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B-115369

MAY 23, 1979

The Honorable Jack Brooks, Chairman
 Committee on Government Operations
 House of Representatives *HSE 01500*

Dear Mr. Chairman:

its On October 6, 1978, you requested that we review the [Veterans Administration's ~~(VA's)~~ plans to noncompetitively upgrade VA's Austin, Texas, Data Processing Center] (DPC) and that we conduct a comprehensive review of VA's management and use of its automated data processing resources. We are conducting this review in two phases. The first phase, the review of the upgrade, is the subject of this report. We plan to report on the second phase of our review later this year.

Based on our review, we concluded that VA's planned replacement of the Austin DPC's current equipment on a non-competitive basis is not warranted. Our review showed that:

- The VA requirements analysis understated the current system capacity and proposed no actions to minimize the computer resource requirements.
- Although system performance improvements have been made, additional gains can be achieved through operational and procedural changes.
- Interim solutions, which are less costly than the proposed noncompetitive replacement, can meet VA's current data processing needs.

Accordingly, we proposed a combination of actions which should enable VA to reduce its near-term ADP resource requirements at the Austin Data Processing Center. If our proposed actions are accepted and implemented, VA, at most, would need only to supplement the present Austin configuration. Our proposals for VA actions include:

- Instituting operational and procedural changes that would result in work being routed to VA's Chicago Data Processing Center rather than to Austin.

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- Eliminating marginally productive functions and thereby reduce the Center's workload.
- Eliminating on-line updates and thereby reduce the peak computer requirements.
- Acquiring additional main memory or peripheral devices to improve the performance of the present Austin system.

We presented our findings and proposals to officials of VA's Office of Data Management and Telecommunication (ODM&T).^{DLG 01634} These officials generally concurred with these proposals and agreed to

- cancel all actions to acquire an IBM 370/168 multi-processor to replace the current Austin equipment,
- analyze and implement our proposed actions unless indicated otherwise by a planned analysis, and
- expeditiously pursue a long-term solution consistent with Public Law 89-306 and supporting Federal regulations (i.e., competitive acquisition of a new system and/or redistribution of the Center's workload).

If the workload grows faster than VA expects or if the measures taken yield less than the anticipated performance gains, VA has stated that supplementing the Austin Center's configuration may be necessary pending a long-term resolution. We agree that this action may be necessary provided that (1) the need for additional equipment is confirmed by an accurate validation, (2) the additional equipment will handle existing computer applications, and (3) VA takes positive action toward determining a long-term solution.

This approach rather than the proposed noncompetitive replacement of the present Austin computer equipment should save the Government approximately \$8.7 million over a 4-year period.

EFFORTS TO UPGRADE AUSTIN DPC EQUIPMENT

As early as 1975, VA recognized that the aging Austin system, comprising three IBM 360/65s operating in unison, would need upgrading to handle the projected workload. Nonetheless, VA did not begin planning for the competitive replacement of that equipment. Rather, it continued to add

program applications to the Center and expand those applications already being processed there.

In 1977, VA considered resolving the Center's capacity problems by transferring an IBM 370/168 system from its Data Processing Center in Chicago, Illinois. This system, acquired in May 1976 under a restrictive delegation of procurement authority, was to have been used as an interim solution to problems being experienced by the Chicago DPC. VA has since abandoned this approach for acquiring additional capacity for Austin. (We brought the plan to move this equipment to the attention of the Administrator of Veterans Affairs in our report of July 25, 1978, a copy of which was forwarded to you.)

In another attempt to upgrade the Austin Center, VA proposed the noncompetitive acquisition of an IBM 370/168 multi-processor, or operational equivalent, to replace all of the Center's current equipment. VA maintained that the new equipment had to be installed by April 1979 to meet critical needs. Although Federal Property Management Regulations, Section 101-35, require that a noncompetitively acquired system be replaced by a competitively acquired system within 24 months, the Director of ODM&T has stated that VA could not realistically estimate before 1981 when competitive replacement could be undertaken. The permanent nature of this "interim" upgrade was further suggested by VA plans to convert the Center to the latest IBM system software--an effort which would have required about 1 year.

VA's DATA PROCESSING NEEDS ANALYSIS

VA's requirements analysis for the Center showed that by late 1979 the prime-shift workload would be equivalent to about 160 percent of the present system's theoretical capacity or the equivalent of eight IBM 360/65s operating at the industry "standard" of 60-percent utilization.

VA officials maintain that the system is presently operating at or near saturation levels and that the workload is growing rapidly. The major contributor to Austin's projected workload growth is VA's new TARGET system which is in the early stages of implementation. The initial implementation of the TARGET system is designed to provide on-line inquiry, update, and transaction input for compensation, pension, and education payments to veterans. The on-line inquiry is dependent upon the master data base of 35 million veterans--the Beneficiary Identification and Records Locator (BIRLS)--

for much of its data requirements. As the TARGET system implementation progresses, the BIRLS/TARGET workload increases. Because the TARGET system provides on-line support to VA regional offices, this growth is occurring mainly during the prime-day shift.

According to VA statistics, when the initial implementation of the TARGET system is completed in 1979, the BIRLS primeshift workload will have increased about threefold over preTARGET requirements. By that time, VA estimates that BIRLS will be requiring 88 percent of the present system's primeshift resources and 43 percent of the total resources.

VA forecasts show that other applications being run at Austin will also increase. These applications include (1) administrative applications, such as the Centralized Payroll and Personnel System and the VA Automated Management Information System, (2) program applications, such as the Loan Guaranty System which is an automated VA mortgage control system, and (3) the test workload generated by the more than 160 programmers assigned to maintain and develop applications programs. However, according to VA forecasts, the impact of the growth of any of these systems is not nearly as significant as that of BIRLS.

NONCOMPETITIVE REPLACEMENT IS
NOT WARRANTED

Despite the projected increases in Austin's workload, full noncompetitive replacement of the Austin system, as initially proposed by the VA, is not required to handle VA's data processing needs. The potential economies realizable from a combination of our suggested operational and procedural changes coupled with a restatement of system capacity indicate that less costly solutions for meeting these needs are currently feasible as demonstrated below.

Inadequate requirements analysis

The requirements analysis supporting the proposed acquisition did not accurately describe system capacity. Additionally, this analysis did not consider several operational and procedural changes that could minimize Austin's resource requirements.

In estimating the capabilities of the Austin system, the analysis excluded weekends even though much of its routine work is and can continue to be processed then.

Further, the analysis arbitrarily assumed that during the 5-day workweek the computer complex would be available only 80 percent of the time. Historically, weekday system availability at the Austin Data Processing Center has been 87 percent.

The analysis also did not address the possibility of reducing present or minimizing future resource requirements. For example, the economies that could result from BIRLS/TARGET procedural and operational changes were not considered. Additionally, the analysis did not explore the possibility of reducing the test workload, although the test needs account for about 25 percent of the Center's total workload. The analysis also failed to consider other actions, such as reducing processing frequencies or eliminating noncritical applications. However, because the Center is a service center, ODM&T officials believe such changes are not within their purview.

Operational/procedural savings possible

Although some system performance improvements have been made, our analysis demonstrated additional ways to minimize computer resource requirements which would reduce or possibly eliminate the near-term need for additional computers. A brief discussion of each follows.

Modify operating procedures

Much of the data in the BIRLS data base is duplicated in the on-line TARGET data base at VA's Chicago Center. VA regional office personnel are given the choice of using either data base to obtain information. Limited data, assembled by the Los Angeles and Philadelphia VA regional offices, indicates that a significant number of the transactions going to BIRLS could be routed to the TARGET system data base in Chicago. We suggested that the TARGET system, rather than regional employees, determine the routing of transactions. The TARGET system data base at Chicago should be used whenever possible to reduce the workload going to the Austin Center.

Eliminate marginally productive BIRLS searches

Our observations showed that about 95 percent of the BIRLS/TARGET transactions use the computer central processing unit for 1 second or less. These transactions used less

than 60 percent of the BIRLS/TARGET resource requirements. The remaining 5 percent of the transactions were processed in an average of 2.4 computer seconds and accounted for a disproportionate 40 percent of the resources. Furthermore, only a small number of these latter searches yielded the desired data. To reduce the Austin workload, we suggested that the VA consider terminating these prolonged and unproductive searches.

Eliminate on-line updates

Approximately 25 percent of the BIRLS/TARGET transactions result in on-line updates to the BIRLS data base. Because the individual BIRLS records are relatively static, the need for on-line update capability is questionable. We suggested that incoming BIRLS/TARGET update transactions be processed during nonprime periods to reduce the prime-shift workload burden.

Acquire additional main memory
or peripheral devices

During the 5-day workweek, the computer is busy approximately 60 to 65 percent of the time. During the remaining 35 to 40 percent of the time, the computer is awaiting either access to peripheral devices to process work or, less frequently, more work to process. Limitations of the IBM 360/65 architecture, as well as the VA job mix, prevent 100 percent utilization of available computer time. However, an IBM 360/65 computer, when properly tuned, can sustain an 85 percent utilization rate. We recognize that the ability to obtain such high utilization rates is influenced by the particular workload being processed. Nevertheless, we suggested that VA determine whether the use of more main memory and high-performance peripheral devices would allow them to increase computer utilization and work throughput.

The design of BIRLS and the architecture of the IBM equipment is such that only one of the IBM 360/65s can readily process BIRLS transactions. Therefore, the BIRLS workload must not exceed the capacity of one IBM 360/65 if any processor augmentation is to be avoided. Other economies, such as better control of testing, may also reduce the resource demands. We have not explored these avenues; however, a substantial portion of the Center's resources are going to testing and nonrecurring production applications.

AGENCY COMMENTS

ODM&T officials expressed concern that the Center might not be able to accommodate the mission-oriented workload, especially the BIRLS/TARGET transactions, while they seek a long-term solution to the Austin problem. The officials emphasize, and we agree, that actions suggested to reduce the BIRLS prime-shift workload may overload the nonprime shifts. We advised them that if this should occur, the overflow could be handled by an additional IBM 360/65 or equivalent. VA officials cautioned that even with our suggested modifications, BIRLS may exceed the capabilities of an IBM 360/65, and a processor larger than an IBM 360/65 would be required. However, the augmentation would be far less costly than the IBM 370/168 multiprocessor or equivalent initially proposed by VA.

On April 6, 1979, VA gave us a copy of a study they had prepared based on our suggested modifications. The study concluded that all of our suggestions could contribute to increased efficiency of the system but not enough to preclude the need for a larger capacity computer. We have reviewed their report and agree with their findings. We estimate that a computer equivalent to that of an IBM 370/158 will meet their requirements. However, as previously discussed, any VA request for additional equipment for Austin must be accompanied by a plan detailing a long-term solution to the Austin DPC computer capacity problem.

CONCLUSIONS

We estimate that even if VA acquires a larger processor, it will save about \$8.7 million by not acquiring the IBM 370/168 multiprocessor as originally planned. The original plan could have cost about \$11.2 million over 4 years while the current plan will cost an estimated \$2.5 million. The projected savings are summarized below.

	<u>VA proposal</u>	<u>GAO projection</u>
Equipment	IBM 370/168 multiprocessor	IBM 370/158 (or equivalent)
Rental (1 year)	\$2.8 million	\$620,000 (or less)
Rental (4 years)	\$11.2 million	\$2.5 million

Based on these figures, savings over the 4-year period that would be required to completely replace the Austin equipment would equal \$8.7 million (\$11.2 million less \$2.5 million).

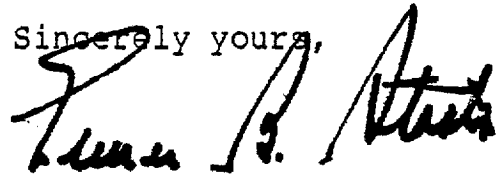
FUTURE AUDIT DIRECTION

As discussed with your office, we are continuing with the second phase of your request--that we make a comprehensive review of VA's management and use of its ADP resources. We expect to brief you on this effort during July 1979 and provide you a final report by October 1979.

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As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 15 days from the date of this letter. At that time, we will send copies to interested parties and make copies available to others upon request.

Sincerely yours,



Comptroller General
of the United States