

December 1997

**AIR FORCE  
PRIVATIZATION-IN-  
PLACE**

**Analysis of Aircraft and  
Missile Guidance System  
Depot Repair Costs**



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**National Security and  
International Affairs Division**

B-277787

December 22, 1997

Congressional Requesters

As requested, we reviewed the Air Force's interim cost comparison of operating its former Aerospace Guidance and Metrology Center (AGMC) in Newark, Ohio, prior to its closure with the current privatized-in-place cost as the Boeing Guidance Repair Center (BGRC).<sup>1</sup> We previously discussed the AGMC/BGRC cost comparison issues in testimonies during March and April 1997.<sup>2</sup> This report provides our assessment of the interim comparison, including the major reasons for cost differences between the two activities. This report contains no recommendations.

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**Background**

AGMC was closed as a result of a 1993 decision of the Base Realignment and Closure (BRAC) Commission. In recommending the closure of the Newark Air Force Base/AGMC, the Commission noted that the workload could be privatized or moved to other depot maintenance activities. The BRAC recommendation states

“The Aerospace Guidance and Metrology Center (AGMC) depot will be closed; some workload will move to other depot maintenance activities including the private sector.”

After the BRAC recommendation to close AGMC was finalized, (1) the Air Force moved a small portion of AGMC's Air Force workload to other Air Force depots, (2) the Navy moved most of its AGMC workload to other sites, and (3) the Army moved all of its AGMC workload to other sites. The Air Force decided to privatize-in-place the remaining AGMC workloads. At the time it made this decision, the Air Force relied on an analysis that estimated privatizing would save about \$5 million in 1997. However, the preaward analysis was not documented and Air Force officials do not know the basis for the costs included. Consequently, the Air Force was not able to reconcile its current interim study to its precontract award analysis.

Since October 1996, the Newark, Ohio facility has been operated as the Boeing Guidance Repair Center by two contractors—Boeing North American, Inc., (Autonetics Electronics Systems Division) and Wyle Laboratories, Inc. The BGRC repair contract is managed by the Air Force's

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<sup>1</sup>The term Boeing Guidance Repair Center refers to the facility housing the two privatization-in-place contractors—the Boeing Company and Wyle Laboratories.

<sup>2</sup>Defense Depot Maintenance: Uncertainties and Challenges DOD Faces in Restructuring Its Depot Maintenance Program ([GAO/T-NSIAD-97-111](#), Mar. 18, 1997) and ([GAO/T-NSIAD-97-112](#), Apr. 10, 1997).

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Ogden, Utah, Air Logistics Center program office. Weapon system and item management functions for missile inertial guidance systems are performed at Ogden and the same functions for aircraft inertial guidance systems are managed at the Air Force's Oklahoma City Air Logistics Center. The Air Force is retaining ownership of depot plant equipment with an estimated value of \$326 million. The Newark-Heath-Licking County Port Authority is in the process of purchasing the Newark Air Force Base real property.<sup>3</sup> The Port Authority currently leases the facility to Boeing, which then subleases a portion of the facility to Wyle Laboratories. Additional details regarding the AGMC's mission and the depot's closure and privatization-in-place are found in appendix I.

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## Privatization-in-Place Experience

The Air Force's AGMC and two Navy facilities are the only privatizations-in-place resulting from BRAC decisions and have, consequently, created much interest in the cost and benefits of this concept.<sup>4</sup> The question of whether closing and privatizing-in-place AGMC's workload would result in savings arose soon after the 1993 BRAC closure decision. After the decision, Air Force organizations conducted several studies comparing the projected cost of privatizing-in-place the AGMC depot maintenance workload against the historical costs of the Air Force depot. These studies concluded that costs of a privatized-in-place operation would exceed the historic costs by \$6.2 million to \$20 million, on a projected workload of about \$82 million to \$90 million. However, in late 1995, at the time of the decision to award the contract, an Air Force Materiel Command (AFMC) analysis concluded that privatization-in-place would save about \$5 million in 1997 and a total of \$20 million over the 5-year contract period.

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## Preliminary Analysis of Contract Costs

In April 1996, we testified that preliminary data showed (1) unit costs were higher after privatization-in-place for 201, or about 79 percent of the items we reviewed; and (2) overall, repair costs increased by about \$6 million for the 254 items reviewed.<sup>5</sup> We also noted that AFMC's projected 5-year savings of \$20 million did not include all relevant costs. For example,

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<sup>3</sup>The Heath-Newark-Licking County Port Authority is the Ohio chartered local reuse authority responsible for redeveloping and managing the closed Newark Air Force Base facilities.

<sup>4</sup>The AGMC privatization-in-place is different from current Air Force outsourcing efforts at San Antonio and Sacramento Air Logistics Centers. The Air Force is now conducting public-private competitions at these centers following DOD's December 1996 reinstatement of these competitions.

<sup>5</sup>Defense Depot Maintenance: Privatization and the Debate Over the Public-Private Mix (GAO/T-NSIAD-96-146, Apr. 16, 1996) and (GAO/T-NSIAD-96-148, Apr. 17, 1996).

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estimated contract costs excluded \$15 million in material costs for eight contract items.

Following a 9-month transition period, the first full year of the BGRC contract operations began in October 1996. After the first quarter, Ogden and Oklahoma City logistics center personnel noted that funds were being expended faster than anticipated for the BGRC contract. The most significant factor appeared to be the increased amount of material being ordered. After reviewing Ogden and Oklahoma City information, we requested that the aircraft guidance program office at the Oklahoma City Air Logistics Center and the missile guidance program office at Ogden Air Logistics Center compare contractor versus Air Force depot costs for the fiscal year 1997 workload. Headquarters, AFMC, managed this evaluation.

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## Results in Brief

The Air Force's interim comparison estimates that BGRC's first year privatization-in-place costs will be higher than AGMC's historical costs for similar work. The methodology used in the comparison is analytically sound and appears reasonable given the status of the program; however, until actual cost data is available, it is premature to reach a final conclusion on the cost issue. Three factors significantly influenced the increased cost at the facility—estimated increased material cost, contract oversight, and contractor award fee. As with any successful privatization, improved contractor process efficiencies and operating cost reductions are needed to offset such cost factors. The contractor disagrees with the Air Force study and is working with AFMC to resolve their differences. The Air Force will continue to monitor these contracts as actual cost data becomes available. Specifically our work shows:

- The Air Force performed an interim analysis comparing both actual and estimated aircraft and missile inertial navigation system repair and metrology costs at the Boeing Guidance Repair Center to actual historic costs for comparable workloads prior to privatization-in-place. The analysis estimated that the first full year of operations at the privatized-in-place Center will likely cost \$14.1 million more than it would have if the facility had continued to operate as a public activity. This is a 16-percent cost increase.
- Boeing questioned the Air Force Materiel Command's assessment, saying that its own estimate indicates that costs are about \$6.8 million lower than before privatization-in-place. Boeing also noted that it is exceeding contract quality requirements and minimum delivery schedules. Air Force officials stated that Boeing's cost analysis is not complete and

comprehensive. For example, they noted that Boeing's estimate did not include contract administration and oversight costs of about \$3.4 million, and overstated historic operations and maintenance costs by about \$5 million.

- The Air Force cost study methodology is analytically sound and used the best available data. Based on the available data, the methodology provides a reasonable interim estimate of costs for similar workloads performed by the Air Force depot and during the first year of privatization-in-place. The Air Force's methodology is consistent with Department of Defense (DOD) guidance on public-private depot competitions in the Defense Depot Maintenance Council Cost Comparability Handbook and in supplemental procedures provided by the Air Force for conducting public-private competitions.
- The Air Force's interim study does not include a variable-by-variable comparison between historical and current costs of operations, but it does identify three cost factors contributing to the increased costs at the facility. They are: (1) estimated increased material cost of \$3.4 million, (2) contract administration and oversight costs of \$5.5 million, and (3) estimated contractor award fees of \$5.2 million.

## Air Force Interim Study Indicates That Contract Costs Exceed Costs of AGMC Operations

The Air Force's July 1997 interim study projected that the privatization-in-place of guidance repair and metrology workloads at BGRC will result in fiscal year 1997 costs being from \$3 million to \$32 million more than the costs of performing the same work when the facility was operated as an Air Force depot. Actual data was used to determine AGMC's pre-closure costs and actual cost data available to date and estimates were used to project BGRC's costs for 1997. The Air Force plans to update BGRC's costs using complete actual data after the 1997 workload is closed out. The contractor disagreed with the AFMC interim study and provided its own analysis. Air Force officials said the Boeing analysis was not comprehensive because it (1) did not include contract administration and oversight costs and (2) overstated AGMC costs prior to privatization-in-place.

## Results of Air Force's July 1997 Interim Study

In April 1997, AFMC estimated that privatized-in-place repair operations for the year would cost from \$7.7 million to \$31.2 million more than historical costs of AGMC operations—a 10.2- to 44.8-percent increase—with a most likely increase of \$16.1 million. In July 1997, AFMC expanded its interim

cost analysis to include the metrology costs<sup>6</sup> and revised its prior estimates based on a reevaluation of overhead and base operation and support costs. Using actual cost data, this reevaluation increased the costs of each workload repaired prior to privatization by allocating all base operation and support costs from the Newark Air Force Base, including those not directly affecting the depot maintenance business area, to the maintenance and metrology workloads. The later projection indicated that the privatized-in-place repair and metrology operations during the first year of the contract would cost from \$3.4 to \$32 million more than the historical AGMC cost—a 3.8- to 39-percent increase—with a most likely increase of \$14.1 million, or about 16 percent. Because these comparisons are subject to change, AFMC officials noted that they would be revisited when the fiscal year 1997 contract period is over. Appendix II summarizes the results of these analyses.

#### Earlier Study Results Cannot Be Reconciled

The AFMC 1995 precontract award analysis indicated potential savings of \$5 million in fiscal year 1997 through privatization-in-place. However, the more recent, interim study suggests that privatization-in-place may cost \$14.1 million more, which would indicate a 16-percent cost increase. The interim analysis estimated the cost of operating the privatized facility to be 3.7 percent higher than the preaward study, and the preclosure cost of operations to be about 15.6 percent less than the preaward study. Table 1 provides a comparison of total costs from AFMC's preaward and interim post-award analyses. We asked AFMC Headquarters officials for the rationale for the difference between these estimates—particularly the substantial decrease in AGMC's preclosure cost. They stated that they do not have the documentation supporting the \$5 million savings, and, therefore, they are not able to reconcile differences between the 1995 and current analyses. They noted that the estimated inhouse costs from the interim study were based on the fiscal year 1995 data obtained from the end-item cost report dated September 30, 1995, adjusted for quantity differences. Comparability adjustments were made to cost elements as specified in the cost comparability handbook for public-private competitions. Air Force officials said no data was available to support the estimated inhouse costs included in the preaward study and the estimates do not provide a valid comparative baseline of historical costs. On the other hand, the interim study provides an accurate baseline of AGMC's costs for comparison with the current and future costs of the privatized activity. Our review of historical data and study documentation supports this conclusion.

<sup>6</sup>AGMC performed overall technical direction and management of the Air Force Metrology and Calibration Program and operated the Air Force Measurement Standards Laboratory.

**Table 1: Results of AFMC Studies Comparing Estimated Fiscal Year 1997 Organic to Privatized-in-Place Costs for Same Workload**

	AFMC Cost Analyses	
	Preaward study	Interim study
Dollars in millions		
<b>Operations</b>		
AGMC (Air Force depot)	\$99.8	\$84.2
BGRC (privatized depot)	94.8	98.3
<b>Difference</b>	<b>\$ 5.0</b>	<b>-\$14.1</b>

Source: AFMC November 1995, April 1997, and July 1997 AGMC cost studies.

## Boeing Disagrees With Air Force Interim Study

Boeing officials disagreed with the results of AFMC's most recent interim study. They believe it overstates the contractor's material consumption and neglected to adjust for historic military construction expenditures. As a result, they are concerned that AFMC miscalculated the cost of privatization-in-place. In response, Boeing did its own analysis estimating that privatization-in-place would cost \$67.2 million compared to its estimate of \$74.0 million for government operations—a \$6.8 million savings over government operations in fiscal year 1997. Boeing officials met with AFMC officials on August 5, 1997, to present their analysis and to gain an understanding of the AFMC methodology. According to Boeing and AFMC officials, the Boeing estimate did not include a detailed analysis of specific workloads and costs. AFMC officials added that the Boeing analysis was not comprehensive. For example, they pointed out that Boeing's estimate did not include contract administration and oversight costs of about \$3.4 million, and it overstated historic AGMC operations and maintenance costs by about \$5 million.

However, AFMC did acknowledge the need to address Boeing's concern about historic military construction expenditures and to meet with Boeing to discuss the need for some adjustments to its cost comparison. AFMC stated that the issue of material consumption would be resolved through an Air Force Audit Agency review that is scheduled to be completed in December 1997.

Boeing officials also pointed out that they are meeting or exceeding contract requirements for cost, schedule, and performance. For example, Boeing officials, noted that they are:

- underrunning target costs by 5 percent and 15 percent for Intercontinental Ballistic Missile and aircraft guidance system repair;



- exceeding minimum delivery schedules and delivering more end-items per month than AGMC had been tasked to deliver in fiscal year 1995; and
- exceeding quality requirements by achieving less than a 3-percent quality deficiency report rate versus the contract goal of 10 percent or less.

We agree with Boeing that preliminary indications show that it is meeting contract goals. It will not be until all the costs are available for 1997, the first full year of privatized operations, that we will be able to determine how the cost of the privatized maintenance operations compares with cost of comparable maintenance operations by the Air Force depot.

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## AFMC Interim Study Methodology Is Reasonable and Provides Indications of Reason for Cost Increases

Our work indicates that, in general, AFMC's methodology for estimating the cost of work performed at the privatized-in-place BGRC facility and the cost for the same work based on AGMC cost data was reasonable. The methodology was analytically sound and used the best available data. In selecting its methodology and identifying the appropriate data, AFMC gathered input and addressed criticisms from various Air Force, Defense Contract Management Command, and contractor officials. AFMC's methodology is consistent with DOD guidance on public-private depot competitions found in the Defense Depot Maintenance Council Cost Comparability Handbook and in supplemental Air Force procedures for conducting public-private competitions. Defense contractors participated in the development of the handbook and in subsequent revisions. We previously reviewed the handbook as a part of our assessment of depot maintenance public-private competitions and found that it generally covers the factors that should be considered in such competitions. In performing its analysis, the Air Force Materiel Command used actual data where it was known and estimated costs when actual costs were not available. Estimated costs were expressed as ranges, using most likely, low, and high estimates. A summary of the methodology used for the analysis is provided in appendix III.

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## Reasons for Increased Contractor Cost

AFMC's interim study does not include a variable-by-variable comparison between historical and current costs of operations. However, the study provides sufficient data to identify three factors that increased costs at the facility: (1) material cost, (2) contract administration and oversight, and (3) contractor award fee.

## Materials

Material orders have significantly increased since privatization. However, the Air Force has not determined the extent to which material

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consumption has increased. Therefore, the interim AFMC study results covered the range of possible contractor material consumption from no increase at the low end to a 100-percent increase, or about \$15.7 million at the high end, with the most likely increase being 35 percent, or about \$5.5 million.

AFMC asked the Air Force Audit Agency to determine the contractor's actual material consumption. While the Audit Agency does not anticipate completing the audit until December 1997, auditors have visited BGRC to review material ordering and consumption with the contractor and program offices. Based on work performed thus far, the auditors made the following observations:

- Contractor inventory records are not sufficiently complete to allow them to determine the value of total inventory on hand.
- Contractor inventory records do not provide an accurate basis for determining the value of inventory usage.
- The contractor appears to have a greater amount of government-furnished material than necessary for existing needs.
- Items to be repaired have been misclassified as government-furnished material.

According to Audit Agency officials, two factors will inhibit AFMC's ability to reconcile physical inventory with the inventory records and establish material consumption rates. First, with Air Force and contractor concurrence, the contractor accepted a transfer of initial material inventory from the Air Force without the Air Force performing a physical inventory. According to the Audit Agency, the contractor disputes the accuracy of the Air Force's inventory transfer documents and, therefore, it may be impossible to determine how much material the contractor has consumed. In addition, the contractor assumed control over stock already issued to the shop floor that was not on Air Force inventory records. Therefore, the Air Force has no accurate way to measure consumption of those items typically held in stock at repair work benches.

According to the Air Force Audit Agency, because the contract award fee structure does not emphasize minimizing the use of government-furnished material, the contractor may have used a greater amount of such material than necessary in order to reduce repair turn around time on items. Nonetheless, BGRC personnel maintain that BGRC's consumption of material does not vary significantly from prior AGMC consumption levels because it

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is repairing items using the same people, the same facilities, and the same repair procedures.

While the increased ordering of material clearly represents an increased cost to the program during the period evaluated, it is uncertain how material consumption will compare over a longer period. Considering the significant increase in material orders and the absence of actual consumption data, we believe it is reasonable for AFMC to reflect this increase in its treatment of material consumption at this time.

Contract Oversight and Administration

Consistent with the Defense Depot Maintenance Council's Cost Comparability Handbook, the interim study includes contract oversight and administration as an additional cost to privatization. AFMC estimated this cost for the two BGRC contracts to be \$3.4 million for 1997. The contracts require oversight from three entities: the Defense Contract Management Command (DCMC), the Ogden Air Logistics Center's program office, and the Defense Contract Audit Agency (DCAA). The payroll costs for these organizations as well as the cost of supplies and travel expenses added by AFMC seem appropriate for the cost comparison.

Contractor Award Fee

AFMC's interim study recognizes that the award fee earned by the contractor accounts for a portion of the cost of privatization-in-place. While the fee can range from zero to 10 percent of the estimated contract cost, the average Air Force fee for performance reviews to date has been 9.4 percent. In its cost study, AFMC provided for varying projections of contractor award fees, based on historical data and contractor performance during the first half of 1997. The estimated fee ranged from 5 percent to 10 percent, with 9 percent being suggested as the most likely award fee rate, equating to a most likely contractor fee of about \$5.2 million for 1997.

Including this cost element is consistent with a December 1996 joint memorandum from the Principal Deputy Assistant Secretaries of the Air Force for Acquisitions and for Financial Management, which called for recognizing award fees in evaluating public-private depot competitions. According to AFMC officials, the award fee adjustment was added to the standard adjustments provided for in the Cost Comparability Handbook to enhance the Air Force's ability to arrive at decisions that provide the best overall value to the government. The methodology followed in estimating this cost element appears reasonable.

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## Conclusions

The Air Force's interim comparison estimates that BGRC's first year privatization-in-place costs will be higher than AGMC's historical costs for similar work. The methodology used in the comparison is analytically sound and appears reasonable given the status of the program; however, until actual cost data is available, it is premature to reach a final conclusion on the cost issue. Three factors significantly influenced the increased cost at the facility—estimated increased material cost, contract oversight, and contractor award fee. As with any successful privatization, improved contractor process efficiencies and operating cost reductions are needed to offset such cost factors. The contractor disagrees with the Air Force study and is working with AFMC to resolve their differences. Further, the Air Force will continue to monitor these contracts as actual cost data becomes available.

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## Agency and Contractor Comments and Our Evaluation

DOD officials provided oral comments on a draft of this report addressing two points. The first pertained to our reference to the Air Force's interim analysis as using 0 percent, 35 percent and 100 percent to simulate the minimum, most likely, and maximum cost. Air Force officials stated that its interim analysis actually assigned 100 percent to both the minimum and most likely material consumption cost computations and 200 percent to the maximum material costs. The 100 percent referred to by the Air Force is the same as the historic material consumptions costs and represents the 0-percent increase we use in our explanation for the minimum condition. In stating that there was no increase in material assigned to the most likely scenario, the Air Force was referring to the material consumption variable input to the model. Our discussion of this factor refers to the material consumption cost estimates that resulted from the processing of the model. The second comment dealt with our discussion of the employee benefits proposal submitted by Boeing. Since the benefit proposal has since been rejected, we have removed from the draft of this report our discussion of the proposal and its potential cost.

Officials from the Autonetics and Missile Systems Division of Boeing North American, Inc., also commented, raising concerns about comments made by the Air Force Audit Agency and about the material usage assumptions in the AFMC interim study. Boeing officials said they thought the Audit Agency's comments about material consumption were misleading because the level of inventory was not properly recorded at the time of transition. Moreover, they said that the Audit Agency's approach greatly overstated material usage. As previously discussed, lacking precise data on material consumption, the Air Force study used a range from no

increase on the low end to a high of a 100-percent increase, with a 35-percent increase used to represent the most likely usage. In the absence of actual consumption data, Air Force officials stated that they based their treatment of consumption on material orders, which should provide a good indicator of consumption. Given the high material usage indicators but the lack of definitive data, the Air Force also took several independent actions. It initiated a material consumption review by the Air Force Audit Agency and made plans for a follow-on analysis when actual consumption data is available. We believe the Air Force study approach and follow-on actions provide a reasonable approach.

## Scope and Methodology

To obtain information for this report, we reviewed documents and interviewed officials from the Office of the Secretary of Defense and the Headquarters, Air Force, Washington, D.C.; Headquarters, Air Force Materiel Command, Wright-Patterson Air Force Base, Ohio; and two subordinate activities—the Ogden Air Logistics Center, Hill Air Force Base, Utah, and the Oklahoma Air Logistics Center, Tinker Air Force Base, Oklahoma. Since some of the actual data needed to make such an assessment is not yet available, we reviewed preliminary cost estimates. We also discussed and gathered documentation on the program and the benefits and costs of privatization-in-place with representatives from the BGRC, Heath, Ohio; the Newark-Heath-Licking County Port Authority; and Defense Contract Management Command at BGRC.

We discussed and reviewed the supporting data for the AFMC's cost analysis with representatives from the Ogden and Oklahoma Air Logistics Centers, as well as with Boeing representatives and the AFMC cost-analysis team. We reviewed DOD's guide for making cost comparisons between public depots and private contractors (the Defense Depot Maintenance Council's Cost Comparability Handbook) to ensure that the AFMC study included all applicable cost elements and included any necessary adjustments. We also reviewed Air Force procedures for conducting public-private depot competitions. To test the reasonableness of the AFMC methodology used to allocate the Newark Air Force Base operating support costs to AGMC aircraft, missile, and metrology workloads, we consulted responsible officials in the DOD comptroller and Air Force financial management organizations, and reviewed applicable DOD instructions on reimbursable base support costs. We reviewed the type of source used for each cost element to ensure that actual data was used when available instead of estimates. We reviewed contractor cost reports to assess for shifts in cost trends that may impact the cost analysis.

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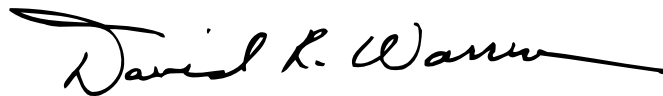
Further, during the development of the cost study, we held extensive discussions with the cost-analysis team to review adjustments, both additions and deletions, for reasonableness.

We conducted our review from March through August 1997 in accordance with generally accepted government auditing standards.

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We are sending copies of this report to the Director, Office of Management and Budget; the Secretaries of Defense and the Air Force; and other interested parties. We will make copies available to others upon request.

Please contact me at (202) 512-4812 if you or your staff have any questions concerning this report. Major contributors to this report were Jim Wiggins, Julia Denman, Larry Junek, and John Strong.

A handwritten signature in black ink that reads "David R. Warren". The signature is written in a cursive style with a long horizontal flourish at the end.

David R. Warren, Director  
Defense Management Issues

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List of Requesters

The Honorable James M. Inhofe  
Chairman

The Honorable Charles S. Robb  
Ranking Minority Member  
Subcommittee on Readiness  
Committee on Armed Services  
United States Senate

The Honorable Neil Abercrombie  
The Honorable Saxby Chambliss  
The Honorable Tillie K. Fowler  
The Honorable James V. Hansen  
The Honorable John N. Hostettler  
The Honorable Ernest J. Istook  
The Honorable Walter B. Jones, Jr.  
The Honorable Solomon P. Ortiz  
The Honorable Norman Sisisky  
The Honorable J.C. Watts, Jr.  
House of Representatives

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**Abbreviations**

AFMC	Air Force Materiel Command
AGMC	Aerospace Guidance and Metrology Center
BGRC	Boeing Guidance Repair Center
BRAC	Base Realignment and Closure
DCAA	Defense Contract Audit Agency
DCMC	Defense Contract Management Command
DOD	Department of Defense

# AGMC Mission and Closure History

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Prior to its closure in 1996, Newark Air Force Base supported the industrial complex comprising the Aerospace Guidance and Metrology Center (AGMC), supporting two Air Force missions—depot maintenance and metrology and calibration. AGMC provided the Air Force with depot-level repair for inertial guidance and inertial navigation systems and displacement gyroscopes for the Minuteman and Peacekeeper intercontinental ballistic missiles and most of the Air Force's aircraft. In fiscal year 1994, AGMC's depot maintenance workload consisted of about 900,000 hours; almost 10,500 items were produced to support repair requirements for 66 Air Force, Navy, and Army systems and components. This work was accomplished by about 500 maintenance and engineering personnel and 325 management and support personnel. Figure I.1 shows an aerial view of the Newark facility.

**Appendix I**  
**AGMC Mission and Closure History**

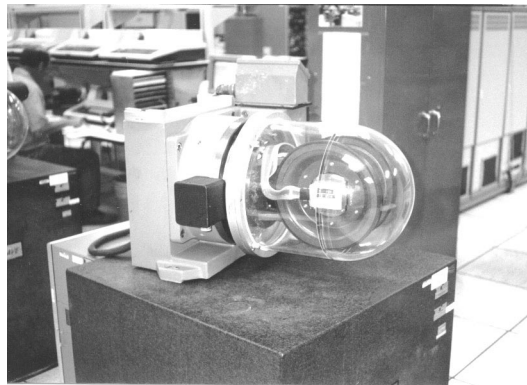
**Figure I.1: Photographs of Boeing Guidance and Repair Center**



Navy DMINS test station.



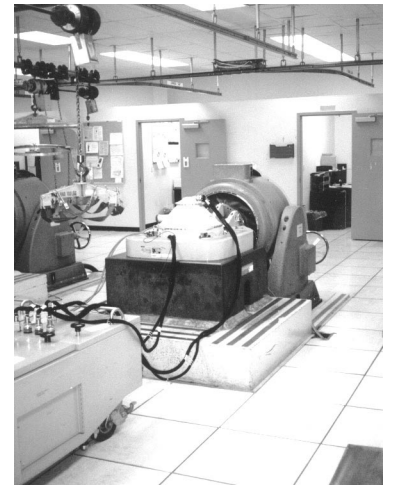
Technician in clean room.



Aircraft gyro repair



Inertial Navigator Unit testing



Gyro Test Station

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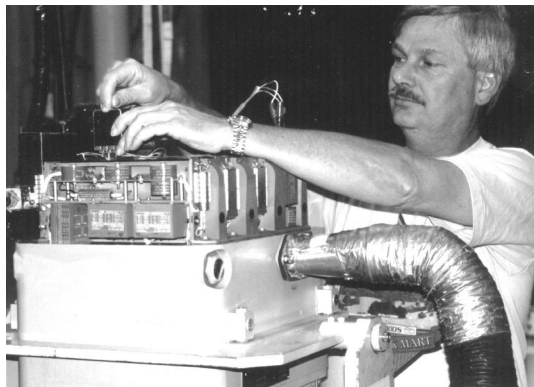
**Appendix I**  
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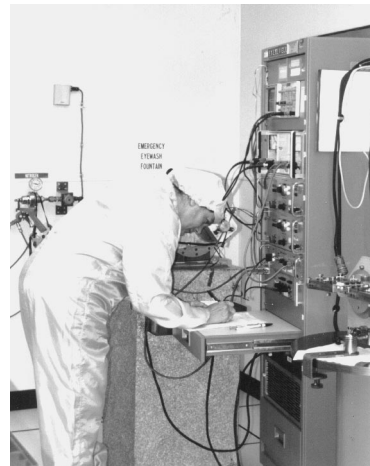
AGMC was different from the Air Force air logistics centers because it did not have weapon system and item management responsibility collocated at the same base. For Air Force systems repaired at AGMC, weapon system and item management functions are performed primarily at the Ogden, Utah, or Oklahoma City, Oklahoma, Air Logistics Centers.

**Appendix I**  
**AGMC Mission and Closure History**

**Figure I.2: Examples of Various Test and Repair Stations at Boeing Guidance and Repair Center, Heath, Ohio**



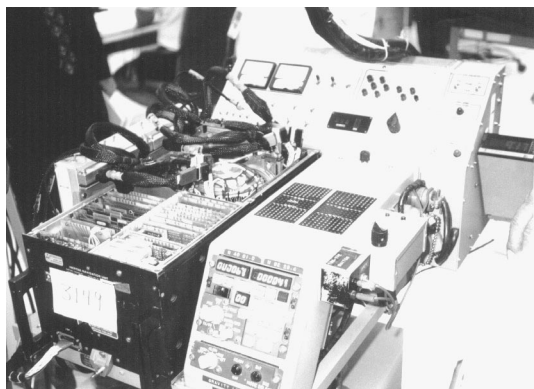
Receiving area for missile guidance induction showing shipping containers for minute man missiles.



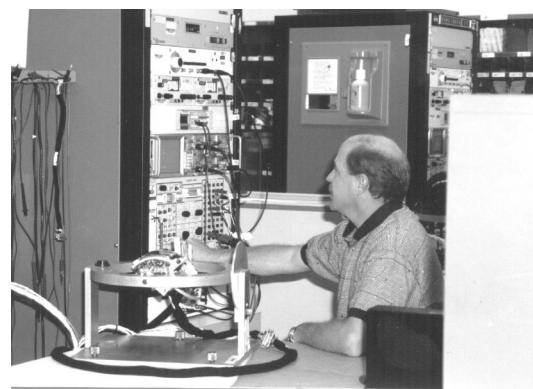
Automatic testing on guidance gyros.



Diagnostic and functional testing on Pendulous Integrating Gyro Accelerometer (PIGA), a component of the minute man inertial guidance system.



PIGA test station



Minute Man ICBM platform vibration station

For its second Air Force mission—metrology and calibration—AGMC performed overall technical direction and management of the Air Force Metrology and Calibration Program and operated the Air Force Measurement Standards Laboratory. About 200 personnel were involved in the metrology and calibration mission—109 in generating technical orders, certification of calibration equipment, and management operations and 89 in the standards laboratory.

The Department of Defense (DOD) considered AGMC’s work conducive to conversion to the private sector and recommended closing Newark Air Force Base/AGMC through privatization and/or transferring the workload to other depots. DOD justified the closure by (1) identifying at least 8.7 million hours of excess Air Force depot maintenance capacity, with the closure of AGMC expected to reduce the excess by 1.7 million hours and (2) applying the eight base closure criteria to Air Force bases having depots and ranking Newark Air Force Base low relative to the others.

DOD estimated that implementing its recommendation on Newark Air Force Base/AGMC would cost \$31 million, result in an annual savings of \$3.8 million, and have an 8-year payback period for closure and relocation expenses. In our report on the base closure and realignment recommendations and selection process, we estimated that the Newark Air Force Base/AGMC closure costs would be \$38.29 million, with a 13-year payback. The Base Closure and Realignment Commission determined that the AGMC workload could either be contracted out or privatized-in-place at the same location, although the BRAC noted that industry interest in privatization-in-place was limited. The BRAC recommended closing Newark Air Force Base/AGMC—noting that workload could be moved to other depot maintenance activities, including the private sector.

Our December 1994 report questioned the impending closure of AGMC and recommended reassessment of the Air Force closure and privatization-in-place plans.<sup>1</sup> DOD reevaluated its decision and reaffirmed its closure and privatization-in-place plans. In December 1995, the Air Force awarded two 5-year contracts for repair and metrology services at Newark: an estimated \$264 million cost plus award fee contract to Rockwell International for AGMC’s repair mission<sup>2</sup> and a \$19 million cost plus award fee contract to Wyle Laboratories for operation of the Air

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<sup>1</sup>Aerospace Guidance and Metrology Center: Cost Growth and Other Factors Affect Closure and Privatization (GAO/NSIAD-95-60, Dec. 9, 1994).

<sup>2</sup>Following the decision to close AGMC, the Army and the Navy transferred about 95,000 direct labor hours of work to other sources of repair.

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Force's standard metrology laboratory. In October 1996, Boeing acquired the AGMC repair operations through its acquisition of Rockwell International.

In addition to these contract operations, the Air Force retained about 130 government employees at Newark—about 69 percent of the preclosure metrology staff. They perform such functions as (1) periodically reviewing and certifying the operations of the Air Force's 130 metrology laboratories and (2) helping the Defense Contract Management Command monitor Wyle Laboratories' metrology contract. In addition, 24 government civilian employees of the Defense Contract Management Command provide on-site contract oversight.

The Newark-Heath-Licking County Port Authority is in the process of purchasing the Newark Air Force Base real property.<sup>3</sup> The Port Authority currently leases the facility to Boeing, which then subleases a portion of the facility to Wyle Laboratories. Figure I.3 depicts the relationship between the Air Force, the contractors, and the local reuse authority.

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<sup>3</sup>The Newark-Heath-Licking County Port Authority is the Ohio chartered reuse authority responsible for redeveloping and managing the closed Newark Air Force Base facilities.

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**Appendix I**  
**AGMC Mission and Closure History**

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**Figure I.3: Air Force, Contractor, and Local Reuse Authority Relationship**





# AFMC Interim Cost Analysis Summaries

**Table II.1: AFMC Estimated Fiscal Year 1997 Costs for Missile and Aircraft Workload Before and After Privatization-in-Place (Mar./Apr. 1997 analyses)**

	<b>Optimistic</b>	<b>Most likely</b>	<b>Pessimistic</b>
Missiles AGMC	\$39,654,845	\$38,143,561	\$37,625,067
Missiles BGRC	43,010,320	44,933,117	50,858,073
Difference	\$3,355,475	\$6,789,556	\$13,233,006
Aircraft AGMC	\$35,540,990	\$33,092,111	\$32,002,958
Aircraft BGRC	39,923,218	42,416,090	49,954,755
Difference	\$4,382,228	\$9,323,979	\$17,951,797
<b>Total AGMC</b>	<b>\$75,195,835</b>	<b>\$71,235,672</b>	<b>\$69,628,025</b>
<b>Total BGRC</b>	<b>82,933,538</b>	<b>87,349,207</b>	<b>100,812,828</b>
<b>Total difference</b>	<b>\$7,737,703</b>	<b>\$16,113,535</b>	<b>\$31,184,803</b>

Source: AFMC March/April 1997 AGMC cost analyses.

**Table II.2: AFMC Estimated Fiscal Year 1997 Costs for Missile, Aircraft, and Metrology Workloads Before and After Privatization-in-Place (June/July 1997 analyses)**

	<b>Optimistic</b>	<b>Most likely</b>	<b>Pessimistic</b>
Missiles AGMC	\$42,993,855	\$41,154,587	\$40,512,943
Missiles BGRC	43,527,092	45,509,268	51,321,727
Difference	\$533,237	\$4,354,681	\$10,808,784
Aircraft AGMC	\$37,147,039	\$34,386,422	\$33,271,371
Aircraft BGRC	39,920,618	42,380,471	50,710,634
Difference	\$2,773,579	\$7,994,049	\$17,439,263
Metrology AGMC	\$9,529,315	\$8,671,675	\$8,196,359
Metrology BGRC	9,654,497	10,453,622	11,982,424
Difference	\$125,182	\$1,781,947	\$3,786,065
<b>Total AGMC</b>	<b>\$89,670,209</b>	<b>\$84,212,684</b>	<b>\$81,980,673</b>
<b>Total BGRC</b>	<b>93,102,207</b>	<b>98,343,361</b>	<b>114,014,785</b>
<b>Total difference</b>	<b>\$3,431,998</b>	<b>\$14,130,677</b>	<b>\$32,034,112</b>

Source: AFMC June/July 1997 AGMC cost analyses.

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# AFMC Cost Analysis Methodology

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In performing its cost analysis, the Air Force Materiel Command (AFMC) used actual cost data when it was known. Estimated cost data were expressed as ranges, using most likely, low, and high estimates. The cost analysis was constructed using triangular probability distributions for each estimated cost element. The cost elements were then summed statistically using a probability simulation model, with all estimated costs stated in fiscal year 1997 dollars. To provide a valid basis for comparison, AFMC determined that it was necessary to derive AGMC and contract cost estimates using two distinct methodologies.

The AGMC estimate is based largely on fiscal year 1995 data obtained from the end-item cost report dated September 30, 1995, adjusted for quantity differences. The cost categories in that report consist of (1) depot product direct hours, (2) direct labor, (3) direct material, (4) shop overhead, (5) support overhead, and (6) general and administrative costs. The organic estimate also included cost categories for unprogrammed work and cost comparability adjustments. Comparability adjustments were additions to the Defense Maintenance Business Area for expenditures funded by other sources. These adjustments were made in accordance with the Defense Depot Maintenance Council Cost Comparability Committee Handbook dated August 10, 1993. Cost comparability adjustments consisted of the following cost elements: state unemployment tax, unfunded civilian retirement, casualty insurance, impact aid, retiree health benefits, other operation and maintenance costs, and costs associated with the guidance replacement program (new cost on the contract).

For the contract estimate, AFMC based many of the most likely input variables on costs as stated in the current contract. Latest revised estimates for the contract cost categories were obtained from the Contractor/Schedule Status Report dated end-of-month December 1996 and February 1997. Additional cost categories for the contract estimate included security, lease, depot maintenance business area contract fees, equipment depreciation, capital expenditures, and privatization-in-place costs.

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**Appendix III**  
**AFMC Cost Analysis Methodology**

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# Related GAO Products

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Outsourcing DOD Logistics: Savings Achievable but Defense Science Board's Projections Are Overstated ([GAO/NSIAD-98-48](#), Dec. 8, 1997).

Air Force Depot Maintenance: Information on the Cost Effectiveness of B-1B and B-52 Support Options ([GAO/NSIAD-97-210BR](#), Sept. 12, 1997).

Navy Depot Maintenance: Privatizing the Louisville Operations in Place Is Not Cost Effective ([GAO/NSIAD-97-52](#), July 31, 1997).

Defense Depot Maintenance: Challenges Facing DOD in Managing Working Capital Funds ([GAO/T-NSIAD/AIMD-97-152](#), May 7, 1997).

Depot Maintenance: Uncertainties and Challenges DOD Faces in Restructuring Its Depot Maintenance Program ([GAO/T-NSIAD-97-111](#), Mar. 18, 1997) and ([GAO/T-NSIAD-112](#), Apr. 10, 1997).

Defense Outsourcing: Challenges Facing DOD as It Attempts to Save Billions in Infrastructure Costs ([GAO/T-NSIAD-97-110](#), Mar. 12, 1997).

Navy Ordnance: Analysis of Business Area Price Increases and Financial Losses ([GAO/AIMD/NSIAD-97-74](#), Mar. 14, 1997).

High-Risk Series: Defense Infrastructure ([GAO/HR-97-7](#), Feb. 1997).

Air Force Depot Maintenance: Privatization-in-Place Plans Are Costly While Excess Capacity Exists ([GAO/NSIAD-97-13](#), Dec. 31, 1996).

Army Depot Maintenance: Privatization Without Further Downsizing Increases Costly Excess Capacity ([GAO/NSIAD-96-201](#), Sept. 18, 1996).

Navy Depot Maintenance: Cost and Savings Issues Related to Privatizing-in-Place the Louisville, Kentucky, Depot ([GAO/NSIAD-96-202](#), Sept. 18, 1996).

Defense Depot Maintenance: Commission on Roles and Mission's Privatization Assumptions Are Questionable ([GAO/NSIAD-96-161](#), July 15, 1996).

Defense Depot Maintenance: DOD's Policy Report Leaves Future Role of Depot System Uncertain ([GAO/NSIAD-96-165](#), May 21, 1996).

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Military Bases: Closure and Realignment Savings Are Significant, but Not Easily Quantified ([GAO/NSIAD-96-67](#), Apr. 8, 1996).

Depot Maintenance: Opportunities to Privatize Repair of Military Engines ([GAO/NSIAD-96-33](#), Mar. 5, 1996).

Closing Maintenance Depots: Savings, Personnel, and Workload Redistribution Issues ([GAO/NSIAD-96-29](#), Mar. 4, 1996).

Navy Maintenance: Assessment of the Public-Private Competition Program for Aviation Maintenance ([GAO/NSIAD-96-30](#), Jan. 22, 1996).

Depot Maintenance: The Navy's Decision to Stop F/A-18 Repairs at Ogden Air Logistics Center ([GAO/NSIAD-96-31](#), Dec. 15, 1995).

Military Bases: Case Studies on Selected Bases Closed in 1988 and 1991 ([GAO/NSIAD-95-139](#), Aug. 15, 1995).

Military Base Closure: Analysis of DOD's Process and Recommendations for 1995 ([GAO/T-NSIAD-95-132](#), Apr. 17, 1995).

Military Bases: Analysis of DOD's 1995 Process and Recommendations for Closure and Realignment ([GAO/NSIAD-95-133](#), Apr. 14, 1995).

Aerospace Guidance and Metrology Center: Cost Growth and Other Factors Affect Closure and Privatization ([GAO/NSIAD-95-60](#), Dec. 9, 1994).

Navy Maintenance: Assessment of the Public and Private Shipyard Competition Program ([GAO/NSIAD-94-184](#), May 25, 1994).

Depot Maintenance: Issues in Allocating Workload Between the Public and Private Sectors ([GAO/T-NSIAD-94-161](#), Apr. 12, 1994).

Depot Maintenance ([GAO/NSIAD-93-292R](#), Sept. 30, 1993).

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Defense Force Management: Challenges Facing DOD as It Continues to Downsize Its Civilian Workforce ([GAO/NSIAD-93-123](#), Feb. 12, 1993).

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