloads were moved from the closing air logistics centers to the remaining centers in the late 1990s, millions of dollars of material were also transferred. Officials at one center acknowledged that this material was never recorded in the center's accounting records. When the maintenance shops needed component parts to accomplish the transferred workloads, they used the transferred material and did not record an expense in their financial records. This caused their reported material expenses to be understated in fiscal year 2000. However, since most of the transferred material has now been consumed, they now have to record the new material being purchased as expenses in their financial records. Consequently, part of what appears to be higher material costs is a more accurate reflection of actual costs.

Efforts to Develop an Effective and Systematic Methodology for Analyzing Material Cost Variances Have Been Ongoing for Several Years

In August 2000, we reported⁷ that the Air Force depot maintenance activity group did not have an effective, systematic process for identifying and analyzing variances between planned and actual material costs. The report noted that such an analysis is frequently used for manufacturing processes to determine if material usage has increased and, if so, to determine the impact on material costs. The report also pointed out that such an analysis could be used to validate Air Force officials' view that increased material usage is caused by external factors beyond the Air Force Materiel Command's control, such as the aging of the Air Force's aircraft and engine inventory. The report recommended that the Secretary of the Air Force direct the Commander, Air Force Materiel Command, to develop a systematic process to identify and analyze variances between depot maintenance activities' planned and actual material usage. In its comments on our report, the Department of Defense concurred with our recommendation and stated, among other things, that the Air Force Materiel Command planned to develop a database that could be used to analyze material usage.

As summarized below, the Air Force Materiel Command has subsequently taken numerous actions to gain a better understanding of its material cost and usage increases.

⁷U.S. General Accounting Office, *Air Force Depot Maintenance: Budgeting Difficulties and Operational Inefficiencies* [GAO/AIMD/NSIAD-00-185](#) (Washington, D.C.: Aug. 15, 2000).

-
- From September through November 2000, material analysis teams were established at Air Force Materiel Command headquarters and at each air logistics center.
 - In November 2000, Air Force Materiel Command headquarters developed a material analysis plan that (1) identified some of the material problems that would be addressed by the material analysis teams and (2) indicated that one of the key functions of the material analysis teams would be to link ongoing and planned material studies—thereby helping to reduce duplication of effort and increase coordination on ongoing studies.
 - From January 2001 through February 2002, Air Force Materiel Command conducted a comprehensive analysis of the material cost and usage increases that occurred between fiscal years 1999 and 2000. However, for a variety of reasons, the Command concluded that its analysis of these data was inadequate; for example, because it did not include all work. Consequently, from March 2002 through November 2003, the Command developed a database to facilitate its material analyses.

In November 2003, the Air Force Materiel Command initiated an analysis of the material cost and usage increases that occurred between fiscal years 2002 and 2003. Air Force Materiel Command officials believe, and we agree, that the revised methodology for analyzing material cost variances should provide more reliable results than the one they used to analyze the depot maintenance activity group's fiscal year 1999 and fiscal year 2000 material cost and usage data. However, when they completed their preliminary analysis, they determined that additional work was needed on their methodology. According to the activity group's fiscal year 2005 budget estimate, the revised model should be fully functional in November 2004.

Labor Cost Contributed to Price Increases

As shown in table 1, higher budgeted labor costs per direct labor hour of work accomplished (labor expense rate) accounted for \$11.86, or about 10 percent, of the total increase that occurred in the activity group's composite sales price between fiscal years 2000 and 2004. This increase, which is shown in table 2, was due to both an increase in the budgeted average cost of civilian labor and a decline in budgeted productivity.

Table 2: Air Force Depot Maintenance Activity Group's Budgeted Labor Expense Rates for Fiscal Years 2000 through 2004

	Fiscal year					Increase
	2000	2001	2002	2003	2004	
Budgeted labor rate	\$53.32	\$52.64	\$56.55	\$63.58	\$65.18	\$11.86

Source: Air Force Materiel Command.

Although the increase in the labor expense rate was the second most significant reason for the composite sales price's increase during this period, the labor costs' relative impact on the overall composite sales price declined significantly during this 5-year period. Specifically, in fiscal year 2000, the budgeted labor expense rate (\$53.32) was \$5.49 higher than the budgeted material expense rate (\$47.83), but by fiscal year 2004, it was more than \$60 per hour less.

Further, our analysis showed that about 61 percent of the higher labor cost was due to factors that are largely beyond the activity group's control, such as annual cost-of-living increases and increased costs for health benefits for federal employees. Specifically, our analysis showed that about \$7.25 of the \$11.86 increase in the budgeted labor expense rate was due to an increase in the average cost of civilian labor from about \$57,434 per work year per employee in fiscal year 2000 to about \$65,132 in fiscal year 2004. This increase, in turn, was due to two factors: (1) budget estimates for the average annual cost of employee compensation (for basic salary and such variables as holiday and overtime pay) increased by \$5,649 per work year per employee, or about 3 percent per year, and (2) budget estimates for the average annual cost of employee benefits (employer contributions for such things as health and life insurance) increased by about \$2,049, or about 5 percent per year.

The rest of the increase in the budgeted labor expense rate—about \$4.61 per hour—was the result of a 7 percent decline in budget estimates for worker productivity. Our analysis showed that this decline was not the result of an actual decline in reported actual worker productivity, but rather was due to overly optimistic productivity assumptions for fiscal years 2000 through 2003 and what appears to be an overly pessimistic productivity assumption for fiscal year 2004.

Specifically, our analysis showed that (1) the activity group's reported actual productivity increased about 4 percent between fiscal year 2000 and fiscal year 2003, but was consistently less than the budget estimate and

(2) the fiscal year 2004 budget estimate was based on the assumption that the fiscal year 2004 productivity would be 3 percent less than the reported actual level for fiscal year 2003.

When we asked Air Force Materiel Command officials why the activity group's fiscal year 2004 budget estimate was based on the assumption that the workforce's productivity would decline, they acknowledged that the budget assumption was probably too pessimistic. However, they also stated that they still believe that several initiatives that the Command is implementing will cause some decline in reported actual productivity during fiscal year 2004. For example, they indicated that the workforce's overall productivity is likely to decline, at least in the short term, because they plan to add about 167 overhead positions in order to implement a more effective process improvement strategy, improve the activity group's management of its infrastructure, and develop a methodology and tool to improve financial forecasting.

We attempted to review reported actual productivity data for the first part of fiscal year 2004 to determine if the fiscal year 2004 budget estimate was based on an overly pessimistic productivity assumption. However, we were unable to do so because, as of February 2004, problems related to the implementation of a new accounting system prevented the activity group from producing reliable productivity data. This data reliability problem is discussed later in this report.

Business Operations Costs Contributed to Price Increase, Especially between Fiscal Years 2003 and 2004

Business operations costs are non-labor, non-material overhead costs for such things as the repair and modernization of equipment and facilities and accounting automated data processing services. An increase in business operations costs accounted for \$9.64, or about 8 percent, of the total sales price increase as shown in table 1. Most (\$7.99, or 83 percent) of this increase occurred between the fiscal year 2003 and fiscal year 2004 budget estimates. An Air Force Materiel Command official stated that the large increase in business operations funding for fiscal year 2004 was due largely to the Air Force's realization that infrastructure support and other essential support services had been budgeted too low for several years and needed to be a higher priority in fiscal year 2004. For example, Air Force Headquarters reduced business operations cost projections that were included in the activity group's initial fiscal year 2003 budget estimate by about \$92 million because of concern about the projected large price increase and a desire to hold down costs, if possible. This reduction, in turn, forced the activity group to cut back on certain requirements, such as

the repair and modernization of facilities and equipment. The Air Force Materiel Command official stated that the fiscal year 2004 budget estimate considered the years of deferred maintenance and modernization and allowed for significant increases in these areas.

Another major cause of the large increase in business operations costs from fiscal year 2000 to 2004 is the activity group's ongoing conversion of its legacy accounting systems to the Depot Maintenance Accounting and Production System. According to Air Force depot maintenance officials, this conversion is the primary reason why budgeted costs for automated data processing and software support increased from about \$63.6 million in 2000 to about \$115.5 million in 2004. Similarly, Air Force depot maintenance officials stated that the decision to phase out their old legacy systems is the primary reason why depreciation costs for automated data systems and equipment increased from about \$92.2 million in fiscal year 2000 to about \$122.7 million in fiscal year 2004.

Work Carried Over from Previous Fiscal Year Contributed to Price Increase

During periods of increasing costs, the depot maintenance activity group generally incurs financial losses on work that is carried over from one fiscal year to the next. The reason for this is that DOD's stabilized price policy requires working capital fund activities to establish sales prices prior to the start of each fiscal year and to apply these predetermined or "stabilized" prices to most orders received during the year—regardless of when the work is accomplished or what costs are actually incurred. In other words, the activity group generally incurs financial losses on its "carryover" work because (1) the cost of doing the work generally goes up from one year to the next and (2) the stabilized price policy prevents the activity group from increasing its prices to cover the higher costs. If losses are expected on carryover work, the activity group adds a surcharge to the price of its new work in order to recoup the losses that are anticipated on its carryover work. Conversely, in the rare instance where costs are expected to decrease from one year to the next, a negative surcharge can be added.

As shown in table 1, about \$8.00, or 7 percent, of the increase in the depot maintenance activity group's composite hourly sales price can be attributed to an increase in the carryover surcharge. Our analysis showed that the fiscal year 2004 carryover surcharge added about \$164 million to activity group customers' fiscal year 2004 depot maintenance costs. Our analysis also indicated that the fiscal year 2004 carryover surcharge was probably too high and may have been unnecessary. Specifically, since most of the

work carried over from fiscal year 2003 should have been accomplished during the first quarter of fiscal year 2004 and most of the work on fiscal year 2004 orders (which had the carryover surcharge) should have been accomplished in subsequent quarters, carryover losses should have occurred during the first quarter of fiscal year 2004. However, the activity group reported a profit of about \$80 million for the first quarter. When we discussed this inconsistency with depot maintenance officials, they agreed that most of the carryover losses should have occurred in the first quarter, but they also indicated that they did not know if the reported profit (1) indicated that the carryover surcharge was unnecessary or (2) was unreliable due to problems related to the implementation of a new accounting system which, as discussed later in this report, has adversely affected the reliability of the activity group's reported accounting data.

Fiscal Year 2004 Cash Surcharge Will Generate Excess Cash

Working capital funds are required to maintain cash balances⁸ that are sufficient to finance the operations of their activity groups, but are not to tie up resources. DOD policy⁹ requires working capital funds to maintain cash balances at sufficient levels to cover 7 to 10 days of operational costs and 6 months of capital disbursements. For the Air Force Working Capital Fund, which includes several activity groups including depot maintenance and the U.S. Transportation Command, this equates to a cash balance of between \$924 million and \$1,221 million. It is important to note that (1) this cash requirement applies to the total working capital fund and (2) there is no requirement for individual activity groups to maintain a specific cash balance (for example, a cash surplus in one activity group can offset a deficit in another).

If projections of cash disbursements and collections indicate that cash balances will drop below prescribed levels, the Air Force Working Capital Fund can generate additional cash by adding a surcharge to one or more of its activity groups' composite sales prices. Additionally, if for some reason the cash balance becomes too low and there is a possibility of an

⁸The cash balance is the fund balance with Treasury which is the cash on hand at Treasury used to pay liabilities when due.

⁹DOD Financial Management Regulation 7000.14-R, Volume 2B, Chapter 9.

Antideficiency Act¹⁰ violation, the working capital funds are required to generate additional cash. One way to raise cash is by advance billing customers for work not yet performed. Conversely, if the cash balances are too high, customer prices can be reduced or possibly either the Office of the Secretary of Defense or the Congress can transfer the unneeded funds to other appropriations to either reduce budget requests or finance additional requirements.

About \$3.55, or 3 percent, of the increase in the depot maintenance activity group's composite hourly sales price can be attributed to an increase in the cash surcharge. Our work showed that Air Force Headquarters decided to include a cash surcharge in the depot maintenance activity group's fiscal year 2004 sales price. Our work also showed that the depot maintenance activity group's fiscal year 2004 cash surcharge is unnecessary and, more importantly, that the Air Force Working Capital Fund will have a substantial amount of excess cash on hand at the end of fiscal year 2004 unless either the Office of the Secretary of Defense or the Congress uses this unneeded cash to satisfy other requirements. As noted previously, DOD policy guidance requires the Air Force Working Capital Fund to maintain a cash balance of 7 to 10 days of operational costs and 6 months of capital disbursements, which equates to \$924 million and about \$1.2 billion. Our analysis showed that the Air Force Working Capital Fund's end-of-month cash balance was at least \$2.2 billion for each of the first 4 months of fiscal year 2004 and was more than \$2.5 billion as of January 31, 2004. The \$2.5 billion amount was more than \$1.3 billion higher than the maximum allowed by DOD policy. Most of the excess cash was generated by the work performed by the U.S. Transportation Command, whose cash is included in the Air Force Working Capital Fund.

When we contacted Office of the Secretary of Defense officials in March 2004 about the Air Force Working Capital Fund's excess cash, in general, and the depot maintenance activity group's fiscal year 2004 cash surcharge, in particular, they stated that they allowed the Air Force to include a cash surcharge in its depot maintenance activity group's fiscal year 2004 sales prices because (1) problems related to ongoing efforts to implement a new accounting system made the reliability of the activity group's accounting data questionable and (2) uncertainty related to ongoing actions to remove

¹⁰The Antideficiency Act, 31 U.S.C. 1341(a)(1) provides that no officer or employee of the government shall make or authorize an expenditure or obligation exceeding the amount of an appropriation of funds available for the expenditure or obligation.

contract depot maintenance operations from the Air Force Working Capital Fund made it difficult to reliably project future cash collections and disbursements. However, they also acknowledged that the Air Force Working Capital Fund has had a substantial amount of excess cash throughout fiscal year 2004 and stated that they would be exploring possible uses for the excess cash over the next few months.

Prices Charged Customers Were Not Set High Enough to Recover Costs

Prices that the depot maintenance activity group charged customers were not set high enough to recover the group's reported costs of performing the work. Air Force officials at the three air logistics centers and the Air Force Materiel Command informed us that the activity group's prices were not set high enough because the Air Force artificially constrained the activity group's prices for fiscal years 2000 through 2003 by not including all anticipated costs in the prices. In part, because the sales prices were set too low during this period, the activity group reported losing about \$1.1 billion, as shown in table 3.

Table 3: Activity Group's Reported Losses and Additional Funds Received to Recoup Losses from Fiscal Years 2000 to 2003

Dollars in millions

Fiscal year	Reported actual profit or (loss) before additional funds received	Additional funds received to recoup losses
2000	(\$369)	\$266
2001	(310)	224
2002	(279)	516
2003	(117)	0
Total	(\$1,075)	\$1,006

Source: Air Force budget reports.

To help recoup the losses, the activity group billed and collected more than \$1 billion from customers outside the pricing structure. As a result, the effective prices actually paid by customers were significantly higher during fiscal years 2000, 2001, and 2002.

The Air Force changed its sales price development philosophy in 2002 in an effort to bring prices charged customers in fiscal year 2004 more in line with operating costs. In addition, the Air Force allowed out-of-cycle price

increases in fiscal years 2002 and 2003 to alleviate projected losses. Even though the activity group made out-of-cycle price increases, the activity group still reported losses for those two fiscal years.

Customer Sales Prices Constrained

Air Force officials told us the prices were constrained to help ensure that the activity group's customers would be able to get needed work done with the amount of funds provided them through the budget process. Our work at the air logistics centers showed that customer sales prices were in fact constrained. For example, at one center we found that sales prices for work on inventory items performed by the avionics shop were constrained by not including all estimated costs of materials to be used in accomplishing the work. In developing its fiscal year 2003 customer prices, this shop estimated that its material costs would be about \$160 million. However, because of the pricing constraints levied by the Air Force, the avionics shop was only allowed to include about \$123 million of material costs in its prices, a difference of about \$37 million. However, constraining prices is contrary to DOD policy (DOD Financial Management Regulation, 7000.14-R, Volume 2B, Chapter 9) that requires activity groups to set prices to recover the full cost of providing goods and services to customers so that the working capital fund activity group would operate on a break-even basis—that is, not make a profit or incur a loss.

Air Force Changed Its Sales Price Development Philosophy

During fiscal year 2002, Air Force headquarters reversed its philosophy of constraining customer sales prices when it was developing the depot maintenance activity group's fiscal year 2004 prices to reduce the risk of future financial losses. In addition, the Air Force allowed the activity group to impose out-of-cycle customer price increases in fiscal years 2002 and 2003 to lessen projected losses resulting, in part, from its price constraining philosophy that had been in place when these fiscal year prices were developed for the budget. Specifically, in June 2002, the Office of the Assistant Secretary of the Air Force directed the Air Force Materiel Command to direct each air logistics center to increase the sales (repair) prices on 20 inventory items that it estimated were going to lose the most dollars. These price increases were effective beginning July 1, 2002—the last quarter of fiscal year 2002. Our analysis of data provided by the three air logistics centers showed that this action increased the activity group's revenue by about \$23 million, thus avoiding additional losses by this same amount.

By authority of the same June 2002 directive, the three air logistics centers were also directed to increase their fiscal year 2003 sales prices to avoid an estimated \$443 million loss that was being projected for fiscal year 2003 at that time. This out-of-cycle increase resulted in the prices charged customers increasing from \$179.42 an hour to \$199.66 an hour, approximately \$20 per hour. The air logistics centers were not provided guidance regarding how the price increase was to be applied to their individual workloads. One center applied the increase “across the board” to all workloads. Another center applied the increase primarily to its aircraft workload. The third center applied the increase primarily to its aircraft workload and also increased the sales price for one of its engines. As shown in table 4, how this increase was implemented had a profound impact on some of the fiscal year 2003 prices charged customers, resulting in price increases significantly higher than the average \$20 per hour. In some cases the prices increased by more than 50 percent.

Table 4: Air Logistics Centers’ Revised Fiscal Year 2003 Sales Prices for Selected Workloads due to Out-of-Cycle Price Increases

Workload	Original fiscal year 2003 sales price ^a	Revised fiscal year 2003 sales price ^a	Dollar increase	Percent increase
F110-100B engine	\$1,325,410.00	\$1,808,900.00	\$483,490.00	37
B-1 aircraft	200.77	332.23	131.46	65
B-52 aircraft	159.70	215.50	55.80	35
KC-135 aircraft	174.80	199.81	25.01	14
E-3 aircraft	194.72	317.28	122.56	63
F-15 aircraft	202.15	285.98	83.83	42
C-5 aircraft	203.00	236.98	33.98	17
C-130 aircraft	115.83	136.92	21.09	18
C-141 aircraft	249.11	383.03	133.92	54

Source: Air Force air logistics centers.

^aAircraft sales prices are charged per hour, whereas the sales price for engine work is per engine.

The \$20 per hour average sales price increase for fiscal year 2003 was intended to make the activity group break even at the end of fiscal year 2003 based on projected losses at the time the decision was made to increase prices. Even though sales prices were increased—significantly in some cases as shown in table 4—the activity group still reported a financial loss at the end of the fiscal year. According to an Air Force Materiel Command official, when the estimated price increase was developed they

did not consider that some of the revenue from the fiscal year 2003 price increase would be realized in fiscal year 2004 because of work started and/or accepted in fiscal year 2003 that had to be carried over and completed in fiscal year 2004.

Further, we found that the amount of the reported loss at the end of fiscal year 2003 was questionable. Based on our analysis of the financial data and discussions with activity group officials, the Air Force's implementation of the new accounting system, DIFMS, resulted in wide swings in the group's reported net operating results during fiscal year 2003. For example, one air logistics center's net operating results went from a \$1 million loss to a \$94 million loss over a period of 1 month due to the implementation of DIFMS. Another center reported a profit throughout most of fiscal year 2003, including a reported profit of \$137 million at the end of August 2003. However, the center ended the fiscal year with a reported loss of \$17 million—a \$154 million shift in 1 month—due to the implementation of the new accounting system. Air Force officials told us that implementing DIFMS was a major effort and were aware of system implementation problems and were working to resolve them.

Air Force Depot Maintenance Needs More Systematic and Effective Processes for Controlling Costs

The Air Force lacks systematic and effective processes for controlling costs. In an effort to better control cost growth, the Air Force Materiel Command has (1) been trying since 2000 to develop a systematic methodology to better understand the reasons for the rapidly increasing material costs and (2) implemented a depot maintenance process improvement program. Although these efforts represent a positive step in trying to better understand and control its depot maintenance costs, the Command has not (1) completed a successful methodology for analyzing the reasons for the rapid material cost increases and (2) entered data into a data repository¹¹ that is to be used to share cost-saving ideas among the three air logistics centers on process improvements and track the costs and savings for these improvements. These actions are necessary in order for management to control the increasing depot maintenance costs.

¹¹The Air Force Materiel Command Instruction 21-137, *Depot Maintenance Process Improvement*, August 20, 2003, established a standard Command database and all process improvement initiatives and results must be recorded and tracked in this database. This database has standardized data fields and metrics input forms to ensure data are entered in a consistent manner.

Efforts to Develop an Effective and Systematic Methodology for Analyzing Material Cost Variances Have Been Ongoing for Several Years

In August 2000, we reported¹² that the Air Force depot maintenance activity group did not have an effective, systematic process for identifying and analyzing variances between planned and actual material costs. In its comments on our report, the DOD concurred with our recommendation and stated, among other things, that the Air Force Materiel Command planned to develop a database that could be used to analyze material usage. However, as discussed earlier in this report, the Command still has not completed the methodology for analyzing material cost increases.

It is imperative that the Air Force Materiel Command complete this methodology for analyzing material costs since material costs have increased significantly over the past few years. Specifically, budgeted material costs for fiscal year 2004 are about \$2.8 billion and are expected to account for about 57 percent of the activity group's total fiscal year 2004 costs. A second reason is the fact that, as discussed previously, higher material costs account for about 67 percent of the total sales rate increase that occurred between fiscal years 2000 and 2004.

Air Logistics Centers Initiated Process Improvement Initiatives

The Air Force has recognized the need to make its depot maintenance activities more effective and efficient by incorporating best business practices that commercial companies used. The three air logistics centers undertook various process improvement initiatives designed to improve the efficiency and effectiveness of their operations. However, as discussed in the next section, the activity group does not have an effective mechanism for tracking costs and documenting savings that may have resulted from these initiatives. According to Air Force depot maintenance documentation, these initiatives are intended to eliminate waste or non-value-added processes for selected business lines, thereby reducing the number of flow days,¹³ improving the usage of available workspace, and reducing the overtime worked. In implementing these initiatives, Air Force officials visited over 35 private industry companies to gather information to improve their processes. For example, officials at the Oklahoma City Air Logistics Center consulted with Standard Aero (San Antonio), Inc. to

¹²U.S. General Accounting Office, *Air Force Depot Maintenance: Budgeting Difficulties and Operational Inefficiencies*, GAO/AIMD/NSIAD-00-185 (Washington, D.C.: Aug. 15, 2000).

¹³The number of days it takes an item to go from initial inspection to delivery back to the warfighter.

reengineer its constant speed drive repair process. According to the center's documentation, this initiative, to date, has reduced flow days by 20, reduced the part rejection rate by 25 percent, and resulted in an additional \$2.9 million in revenue over pre-2002 levels. When we visited Standard Aero (San Antonio), Inc. we found that these efficiencies were obtained by applying a cellular approach¹⁴ to depot maintenance repair work that differed significantly from the traditional functional approach.¹⁵ Other process improvement initiatives included the following.

- The Oklahoma City Air Logistics Center's initiative for the KC-135 aircraft cut in half the number of aircraft awaiting scheduled depot maintenance according to center documentation and officials. Further, the center reported that this effort reduced the number of flow days from 421 days in fiscal year 2000 to 221 days in fiscal year 2003 with a goal to have it down to 178 days by fiscal year 2005. This initiative (1) included the renovation of nine depot maintenance docks and the associated support areas and (2) implemented the "continuous flow" concept that consists of having as many aspects of the job in one area as possible and arranged so that the work flows from one step to the next without unnecessary movement to create more effective cells of productivity. Project officials noted that these changes have enabled the center to become much more efficient and put the needed aircraft back into the warfighter's hands more quickly.
- The Ogden Air Logistics Center reported that its central gearbox initiative—which is one of six projects initiated to improve the processes it uses to repair brakes, gearboxes, pylons, struts, actuators, and wheels—has increased both the efficiency and effectiveness of the gearbox repair process. Specifically, according to the center's process improvement manager, the gearbox project has allowed the center to (1) reduce gearbox's average shop flow days from 90 days to 52 days, (2) reduce the average number of gearbox assemblies in work at any given time from 46 to 21, and (3) reduce the gearbox's average labor

¹⁴An approach that arranges the work into cells that have the equipment and workstations in a sequence that supports a smooth flow of materials and components through the process, with minimal transport or delay (such as, equipment is located where needed to perform the work).

¹⁵A traditional manufacturing approach that is organized functionally with similar machines in one area (such as, all molding machines in the molding department and any molding work is transported to that location).

standard from 236 hours per gear box to 68 hours. The initiative is also expected to reduce annual direct labor costs by about \$5 million, beginning in fiscal year 2005. The process improvement manager stated that the Ogden Air Logistics Center achieved the reduction in labor costs by streamlining processes under the cellular repair concept, which eliminated bottlenecks in staging areas and cut out wasteful, unneeded repair steps.

Air Force Materiel Command Has Not Effectively Implemented Its Data Repository for Process Improvement Initiatives

The Air Force Materiel Command has not effectively implemented its data repository, which is a key part of its Process Improvement Program. Because the air logistics centers did not enter all the process improvement initiative data into the data repository, the Command (1) has been unable to properly document and implement a shared, standard process improvement program to continuously measure, analyze, and improve its depot maintenance processes and (2) does not have an effective mechanism for tracking costs and documenting savings that could have resulted from these initiatives.

Recognizing the need for better oversight of its process improvement efforts, the Air Force Materiel Command issued Instruction 21-137 on August 20, 2003, which established the policies and procedures for process improvements within all maintenance divisions at the centers. The instruction points out that process improvement within the Command is vital to becoming “World Class Depots providing the world’s best warfighter support.” It goes on to add that leveraging process improvement initiatives across the command requires standardized guidance, integration, and tracking. Accordingly, the instruction established a standard methodology by which the three centers would accomplish process improvement and become “World Class.” This was to be done by documenting and implementing a shared, standard process improvement program to continuously measure, analyze, and improve the Command depot maintenance processes. A key component was the establishment of the Command data repository to enable the Command to track process improvement results and to share the lessons learned among the centers. As of October 2003, the data repository contained 108 process improvement initiatives.

We found three problems with the implementation of this instruction and the creation of the Command data repository. First, we found that several large process improvement initiatives were not included in the data repository. For example, the process improvement projects that make up

the Oklahoma City Air Logistics Center's initiative to transform the largest industrial facility in the DOD—its building 3001—into a world class depot maintenance facility were not included in the Command data repository. According to Command Depot Maintenance Transformation officials, this initiative is beyond what they were targeting to document and capture in the data repository, but they agreed that the individual projects resulting from this initiative should be included. These officials also acknowledged that the major projects that currently make up their F-15 Trailblazer initiative—to evaluate, test, and redefine business processes for repairing the Air Force's F-15 aircraft—were not in the data repository. Air Force Materiel Command officials stated that the projects from these two large initiatives need to be included in the data repository in order for the Command to oversee the process improvement initiatives at each of the centers. The officials added that they plan to add these initiatives to the data repository as they become better defined. The Command officials also stated that the data repository has not been as fully used as envisioned and that not all process improvement initiatives have been entered as required by the Air Force Materiel Command Instruction 21-137.

Second, while the Air Force Materiel Command created a data repository of ongoing initiatives to provide needed oversight of its improvement initiatives, the information in the data repository has not proved useful because in many cases the centers failed to fill in the data fields for each initiative. As a result, we found that some of the required data fields were missing important information needed to centrally manage the process improvement initiatives. For example, 51 of the 108 initiatives had no title clearly describing the initiative. Another important required data field to identify the root causes of the problem to be corrected or improved was not completed for 54 of the 108 initiatives. Command officials agreed that the data repository has not been as useful as envisioned because many of the initiatives entered have not been fully documented since the centers have not completed the needed or required data fields.

Third, the Air Force Materiel Command Instruction 21-137 also requires that the process improvement results be recorded and tracked in the Command data repository including the costs and benefits associated with each initiative. However, the Command's input guidance to record process improvements in the data repository does not require that the data fields for costs, return on investment, and quantifiable results be completed. This contradicts the Command Instruction 21-137, which requires this information. As a result, we found the following:

-
- Cost information to implement the initiative was not recorded in the data repository for 89 of the 108 initiatives. Of the 19 initiatives containing some cost information, only 10 initiatives had recorded costs totaling \$6,328,000. The remaining 10 initiatives had recorded costs as “minimal” or “not applicable.”
 - Return on investment information—such as dollar savings—was not recorded in the data repository for 93 of the 108 initiatives. Of the 15 initiatives containing some return on investment information, only two initiatives had recorded a return on investment totaling \$828,000. The remaining 13 initiatives had recorded return on investment information with no dollar savings identified or as not applicable.
 - Quantifiable results information—such as flow days reduced—was not recorded in the data repository for 64 of the 108 initiatives. We analyzed the recorded information for the remaining initiatives containing quantifiable results and found that they did report improvements such as reducing the number of flow days and man days and improving the usage of available workspace.

An official at one air logistics center pointed out that in addition to reporting their improvement initiatives in the Command data repository, they maintain their projects on two additional local databases. Since none of these databases can communicate with one another, each database is separately maintained and updated by the program managers and the process improvement office. This is difficult to do in a timely manner and leads to differences among the databases. The center has approved a process improvement initiative to standardize these databases. Additionally, a Command depot maintenance transformation official stated that in preparing for a presentation to the Command’s depot maintenance management team he had to contact the three air logistics centers directly to obtain complete project information for his presentation. He emphasized that this would not have been necessary if the three centers had been updating the data repository with complete and useful information as required. Without complete and useful information, the data repository cannot serve as an effective tool for management to oversee these initiatives and the Command runs the risk of the centers duplicating efforts and developing stovepipe processes that hinder the Command’s efforts to provide world class depot maintenance services.

Conclusions

The Air Force depot maintenance activity group has not always operated like a business entity and thus, has not achieved the goals envisioned under the working capital fund concept—that is, to operate like a business by developing and using effective methods to control operating costs, charging customers prices that recover operating costs, and ensuring that established management tools to measure the results of operational improvement efforts are used as intended. Specifically, the group has been unable to develop an analytical methodology to effectively identify the causes of and take corrective actions, as appropriate, on its continuously upward spiraling material costs. Further, working capital fund activities are to establish sales prices that allow them to recover their expected costs from their customers. However, the activity group intentionally set its sales prices lower than what was required to recover its operating costs and, as a result, incurred operating losses. Although several promising improvement initiatives are underway at the three centers, these efforts are stove piped and management has been unable to clearly show that the benefits of the initiatives exceed their costs.

Matter for Congressional Consideration

The congressional defense committees have shown interest in the amount of cash in the Defense Working Capital Fund in past years. The Air Force Working Capital Fund cash balance has exceeded the maximum cash requirement by over \$1.3 billion for each of the first four months of fiscal year 2004. If DOD does not take action to reduce the cash balance to the 7 to 10 day requirement, the Congress may wish to take action to reduce the amount of excess cash in the Air Force Working Capital Fund.

Recommendations for Executive Action

To improve the business operations of the Air Force Working Capital Fund including cash management and the setting of prices and efforts to control costs of the depot maintenance activity group, we are making two recommendations to the Secretary of Defense and four recommendations to the Secretary of the Air Force.

We recommend that the Secretary of Defense

- take action to reduce the amount of excess cash in the Air Force Working Capital Fund.

-
- direct the Secretary of the Air Force to develop prices that cover the total costs of providing goods and services to customers and not constrain prices as has been done in the past.

We recommend that the Secretary of the Air Force direct the Commander, Air Force Materiel Command to

- develop and complete a viable, systematic methodology for analyzing material cost variances that encompasses both the price paid for material and material usage that would enable the Air Force Materiel Command to better understand the underlying causes of the rapidly increasing material costs and take actions to control material costs, as appropriate.
- hold the air logistics centers' managers accountable for compliance with the Command's mandatory Instruction 21-137 requiring the centers to enter all initiatives and related data into the data repository completely and accurately. This should include initiative information on costs, return on investment, and quantifiable results for all process improvement initiatives. At a minimum, the Command needs to issue a memorandum to the air logistics centers reiterating their responsibilities for compliance with the instruction.
- periodically review the data contained in the data repository to (1) determine whether the data provided by the air logistics centers is complete and useful and (2) identify ways to consolidate initiatives and share lessons learned from the initiatives with the three centers.
- summarize and determine the actual savings and/or real benefits as compared to the costs from the improvement initiatives already contained in the repository.

Agency Comments and Our Evaluation

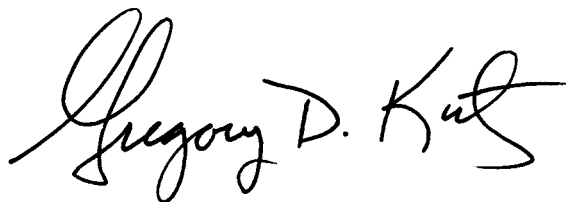
DOD provided written comments on a draft of this report. In its comments, DOD concurred with the six recommendations in the draft report and is taking action to implement them. In fact, DOD has already taken action to help eliminate the excess cash in the Air Force Working Capital Fund by transferring \$1.1 billion of the excess cash to the Army and Navy Operation and Maintenance appropriation accounts in April 2004. However, the Air Force Working Capital Fund had about \$400 million of excess cash as of the end of April 2004. Recognizing that cash balances fluctuate from month to month, we continue to believe that it would be appropriate for the

Congress to monitor the working capital fund cash balances and take action to reduce the amount of excess cash if the balances continue to be in excess of amounts necessary. Concerning our recommendation on the Air Force developing prices that cover the total costs of providing goods and services to customers, DOD stated that the DOD Comptroller will perform a more intensive review of the Air Force depot maintenance billing rates to ensure that the proposed pricing structure is adequate to cover the costs of operations.

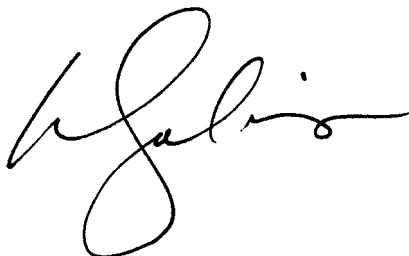
We are sending copies of this report to the Chairmen and Ranking Minority Members of the Senate Committee on Armed Services; the Subcommittee on Readiness and Management Support, Senate Committee on Armed Services; the Subcommittee on Defense, Senate Committee on Appropriations; the House Committee on Armed Services; the Subcommittee on Readiness, House Committee on Armed Services; and the Ranking Minority Member, Subcommittee on Defense, House Committee on Appropriations. We are also sending copies to the Secretary of Defense, Secretary of the Air Force, and other interested parties. Copies will be made available to others upon request. Should you or your staff have any questions concerning this report, please contact Gregory D. Kutz, Director, at (202) 512-9505 or kutzg@gao.gov or William M. Solis, Director, at (202)

512-8365 or solisw@gao.gov. An additional contact and key contributors to this report are listed in appendix III.

Sincerely yours,

A handwritten signature in black ink that reads "Gregory D. Kutz". The signature is written in a cursive style with a large initial 'G'.

Gregory D. Kutz
Director, Financial Management and Assurance

A handwritten signature in black ink that reads "William M. Solis". The signature is written in a cursive style with a large initial 'W'.

William M. Solis
Director, Defense Capabilities and Management

Scope and Methodology

To determine what factors were primarily responsible for causing the composite sales price to increase from \$119.99 per hour in fiscal year 2000 to \$237.84 per hour in fiscal year 2004, we obtained and analyzed budget documents that provided information on cost factors, such as material costs, overhead costs, and salaries used in developing the prices. We determined which factors caused the prices to increase the most and discussed the reasons for the price increases with officials at the Air Force Materiel Command and the three air logistics centers. In addition, we obtained information on the impact of the price increases on certain aircraft and engines such as the F-15 and E-3 aircraft. We also reviewed and analyzed the Air Force February 2002 report on depot maintenance material usage and cost analysis study to determine why prices have increased. Finally, we met with Air Force Materiel Command officials to determine what actions they were taking to identify the causes for increasing material costs—a significant factor causing prices to increase—since the Air Force issued its February 2002 report.

To determine if the prices charged customers during fiscal year 2000 through fiscal year 2003 recovered the reported actual costs of performing the work, we obtained and analyzed budget documents and accounting data that provided information on budgeted and actual revenue, direct costs, overhead costs, and net operating losses. When the activity group reported losses, we met with officials to determine (1) why the prices charged customers did not recover costs incurred in providing them the goods and services and (2) how the Air Force recovered these losses.

To determine if the Air Force has taken effective steps to improve efficiency and control the activity group's costs, we obtained the Command's depot maintenance database that contained 108 initiatives aimed at improving depot maintenance operations. We analyzed the database to determine if each initiative had information on the (1) cost to implement the initiative and (2) the amount of dollar savings associated with implementing the initiative. Information on cost and savings is critical to determine if the initiative is cost beneficial. We also analyzed the database to determine if there was sufficient information that would enable the air logistics centers to share information with each other on the initiatives thereby reducing or eliminating redundant efforts. We also met with officials from Air Force Materiel Command and the air logistics centers to discuss (1) process improvement initiatives, especially information on initiative costs, savings, and the sharing of information and (2) whether all initiatives were included in the database.

We performed our work at the headquarters, Office of the Under Secretary of Defense (Comptroller) and the Office of the Secretary of the Air Force, Washington, D.C.; Air Force Materiel Command, Ohio; the Oklahoma City Air Logistics Center, Tinker Air Force Base, Oklahoma; the Ogden Air Logistics Center, Hill Air Force Base, Utah; and the Warner Robins Air Logistics Center, Robins Air Force Base, Georgia. We also visited Standard Aero (San Antonio) Inc. and discussed with company officials the Oklahoma City Air Logistics Center's initiative to reengineer its constant speed drive repair process. We did not verify the accuracy of the accounting and budget information used in the tables in this report, all of which was provided by the Air Force in then-year dollars. We conducted our work from June 2003 through April 2004 in accordance with U.S. generally accepted government auditing standards. We requested comments on a draft of this report from the Secretary of Defense or his designee. DOD provided written comments, and these comments are presented in the Agency Comments and Our Evaluation section of this report and are reprinted in appendix II.

Comments from the Department of Defense



COMPTROLLER

UNDER SECRETARY OF DEFENSE
1100 DEFENSE PENTAGON
WASHINGTON, DC 20301-1100



MAY 10 2004

Mr. Gregory Kutz, Director, Financial Management and Assurance
Mr. William Solis, Director, Defense Capabilities and Management
U.S. General Accounting Office
Washington D.C. 20548

Dear Mr. Kutz and Mr. Solis:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "AIR FORCE DEPOT MAINTENANCE: IMPROVED PRICING AND COST REDUCTION PRACTICES NEEDED" dated April 14, 2004 (GAO Code 04-498). I concur with the recommendations identified in the draft report and am taking action to comply with them. Additional comments are provided in the enclosure.

While the report identifies significant problems in estimating cost and establishing pricing for this activity group, our internal reviews have indicated that FY 2004 pricing and performance shows significant improvements over past practices.

Sincerely,

John P. Roth
Deputy Comptroller for
Program Budget

Enclosure
As stated

GAO DRAFT REPORT DATED APRIL 14, 2004
GAO-04-489 (GAO CODE 192098)

"AIR FORCE DEPOT MAINTENANCE: IMPROVED PRICING
AND COST REDUCTION PRACTICES NEEDED"

DEPARTMENT OF DEFENSE COMMENTS
TO THE GAO RECOMMENDATIONS

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense take action to reduce the amount of excess cash in the Air Force Working Capital Fund. (p. 38/GAO Draft Report)

DOD RESPONSE: Concur. The Department periodically reviews DWCF cash balances and takes appropriate action to correct both excess cash balances and cash shortfalls in its DWCF activities. In April 2004 the Department took steps to eliminate excess cash balances in the Air Force Working Capital Fund by transferring excess cash balances to Service Operation and Maintenance appropriations.

RECOMMENDATION 2: The GAO recommended that the Secretary of Defense direct the Secretary of the Air Force to develop prices that cover the total costs of providing goods and services to customers and not constrain prices as has been done in the past. (p. 38/Draft Report)

DOD RESPONSE: Concur. In our instructions for the upcoming FY 2006 budget review the Air Force will be directed to comply with this recommendation. Additionally, OSD (Comptroller) will perform a more intensive review of the Air Force Depot Maintenance billing rates to ensure that their proposed pricing structure is adequate to cover the total cost of operations.

RECOMMENDATION 3: The GAO recommended that the Secretary of the Air Force direct the Commander, Air Force Materiel Command, to develop and complete a viable, systematic methodology for analyzing material cost variances that encompasses both the price paid for material and materiel usage that would enable the Air Force Materiel Command to better understand the underlying causes of the rapidly increasing material costs and take actions to control material costs, as appropriate. (p. 38/Draft Report)

DOD RESPONSE: Concur. The Air Force completed implementation of their cost accounting system at the end of FY 2003 and is currently conducting reviewing the data to determine if additional corrective actions are required. The Air Force will continue to brief OSD (C) quarterly on this issue.

RECOMMENDATION 4: The GAO recommended that the Secretary of the Air Force direct the Commander, Air Force Materiel Command, to hold the Air Logistics Center managers accountable for compliance with the Command's mandatory Instruction 21-

Enclosure

137 requiring the centers to enter all initiatives and related data into the data repository completely and accurately. The GAO suggests that this include the initiative information on costs, return on investment, and quantifiable results for all process improvement initiatives. At a minimum, the GAO states that the Command needs to issue a memorandum to the Air Logistics Centers reiterating their responsibilities for compliance with the instructions. (p. 39/Draft Report)

DOD RESPONSE: Concur. Starting with FY 2004 data the Air Force will hold the Air Logistics Center managers accountable for compliance with Air Force Instruction 21-137.

RECOMMENDATION 5: The GAO recommended that the Secretary of the Air Force direct the Commander, Air Force Materiel Command, to periodically review the data contained in the data repository to (1) determine whether the data provided by the Air Logistic Centers is complete and useful and (2) identify ways to consolidate initiatives and share lessons learned from the initiatives with the three centers. (p. 39/Draft Report)

DOD RESPONSE: Concur. The Air Force will establish a schedule to periodically review the data repository and brief OSD (C) quarterly on the status of this initiative.

RECOMMENDATION 6: The GAO recommended that the Secretary of the Air Force direct the Commander, Air Force Materiel Command, to summarize and determine the actual savings and/or real benefits as compared to the costs from the improvement initiatives already contained in the repository. (p. 39/Draft Report)

DOD RESPONSE: Beginning with the FY 2006 Budget review the Air Force will brief OSD (C) quarterly on the status of this initiative.

Enclosure to Memo,
GAO Draft Report,
Page 2 of 2

GAO Contact and Staff Acknowledgments

GAO Contact

Greg Pugnetti, (703) 695-6922

Acknowledgments

Staff who made key contributions to this report were Francine DelVecchio, Karl Gustafson, Keith E. McDaniel, Christopher Rice, Harold P. Santarelli, Ron Tobias, and Eddie Uyekawa.

GAO's Mission

The General Accounting Office, the audit, evaluation and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through the Internet. GAO's Web site (www.gao.gov) contains abstracts and full-text files of current reports and testimony and an expanding archive of older products. The Web site features a search engine to help you locate documents using key words and phrases. You can print these documents in their entirety, including charts and other graphics.

Each day, GAO issues a list of newly released reports, testimony, and correspondence. GAO posts this list, known as "Today's Reports," on its Web site daily. The list contains links to the full-text document files. To have GAO e-mail this list to you every afternoon, go to www.gao.gov and select "Subscribe to e-mail alerts" under the "Order GAO Products" heading.

Order by Mail or Phone

The first copy of each printed report is free. Additional copies are \$2 each. A check or money order should be made out to the Superintendent of Documents. GAO also accepts VISA and Mastercard. Orders for 100 or more copies mailed to a single address are discounted 25 percent. Orders should be sent to:

U.S. General Accounting Office
441 G Street NW, Room LM
Washington, D.C. 20548

To order by Phone: Voice: (202) 512-6000
 TDD: (202) 512-2537
 Fax: (202) 512-6061

To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Web site: www.gao.gov/fraudnet/fraudnet.htm

E-mail: fraudnet@gao.gov

Automated answering system: (800) 424-5454 or (202) 512-7470

Public Affairs

Jeff Nelligan, Managing Director, NelliganJ@gao.gov (202) 512-4800
U.S. General Accounting Office, 441 G Street NW, Room 7149
Washington, D.C. 20548

**United States
General Accounting Office
Washington, D.C. 20548-0001**

**Official Business
Penalty for Private Use \$300**

Address Service Requested

**Presorted Standard
Postage & Fees Paid
GAO
Permit No. GI00**

