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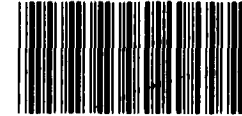
RELEASED COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

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JANUARY 24, 1980

The Honorable Jack Brooks
Chairman, Committee on
Government Operations
House of Representatives HSE01500



111469

Dear Mr. Chairman:

Subject: [Air Force Sole Source Computer
Acquisitions Not Warranted]
(FGMSD-80-30)

AGC00035

On June 8, 1979, you requested that we investigate the Air Force weather program to determine if the Air Force has (1) justified its need for a proposed sole source upgrade, (2) properly defined its mission needs, (3) complied with Federal automatic data processing (ADP) policies, and (4) properly justified its plan to perpetually upgrade its weather program equipment on a sole source basis. You also requested that if our investigation revealed problems of a broader nature that we identify the problem areas and recommend corrective actions.

This report, as agreed to by your office, addresses primarily item (1), the sole source acquisition of two (1) - Univac 1100/81 computers.

Two Univac 1100/81 computers were acquired noncompetitively in July 1979 by the Air Force Global Weather Central (AFGWC) and three more noncompetitive large Univac acquisitions are planned through 1985. Air Force reasons for these sole source procurements are:

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--There was an urgent need for the two 1100/81s because the existing capacity at the AFGWC could not support validated operational requirements.

--Economies associated with the 1100/81s made the acquisition cost effective.

--Compared to sole source acquisition, competitive acquisition would cost the Air Force an additional \$30 million because of program conversion, site preparation, and parallel operations costs.

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--The technical risks associated with a vendor change were exceptionally high and could lead to disruptions in AFGWC operations.

We have reviewed the acquisition of these two computers and we believe the sole source acquisition was not warranted and was not consistent with Federal ADP policies. We found that

--with some change in operations there was sufficient capacity at the AFGWC to satisfy validated operational requirements without the new 1100/81 computers, and

--a number of specific criteria required by Federal Property Management Regulation (FPMR) 101.35 to support sole source acquisitions were not met. These included a requirement that the need for additional capacity be unforeseen and urgent, that the existing system be at optimum performance, and that sharing with other Government agencies and use of commercial sources be considered. These criteria also included a caution that the mere availability of better cost performance equipment within a vendor's product line is not sufficient justification for a sole source procurement.

Details of our findings are in enclosure I.

The two Univac 1100/81s were acquired under a restricted delegation of procurement authority. The General Services Administration (GSA) upon completion of the GAO review will determine whether the Air Force should be allowed to retain the equipment. GSA could declare the procurement authority invalid, have the computers removed, and force the Air Force to seek other solutions. GSA could accept the fact that the sole source acquisition was unwarranted, but allow the Air Force to proceed with it. ~~GSA could also seek a resolution between these extremes.~~ The decision is not easy because the alternatives have far-reaching implications.

We recommend that the Administrator of General Services carefully consider the advantages and disadvantages of each alternative as well as any combination thereof, determine whether the conditional authority granted to the Air Force for sole source procurement will be deemed valid, and require the Air Force to provide a detailed cost/benefit analysis for each alternative and a firm plan and commitment as to how future acquisitions will be made competitively.

As requested by your office, we have not obtained formal agency comments but have informally discussed these issues with Air Force officials. As arranged with your office, unless you publicly announce the contents of this report earlier, we will not distribute it until 15 days from the date of this letter. At that time, we will send copies to interested parties and give copies to others upon request.

Sincerely yours,



ACTING Comptroller General
of the United States

Enclosures - 2

FINDINGS AND RECOMMENDATIONS ON THE AIR FORCE'SSOLE SOURCE COMPUTER ACQUISITIONSBACKGROUND

The Air Force Global Weather Central (AFGWC), a unit of the Military Airlift Command, is the centralized, automated facility for environmental support to current operations of the Air Force and other defense agencies. Over the past 20 years, AFGWC has relied on computers to meet customer support requirements.

Increasing requirements have dictated that AFGWC continually expand its ADP capabilities. AFGWC acquired its first computer, an early IBM system, in 1960. During the next 5 years, because of additional requirements, two more IBM systems were acquired. The entire complex was converted to four competitively acquired Univac 1108s in 1968 and 1969. AFGWC's computational power was again upgraded between 1972 and 1976 by sole source acquisitions of three Univac 1110s. During this period one Univac 1108 was released. The latest expansion was the noncompetitive acquisition of the two Univac 1100/81s which are the subject of this report. These two computers replaced three 1108s.

The Air Force justified the sole source procurement of the 1100/81s on the basis of urgent operational requirements which were not being met at the AFGWC. However, the General Services Administration (GSA) would not approve sole source acquisition until the Air Force agreed to abide by the terms of a November 1977 delegation of procurement authority requiring it to competitively upgrade all Univac equipment in the AFGWC by September 1985.

The Air Force would not agree. Instead, in March 1979 it informed GSA that its long range plans for the AFGWC included sole source acquisitions of a total of five large computers within the Univac product line through 1985. The plan also proposed competitive acquisition of other system components. It cited exceptionally high technical risks and an excessive cost of changing vendors for its decision to use sole source methods. After extensive correspondence which included a statement by the Air Force to GSA that it would proceed with the sole source acquisition without GSA's approval, the two Univac 1100/81s were acquired in July 1979. GSA granted AFGWC conditional authority to lease but not purchase the equipment until our study was completed and cautioned that

"Should it be determined, upon completion of the [GAO] evaluation, that deficiencies exist in the"

"stated program requirements or the system architecture plan, the procurement action would be deemed in valid."

The 1100/81 computers are now in place and in use. Should the procurement action be invalidated and the 1100/81 computers removed, the AFGWC would be confronted with the cost of removal plus other costs of redesigning the interface between the 1100/81s and the Satellite Data Handling System. The Air Force estimated these costs at \$2.6 million. In addition to our effort, two other studies regarding the long range plan are being performed by the Air Force in response to GSA's misgivings with some technical features of the Air Force's proposal. These studies are scheduled for completion in January 1980.

Because some of our findings relate to the way that the AFGWC uses its computers, some understanding of that operation might be helpful. As of December 1979, the two Univac 1100/81s were installed at AFGWC and had functionally replaced the three Univac 1108s. The present configuration consists of two 1100/81s, three 1110s, and three unused 1108s. AFGWC intends to release the Univac 1108s if the 1100/81s are allowed to remain.

The five operating machines can be divided functionally into two complexes. The Univac 1100/81 complex handles conventional meteorological data, numerical weather forecasts, and tailored customer products. The Univac 1110 complex handles meteorological satellite data and classified applications. One machine in each complex is reserved for backup and systems development.

THE SOLE SOURCE ACQUISITION OF THE UNIVAC
1100/81s WAS NOT WARRANTED

In order to justify a sole source acquisition, such as the 1100/81 computers, Federal Property Management Regulation 101.35 states that

- the need must be unforeseen and urgent,
- the existing system must be at optimum performance,
- a comparative cost analysis must be performed to verify that a commercial ADP service approach is not more appropriate,
- the sharing of already installed/available Government ADP software or services must be considered prior to an acquisition, and

--the mere availability of equipment within the vendor's product line which may offer a better cost performance ratio is not sufficient justification for noncompetitive acquisitions.

We concluded that the sole source acquisition of the 1100/81 computers was not warranted in that it failed to meet the requirements of each of these criteria as discussed in the following sections.

Requirements neither
unforeseen nor urgent

The requirements which justified the 1100/81 acquisition were neither unforeseen nor urgent. The lack of automated support for these requirements was identified about 5 years earlier. Since then, the Air Force has, on at least three occasions, disapproved proposals designed to meet these needs.

When the Air Force finally approved the acquisition of the 1100/81s, the justification for the sole source procurement presented in the Air Force Data Automation Requirement MAC-L76-5-1 included these requirements for the AFGWC:

- Deliver, within a specified time, computer flight plans (CFPs) for use by air crews at various locations around the world. (Approximately 10 percent of the 800 daily computer flight plans were being delivered late.)
- Establish a readiness to provide 3,000 CFPs a day if a contingency should arise where they might be needed.
- Provide an additional 41 operational weather reports as requested by four major commands.

According to the Air Force, these requirements translate into a need for about 31 percent more capacity of an 1108 computer than was available at the AFGWC. Furthermore, the Air Force stated that an additional 25 percent of one Univac 1108 was required to reduce the current saturated operation of the two production 1108s and to handle the applications that were overflowing onto the backup 1108. The total shortfall in computer capacity to meet validated requirements was set by the Air Force at about 56 percent of one Univac 1108 computer.

The Air Force has been aware since the mid-1970s of AFGWC's inability to support CFPs and operational weather

reports. The lack of computational power to meet contingency CFP requirements has been obvious to the Air Force since 1973. The inability to meet all routine CFPs in the 1-hour performance standard was known as early as 1974. Similarly, the lack of resources to meet operational weather report requirements was identified in the 1974-75 time frame. Nevertheless, the Air Staff denied two plans to provide resources for all these requirements--the 1975 plan to acquire a computer for AFGWC and the 1976 plan to retain a competitively acquired Univac 1108. Additionally, the Air Force disapproved a 1977 plan to competitively acquire a communications front-end processor that would have freed enough resources to meet a majority of these requirements.

We have no argument with the validity or the importance of these mission requirements. However, we were given no information that indicated any increase in the urgency of these requirements over that which existed when AFGWC's earlier requests for additional capacity were disapproved.

Existing system not
at optimum performance

While the AFGWC computer center was effectively utilizing the computers it had in a production mode, our analysis of how the equipment was being utilized and of system reliability data shows that by operating with one instead of two backup computers, the AFGWC would not have had to acquire the 1100/81 computers. Releasing a Univac 1108 from the backup mode and retaining one Univac 1110 as backup for all 1108s and 1110s, would provide additional production capacity equivalent to 65 percent of an 1108. This would be sufficient to process all new validated workload requirements.

As explained in enclosure II, this change would cost little in systems reliability. A cost would be incurred only when there was a simultaneous failure of an 1108 and an 1110 computer. Based on past operational data, the probability of a simultaneous 1108 and 1110 failure is 0.3 percent. While we do not question the Air Force's determination that additional capacity was needed, we believe that further capacity was already available if the Air Force had effectively utilized the backup computers. We believe the probability of any adverse impact on AFGWC security and systems reliability caused by using a single backup computer could have been further reduced by assigning priorities to the more critical processing needs.

Air Force states that security and reliability considerations prohibit use of a single computer as backup for the 1108s and 1110s. We have been unable to validate this position but

believe that one backup computer jeopardizes neither security nor systems reliability. They also stated that use of a single backup computer would have required software modifications and created operating difficulties. But we noted that current Air Force plans require similar software modifications and no studies had been made regarding the expected operational difficulties.

The Air Force's position that two backup computers are needed to provide a high degree of reliability is not consistent with its failure to fund on a priority basis the uninterruptible power project for air chillers. Power failures to the computer air chilling system cause the most severe production interruptions because such failures result in total system outages. However, since 1974, the Military Airlift Command has refused to fund an uninterruptible power source needed to provide a reliable supply of chilled air to the computers. During the January through August 1979 time frame, seven outages halting operations on six systems resulted from air chiller failures. These failures ranged from about 30 minutes to about 2 hours. All six systems never were down simultaneously due to hardware failures.

Availability of commercial
service not adequately analyzed

The Air Force did not adequately pursue, as required by regulation, the possibility of private sector support to meet its computational requirements. The Air Force wants to replace its CFP system with a more advanced fuel saving version. It has recently contracted with Lockheed to convert the company's IBM-based minimum fuel flight model to process on AFGWC's Univac system. We found that the Air Force could possibly have contracted for minimum fuel flight plan support, software and hardware included, for a price comparable to the software conversion approach. The Air Force discounted this approach without performing any formal studies or soliciting any offer.

The present 1 year, \$465,000 contract with Lockheed Jetplan will provide the Air Force with a CFP system that could possibly generate fuel savings of up to \$1 million a month. Nine months will be spent converting the IBM-based model so it will operate on AFGWC's Univac system and the remaining 3 months will be a test period. If significant fuel savings are realized during this test period, the Air Force will lease this package for an additional 2 to 5 years. Since Lockheed maintains all rights to the converted model, the Air Force will use this time to develop a replacement.

Lockheed Jetplan officials stated that although no formal proposal has been prepared, it is feasible to provide the

same service by placing Lockheed-owned equipment at AFGWC. They added that barring any unforeseen technical problems

- the price should be competitive, possibly less costly since much of Lockheed's \$500,000 conversion expense would be eliminated;
- the flight plans could be produced sooner because this alternative could be implemented more quickly than the conversion approach; and
- the Lockheed Jetplan system could provide offsite backup for AFGWC's flight plan needs because the computer systems would be compatible.

Furthermore, we noted that use of Lockheed equipment for flight planning would free valuable AFGWC computer time for other uses.

Sharing with another Federal weather agency not adequately considered

Another alternative not pursued by the Air Force was obtaining interim flight planning support from the Navy. The new minimum fuel flight planning system being implemented by the Navy could generate flight plans for Air Force aircraft. As far as we could learn, the Air Force has formally evaluated neither the capabilities of this system nor Navy's willingness to prepare Air Force flight plans. Such considerations are required by FPMR 101.35.

In 1975, the Navy requested that the Air Force participate with it in developing a minimum fuel flight planning system. The Air Force declined citing funding limitations. The Navy Fleet Numerical and Oceanographic Center in Monterey, California, pursued the project and is presently refining and implementing its optimum path aircraft routing system, an advanced minimum fuel flight model. The Navy hopes to have the system functioning smoothly by mid-1980.

Though designed for the Navy's use, with minor modifications the Navy system could produce minimum fuel flight plans for Air Force aircraft. The computer system used by the Navy will not have the capacity to process all Air Force flight plans, but it could handle enough flight plans to relieve the routine peaks and provide the Air Force with some contingency backup.

The Air Force insists it needs a flight planning system tailored to its unique requirements. We did not, in this review, evaluate the differences between the Navy-produced

flight plans and those required by the Air Force. We believe, however, that the Air Force should arrange to obtain the types of flight plans that it can use from the Navy as a partial solution to its overload until the long term solutions to AFGWC's capacity problems are resolved. Our concern about actions which can lead to duplicative effort by Federal agencies in providing weather support and computer flight plans has been reported previously (LCD-78-437, October 10, 1978, and LCD-80-10, October 16, 1979). We understand that the extensive duplication in this area by Federal weather agencies is one of the issues the House Appropriations Committee is considering for review during the fiscal 1981 budget review.

More economical equipment does not justify sole source procurement

Workload aside, the Air Force states that it is economical to replace the 1108s with the 1100/81s. Citing operational economies, the Air Force estimates that the 1100/81s can be acquired at an annual incremental cost of \$600,000. Further, it estimates the reutilization value of the three Government-owned 1108s at about \$2 million annually, a sum which more than offsets the \$600,000 acquisition.

The Air Force's estimate of the reutilization value of an 1108 is overstated. Although we were unable to establish a lease value, an 1108 can be purchased for \$250,000. We have no argument with the Air Force position that upgrading from the 1108s to the 1100/81s within the Univac product line is cost effective. Almost any vendor's modern equipment would offer economies in maintenance, staffing, and power consumption over the 10-year-old 1108s. These economies could also be part of the justification for competitive replacement of any aging system. On the other hand, these economies can also be used to justify a perpetual upgrade within a vendor's product line and thereby avoid the planning and management discipline needed to prepare for a competitive acquisition.

The Air Force's track record in complying with the policy of competitive acquisition has not been good. Management's responsibility for competitive acquisition was emphasized by the Director of Computer Resources, Headquarters, Air Force, on February 9, 1979. He stated that the inability of Air Force activities to properly plan for and manage their programs for competitively replacing automatic data processing equipment had reached unacceptable proportions. He also stated that when

"* * * this lack of advance planning for replacement systems continues to result in requests for other than fully competitive acquisitions and forces the"

"Air Force to accept 'interim' upgrades and/or modify written agreements to fully compete, the credibility of the Air Force, its ADP program and its senior managers here [at headquarters] and in the field suffers."

In another memorandum the same day, the Assistant Secretary of the Air Force (Financial Management) expressed his concern about the number of cases which requested his approval for noncompetitive acquisition of ADP equipment.

It is our experience that large conversion costs are an indication of past failures by management to plan for replacement. We have not yet analyzed the details of the Air Force's estimate that a vendor change at AFGWC will cost an additional \$30 million. This will be done in the next phase of our review. However, a sole source continuation within the Univac product line without any specific actions to prepare for a competitive replacement can only make subsequent decisions for a competitive acquisition more difficult and more costly.

ALTERNATIVE SOLUTIONS ARE COMPLEX

The events which led the Air Force to acquire the two Univac 1100/81 computers noncompetitively indicate lack of management planning and failure to comply with existing policies and regulations. The more serious problem now is what to do about it. There are two obvious solutions. One would be to declare the procurement authority invalid, have the computers removed, and force the Air Force to seek other solutions. The other alternative would be to accept the fact that the sole source acquisition was unwarranted but allow the Air Force to proceed with it. The decision is not easy because both alternatives have far-reaching implications.

The most obvious alternative, at first glance, is to suggest the computers be removed because the sole source acquisition was not justified and unused capability already exists in-house. Unfortunately, this may not be the most cost effective approach since some costs would be incurred. For example, the Satellite Data Handling System which Air Force is currently designing to interface with the 1100/81s would be adversely affected. Air Force personnel stated that removal of the 1100/81s would require redesign of the software interface and delay implementation of the new system. They estimate that changes to the interface would cost \$2.6 million.

The second alternative of finalizing the acquisition may be the more cost effective approach but it also has its pitfalls in that it would appear to condone the actions taken

by the Air Force in continual resorting to noncompetitive acquisitions. In addition, it might set the stage for sole source procurement as a means of acquiring the additional computers necessary to increase the capacity of the AFGWC as set forth in the long range plans for fiscal 1982-92. There may also be other alternatives such as retaining just one 1100/81 in place of the two 1108 computers.

Whatever the decision regarding the 1100/81s, it seems inconceivable that the Air Force--knowing that it might be confronted with the prospects of releasing this equipment--would proceed to invest heavily in interface designs that bind it to the 1100/81s.

RECOMMENDATION TO THE ADMINISTRATOR
OF GENERAL SERVICES

With regard to the two computers in question, we recommend that the Administrator of General Services, carefully consider the advantages and disadvantages of each alternative as well as any combination thereof, and determine whether the conditional authority granted to the Air Force for sole source procurement will be deemed valid.

As part of the determination process, we recommend that the Administrator require the Air Force to provide a detailed cost/benefit analysis for each alternative and a firm plan and commitment as to how future acquisitions will be made competitively.

AIR FORCE GLOBAL WEATHER CENTRAL SYSTEMS RELIABILITY DATA FORJANUARY 1 TO AUGUST 31, 1979

<u>AFGWC</u> <u>systems</u>	<u>Function</u>	<u>Average</u> <u>time</u> <u>between</u> <u>failures</u> <u>(hours:min.)</u>	<u>Average</u> <u>time to</u> <u>repair</u> <u>(hours:min.)</u>	<u>Percentage</u> <u>of time</u> <u>unavailable</u> <u>(note a)</u>
Univac 1108	Production	18:08	:41	4.0
Univac 1108	Production	95:31	:40	1.0
Univac 1108	Backup	24:43	:27	2.0
Univac 1110	Production	24:43	1:05	4.0
Univac 1110	Production	35:44	:51	2.0
Univac 1110	Backup	17:00	:34	3.0

a/The percentage of time the system is down for reasons other than preventive maintenance.

Computations: The probability that both a production 1108 and a production 1110 computer would fail at the same time is very small. To find this probability, take the sum of the percentages in the last column, expressed as decimals, for both production 1108s ($.04 + .01 = .05$); the sum of the percentages for the two production 1110s ($.04 + .02 = .06$); then multiply both sums ($.05 \times .06 = .0030$) or .3 percent.