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UNITED STATES GENERAL ACCOUNTING OFFICE

WASHINGTON, D.C. 20548

B-163074   AUG 30 1977

The Honorable
The Secretary of Defense

Dear Mr. Secretary: ┌ NAVSEA

        We recently reviewed the policies and practices used
~~by the Naval Sea Systems Command (NAVSEA)~~ to manage
personnel involved in data processing activities┘ We con-
centrated on how NAVSEA determined the number and composi-
tion of staff needed to design, maintain and operate the
management information system for naval shipyards (shipyard
MIS) and noted several problems arising from these practices
which we think warrant your attention. The shipyard MIS
is supported by about 680 ADP personnel and is one of ap-
proximately 45 Navy management information systems. We
are concerned that the practices may typify the manage-
ment of a much larger portion of the 13,500 Navy, and
possibly other services people, working in automatic data
processing.

        Effective management control over Navy ADP personnel
is imperative to efficient, economical ADP support, espe-
cially in light of the large expenditures for ADP personnel.
Effective management calls for Navy-wide guidance and direc-
tion on how to best employ ADP staff. Presently, the Navy
has no central guidance or direction on how to staff or
structure ADP organizations. Rather, responsiblity for
ADP personnel is diffused throughout the Navy.

        Responsibility for ADP personnel is also diffused
within NAVSEA which has not issued guidance nor direction
on how to staff or structure its ADP organizations.
Management of ADP personnel is fragmented among various
NAVSEA officials with responsibility over certain elements
of ADP personnel management for the shipyard MIS. We
found that:

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--NAVSEA has not promulgated factors to be considered
in establishing the size and composition of a cen-
tral design activity (CDA). NAVSEA has two CDAs,
the Computer Applications Support and Development
Office (CASDO) and the Central Naval Ordnance Manage-
ment Informations Systems Office (CENO). Differences
in staff size and composition at these activities
are not based on centrally established criteria
or standards. Further, CASDO, which designed and
developed the shipyard MIS, had a staff ceiling of
108 when the system went operational on a standard
computer configuration in 1974. It has maintained
this ceiling even though its responsibilities and
activities changed from design and development to
maintenance and improvements. (See Appendix I.)

--two NAVSEA divisions, the Director of CASDO and the
eight naval shipyard commanders, all have authority
over a portion of the 680 ADP support staff without
benefit of Navy or NAVSEA direction and guidance
for the management of ADP personnel. As a result (1)
CASDO's staffing is dependent upon the actions of
two different NAVSEA headquarters organizations;
(2) difficulties have been experienced in completing
required shipyard MIS programming; (3) staff size
and composition of the eight shipyard data proc-
essing offices (DPOs) vary significantly; and (4)
local programs are developed at each naval shipyard
without the full knowledge of NAVSEA headquarters.
(See Appendix II.)

--there is inefficient use of the shipyard MIS training
program. A selection of class attendance sheets
showed that in 17 of 40 classes, even a minimum number
of students did not attend. Also, while each naval
shipyard pays equally for instruction, not all have
received an equal amount of instruction time. Ports-
mouth Naval Shipyard officials believe the program
costs exceed program benefits (see Appendix III).

Although NAVSEA officials acknowledge these problems
existed for several years, they have no immediate plans
for correction. Their studies of the advisability of
merging CASDO and CENO have offered several alternatives
but resulted in no action. A current NAVSEA ADP Steering
Group is again considering NAVSEA's ADP problems and the
CASDO/CENO merger. We understand the most likely early
action could be to restructure the MIS training program.

For fiscal year 1976 the Navy estimated that 50 percent of its $388 million ADP budget related to personnel costs. A 1972 study estimated that 70 percent of all ADP costs within the Department of Defense related to personnel. This percent is expected to increase in the years ahead. If the Navy is to reduce its ADP costs, it must take steps to effectively manage its ADP personnel.

The experience of the other services may prove helpful. The Army's Computer Systems Command and two centers responsible to the Air Force's Data Automation Agency supervise and control the systems analysts and programmers for their services. The Army has developed a staffing model and the Air Force is currently performing a study to derive staffing determinants.

The Army and Air Force's development of software systems are divided into several phases such as planning, design, and maintenance. Estimates of staff requirements, costs and time to reach milestones are determined for each phase of the system's development over the estimated life of the system. The Air Force Data Automation Agency, in its current review of the Data Service Center, plans to establish a minimum essential requirement for the maintenance of existing standard systems, management overhead and technical services to which requirements are added for new systems development.
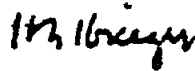
The Army has also developed and is using techniques to determine staff requirements for software development.

To promote better management of ADP staff within both the Navy and NAVSEA, we recommend that

--the Navy designate the CDAs as the manager of the systems analysts and programmers,

--the Navy develop staffing criteria for CDA's. Consideration should be given to the models developed by the other services,

--NAVSEA centralize management responsiblity over the shipyard MIS ADP support staff and consider developing criteria for staffing data processing offices, and

--NAVSEA evaluate the operations and administration of the shipyard MIS training program.

We would appreciate being advised of any actions
planned or taken on our recommendations. As you know,
Section 236 of the Legislative Reorganization Act of 1970
requires the head of a Federal agency to submit a written
response on actions taken on our recommendations to the
House and Senate Committees on Government Operations not
later than 60 days after the date of the report and to the
House and Senate Committees on Appropriations with the
agency's first request for appropriations made more
than 60 days after the date of the report.

Sincerely yours,

H. L. Krieger
Director

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NO CRITERIA IN EFFECT FOR
STAFFING CENTRAL DESIGN ACTIVITIES

ADP Central Design Activities (CDAs) design and
develop major Navy computerized information systems.
At a minimum a CDA is responsible for

--designing, coding, testing, documenting, modifying,
   and maintaining computer programs for standard use;

--creating and disseminating computer programs to more
   than one data processing installation; and

--providing technical assistance and corrective
   programming for standard computer programs.

A recent Navy report states that, depending upon
definition, the Navy operates about 17 CDAs. In total,
there are about 5,580 CDA personnel which provide varying
degrees of ADP support to commands and activities through-
out the Navy. The Naval Sea Systems Command (NAVSEA),
operates two Central Design Activities; the Computer
Applications Support and Development Office (CASDO),
and the Central Naval Ordnance Management Information
Systems Office (CENO). CASDO is primarily responsible
for design, development and program maintenance support
for the Shipyard Managment Information System (shipyard
MIS). CENO has similar responsiblities for the Naval
Ordnance Management Information System (NOMIS). Because
each performs similar functions, NAVSEA plans to merge
the two CDAs in the near future.

Our review did not evaluate the validity or necessity
of current workload or the differences in the complexities
of the MIS systems CASDO and CENO support. However, our
review did show significant difference in the staff
size, personnel composition and activities of the two
CDAs. We believe that these differences stem, in part,
from a lack of criteria/guidelines for staffing a CDA.

Staffing Differences
Between CASDO and CENO

A comparison of the staff size of the two NAVSEA
CDAs as of October 1976 follows:

	CASDO	CENO
Authorized staff	108	142
Supplemental staff 1/	67	–
Total available staff	175	142

1/ Information as of June 30, 1976.

The 67 supplemental staff shown under CASDO refers to assistance provided by the eight naval shipyard data processing offices (DPOs). CASDO is authorized to assign system analysis and programming tasks to each DPO. CASDO has a small number of programming staff and must therefore rely upon the DPOs to do most of the detailed analysis and programming for the shipyard MIS. CENO, however, maintains its own programming staff who perform the necessary NOMIS programming. NAVSEA officials stated that after the CASDO-CENO merger, the DPOs will continue to perform detailed analysis and programming on the shipyard MIS while these functions on the NOMIS will be handled centrally by the new CDA.

CASDO and CENO also have significant differences in the number of staff assigned to the functions of maintenance and improvement of their respective MIS systems. The following information is as of September 1976:

	CASDO	CENO
Staff assigned to maintenance	37 1/	52
(Percentage of total available staff)	21%	37%
Staff assigned to improvement	107 1/	16
(Percentage of total available staff)	61%	11%

1/ Includes DPO staff.

Both the shipyard MIS and the NOMIS have been operational for the past several years. Yet, since July 1974, CENO's authorized staffing has been reduced by a total of 20 positions while CASDO's authorized staffing has remained constant. It should be noted that CASDO has undertaken a major improvement program on the shipyard MIS. Thus, while CASDO's basic functions have changed from designing and maintaining a system to improving the

system, CASDO's authorized staffing has remained constant.
The Navy has not issued policy guidance on the level of
effort or the other factors to be considered in determining
the number of staff needed to design, maintain and modify
standard management information systems.

The Assistant Secretary of the Navy (Financial Manage-
ment) has stated that Central Design Activities tend to per-
petuate their own existence after management information
systems have become operational; represent an inflexible use
of Navy talent on high priority programs; and, represent a
marginal and inflexible environment for use of scarce, highly
trained, technical ADP skills.

Conclusion

We believe criteria/guidelines are needed for staffing
Navy Central Design Activities. The differences noted
between CASDO and CENO may be indicative of similar staffing
and operational disparities among other CDAs. Since each
Command determines its own CDA staff needs without Navy
guidelines, Navy management has no assurance that it is
getting the most effective and efficient use of its CDA
personnel. With at least half of total Navy ADP costs
relating to personnel, criteria/guidelines would provide
the Navy with a central measure of control over significant
ADP costs and resources which are currently controlled on a
decentralized basis.

Recommendation

We recommend that the Navy develop and implement staff-
ing criteria/guidelines for Central Design Activities. The
criteria/guidelines should take into account the CDA staff-
ing needed to support the different life cycle stages of a
management information system.

DECENTRALIZED AUTHORITY LOES NJT
ASSURE EFFECTIVE, EFFICIENT USE OF ADP
STAFF RESOURCES

NAVSEA management of ADP personnel associated with the shipyard MIS is both operationally and geographically decentralized. Staff responsible for the design, development, maintenance and operation of the system are located at NAVSEA headquarters in Washington, D.C., the Computer Applications Support and Development Office in Portsmouth, N.H., and the eight naval shipyard data processing offices scattered across the country. There is no central control over the approximately 680 ADP staff supporting the shipyard MIS.

Current NAVSEA practices do not assure effective and efficient utilization of ADP staff. Decentralized management has resulted in divided control over the staffing and operations of CASDO, difficulties in accomplishing required shipyard MIS computer programming, significant differences in the size and personnel composition of the DPOs and the creation of local programs at each of the naval shipyards.

Responsibility of CASDO's Workload and Budget Divided Between Two NAVSEA Divisions

NAVSEA 09B5 (Management Information and Data Systems Division) develops, coordinates and allocates Command-wide ADP funds and personnel. This responsibility includes establishing CASDO's budget and personnel ceiling. However, CASDO devotes only about 20 percent of its staff effort to projects controlled by NAVSEA 09B5.

NAVSEA 073 (Industrial Activity Management Systems Division) is responsible for the overall design and implementation of the shipyard MIS. CASDO supports NAVSEA 073 by providing central design and analysis services for the system. About 80 percent of CASDO's workload is assigned by this NAVSEA division.

CASDO officials stated that their staffing is dependent upon both workload and budgeted funds. Under current procedures, the primary user of CASDO's services (NAVSEA 073) has no authority over the staffing or budget of CASDO. NAVSEA 09B5 and NAVSEA 073 negotiate what CASDO's staffing will be. According to a NAVSEA 09B5 official, this awkward management procedure will continue when CASDO and CENO are merged.

Decentralized Management Has Hampered
Shipyard MIS Programming

NAVSEA Instruction 5450-4 states that naval-shipyard
DPOs will provide CASDO with detailed analysis and pro-
gramming effort on shipyard MIS program areas. Since
inception in 1965, CASDO has relied upon the DPOs to pro-
vide these services. Each DPO has lead responsibility for
selected shipyard MIS program areas. Before assigning a
project to a DPO, CASDO staff perform the broad analysis of
the project.

While CASDO has the overall responsibility for analysis
and programming, it lacks authority over the services pro-
vided by the DPOs. Each DPO is directly responsible to the
shipyard commander, not to CASDO. The Portsmouth Naval Ship-
yard DPO Director stated that his first concern was meeting
the needs of the shipyard and the shipyard commander, not
the needs of CASDO.

Two problems result from this analysis and programming
procedure. One, CASDO often receives untimely products from
the DPOs. A review of 27 CASDO projects assigned to the
DPOs between January and June 1976 showed that in 17 cases
the estimated release date had been revised. A NAVSEA offi-
cial acknowledged that some DPOs are more responsive to
CASDO's needs than others. Secondly, the Director of CASDO
stated that the lack of authority over the DPOs has resulted
in a significant amount of CASDO backlogged work. DPOs can
and do decline to perform necessary work for CASDO. He also
stated that this problem has worsened over the past year.

Shipyard Commanders Control
Size of DPOs

NAVSEA 07 (Industrial and Facility Management Direc-
torate) establishes the staff ceiling for each naval ship-
yard. Within the ceiling the shipyard commander, through
the Director of Management Engineering, authorizes per-
sonnel positions for the various shipyard departments,
including the DPO.

According to the Standard Naval Shipyard Organization
Manual, the DPOs are under the direct authority of the ship-
yard commander. The manual prescribes standard duties and
responsibilities of a DPO including the providing of ADP
systems design, analysis and computer programming services
for the shipyard and for higher authority as needed.

There are significant differences in the size and
personnel composition of the eight DPOs. Also, there
are major differences in the number of staff at each DPO
supporting CASDO. These differences are due in part to
the individual authority and prerogatives of the shipyard
commanders. Neither the Navy nor NAVSEA has developed
standard criteria for staffing DPOs.

The following information, as of June 30, 1976,
clearly shows the differences in the staffing of the DPOs.
As seen from the chart, there is no standardization among
the DPOs in their size and composition. Yet, each is
responsible for performing the same standard duties and
each operates the standard shipyard MIS on a standard
computer configuration.

SIZE AND COMPOSITION OF THE
NAVAL SHIPYARD DATA PROCESSING OFFICES
As of June 30, 1976

Type of personnel	Portsmouth	Philadelphia	Norfolk	Charleston	Long Beach	Mare Island	Puget Sound	Pearl Harbor	Total
Admin/clerical	4	6	1	4	4	3	3	2	27
Computer systems analyst/ programmers	21	19	14	21	28	20	15	21	159
Keypunching	21	27	31	24	29	30	45	19	226
Data control/scheduling	8	8	8	8	12	8	9	5	66
Operations	12	14	13	12	12	15	13	12	103
Total	66	74	67	69	85	76	85	59	581
Staff supporting CASDO	(10)	(7)	(5)	(13)	(9)	(5)	(6)	(12)	(67)

Autonomy of DPOs Allows For
Creation of Non-standard Programs

In an April 1975 report 1/ GAO pointed out that within
the Navy there is a "management philosophy which allows
the commanders of activities to unduly influence the design
of standard systems prescribed for use at those activities
and to modify standard systems or develop their own
systems to suit local needs without regard to the Depart-
ment's overall program objectives and management needs."
This problem is evident within the naval shipyards.

Each DPO develops local programs. NAVSEA has not
issued standard procedures to be followed in the design
and development of local programs. There is no central
library of local programs operated by each DPO even
though NAVSEA once attempted to create such a library.
Thus, NAVSEA can not be assured that the eight DPOs are
not duplicating one another in creating local programs.

According to the NAVSEA official, the creation of
local programs is not a problem within the shipyard MIS.
NAVSEA considers the controlling of locals is to be a low
priority, low payback item. However, there are a total
of 92 (out of 159) systems analysts and programmers in
the eight DPOs not assigned to supporting CASDO. For
an information system costing an estimated $119.2 million
to develop and operate through 1974 and which is supposedly
a "standard" system, there would appear to be many DPO
analysts and programmers working on nonstandard functions.
Also, the 92 analysts and programmers represent a signifi-
cant number of trained, valuable staff and whose activities
may be indicative of misused ADP capacity.

In May 1976, the Director of the Navy's ADP Management
stated that for a variety of reasons, the existing
decentralized approach to ADP support has generated a
range of operational, technical, economic and political
problems. The organizational barriers inherent in tne
existing decentralized support structure promote
parochialism and resistance to standardization of Navy
ADP systems. These same barriers also preclude the
concentration of scarce professional and technical per-
sonnel talent to satisfy high-priority Navy requirements.

1/Ways to Improve Management of Automated Data Processing
  Resources (LCD-74-110, April 16, 1975).

Conclusion

The problems noted by GAO stem from NAVSEA's decentralized management of shipyard MIS ADP staff. NAVSEA cannot expect to operate its ADP staff in the most effective and efficient manner under the current decentralized approach. More centralized control is needed to assure that both NAVSEA and the Navy get the most out of the ADP staff resources.

Recommendation

We recommend that NAVSEA develop procedures to centralize control over ADP staff associated with the shipyard MIS. This, in part, may require the removal of the systems analysts and programmers from the DPOs and/or the placement of the DPOs under the direct authority of NAVSEA headquarters.

We also recommend that NAVSEA consider standardizing the personnel size and composition of the eight DPOs.

MORE EFFECTIVE CONTROL
NEEDED OVER THE SHIPYARD MIS
TRAINING PROGRAM

NAVSEA provides training for naval shipyard employees
on the uses and benefits of the shipyard MIS. The training
program is designed to increase both a person's knowledge
and understanding of the shipyard MIS and the efficiency
and effectiveness of the system as a management tool.
Between inception of the training program in 1970 and May
1976, about 10,000 naval shipyard employees attended
the training program. Courses are taught at each naval
shipyard and consist of case studies, workshops, lectures
and lecture/discussions. Courses are taught under con-
tract by personnel of Harbridge House, Inc. of Boston,
Massachusetts. Contract costs for the period of July 1976
to July 1977 are approximately $592,000, and are allocated
equally to each shipyard. CASDO is responsible for adminis-
tering the training program.

Deficiencies in Administering and
Operating the Training Program

Several problems exist with training program operating
procedures. These problems relate to inconsistent use
of the training program by the naval shipyards and the
cost allocation method used to pay for the program.

The shipyard MIS training manual states that the
minimum class size for any course is 20. Should fewer
students attend, NAVSEA considers the cost per student
to be prohibitive. The manual also requires that
attendance be taken daily.

On a selective basis, we reviewed the course atten-
dance at the eight naval shipyards for the period January
1975 through June 1976. Of the 40 courses selected for
review, 14 had fewer than 20 in attendance. In another
11 courses, we could not determine if the minimum number
attended as daily attendance was not taken. According
to a CASDO official, CASDO does not know whether the
minimum number of students are scheduled to attend prior
to the presentation of a course.

Portsmouth Naval Shipyard officials stated that the
cost of the training was excessive in comparison to the
benefits received. They also stated that it was not
effective to send personnel to learn a system which,
because of the shipyard MIS Improvement Program, will be

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significantly changed in a few years. The largest class
size scheduled for the Portsmouth Naval Shipyard in the
current training period is nine students.

The second problem relates to charging each naval
shipyard equally for training even though some shipyards
receive more instruction time than others. Between
April 1974 and June 1976, each naval shipyard paid for
400 hours of instruction. However, the Puget Sound
and Pearl Harbor Naval Shipyards each did not use 40
hours of instruction while the Portsmouth naval shipyard
did not use 80 hours. CASDO officials stated that the
naval shipyards were not reimbursed for the unused course
time.

During the current training period, the Charleston
Naval Shipyard is scheduled to receive 120 hours of
instruction while the seven other naval shipyards will
receive 200 hours. Between April 1974 and June 1975,
the Charleston Naval Shipyard had received 80 additional
hours of instruction without incurring any additional
cost. However, the extra training was taken when the
naval shipyards were paying $55,000 a year for training,
not the $74,000 charged for the current year.

Conclusion

An important feature of any management information
system is the training provided on how to use that system.
Several deficiencies relating to operation and adminis-
tration exist within the shipyard MIS training program.
After 7 years of operation and in light of the changes
being made to the shipyard MIS, we believe it would be
beneficial for NAVSEA to reexamine the procedures and
practices used in the training program.

Recommendation

We recommend that NAVSEA evaluate the operations
and administration of the shipyard MIS training program.
Particular attention should be given among other things,
to such matters as the selection of students, size of
classes, attendance at classes and allocation of costs.
NAVSEA should also evaluate whether it is still beneficial
to use a contractor to teach this course.

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