REPORT

OF THE

DEFENSE SCIENCE BOARD

ON

USE OF COMMERCIAL COMPONENTS

IN MILITARY EQUIPMENT

JUNE 1989

Office of the Under Secretary of Defense for

Acquisition

Washington, D.C. 20301

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OFFICE OF THE SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301-3140

DEFENSE SCIENCE BOARD

June 14, 1989

MEMORANDUM FOR SECRETARY OF DEFENSE

SUBJECT: Defense Science Board Report on Use of Commercial Components in Military Equipment

I am very pleased to forward to you the Final Report of the Defense Science Board study of the Use of Commercial Components in Military Equipment. This study was a revisit of the 1986 Summer Study on this topic. Co-Chairmen Dr. Bob Burnett and Dr. Bill Perry have done an excellent job in getting to the major issues and summarizing the opportunities for improvement.

The Defense Science Board finds that the opportunities for saving time and money and improving performance through the use of commercially available components instead of special military components are even greater than previously thought. However, little progress in this direction has been made in the last three years and more forceful actions are required. The challenge will be one of communicating the need for change and getting commitment from personnel at all levels. The Defense Science Board recommends you make commercial acquisition the "Flag Ship" of procurement reform.

I urge that you read the attached letter from the Co-Chairmen, the Executive Summary, and the Implementation Plan. We are ready to assist further in any way you desire.

Robert R. Everett
Chairman

OFFICE OF THE SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301-3140

DEFENSE SCIENCE BOARD

13 JUN 1989

Mr. Robert Everett
Chairman
Defense Science Board
The Pentagon
Washington, DC 20301-3140

Dear Mr. Everett:

Attached is the final report of the Task Force on Use of Commercial Components in Military Equipment.

This study began at Dr. Costello's and your request for a "...quick relook..." at the 1986 Summer Study on the same subject. Seeing that the recommendations of that study were not effectively implemented, we were pleased to revisit those findings and recommendations and to try to craft new direction to achieve the goal of increased use of commercial products and buying practices.

The Task Force found that, despite overwhelming verbal support, movement toward greater use of commercial products and practices has been slow. Well intentioned reform in legislation and regulation, increased oversight and audit, continued expansion of administrative burden, and increased risk of civil and criminal liability have combined to make Defense procurement more and more discordant with commercial practices. Some of these changes are under the control of DoD and some will require legislative changes. To overcome this slide away from commercial products and buying practices, the Task Force recommends that the Secretary make commercial acquisition the "flag ship" of procurement reform. Specifically, the Task Force recommends that the DoD:

<u>Matters Under DoD Control</u>

- o continue, and give increased emphasis to some positive activities already underway;
- o aggressively pursue use of commercial microcircuits to gain the capability and benefit of using commercial components;
- o pursue an open systems architecture approach to greater use of commercially available computer hardware and software, taking full advantage of the leverage of our computing

industrial base, to demonstrate the ability and benefit of using commercial subsystems and nongovernment standards;

- o establish organizational entities empowered, charged with overseeing and institutionalizing these programs, and continuously seeking further enhancements to DoD's ability to intelligently use the extraordinary power available in the commercial marketplace.

Matters Requiring Legislation

- o propose and actively support legislation authorizing a pilot program to demonstrate that commercial buying practices, unencumbered by extensive legislation and regulation, can dramatically improve the efficiency of acquisition and the quality of what we buy, without abandoning our responsibility to treat businesses fairly, and to support social and economic programs necessary to continued economic health and welfare of the nation. Data and experience from this pilot program can be used later as a basis for permanent legislative change.

Benefits possible from full implementation of the recommendations are enormous. The nation can not afford for the Defense Department to neglect these benefits. The Task Force believes that decisive steps are necessary, and that the recommendations provide the outline for reform in this area. To achieve the goal, it will be necessary -- especially in a constrained budget environment -- for the Secretary of Defense to establish the commercial acquisition program as a "flag ship" in the overall efforts at acquisition reform. We strongly recommend such a priority.

James R. Burnett
Dr. James R. Burnett

William J. Perry
Dr. William J. Perry

Executive Summary

Background: In 1986 a Defense Science Board Summer Study, building on the recommendations of the Packard Commission, recommended increased use of commercial products and commercial buying practices. At the request of the Under Secretary of Defense for Acquisition and the Chairman of the Defense Science Board, the Task Force reconvened to revisit the findings and recommendations from the Summer Study. Following a brief review of progress since 1986, the Task Force concluded that some new, clear direction was needed, that some of the recommendations from the Summer Study required re-emphasis, and that some initiatives deserved recognition and support from the Defense Science Board.

Summary: The Task Force found that, despite overwhelming verbal support, movement toward greater use of commercial products and practices has been slow. Well intentioned reform in legislation and regulation, increased oversight and audit, continued expansion of administrative burden, and increased risk of civil and criminal liability have combined to make Defense procurement more and more discordant with commercial practices. To overcome this slide away from commercial products and buying practices, the Task Force recommends that the Secretary make commercial acquisition the "flag ship" of procurement reform. Specifically, the Task Force recommends that DoD:

- continue, and give increased emphasis to some positive activities already underway. Examples include the implementation of the *Enhancing Defense Standardization* report, the "Competition for Performance" concept, and work on contract simplification efforts;

- aggressively pursue use of commercial microcircuits to gain the capability and benefit of using commercial components;

- pursue an open systems architecture approach to greater use of commercially available computer hardware and software, taking full advantage of the leverage of our computing industrial base, to demonstrate the ability and benefit of using commercial subsystems and nongovernment standards;

- establish organizational entities empowered, charged with overseeing and institutionalizing these programs, and continuously seeking further enhancements to DoD's ability to intelligently use the extraordinary power available in the commercial marketplace.

- propose and actively support legislation authorizing a pilot program to demonstrate that commercial buying practices, unencumbered by extensive legislation and regulation, can dramatically improve the efficiency of acquisition and the quality of what we buy, without abandoning our responsibility to treat businesses fairly, and to support social and economic programs necessary to continued economic health and welfare of the nation. Data and experience from this pilot program can be used later as a basis for permanent legislative change.

IMPLEMENTATION PLAN

The Task Force has made specific recommendations in order to provide a clear road-map of the direction that needs to be taken to implement the recommendations in this report. The recommendations along with their implementation statements are summarized here.

New Major Thrusts

- Establish a components demonstration program, using microcircuits as a case study.

  Recommendations

  1. Establish an OSD single point-of-contact responsible for DoD semiconductor activities. Designate a field organization to implement semiconductor design and process certification.
  2. Fully implement a semiconductor standard design and cataloging system in consonance with the QML and SMD programs, which minimizes customizing identical basic commercial device designs into "unique" military parts and part numbers.
  3. Continue efforts with industry to standardize on common, electronic component specifications, and work with industry to catalyze broad adoption and use by component manufacturers, original equipment manufacturers, and the DoD alike. Use the common plastic industrial grade IC specification as a prototype to achieve this goal.
  4. Develop a single national system for certifying processes for semiconductor design and manufacture in conjunction with the effective test and inspection of individual integrated circuits. Use, as first preference, semiconductors supplied by these certified design and manufacturing processes.
  5. Use the appropriate semiconductor for the design and environment. Selectively use "industrial" grade semiconductors in appropriate DoD environments.

  Implementation

  The Secretary and Under Secretary for Acquisition, as appropriate, should direct the Services, DLA, and the Office of the Secretary of Defense to take appropriate action to implement the above recommendations.

- Establish a subsystems demonstration program, using computers -- both hardware and software -- as the case studies.

  Recommendation

  All services adopt the open systems architecture concept, endorse the international ISO/OSI standards and protocols, comply with GOSIP, and make optimum use of commercially available hardware and software.

(Note: In that all open systems architectural standards and protocols are in a stage of rapid development and evolution, the DSB also recommends that any and all potential incompatibilities between these emerging standards be brought to the immediate attention of the cognizant standards committees.)

Implementation

The Secretary should direct all services to cooperate with industry in the development of the open systems architectural standards for both hardware and software. If warranted, these standards should become the basis for all future hardware and software acquisitions.

- Acquisition system demonstrations -- a pilot program -- which will fully test the government's ability to buy commercial goods and services using commercial practices, and will also determine where changes in legislation and regulation might be required.

Recommendation

The DSB recommends that the Secretary initiate a pilot program to test the application of commercial buying practices to defense acquisition of commercial products.

Implementation

The proposed legislation at appendix 8 should be submitted to the Congress and should be vigorously supported.

- Establishment of new organizations and commitment of the required resources, to support the shift to commercial goods and services and commercial buying practices.

Recommendation

The Secretary should establish a Directorate for Commercial Acquisition within the Under Secretary for Acquisition, and direct that the Services and The Defense Logistics Agency establish or designate appropriate organizational entities at headquarters and at buying command levels.

Actions Already Underway

- Continue and support actions associated with the *Enhancing Defense Acquisition* report.

Recommendation

The DSB believes that these actions are appropriate, are well underway, and only recommends that the current thrust be continued and maintained at a high level of attention and emphasis.

Implementation

The Secretary should sign a memorandum to the Service Secretaries giving the new administration's stamp of approval and impetus to the actions represented by the report.

- Support the OFPP/DoD proposed legislation on commercial buying.

Recommendation

While recognizing that it does not address some issues inhibiting significantly expanded use of commercial products and practices, the DSB believes that the proposed legislation is necessary and recommends that enactment of a statute similar to the one being considered by DoD and OFPP (at appendix 9) be made a high legislative priority.

INTRODUCTION

In 1986 a Defense Science Board Task Force made strong recommendations aimed at shifting the Department of Defense towards far greater use of commercial products and commercial buying practices. This report argued that the Department of Defense would achieve the triple benefits of reduced life cycle costs, increased operational capability, and more rapid fielding of equipment, if it made such a shift.

The Under Secretary of Defense (Acquisition) reconvened the Defense Science Board Task Force to take a "...quick re-look at the subject in light of the recommendations of the Packard Commission, changes within the DoD and actions by the U.S. Congress. Based on this revisit the group may choose to modify and/or reinforce its recommendations." The task force quickly concluded that the recommendations had not been fully implemented, and set about determining why, whether the recommendations were still valid, and whether or not something else must be done. Essentially, the Task Force decided that it was necessary to develop a 1989 set of recommendations and a detailed plan to assure implementation.

In spite of the strong verbal support from the Department of Defense and the Congress since the 1986 report, regulations, and practices have moved in the opposite direction! The preference for military specification items has increased as protection against protest. Buyers have been demanding more cost data -- even on "market priced" items of commercial use. "Full and open" competition has been interpreted to mean obtaining the maximum number of bidders regardless of qualifications. Regulations intended to protect the Government in "open" competition have become so onerous that commercial suppliers are limiting their participation, thus inhibiting "full" competition.

While the atmosphere surrounding commercial acquisition has become even more hostile, technology trends and industry practices, since the 1986 report, have made the desirability of shifting to commercial equipment even more compelling. For example, for a given environment, it has been demonstrated that commercial electronic microcircuits are often much higher in performance, lower in cost, and of higher quality and reliability than defense components for comparable environmental requirements. Similarly, commercial firms are shifting to "total quality management" in order to be "world class" suppliers. The DoD -- using its traditional and unique practices -- has not been able to move as rapidly in this direction and thus is suffering -- in both cost and quality -- as a result.

The overall effect of the Department of Defense becoming more unique, and not taking advantage of the commercial equipment and practices that have evolved in the last few years, is that the DoD is paying significantly more and getting significantly less -- a trend which neither the nation's security nor its taxpayers deserve.

Background

The 1986 Defense Science Board Summer Study Task Force observed that reduced life cycle costs would come from: reduced research and development (R&D) costs, reduced production costs (due to the larger production runs), increased competition, and reduced

maintenance and upgrade costs. The increased operational capability would come from the fact that today's commercial parts, (e.g., electronics), are often more advanced than military parts (in terms of state-of-the-art technology), have built-in supportability, and are frequently designed to be more "robust" in terms of tolerance of both inapplicable use and failures. Finally, commercial equipment is often more readily fielded in response both to new technology and to changing threats, because there is less R&D required; and it has been designed both for modularity and upward compatibility, thus lending itself to modification when required.

In spite of these advantages, the 1986 DSB Task Force found that there have been significant problems in getting wide acceptance of commercial parts and practices within the Department of Defense. DoD procurement practices place excessive emphasis on unique military specifications and standards; which then lead to unique military designs; and therefore, to the buying of unique military products. This means that the Department of Defense must pay for all of its required R&D rather than sharing costs with the commercial world; additionally, the defense equipment acquisition cycles tend to run far longer (often 8-12 years); resulting in products that are perhaps 5-10 years behind the state-of-the-practice when they are finally fielded. Additionally, because of the specialized nature of the equipment and its high cost, the unique military units are produced in small production lots, thus driving their costs still higher. Then, when the equipment goes into the field, it has to be supported by unique defense support systems, both hardware and software, which increases the operating and maintenance costs. Additionally, because of the small quantity of fielded systems, there is less opportunity for improving reliability -- which makes the units still more expensive to operate and maintain. Finally, when it is time for product modifications, the DoD again pays a very high cost for these unique product improvements.

Recommendations - 1986 Summer Study on Commercial Components

To overcome these problems, and to take advantage of the potential cost, operational capability, and speed of deployment advantages offered by far greater use of commercial products and commercial buying practices, in the fall of 1986 the Defense Science Board specifically recommended:

- Revise the Federal Acquisition Regulations (FAR) and establish new policies, guidance, and procedures that would remove the current barriers and encourage implementation for acquiring commercial products and using commercial practices.
- Revise the military weapon's "requirements process" to include a "needs" document which emphasizes commercial trade-offs and incorporates contractor inputs to help achieve these trade-offs.
- Give the program manager discretionary authority to use commercial practices and products whenever appropriate.
- Strengthen DoD efforts to rapidly revise the specs and standards program -- with a particular emphasis upon adopting industry standards wherever possible (such programs as MIL Prime, commercial specs, streamlining, variable environments, etc. were to be encouraged).

- Shift the integrated circuit procurement process to include: removing the precedence of MIL-STD-454; certifying design and process versus parts; streamlining the MIL drawing system; and adopting a military/industrial common specification.
- Implement a set of "pilot programs" to validate the benefit of legal and regulatory exemptions that are required for the use of commercial practices by the Department of Defense.

The Barriers to Progress

When the DSB Task Force reconvened they found that only minuscule progress had been made. While the DoD had made some changes (see Actions Already Underway), the principal barriers to "commercialization" still existed, i.e., procurement regulations and bureaucratic pressure to continue business as usual. Fixes that had been proposed or implemented during the time period from 1986 to 1989 represented only marginal adjustments to a system that had largely been able to preserve the status quo. Worse still, the existing culture was being reinforced by well-intended "reforms" such as new legislation, more restrictive procurement practices, rigid enforcement of obsolete military specifications, which had actually moved the procurement process further in the direction of making defense more and more unique.

Thus, for the Department of Defense to receive the potential benefits of higher quality, reduced total costs, greater access to advanced technology, a broader industrial base, and greater customer satisfaction -- as represented by recent trends in the civilian sector -- there must be basic cultural changes to the DoD way of doing business. Such changes are going to require continuous and energetic DoD leadership, redirected defense resources (people and dollars), and cooperation from Congress. Cultural changes are neither easy nor fast to bring about. However, in this case, they are clearly required.

FINDINGS - 1989 TASK FORCE

First, the Task Force found that actions already initiated need to be vigorously pursued and financially supported. These include: the specifications and standards "commercialization" effort; the "blue ribbon contractor" buying practices (rewarding contractors who have. performed well by giving them a competitive advantage); other procurement efforts aimed at "buying quality" (rather than simply the "lowest offer"); the draft DoD/OFPP legislative proposal; changes to technical data and cost data requirements from commercial suppliers; the joint industry semiconductor specification efforts; and the joint industry/Navy Next Generation Computer standards program.

However four additional major thrusts are also needed.

- A components demonstration program, using microcircuits as case studies.
- A subsystems demonstration program, using computers -- both hardware and software -- as case studies.
- Acquisition system demonstrations -- a pilot program -- which will fully test the government's ability to buy commercial goods and services using commercial practices, and will also determine where changes in legislation and regulation might be required.
- Establishment of new organizations and commitment of the required resources to support the shift to commercial goods and services and commercial buying practices.

It is the combination of these four actions, together with the continuation of ongoing programs identified earlier, which must be actively pursued and supported. Over time, the result of these efforts will be significant progress toward the needed changes in DoD buying practices.

Components Demonstration Program - Electronic Microcircuits

The Department of Defense (DoD), as the initial major user of semiconductors, established rules and standards for design, inspection, test and certification to achieve high quality and reliability. The devices were used in stringent environments and in high value applications. The DoD drive toward quality and reliability led, over time, to semiconductor categorization and selection precedence rules which mandated the use of higher cost devices than necessary for many use environments and permitted the proliferation of "custom" devices. The rules also required individual part inspection and certification and biased part selection toward older technology and related onshore manufacturing. As the commercial market expanded, semiconductor technology exploded in materials, design, manufacturing, packaging, and testing and now provides low cost, high quality and reliability devices for numerous commercial applications. At the same time, DoD's market share decreased to about seven percent, and its semiconductor supply system and devices became unique and thus, more expensive. The incorporation of modern design and manufacturing processes, along with the effective use of tools such as statistical process control (SPC), has resulted in commercial components that demonstrate both high quality and reliability. By building on this already

existing commercial base, the DoD's prototype Qualified Manufacturers List (QML) program could be, and must be, expedited. Individual QML certified facilities will process, simultaneously, commercial and military components on the same process lines. This combines, synergistically, the best of both worlds; increases in line loading and flow rates leading to further increases in yield, quality, and reliability; and should substantially lower costs.

There may be a false sense of security regarding the domestic capability for semiconductor production during times of national emergency. The current semiconductor selection precedence requires that first priority be given to devices which are "manufactured" onshore, and only twenty-five percent of DoD IC usage falls in this category. Worse, for this category of devices, most piece parts other than the die are produced by non-U.S. manufacturers or U.S. firms using off shore plants, and the devices are simply "assembled" onshore. Additionally, 95% of all Standardized Military Drawing (SMD) die are produced in off shore facilities owned by U.S. firms.

DoD expenditures on semiconductors in 1985 were about $1.3 billion. This is projected to increase to $2.5 billion by 1992. DoD could realize an estimated $800 million annual cost avoidance by changing procurement practices and using "commercial" devices where appropriate. This can be done while achieving earlier use of technology, improving semiconductor quality and reliability, maintaining configuration control and improving long-term availability. While there has been concern raised about the impact of these recommendations on the domestic industrial base, this Task Force believes that, when implemented, they will tend to bolster our domestic capability rather than damage it.

Recommendations

The Defense Science Board recommends five interrelated actions:

1. Establish an OSD single point-of-contact responsible for DoD semiconductor activities. Designate a field organization to implement semiconductor design and process certification.

2. Fully implement a semiconductor standard design and cataloging system. in consonance with the QML and SMD programs, which minimizes customizing identical commercial basic device designs into "unique" military parts and part numbers.

3. Continue efforts with industry to standardize on common, electronic component specifications, and work with industry to catalyze broad adoption and use by component manufacturers, original equipment manufacturers, and the DoD alike. Use the common plastic industrial grade IC specification as a prototype to achieve this goal.

4. Develop a single national system for certifying processes for semiconductor design and manufacture in conjunction with the effective test and inspection of individual integrated circuits. Use, as first preference, semiconductors supplied by these certified design and manufacturing processes.

5. Use the appropriate semiconductor for the design and environment. Selectively use "industrial" grade semiconductors in appropriate DoD environments.

Implementation

The Secretary and Under Secretary for Acquisition, as appropriate, should direct the Services, DLA, and appropriate portions of the Office of the Secretary of Defense to take appropriate action to implement the above recommendations.

Subsystem Demonstration Programs - Government Computer Architectures

The industry moved rapidly to open system computer architectures during the 1980's. This lead to evolution of both commercial hardware and software technology (state-of-the-practice) at a pace completely outstripping the military's ability to assimilate it. This country depends on the technological superiority of its weapon systems as "force multipliers" on the battlefield. Consequently, it is imperative that we revise our systems acquisition to allow more rapid assimilation of state-of-the-practice commercial technologies while maintaining full and open competition throughout the systems lifecycle.

The government has embarked on a joint venture with industry to select and establish a set of widely accepted commercial, nonproprietary, open systems architecture, interface and protocol standards -- Government Open System Interconnection Profile (GOSIP). All future government computer acquisition contracts must comply with GOSIP. Internationally, governments and industry are adopting the standards of the International Organization for Standards on Open System Interconnection as they evolve.

Navy - Next Generation Computer Resources

The Services are initiating new computer development programs -- both embedded and stand alone -- to satisfy user requirements in the mid-1990's and beyond. Although all appear proactive, the Navy must be commended for three of its major thrusts:

- a universal move toward higher level interfaces and endorsement of the international "open systems architecture" (ISO protocols at all eight levels).
- stable, longer term contracts addressing both periodic revalidation of user requirements and continuous technology infusion, all "within scope."
- recognition of and commitment to using the total resources of the commercial computing base, both hardware and software.

Within this framework, the Navy established the Next Generation Computer Resources Program (NGCR), and has accepted such standards for its use. Joint Industry/Navy Working Groups have demonstrated significant progress toward achieving standards for local area networks and computer systems level back planes. Additional working groups in other standards areas are scheduled for the future.

One of the Navy's major goals for this program is to select 10 (see appendix 5) interface standards representing the basis for development of business, industrial, and military

systems of the 1990's. These standards are not "black boxes," but the engineering framework upon which fully integrated warfare systems can be built. The standards are technology independent allowing for the implementation of systems using state-of-the-practice technology, and providing for the development of highly modularized systems. This technology independence facilitates cost-effective evolution of weapon systems as threats and requirements evolve.

Army - Common Hardware and Software

Following this same theme, and leveraging off the power of the commercial computing base, the Army has created its Common Hardware and Software (CHS) Program. In this program, using a new acquisition strategy, they buy nondevelopmental items (NDI) for use in each of five separate "nodal" command, control, communication and intelligence systems. CHS provides the "glue" to link and support each separate node. Within CHS, each NDI package becomes a "building block," interoperable with all other components. Each nodal program manager can then use these CHS "building blocks" to construct system-unique development or support packages.

In the actual contract phase, the Army used industry standards to the greatest extent possible, relied on industry to maintain support equipment using best commercial practices, and contracted for industry to provide technology insertion to reduce obsolescence. A summary of the CHS program and lessons learned is at appendix 6.

Air Force - Joint Integrated Avionics and NDI Communication and Computer Systems

Recognizing both the importance of acquiring the latest technology and the simultaneous need for full interchangeability and interoperability, Congress required that all avionics "boxes" for the ATA, ATF, and LHX be modular and interchangeable. The Air Force developed the Integrated Avionics Architecture (IAA) for these multi-service weapons systems and took the lead in establishing the Joint Integrated Avionics Working Group, (JIAWG). Joint definition of the final avionics architecture is currently underway, and reportedly it will also follow many of the "open architecture" concepts.

The Air Force also manages 14% of the DoD computer systems with an annual information resources budget of over eight billion dollars. A description of the Air Force NDI computer and communications programs is at appendix 7.

Recommendation

The DSB recommends that all services adopt the open systems architecture concept, endorse the international ISO standards and protocols, comply with GOSIP, and make optimum use of commercially available hardware and software.

(Note: In that all open systems architectural standards and protocols are in a stage of rapid development and evolution, the DSB also recommends that any and all potential incompatibilities between these emerging standards be brought to the immediate attention of the cognizant standards committees.)

Implementation

The Secretary should direct all services to cooperate with industry in the development of the open systems architectural standards for both hardware and software. If warranted, these standards should become the basis for all future hardware and software acquisitions.

Acquisition System Demonstrations - Pilot Program

The Packard Commission and other studies and reports have stated that the DoD should make greater use of components, systems, and services available off-the-shelf. These items, commonly referred to as commercial products and services, offer the benefits of lower costs, increased availability, higher reliability, better quality, improved user acceptance, earlier incorporation of new technology, and proven track records of acceptance in the commercial marketplace. Notwithstanding the strong and repeated recommendations, the vocal adoption of the recommendations, and the issuance of numerous policy statements and legislation favoring the acquisition of commercial products, many statutes, regulations, and procurement policies continue to mitigate against such acquisitions. Policies that force buying officials to award on lowest price rather than best value, to require contractors to treat their government customer significantly differently from the way they treat their commercial customers, and statutes that greatly increase contractors civil or criminal risk when they do business with the DoD drive potential suppliers away from DoD contracting. Corporations are increasingly making decisions to severely restrict their government contracting, or are insulating their commercial customers from the cost, and the balance of their company from the risk, of doing business with the government by setting up separate government divisions. These impediments severely discourage both buyers and sellers. It will take no less than a dramatic cultural change to bring buyers and sellers together.

The current system is so encumbered with law, regulation, red tape and bureaucracy that it is difficult if not impossible for a predominately commercial supplier to comprehend it sufficiently to be able to market products effectively. The current acquisition system is:

- Based on a concept of fairness in competition designed principally to benefit <u>any</u> potential suppliers rather than the best interests of the customer.
  - Full and open competition vice effective competition
  - Lowest price vice best value
- Biased in favor of excessive use of Military Specifications or other detailed product descriptions to try to ensure that the item acquired will be suitable.
- Unable to take advantage of the most innovative solutions and efficient producers.
- Burdened with law and regulation that far exceeds what is the norm for commercial contracting.

Previous attempts to promote commercial product acquisition through policy and evolutionary change have achieved only limited success. Changes to buying practices are

inhibited because the practices are generally based on statute and are therefore not readily susceptible to modification. So government buyers continue to try to do the best they can within the framework they must work, while commercial buyers successfully apply a totally different set of laws and practices to buy all manner of commercial products. The DSB believes that these commercial buying practices could be applied successfully to DoD acquisition, but also believes that this approach should be measured to assure fairness, efficiency, and that national interests are not sacrificed. We recommend that a pilot program be established to determine experimentally the proper balance between prudence and an aggressive change in the current system.

The pilot program defined by the proposed legislation at appendix 8 is structured to test the application of law and commercial buying practices to the acquisition of commercial products for DoD. While the changes represented by the pilot program are dramatic, the impact has been restricted by applying it only to:

- Commercial products;
- Five buying activities; and
- Contracts over $25,000.

The pilot program will include training of government contracting personnel in the techniques used by commercial buyers including price analysis and best value evaluations. It will also require a comparison of the results to non-pilot program buys of the same or similar commodities, based on price paid, delivery, quality, reliability, customer support, impact on small business, and other pertinent criteria. A Commercial Acquisition Ombudsman will be established to oversee the program, provide assistance to contractors and to contracting officers, and to act as the final arbiter in any protests filed by contractors. The Ombudsman will also provide DoD liaison with the OFPP Advocate for Acquisition of Commercial Products. The program will allow for competition structured to benefit the buyer rather than the seller, will modify the existing protest system to moderate the impact of protest, and place maximum trust in the contracting officer to obtain "best value" without need to fill a file cabinet with justifications and the paper trail necessary to guard against protest and audit. This trust will have to be backed with visible support by management, to the Secretary of Defense level when needed, for contracting officer and program manager decisions to do something other than that which is most easily documented (lowest price offer). To encourage the risk taking inherent in this approach, the consequences of failure must be moderate and the reward for success, substantial. These elements are absolutely essential to the success of the pilot program.

Recommendation

The DSB recommends that the Secretary initiate a pilot program to test the application of truly commercial buying practices to defense acquisition of commercial products.

Implementation

The proposed legislation at appendix 8 should be submitted to the Congress and should be vigorously supported.

New Organization

The demonstration programs at the components, subsystems, and acquisition system levels -- as well as the continuation of the current efforts at specifications, "quality", etc. -- must not be viewed as "one shot experiments". The value of these efforts must be to develop a set of "lessons learned" which will result in revisions to laws, regulations, specifications, practices, etc. that will be permanently implemented within the Department of Defense. In order to assure the needed, proactive leadership, the required coordination, and support of these programs, and the continuous working with Congress, the OFPP Advocate for Commercial Product Acquisition, and industry, new organizations and redirected resources are going to be required.

It is recommended that there be new organizational elements to implement these policies, within the Under Secretary of Defense (Acquisition), the Services, and the Defense Logistics Agency. These organizations must be created with missions, authority, and resources to:

- Find programs that can be satisfied by commercial equipment (at the systems, subsystems, and components levels). To achieve this, these organizations must review all new system requirements at whatever appropriate equipment level analysis indicates that commercial items will "do the job".
- Oversee -- and in some cases act as the Program Executive Office for -- the "pilot programs" as well as the subsystem and component "demonstration" programs. This will assure that lessons learned on one program are rapidly transferred to others and that the aggregate information is available for necessary regulatory and/or legislative changes.
- Perform detailed analyses of laws, procurement practices, specifications, etc. and develop the needed changes that will allow and encourage DoD to make far greater use of commercial equipment and commercial practices. Without this supporting analysis, the other efforts become simply "experiments" and there will not be the rapid implementation of the needed cultural changes.
- The scope of these new organizational elements must include:
  - Developing regulatory cases (e.g., on technical data, software rights, commercial market acceptability, "quality sources", price "reasonableness", and "adequate" competition). For example:
    - Making the needed changes to the policies and regulations to ensure that suppliers can obtain exemptions from submission of cost or pricing data requirements based on the contracting officer's determination of the commercial nature of the

goods or services rather than the current arbitrary formula based on sales volumes.

  - Developing the necessary policy and regulatory changes and training programs to establish and implement price analysis as an appropriate tool for evaluation of "best value" in the context of price reasonableness and competition.

- Developing appropriate tools, techniques, and implementing policies for measuring the success of policies and procedures to use more commercial products and to increase commercial supplier participation in competition.

- Assuring that the "demonstration programs" and other concurrent efforts receive all the needed financial and organizational support required for their successful completion.

- Developing the necessary policy changes, recommending legislative changes to ensure that appropriate portions of the demonstration programs are institutionalized, and rigorously following through to ensure that recommendations are actually implemented.

- Assuring that procurement practices actually implement the intended changes (which has often not been the case in some of the recent "fixes").

In order to implement the above responsibilities, the new organizations must have adequate staffs and budgets (including funds required for supporting analyses). The return-on-investment associated with these small manpower and budget expenditures will be enormous -- orders of magnitude!

Recommendation

The Secretary should establish a Directorate for Commercial Acquisition within the Office of the Under Secretary for Acquisition, and direct that the Services and The Defense Logistics Agency establish or designate appropriate organizational entities at headquarters and at buying command levels to implement these recommendations.

Conclusion

The Task Force finds that the Defense Department can do much more to reap the benefits available from greater use of commercial products and commercial buying practices. The recommendations presented here outline an aggressive program to achieve these benefits. The changes will not come easily, but we can not afford not to try. For all of the above to be achieved, it will be necessary -- especially in a constrained defense budget environment -- for the Secretary of Defense to establish the commercialization program as a "flag ship" in the overall efforts at acquisition reform. This Defense Science Board Task Force strongly recommends such a priority.

ACTIONS ALREADY UNDERWAY

The task force recognized that a number of activities have been initiated since the 1986 summer study which bear directly or indirectly on the Department's ability to buy commercial products and use commercial buying practices. Included here is a short description of several such initiatives that the DSB thinks are positive steps worthy of note and deserving of continued attention, support, and nurturing in order to achieve the intended results.

Specifications and Standards

Much has been written about the way excessive specification detail inhibits the ability for commercial entities to compete for DoD contracts. The 1986 Summer Study Task Force recommended that the DoD make greater use of non-Government standards, use more functional/performance descriptions, increase use of "fill-in-the-blanks" type specifications, and emphasize streamlining.

The DoD initiated a major study of the standardization program culminating in issuance by the USD(A) of a report titled *Enhancing Defense Standardization*. The report details significant actions being taken to improve the standardization program and respond to the DSB's recommendations as well as those from other studies, critiques, and reports.

In order to be more responsive to current and future acquisition needs, restore credibility to existing specifications and standards, and generally revitalize the Defense Standardization Program, there are six broad areas in which action is being taken: (1) establish accountability within the Services and Agencies for achieving the program objectives; (2) conduct a comprehensive review of all existing specifications and standards to ensure compliance with Department of Defense policies; (3) establish closer relationships with industry associations and non-Government standards bodies; (4) automate data bases that serve as tools in the development, storage, retrieval, dissemination, application, and analysis of specifications and standards; (5) establish a budget line item controlled by the Office of the Secretary of Defense to aid the Services and Agencies with special standardization projects; and (6) promote greater training for the developers and users of specifications and standards to effect a necessary cultural change. Taking action in these areas will correct persistent problems, ensure these problems do not recur, and will allow the DoD to seize new opportunities to perform it's mission more effectively. The Under Secretary for Acquisition has already acted in some areas and the DSB endorses those actions and recommends their full and active support. For example, military specifications and standards may no longer be issued or revised for nearly 400 federal supply classes where there is a high potential for commercial acquisition, unless a waiver is granted. The waiver will be granted only if justification is provided to demonstrate the product or process is uniquely military. We believe that such actions are appropriate steps for enhancing the DoD's ability to buy commercial.

Recommendation

The DSB believes that these actions are appropriate, are well underway and only recommends that the current thrust be continued and maintained at a high level of attention and emphasis.

Implementation

The Secretary should sign a memorandum to the Service Secretaries giving the new administration's stamp of approval and impetus to the actions represented by the report.

Draft OFPP/DoD Legislative Proposal on Commercial Buying

Commercial products compete in the open market on a number of bases - performance, reliability, and other aspects of quality as well as price. The freedom to innovate and compete in those many areas is largely what makes competition in the commercial market so vigorous. The rigidity of current government procurement procedures favors the use of detailed specifications precisely defining minimum needs and the award of contracts on the basis of low price, regardless of other considerations. When we focus on attempting to define minimum needs in detailed specifications - rather than on determining how needs can be addressed by products already available in the commercial market - competition in areas other than price is limited. The only offerors who may want to compete are those willing to specially manufacture a product for the government market. Many high-value commercial products that are suitable for the government's needs may not address those needs in the precise ways contemplated by the government's specification writers. Moreover, the bias in the current acquisition system in favor of detailed specifications and low price awards serves to level any competitive advantages gained by the contractor's investment in innovations which improve performance or other aspects of quality. Where commercial products suitable for DoD's needs are available, the use of detailed specifications and over-emphasis on price is likely to disqualify commercial products and result in less, rather than more, competition.

The Packard Commission, in two related recommendations, urged the Department of Defense (DoD) to increase its reliance on commercial market competition. First, the commission recommended that off-the-shelf products, rather than custom-designed ones, be used whenever such products are available to meet DoD's needs. Second, the commission recommended that DoD increase its use of commercial-style procurement techniques that emphasize quality and established performance as well as price. In attempting to carry out these two Packard Commission recommendations, DoD, working with the Office of Federal Procurement Policy (OFPP), concluded that the competitive procedures prescribed by the current statutory framework neither accommodate the routine purchase of commercial products nor permit the effective and efficient use of commercial-style techniques.

The market rewards investment in successful innovation and manufacturers are under constant pressure to develop new and improved products. Those manufacturers that fail to do so soon lose their competitive position. In order to take advantage of this broadly based commercial competition, DoD's buyers need an efficient means for learning about and

considering differences among products and for making product selections on the basis of best value.

The competitive procedures currently available were not designed with commercial product acquisition in mind. They limit the utility of market research and discourage elevating quality above price. The current statutes seek to maximize competition by ensuring every source that wants to manufacture or supply a product has the opportunity to compete and by favoring awards to sources offering minimally acceptable products at the lowest prices. Operating within those constraints, contracting officials adopt specifications early in the acquisition process in an attempt to ensure suitable products are routinely purchased within tolerable timeframes. This approach limits the scope of product evaluations, driving contracting officials to make contract awards based primarily, if not exclusively, on price, regardless of other considerations and the availability of superior, off-the-shelf products. Further, under the minimum needs, low price model, specifications development is not viewed as part of the competitive process, therefore revising requirements to take account of knowledge gained through market research risks the accusation of bias.

It is anticipated that the commercial-style procedures authorized by the statute proposed by DoD and OFPP would incentivize users to require items that are commercially available and tested in the marketplace. Acquisition officials would have an efficient means for becoming familiar with available commercial products, identifying those that are most suited for DoD's needs, and selecting the product constituting the best value. This practice, followed to its conclusion, should increase competition by attracting greater participation of established commercial sources. While regulations have not yet been drafted, it is expected that procurements would be initiated with a public notice requesting interested sources to make submissions describing their products and explaining how they meet the advertised needs. The public notice would be issued as soon as contracting officials were able to explain needs in conceptual terms. The early adoption of specifications would be avoided; however to qualify for consideration, products would be required to have achieved commercial market acceptance and to comply with minimum, fundamental requirements synopsized in the public notice. These could include commercial standards, minimum function and performance levels, essential form and fit specifications, and in appropriate cases, DoD manufacturing process qualification standards.

After receiving product information from interested sources, contracting officers would be encouraged to continue to refine requirements based on the knowledge gained through reviewing the product information. Only products qualifying under the public notice would be considered in that review. Permitting contracting officials to focus on the characteristics of the qualified products would allow efficient determination of any additional mandatory requirements necessary to ensure suitability for DoD use or, if necessary, to narrow the competitive field to those products most likely to be selected. Specifications and evaluation criteria could be adopted up to the point that (best and final) offers were solicited. The premise underlying this commercial-style model is that market research, needs refinement and specifications development should be visible, dynamic activities that are performed concurrently and recognized as essential elements of the formal competitive process. Contracting officials would have an efficient means for integrating their analyses of program

needs, commercially available options, and budgetary considerations with the aim of determining the optimal tradeoff.

Recommendation

While recognizing that it does not address some issues inhibiting significantly expanded use of commercial products and practices, the DSB believes that the proposed legislation is necessary and recommends that enactment of a statute similar to the draft being considered by DoD and OFPP (at appendix 9) be made a high legislative priority of the new administration.

Technical Data

The Department of Defense recognizes that requiring contractors to sell or otherwise relinquish their legitimate proprietary rights in technical data as a condition for the award of a contract can have a detrimental impact on privately funded development and DoD's access to commercial technologies. Not only are such requirements not in the best interest of the Department but they are contrary to existing law. These facts are recognized in DoD's Supplement to the Federal Acquisition Regulation Part 227.4 which expressly prohibits such activities by DoD acquisition personnel. This section of the regulation was extensively revised by Defense Acquisition Circulars 88-2 (1 Dec 1988) and 88-3 (15 Dec 1988). The latter regulation complies with 10 U.S.C. 2305 (d) (4), which was amended under Section 806, Incentives for Innovation, of the FY89 DoD Authorization Act, P.L. 100-456, on September 29, 1988. The statute limits the the Government's authority to require that prospective developers or producers of major systems provide proposals which would enable the Government to use technical data to obtain future competition when acquiring items or components of the weapon system, where the items or components were developed exclusively at private expense.

Pilot Contracting Activities Program

The Pilot Contracting Activities Program (PCAP) began in the summer of 1987. It was established by the USD(A) to use our field contracting personnel as a resource to provide and test initiatives that would support the Packard Commission goals of increasing contracting officer authority and streamlining procedures. Using this "bottom up" method as one approach to regulatory reform, the USD(A) delegated his authority to issue class deviations to the Federal Acquisition Regulation (FAR), the Defense Federal Acquisition Regulation Supplement (DFARS) and other procurement regulations, not required by statue or Executive Order, to Service/Defense Agency Directors for Contracting. This deviation authority is applicable to proposals submitted by the designated activities participating in the program. There are currently 45 activities, representing a broad spectrum of contracting, in participation.

Under the program a designated activity can propose a change initiative that, if approved, will normally undergo testing at the activity for a year. If the initiative is successfully tested it will be evaluated at quarterly reviews held to obtain Service/Agency

agreement on those initiatives appropriate for DoD-wide implementation. Initiatives agreed upon at these reviews then become DAR cases that undergo the normal acquisition rule-making process.

To date, the majority of PCAP initiatives received concern detailed internal procedures viewed in the field as burdensome, unnecessarily complex or in need of revision or update. Examples include dollar thresholds that have not kept pace with inflation and procedures that limit the flexibility of contracting personnel to exercise sound business judgment.

Through November there have been 524 PCAP proposals submitted. About sixty percent apply to the FAR/DFARS with the remainder applicable to Service/Agency regulations. One-third have been duplicate submissions that allow testing at more than one activity. Overall, more than seventy percent of all initiatives have been approved.

The Services have recommended that 15 PCAP proposals be considered for incorporation into the FAR or DFARS. They have taken action on a similar number of initiatives applicable to procurement regulations that are within their own purview. As the program produces additional ideas that successfully complete the testing period and can achieve a DoD-wide consensus, more will be considered for implementation.

PCAP does not have quotas for submissions, approvals or successful initiatives. As ideas occur to program participants they are submitted and evaluated along with other procurement initiatives. While still relatively new, the program is firmly in place and is providing field acquisition personnel an institutionalized method of expeditiously proposing and demonstrating their ideas to improve the procurement process.

"Competition for Performance"

The Air Force Logistics Command pioneered the "Competition for Performance" initiative which provides the contracting officer with the flexibility to award at a price up to twenty percent higher than the low price offer in order to place an award with a "quality vendor" (a vendor having a history of on time delivery of quality products). The Air Force has expanded the program to all Logistics Centers, and three DLA Supply Centers have adopted and adapted the program to their situations. Under this initiative, vendors of particular Federal Stock Classes are invited to apply for inclusion on a qualified vendor (or similarly-named) list on the basis of their delivery and quality history. This initiative was developed in response to the Packard Commission recommendation that the Department of Defense provide for increased use of commercial-style competition, emphasizing quality and established performance as well as price. The Air Force has approved 76 firms in 429 FSCs from the more than 300 applications received. The Defense Construction Supply Center (DCSC), Defense Electronics Supply Center (DESC), and Defense Industrial Supply Center (DISC) have together made a total of 28 awards (as of January 25, 1989) using the Competition for Performance analysis. In a related effort, the Defense General Supply Center (DGSC) has developed a "Value Based Award" program. This program addresses items identified as having a history of quality and/or delivery problems and provides for award to a contractor who has a good quality and on-time delivery history.

DLA is currently developing tools for evaluating and quantifying costs of doing business with "less-than-stellar" performers. The evaluation factors are designed to show that it costs a certain amount to perform a pre-award survey, or to accept supplies late, or to perform source inspections, or to contend with nonconformances.

Contract Simplification

A DoD Contract Simplification program tested a new solicitation cover sheet, a simplified contract format, and the use of annual representations and certifications. At the conclusion of a test, a Defense Acquisition Regulatory Council case was prepared proposing changes to the Federal Acquisition Regulation. The proposed change would permit use of the simplified contract format for firm-fixed price and fixed-price with economic price adjustment acquisitions of noncomplex supplies or services. The case is currently under review.

Long-Term Contracting

Long-term contracting arrangements with quality suppliers are recognized as effective means for saving money and man-hours. The use of various long-term (one-year or more) contracting techniques has been steadily increasing in DLA. Many petroleum contracts now run for two years. One particularly noteworthy technique is the Paperless Order Placement System (POPS). Under this system, indefinite delivery contracts are written for a one-year period with options to renew for two, three, or four additional years. These contracts provide for direct electronic ordering from contractor stocks for shipment direct to requisitioning activities. POPS is operational at the DLA Hardware Centers (DCSC, DESC, DGSC, and DISC) and each center is attempting to expand its POPS to include more contractors and products.

Appendix 1

Tasking and Terms of Reference

- Memo from Mr. Fowler, Chairman, Defense Science Board to Dr. Costello, Under Secretary for Acquisition, proposing to revisit the 1986 Summer Study Report.
- Tasking Memo from Dr. Duncan, Assistant Secretary of Defense (Research and Technology) to the Chairman, Defense Science Board.
- Original Terms of Reference for 1986 Summer Study

OFFICE OF THE SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301-3140

DEFENSE SCIENCE
BOARD

December 4, 1987

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR ACQUISITION

SUBJECT: Revisit of DSB 1986 Summer Study Task Force on Use of Commercial Components in Military Equipment

Bob

In our last session you noted your interest in pushing greater use of commercial components in DoD systems, and I agreed to explore a DSB revisit of the 1986 Summer Study on this subject. I have since spoken with both co-chairmen Bob Burnett and Bill Perry. Both agree that now would be a most propitious time to have such a revisit and also agree to co-chair the effort.

The attached memo will implement the revisit.

There is, as you probably know, an ongoing GAO review of this study reflecting concern by Congressman Jack Brooks with the recommendation to modify the competition in procurement directive and any possible conflict of interest on the part(s) of any members of the study. The GAO has indicated they do not expect to conclude their efforts until this summer.

Best

Charles A. Fowler
Chairman

Attachment

ACQUISITION

THE UNDER SECRETARY OF DEFENSE

WASHINGTON, DC 20301

8 DEC 1987

MEMORANDUM FOR CHAIRMAN, DEFENSE SCIENCE BOARD

SUBJECT: Reconvening Defense Science Board (DSB) Summer Study on Use of Commercial Components in Military Equipment

You are requested to reconvene selected members of the DSB Summer Study on Use of Commercial Components in Military Equipment to take a quick re-look at the subject in light of the recommendations of the Packard Commission, changes within DoD and actions by the U.S. Congress. Based on this revisit the group may choose to modify and/or reinforce its recommendations.

I would appreciate a report on the results within the next three months.

Robert C. Duncan
Assistant Secretary of Defense
(Research and Technology)

THE UNDER SECRETARY OF DEFENSE

WASHINGTON, DC 20301-3010

RESEARCH AND ENGINEERING

8 APR 1986

MEMORANDUM FOR CHAIRMAN, DEFENSE SCIENCE BOARD

SUBJECT: Defense Science Board Summer Study on The Use of Commercial Components in Military Equipment

You are requested to convene a DSB Summer Study on the use of commercial components in military systems.

There has, for many years, been discussion about the cost of military equipment being greatly inflated by the use of military specification (MILSPEC) items when existing commercial items could have been used more cheaply. Your work should analyze this argument and evaluate the cost-effectiveness and performance trade-offs from increasing the use of foreign and domestic commercial off-the-shelf equipment. Include all levels of piece parts, assemblies, and end items in defining commercial components.

The study should address, but not be limited to the following areas:

a. An examination of some past programs where commercial components could have been safely used but MILSPEC items were used instead. Include an estimate of cost savings that could have been realized.

b. An estimate of "down side" risk if commercial components had been used, including an evaluation of logistics issues such as proprietary data rights, control of supplies and suppliers and the impact on maintenance concepts and warranty programs.

c. Identification of the impediments to the use of commercial components and recommendations for making it easier to use commercial components in military equipment if this is a wise course to pursue. Special attention should be paid to actual methods of implementation.

Dr. James P. Wade, Jr., ASD(A&L) and I will co-sponsor, and Dr. William J. Perry and Dr. J.R. Burnett will co-chair the Summer Study. Mr. Andrew Certo of the ASD(A&L) Production Support Office will be the Executive Secretary and Lt Col Herbert R. Vadney, USAF, will be the DSB Secretariat Representative. It is not anticipated that your inquiry will involve any "particular matters" within the meaning of Section 208 of Title 18, U.S.C.

Donald A. Hicks

Appendix 2

Task Force Membership

Defense Science Board

Task Force

on

Commercial Components

Membership

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Appendix 3

Summary of Meeting Dates and Places

The task force met six times between January of 1988 and April of 1989. Three of the meetings were open to the public with broad participation actively sought. The three meetings that were closed were closed either because classified material was expected to be presented, or because the Task Force was working on final recommendations, the premature disclosure of which could have significantly inhibited effective implementation.

Task Force meetings were attended by a total of 79 different people representing, from the Government, the Office of the Secretary of Defense, the Military Services, the Defense Logistics Agency, the US Postal Service, the Office of Federal Procurement Policy, and the General Accounting Office, 15 private corporations, 3 industry associations, and others. The meeting dates and places are listed below.

January 11, 1988	Arlington, VA
May 11,1988	Fairfax, VA
June 16, 1988	Fairfax, VA
November 4, 1988	Fairfax, VA
January 23, 1989	Redondo Beach, CA
March 30, 1989	Redondo Beach, CA

Appendix 4

Microcircuits Working Group

Briefing Report

DEFENSE SCIENCE BOARD

COMMERCIAL PRACTICES TASK GROUP

SEMICONDUCTOR REPORT

R. L. CATTOI
FEBRUARY 1989

TASKING

To evaluate the potential use of commercial procurement practices and high grade commercial semiconductors in military equipment

To recommend potential changes to existing military semiconductor specifications and application standards/procedures which would

- **Reduce cost and retain high quality, reliability and performance**
- **Obtain early use of advanced technology**
- **Maintain configuration control**

FINDINGS

DoD can:

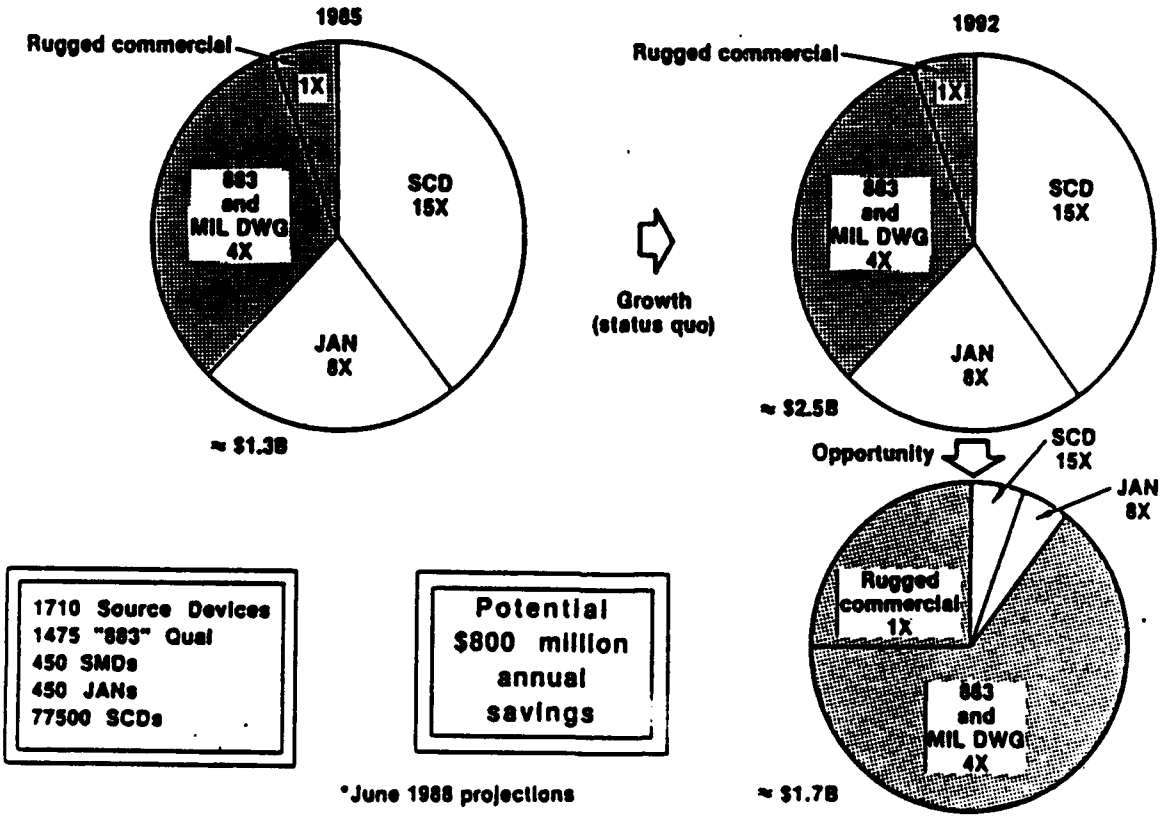
- Achieve earlier use of technology — "commercial" and "military"
- Improve semiconductor quality and reliability
- Provide effective device application disciplines
- Maintain configuration control
- Improve long term availability

and

- Realize $800M annual cost avoidance

by investing about $3M per year to improve semiconductor procurement practices

DoD INTEGRATED CIRCUIT PROCUREMENT*



DEVICE CATEGORIES VS. FEATURES

DEVICE CATEGORY AND RELATIVE COST	MANUFACTURING AUDITED AND CERTIFIED BY	MANUFACTURED	PROCESS AND TEST REQUIREMENTS	SELECTION PRECEDENCE PER MIL-STD-454 REQUIREMENT 64
MIL-M-38510 "JAN" 8X	DESC/RADC	ONSHORE	MIL-STD-883C CLASS B	1st
DESC/ MIL-DRAWING 4X	MANUFACTURER	OFFSHORE PERMITTED	MIL-STD-883C CLASS B	2nd
MIL-STD-883 CLASS B PARA 1.2.1 4X	MANUFACTURER	OFFSHORE PERMITTED	MIL-STD-883C CLASS B	3rd
SOURCE CONTROL DRAWINGS 15X	MANUFACTURER	OFFSHORE PERMITTED	MIL-STD-883C CLASS B	4th

BACKGROUND

- Initial semiconductor uses were in DoD — Minuteman guidance systems
- DoD was the major market and, to control quality and reliability, established "MIL SPEC" requirements and procurement rules
  - — Inspection
  - — Marking
  - — Certifying
  - — Testing
  - — Traceability
  - — Auditing
  - — Design Rules
  - — Packaging
  - — Reporting

Which provided

- — High quality and reliability in stringent environments
- — Traceability of part to source
- — Onshore manufacturing capability

BACKGROUND (CON'T)

This led to:

- A device categorization and selection precedence which
  - Is rigid and, in the view of some, inviolate
  - "Overspeced" ICs for some use environments
  - Tilted toward use on onshore manufactured devices which are more expensive
  - Permitted proliferation of part numbers per device (and "overhead" costs), and thus expensive devices
- Unrealistic rules regarding device qualification, certification and audit, on/offshore manufacture and assembly
- DoD not taking advantage of available technology along with the high volume, high yield, high quality flows of commercial marketplace
- Higher costs and constrained supply

BACKGROUND (CON'T)

- IC usage proliferated in DoD and in commercial sector
  - DoD became minority user (less than 10% of merchant market)
  - IC vendors multiplied, onshore and offshore
  - Wide variations evolved in use environments, quality and reliability
  - DoD market has been "device" oriented — high ratio of processes per part number. Commercial market is process oriented — high ratio of part numbers per process
    - Process control improves yield, cost, and quality
- Meanwhile, technology exploded
  - Material quality
  - Design, manufacturing, packaging and testing processes
  - Statistical Process Control/Total Quality Management

  and provides high quality and reliability in stringent commercial applications

BACKGROUND (CON'T)

- U.S. production moved primarily offshore
  - 53 plants in 15 countries owned by 10 U.S. vendors produce about 75% of all "MIL SPEC" ICs
  - 12 plants in U.S. produce remainder
- But, DoD emphasized the need for domestic supply (Kyocera incident) and perceived that "MIL SPEC" provided highest quality and reliability
- Relationships between device manufacturers, OEMs and DoD were inconsistent and fragile
- Also, DoD procurement system did not keep pace with technology and market dynamics

RECOMMENDATIONS

To reduce cost and retain high quality and reliability, to obtain early use of advanced technology, and to maintain configuration control:

- Eliminate SCDs — replace with SMDs and ruggedized industrial ICs as required
  - 15X cost factor
  - Represent about 40% of procurement
  - Add tremendous "overhead" at DESC
  - Compound long term logistic support problems
- Increase selected use of rugged industrial ICs
  - Lowest cost
  - Leading edge technology: high quality and reliability
  - Currently 10% of procurement
- Assure proper use of "JAN" grade ICs
  - High cost: extended environment
  - Assembled in U.S.
- Certify semiconductor design and manufacturing processes, not individual ICs
  - Real driver for quality/reliability
  - Increases yield, reduces cost
  - Can leverage SEMATECH investment

SPECIFIC RECOMMENDATIONS

- Establish a single OSD point-of-contact responsible for direction, guidance and monitoring implementation of semiconductor recommendations
- Designate DLA/DESC to be the field organization to implement the SMD and process certification/QML actions — onshore and offshore
- Use SMDs in lieu of SCDs and use, as first preference, flows from QMLs
- Standardize with industry on a common plastic industrial grade IC spec
- Develop a single national certification system for government and industry
- Develop a Semiconductor Application Guidebook
- Implement a Field Failure Return Program
- Consider impact of relying on offshore manufacturing

STATUS

- At leadership level we have a real spirit of cooperation and a general acceptance of the DSB Task Force recommendations
  - Semiconductor industry — SIA
  - OEMs — users
  - OSD — DLA — Services

  Remaining issue is erosion of "onshore supply"
- Sorted out fundamental problems from symptomatic problems
  - Quality/reliability (data base, process vs device issues, testing, design process)
  - Source control drawings (configuration control, pricing practice)
- Addressed both policy and technical issues
- Progress, though positive, has been spotty, ad hoc, and mostly catalyzed by DSB working group
  - Some factions are still opposed to change
  - At point where direction and resources are needed

NEED USD(A) FORMAL DIRECTION TO GET CLOSURE

CONCERN BY SOME SEMICONDUCTOR MANUFACTURERS

- If MIL STD 454 "order of precedence" for semiconductor application (e.g., JAN-MIL STD-SCD) is eliminated in favor of specifying "right part for specific application"
  - — There will be reduced demand for JAN — volume will decrease — offset volume will be manufactured offshore
  - — The reduced volume will result in higher JAN costs, further depressing JAN usage
- Therefore, JAN will go away — another increment of domestic production will go offshore

---

- 7% of worldwide merchant semiconductor production is for DoD
- 75% of MIL STD ICs used by DoD is produced offshore
- 25% of MIL STD ICs (JAN) is assembled onshore
  Yet most piece parts other than the die are produced by non U.S. manufacturers

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- From a DoD standpoint, the Task Force recommendations (process control/certification and use of high yield processes) along with the SEMATECH initiative should, in long run, improve U.S. competitiveness

RELIABILITY DATA*

AT&T — Bell Laboratories

Steady State Failure Rate (FITS**)	Technology
15	Bipolar Schottky TTL 1-100 Gates
18	Bipolar Schottky TTL 101-500 Gates
14	64K NMOS DRAM

Rockwell-Collins

Failure Rates (FITS)	Technology
59	Unscreened transistors, diodes and ICs
66	Screened transistors, diodes and ICs

*Provided from AT&T, DELCO, IBM and Rockwell in Dec 1986 and Jan 1987
**FITS — Failures per billion part — operating hours

RELIABILITY DATA (CON'T)*

DELCO

Verified removals per billion hours	Technology
1-57	CMOS
26-77	Linear Bipolar
372	CMOS LSI

IBM

Average Failure Rates (FITS)	Technology
20	DRAMs
20	Microprocessors
20	TTL
20-60	SRAMs

COST AVOIDANCE ACHIEVABLE BY RELAXING ORDER OF PRECEDENCE FOR HELLFIRE DIGITAL AUTOPILOT

DEVICE	COST OF MICROCIRCUITS
JAN	$475
SMD	1,252
DESC	13
SCD	1,055
TOTAL	$2,795

Volume is about 6,000 per year

- If JAN replaced with SCDs - savings is $242 per autopilot or $1.5M per year
- If use rugged industrial where applicable - savings is $809 per autopilot or $4.9M per year (or 135 additional missiles)

SEMICONDUCTOR WORKING GROUP

ACTION ITEMS	ADDITIONAL COST TO DoD
• Establish OSD policy/action officer	$50K/yr
• Implement SMD program	
- Industry SCD-SMD cross reference list	No additional cost
- DESC develop approximately 650 SMDs from SCDs	$750K + $350K/yr
- DESC handle 400 new SMDs and 200 revisions per year	No additional cost
- Approve TISSS/VHDL program	$2.3M +$920K/yr
- Additional equip, printing for DESC	$150K/yr
• Implement QML process	
- Complete process requirements document	No additional cost
- QML certification and audit team(s)	$850K/yr
- Gov't/OEM/supplier/industry oversight team to develop and coordinate QML and national system	No additional cost
• Develop common IC spec (Plastic)	No additional cost
• Implement Quality/Reliability Data Base	
- Quality Data Base and Reporting System	No additional cost
- Field Failure Return Program	$2M/yr for 2 yrs
• Consider impact of relying on offshore sources	6 mos study
TOTAL	$7M over 2 years + about $2.5M/year

ACTION ITEMS

USD(A)	INITIATE	COMPLETE
• Establish OSD policy/action officer		Dec 15
• Request industry to provide SCD – SMD cross reference list	Dec 15	Jul 89
• Direct DLA to develop SMDs to reduce SCD backlog	Dec 15	Dec 90
• Direct Services and DLA to use JAN or SMDs, as appropriate, in lieu of SCDs		Jan 89
• Direct DLA/DESC to implement QML technique for process certification – onshore and offshore	Dec 15	Dec 89
• Direct procurement from QMLs as first preference	Dec 89	Jul 90
• Work with industry toward single national certification system with single method for manufacturer audit and certification	Jan 89	Dec 91
• Work with industry to standardize on a common plastic IC spec	Jan 89	Jul 89
• Direct completion of Applications Guidebook	Dec 15	Jul 89
• Consider impact of relying on offshore manufacturing	Dec 15	Jul 89

ACTION ITEMS (CONT)

	INITIATE	COMPLETE
DLA		
• Periodically report on generation of SMDs and on SCD backlog	Dec 15	
• Assign SMD numbers on new generic devices and issue when requested	Dec 15	
INDUSTRY		
• Upgrade quality of SMD requests	Dec 15	
• Coordinate benchmarks for electrical parameters	Dec 15	Jul 89
• Provide SCD – SMD cross reference list	Dec 15	Jul 89

Appendix 5

Navy Next Generation Computer Resources Briefing Report

NAVY'S NEXT GENERATION COMPUTER RESOURCES PROGRAM

Program Objectives:

- Develop computer resources standards capable of meeting Navy mission critical requirements in the mid-90's and beyond.
- Translate advantages of commercial, nonproprietary open systems architectures into real benefits to the acquisition manager and the fleet

Program Structure:

- Joint industry/Navy working groups - Select and influence commercial standards prior to publication (IEEE, ANSI, SAE, etc.)
- Laboratory prototyping selected standards - Validate standard, develop conformance tests, develop in-house expertise
- Conformance testing - Certify vendor products against standards (Navy controlled)
- Policy - Promulgate policy requiring use of standards

NAVY'S NEXT GENERATION COMPUTER RESOURCES PROGRAM

Products:

- Widely accepted industry supported interface standards and protocols
  - Intra-Computer - Internal
    Backplane, very high bandwidth interfaces for switches, pipelines, systolic arrays, etc.
  - Computer-to-Computer - External
    Networks, point-to-point)
  - Software
    Operating systems (run time environments, etc.), DBMS, SEEs, MMI

Benefits

Flexible Acquisition

- Full Spectrum NDI - CFE - GFE
- Full Spectrum - Commercial - Ruggedized - Militarized
- Permits acquisition of evolutionary systems
  - Hardware (intra and inter computer)
  - Software

Life Cycle Costs

- Competition throughout the system's life
  - Internal to the computing system
  - External to the computing system
- Reduced Navy Upfront R&D Costs
  - Cross-system commonality
  - Multi-vendor availability

- Rapid "plug in" upgrade capability
- Interoperability of NGCR based products through common interfaces
- Rapid (few years vice decade system acquisition cycles) and continual availability of state of the practice in computing which the country is producing
- Program manager/prime contractor flexibility in systems design and acquisition

EXISTING PRACTICES

PROBLEMS WITH PRACTICES

- Total from start to deployment is 8 to 14 years
- Computer is 5 to 12 years behind the state-of-the-practice (SOP) when deployed
- SOP problem exacerbated by the fact that most systems have a 15 - 20 year life
- Out of date ISAs significantly effect software development and maintenance costs
- Navy responsible for developing and maintaining all support and run time software
- Requires Navy pay for product improvement program to update performance - capacity - technology or reduce production or life cycle costs

PROGRAM OBJECTIVES

- o Increase Fleet Operational Readiness and Effectiveness

- Rapid and effective Fielding of functional Changes in response To changing threat	Technology Modularity Interoperability
- Increased operational Availability	Technology Supportability Fault Tolerance
- Reduced Costs	Technology Competition Commonality Commercial Designs Crossover

- o Increase Program Manager's Flexibility

  Tools for efficient/effective system design, design reuseability, integration, test, and life time support

  Innovative solutions by system vendors

JOINT INDUSTRY/NAVY STANDARDS PROGRAM IS THE SOLUTION

NGCR OPEN SYSTEM ARCHITECTURE PROVIDES FRAMEWORK TO MEET NAVY NEEDS IN THE 1990'S

- Can continually provide the fleet the state of the practice in computing which the nation is producing
- Commonality of NGCR products to reduce logistics
- Interoperability of NGCR products through common interfaces
- Rapid "plug in" upgrade capability
- Building block approach to design to provide full spectrum of processing capabilities
- Rapid introduction of latest technologies
- Commercial base provides industry
  - Investment - Utilization for both commercial and militarized
  - Competition - To provide any component they are best at producing
  - Innovation - In design to win market share in systems or modules
- Program manager flexibility in system design and acquisition management
- Top down weapons system design now possible
- Focused industry R&D

STANDARDIZATION AREAS

MULTIPROCESS INTERCONNECTS:

Backplane

High Performance Backplane

Switch Network

MULTISYSTEM INTERCONNECTS

Safenet I/Local Area Network

Safenet II/Local Area Network

High Performance Local Area Network

SOFTWARE STANDARDIZATION AREAS

Network Operating System

Network Data Base Management System

Programming Support Environment

Graphics Language/Interface

BACKPLANE STANDARDS DEFINITION GROUP

COMPANIES SUPPORTING WORKING GROUP:

AITECH
AMERICAN SYSTEMS CORP
AMERITECH SERVICES
AMP, INC
AMPERIF CORPORATION
ANALYSIS & TECHNOLOGY
APTEC
ARINC RESEARCH CORP
AT&T
BOOZ-ALLEN
CENTRAL DATA CORP
CONTROL DATA CORP
DATA GENERAL CORP
DELCO
DGA, INTERNATIONAL
DIGITAL EQUIPMENT CORP
DY-4 SYSTEMS
EG & G
ELECTRONIQUE SERGE DASSAULT
FORCE COMPUTERS
GENERAL DYNAMICS
GURMMAN
HONEYWELL
IBM
HUGHES
INTEL
INTERSTATE ELECTRONICS
JOHN HOPKINS UNIVERSITY
LOGICON
LORAL
MARKEN
MARTIN-MARIETTA
MCC
MICROBAR
MOTOROLA
NATIONAL SEMICONDUCTOR
NORDEN SYSTEMS
ORI
PLANNING RESEARCH CORP
PLESSEY ELECTRONICS
RADSTONE TECHNOLOGY
RAYTHEON
ROLM
RUGGED DIGITAL
SINGER
SYNETICS
TANDEM COMPUTERS
TASC
TELEDYNE SYSTEMS
TEREDYNE CONN SYS
TEXAS INSTRUMENTS
TIBURON
TITAN-SESCO
TRW
UNISYS
VITA
VITRO
WESTINGHOUSE

NAVY/MILITARY SUPPORT:

SPAWAR	NAVAL RESEARCH LABORATORY
NAVSEA	NAVAL SURFACE WARFARE CENTER
NAVAIR	NAVAL UNDERSEA SYSTEMS CENTER
NAVAL AVIONICS CENTER	NAVAL WEAPONS CENTER
NAVAIR DEVELOPMENT CENTER	NAVAL WEAPONS SUPPORT CENTER
NAVAL AIR TEST CENTER	U. S. COAST GUARD
NAVAL OCEAN SYSTEMS CENTER	

RECEIVED INQUIRIES FROM THREE ARMIES SOURCES

SAFENET/LAN STANDARDS WORKING GROUP

* GOVERNMENT

AFSTC	JDL	NAVAIR	NCSC	NSWC
AIRMICS	NAC	NAC	NESESA	NUSC
CPM	NADC	NAVSEA	NOSC	PMTC
FCDSSA/S-D	NASA	NBS	NRL	SPAWAR
				USCG

* PRIVATE INDUSTRY/ACADEMIA

ADSI	ESL	MAGNAVOX	SEMCOR
AMD	MARTIN MARIETTA	FERANTI	SIECOR
AMP	FMC	MITRE	SILICON GRAPHICS
ARINC	FAIRCHILD	NORTH ATLANTIC	SPAR
ARNOLD ASSOC.	G&H TECHNOLOGY	NORTHROP	SPERRY MARINE
ASD	GENERAL DYNAMICS	OCEAN TECH	SYNETICS
AT&T	GE/RCA	ORYX	TECHREP/SYSCON
BGS	GOULD	PCO	TEXAS INSTRUMENTS
BIT	GRUMMAN	PLESSEY ELECT	UNISYS
BOOZ, ALLEN	GTE	PROTEON	UNIV OF VA
CIRCUIT TECHNOLOGY	HONEYWELL	PROTOCOL ENG	VANCE
CMU	HUGHES	RAYCHEM	VAN DYKE ASSOC.
CONTROL DATA	IBM	RAYTHEON	VITRO
CSC	ITT	ROCKWELL	WESTINGHOUSE
CTI	JHU/APL	ROLM	XEROX
ELDYNE	LITTON DSD	SANDERS ASSOC.	

Appendix 6

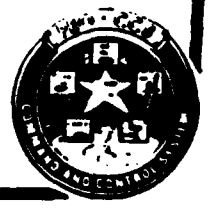
Army Common Hardware

And Software

Briefing Report

ACQUISITION STRATEGY

- UTILIZE A COMMERCIAL LINE
  - — STABLE PRODUCTION LINE
  - — MARKET PLACE TECH INSERTION
  - — CONTRACTOR'S MAINTENANCE
  - — CONTRACTOR'S CONFIGURATION MANAGEMENT
- ADOPT/ADAPT FOR MIL ENVIRONMENT ONLY WHERE ESSENTIAL:
  - — OPERATION IN STANDARD INTEGRATED COMMAND POST SYSTEMS (SICPS)
    - - M577 (MODIFIED)
    - - LT WHEEL (HMMWV)
    - - HV WHEEL (5T)
    - - TENT
- USE BEST COMMERCIAL PRACTICES FOR:
  - — HW & SW
  - — DOCUMENTATION
  - — TEST
  - — SUPPORT



PROGRAM EXECUTIVE OFFICE — COMMAND AND CONTROL SYSTEMS

ACQUISITION STRATEGY

The Army's objective was to write an RFP to buy non-developmental items of computer hardware, computer software, programming support environment, technical assistance, and logistics support that was short, concise, easy to understand and streamlined.

CHS RFP OVERVIEW

THE CHS SOLICITATION IS:

- UNIQUE
- INNOVATIVE
- STREAMLINED
- SHORT
- EASY TO UNDERSTAND

CHS RFP OVERVIEW

The CHS acquisition strategy was to acquire nondevelopment common hardware and software to be used by each nodal system for RDT&E. The nodal systems are using CHS as a building block for software development, software porting, system interface design, software verification and validation, system integration and formal testing.

COMMON BUILDING BLOCKS VERSUS SYSTEMS

- THE ACCS CHS ACQUISITION IS FOR HARDWARE AND SOFTWARE BUILDING BLOCKS, NOT SYSTEMS
- MCS, AFATDS, FAADC2 AND CSSCS ARE SYSTEMS
- NODAL PMs PERFORM SYSTEM DEVELOPMENT
  - — DEVELOPS SYSTEM-UNIQUE SOFTWARE
  - — INTEGRATES CHS WITH SYSTEM-UNIQUE SOFTWARE/HARDWARE
  - — CONDUCTS TESTING AND TYPE CLASSIFICATION

PROGRAM EXECUTIVE OFFICE — COMMAND AND CONTROL SYSTEMS

COMMON BUILDING BLOCKS VERSUS SYSTEMS

The ATCCS CHS acquisition is for a family of computer hardware and software that can be used as common building blocks for each of the five nodal systems. The five nodal systems are Maneuver Control System (MCS), Advanced Field Artillery Tactical Data System (AFATDS), Forward Area Air Defense Command and Control (FAADC2), All Source Analysis System (ASAS) and the Combat Service Support Control System (CSSCS).

The common building blocks will provide basic tools for achieving interoperability and system integration among the five nodal systems. The five command and control systems are developing systems as opposed to product improvements or repackaging old equipments. These systems have project managers who are responsible for insuring the functionality, hardware and applications software of each system are integrated with the common hardware and software procured by Project Manager, Common Hardware/Software for the ATCCS Program.

COMPETITION

BACKGROUND

- MARKET SURVEY (TO SEE WHO COULD MEET GOV'T SPECS - NOT TOO RESTRICTIVE)
  - DRAFT SPECS TO INDUSTRY
  - VISITS/TELECON/LITERATURE
- ADVERTISED SOLICITATION TO INDUSTRY (CBD)
- DRAFT SOLICITATION TO INDUSTRY (MAKE SURE NOT RESTRICTIVE)
- PREPROPOSAL CONFERENCE - FT. MONMOUTH

RESULTS

- EFFECTIVE COMPETITION

An ATCCS CHS market survey was initiated in October 1985 to determine whether the ATCCS objective could be met using non-development items (NDI) common hardware and software from commercial vendors. It was the intent of the survey to first identify the number of vendors having off-the-shelf computers meeting the ATCCS CHS ROC requirements. NDI technical information consisting of brochures and reports were obtained from a list of computer manufacturers for each type of ATCCS computer.

The scope of the investigation included a search of CECOM NDI database, the CECOM libraries, a synopsis in the Commercial Business Daily (CBD) and other technical journals.

A second CBD announcements in March 1986 announced the release of draft functional specifications for industry review. Approximately 200 requests for specifications were accommodated indicating adequate industry interest for this acquisition. A third CBD annoucement was made to release the solicitation package. The solicitation includes contract terms for appropriate utilization of small business. The solicitation was issued May 1987.

MISSION

TO ACQUIRE ITEMS OF COMMON COMPUTER HARDWARE, SOFTWARE, AND SUPPORT TO BE INTEGRATED INTO TACTICAL ARMY COMMAND, CONTROL, COMMUNICATIONS, AND INTELLIGENCE/ ELECTRONIC WARFARE SYSTEMS.

MISSION

The mission of PM, Common Hardware/Software (CHS) is to buy a common family of computers, operating system, database management system, communication protocols, local network and maintenance support to be provided to each of the five Battlefield Automated Systems (BAS's). The BAS's will use CHS as a building block in configurating their overall system.

THE RFP AND THE ROC

- ALL ROC REQUIREMENTS ARE IN THE RFP
  - — CAPSTONE ROC COMPARED WITH NODAL ROC
  - — ROC COMPARED TO RFP
- CLEAR RFP INTENT
  - — SPEAK IN ENGLISH
  - — ELIMINATE DATED AND UNSUPPORTED REQUIREMENTS
  - — CAPTURE THE TECHNOLOGY OF INDUSTRY
  - — LET INDUSTRY SUPPORT THE PRODUCT

THE RFP AND THE ROC

The Request for Proposals (RFP) was compared with the Army Tactical Command and Control Systems (ATCCS) CHS Required Operational Capapability (ROC) to ensure that all essential requirements needed by the Battlefield Automated Systems were being met. The ATCCS capstone ROC superseded all other Battlefield Automated Systems ROC's.

A market survey was conducted to ensure that the requirements in the RFP and ROC could be supported by non-development items and this would allow the government to capture industry technology insertion and industry logistics support.

"PLAIN ENGLISH SOLICITATION"

SECTION I	**WHAT WE WANT TO BUY**
SECTION II	**HOW TO PREPARE YOUR PROPOSAL**
SECTION III	**HOW WE WILL EVALUATE YOUR PROPOSAL**
SECTION IV	**SPECIAL SOLICITATION PROVISIONS AND NOTICES**
SECTION V	**CONTRACT CLAUSES**
SECTION VI	**ATTACHMENTS INCLUDING PRE AWARD PERFORMANCE TEST PLAN (PTP)**

The CHS solicitation consisted of the following six sections:

a. Section I -- What We Want to Buy

This section describes the three types of common computer hardware, software for the common hardware, hardware and software for the programming support environment, technical assistance support and hardware/software logistics support. The three types of computers are the Portable Computer Unit (PCU), the Handheld Terminal Unit (HTU) and the Transportable Computer Unit (TCU). Also peripherals devices, such as hard disk units, displays and keyboards, printers, 3.5 and 5.25 floppy disk drives and an archive device, are included along with a local area network.

b. Section II -- How to Prepare Your Proposal

This section provides guidance to the contractor in preparing his proposal and that the proposal would consist of Part I - Executive Summary, Part II - Technical, Part III - Pricing, Part IV - Reliability and Maintainability, Part V - Logistics, Part VI - Management, and Part VII - Performance Test Demonstration Procedures.

c. Section III -- How We Will Evaluate Your Proposal

This section provides the contractor with a set of guidelines that were used in evaluating their proposal as verified by the performance test. The proposals were evaluated based on technical, price, reliability and maintainability, logistics, manprint and management. Technical and price combined were significantly more important that the other three factors combined.

d. Section IV -- Special Solicitation Provisions and Notices

This section explains that this solicitation contains Federal Acquisition Regulation (48 CFR Chapter 1) and Department of Defense Federal Supplement (48 CFR Chapter 2), pre-proposal conference instruction, use of non-government advisors, accessing the library of classified/unclassified ACCS documents, data rights, etc.

e. Section V -- Contract Clauses

This set forth the clauses applicable to the resulting contract.

f. Section VI -- Attachments Including Pre-Award Performance Test Plan

This section contains documents, forms and other attachments which includes basic award and option quantities, delivery schedules for basic award and options, packing and marking instructions, document summary list, certification and representations and performance test plan.

COMMON HARDWARE AND SOFTWARE OVERVIEW

- OBJECTIVE: TO PROVIDE THE ATCCS NDI SOFTWARE AND HARDWARE ITEMS
- THE COMMON SOFTWARE AND HARDWARE WILL BE USED BY BAS PM'S TO DEVELOP AND FIELD AFFORDABLE, INTEROPERABLE, AND EFFECTIVE TACTICAL SYSTEMS
- NDI COMPUTERS INCLUDE A PORTABLE COMPUTER AND A TRANSPORTABLE COMPUTER IN TWO DEGRESS OF RUGGEDNESS, AND A HANDHELD TERMINAL
- FFP CONTRACT (DAAB07-88-C-J015) AWARDED TO MILTOPE CORPORATION ON 19 AUGUST 1988 FOR THE ACQUISITION OF COMMON HARDWARE AND SOFTWARE
- FORMAL TRAINING, TECHNICAL ASSISTANCE, MAINTENANCE AND HW/SW SUPPORT WILL BE PROVIDED BY MILTOPE
- BASIS OF AWARD WAS BEST VALUE TO THE GOVERNMENT

PROGRAM EXECUTIVE OFFICE — COMMAND AND CONTROL SYSTEMS

The contract was awarded to MILTOPE Corporation on 19 August 1988 to provided the following hardware and software components:

Common Hardware

Handheld Terminal Unit (HTU)
Portable Computer Unit (PCU)
Transportable Computer Unit (TCU)
Standalone Display Unit (SDU)
Color Monitor Device (CMD)
Program Load Unit (PLU)
Archive Device (AD)
Hard Disk Unit (HDU)
Printer
Local Area Network Interface
Tactical Communication Interface

Computer Software

ATCCS Common Operating System (ACOS)
- o Unix SVID
- o MS DOS

Realtime ATCCS Facilities
Local Area Network Control
Graphics Package
Word Processing
Spread Sheet
Maintenance Diagnostics
Ada Programming Support Environment
Database Mgt System (SQL Interface)
Electronic Mail
C Compiler
Tactical Communication Software

The initial ATCCS Common Hardware will consist of three types of microprocessor based computers, two types of electronics display devices, three types of mass storage memory devices, one type of printer, a local area network, cases and cables. To achieve common hardware affordability and milestone goals, the Army has decided to acquire these components which will meet the minimum environmental characteristics consistent with the ATCCS mission. Two of the computers, the Portable Computer Unit and the Transportable Computer Unit, will come in two versions. The first version, referred to as 'V1', will be essentially 'commercial' version with minor environmental ruggedization, while the second version, referred to as 'V2' will reflect major ruggedization. One of the computers, the Handheld Terminal Unit, will be militarized to a moderate degree.

ISSUE: WHAT IS THE BEST MAINTENANCE CONCEPT FOR ACCS?

- RFP TASKS OFFEROR'S TO PROPOSE A MAINTENANCE CONCEPT FOR EVALUATION
- GOVERNMENTS PREFERRED STRATEGY IS:
  - — USE CONTRACTOR'S DIAGNOTICS
  - — EXCHANGE DEFECTIVE LRU'S/ORF
  - — CONTRACTOR REPAIR/REPLACEMENT
- INDUSTRY REQUESTED 30 DAY TURNAROUND FOR REPAIRS
- INDUSTRY ALTERNATIVE'S ARE ENCOURAGED

RECOMMENDED ACTIONS:

- MAKE DEFECTIVE LRU'S/ORF DIRECT EXCHANGE ITEMS
- EVALUATE OFFEROR MAINTENANCE CONCEPTS

ISSUE: SHOULD THE RFP SPECIFY MINIMUM MTBF VALUES?

- ROC SPECIFIES 900 HOURS FOR HTU
- NO OPERATIONAL BASIS FOR REQUIREMENT EXISTS

ACTION: DO NOT INCLUDE MINIMUM MTBF IN RFP. EVALUATE SUITABILITY OF VENDORS MTBF CLAIM (AS COVERED BY NO COST WARRANTY)

Appendix 7

Air Force NDI

Communications - Computers Systems

Briefing Report

SLIDE 1

AIR FORCE USE OF

NON DEVELOPMENTAL ITEMS FOR

COMMUNICATIONS-COMPUTER SYSTEMS

SLIDE 2

"DEPARTMENT OF THE AIR FORCE AT FOREFRONT OF DOD COMPUTING"

GOVERNMENT COMPUTER NEWS FEBRUARY 20, 1989

AIR FORCE COMMUNICATIONS COMMAND (AFCC)

DESIGNATED AS ACQUISITION COMMAND

- -- MANAGE TELECOMMUNICATION ACQUISITION IN POST AT&T ENVIRONMENT
- -- MANAGE OFF THE SHELF ACQUISITION OF COMPUTER SYSTEMS

EXECUTIVE AGENT FOR DOD WIDE STANDARD REQUIREMENT CONTRACTS

- -- PURCHASED OVER 400,000 MICRO COMPUTERS FOR DOD AND CIVIL AGENCIES
- -- AFCC PURCHASED OVER $1 BILLION OF NDI SYSTEMS SINCE 1986
- -- CONTINUED GROWTH IN NDI EXPECTED TO EXCEED $7 BILLION

SLIDE 4

MAJOR AIR FORCE NDI PROGRAMS

PROGRAM NAME	ESTIMATED COST
BASE INFORMATION DIGITAL DISTRIBUTION SYSTEM $1 BILLION (BIDDS)	
AIR FORCE COMMAND AND CONTROL SYSTEM (AFC2S)	$500 MILLION
STRATEGIC WAR PLANNING SYSTEM (SWPS)	$500 MILLION
DOD RED SWITCH	$1.9 BILLION
COMBAT AMMUNITION SYSTEM-BASE	$230 MILLION
AIR FORCE STANDARD REQUIREMENTS CONTRACTS	
STANDARD MULTI-USER (AFCAC 251)	$ 1 BILLION
TEMPEST II	$ 264 MILLION
DESK TOP III	$ 1.7 BILLION

STANDARD AIR FORCE CONCEPTS USED

IN NDI COMMUNICATION-COMPUTER ACQUISITION

SOURCE SELECTION PROCEDURES PER AFR 70-15/AFR 70-30

- EVALUATION CRITERIA
  - -- TECHNICAL
  - -- MANAGEMENT
  - -- COST
- AWARD BASED ON "BEST VALUE"

"COMPUTE OFF" DEMONSTRATION TESTING

- VERIFY PROPOSAL PROMISES THROUGH LIVE TEST DEMONSTRATION

USES COMMERCIAL SOFTWARE

SLIDE 6

AIR FORCE CONCEPTS (CONT'D)

MULTIPLE YEAR CONTRACTS

- BASE YEAR WITH ANNUAL OPTIONS

TECHNOLOGICAL REFRESHMENT

- VENDOR COMMERCIAL PRODUCT IMPROVEMENTS INCORPORATED INTO CONTRACT

COMMITMENT TO OPEN SYSTEM ARCHITECTURE

- ALLOW INTEROPERABILITY OF HARDWARE AND SOFTWARE
- ALLOWS COMPETITION OF FOLLOW ON AND UPGRADE PROPOSALS
- NOT "LOCKED INTO" SINGLE VENDOR PRODUCT LINE

UTILIZE COMMERCIAL MAINTENANCE AND PARTS SUPPORT

- WARTIME CONTINGENCY CLAUSE INCORPORATED IN CONTRACTS

SLIDE 1

THANK YOU FOR ALLOWING US THIS TIME TO PRESENT THE AIR FORCE'S POSITION ON USE OF NON DEVELOPMENTAL ITEMS IN COMMUNICATION AND COMPUTER ACQUISITIONS. I BELIEVE THE INFORMATION PRESENTED TODAY WILL DISPEL ANY MISCONCEPTIONS CONCERNING THE AIR FORCE'S USE OF NDI COMMUNICATION COMPUTER PRODUCTS

SLIDE 2

DEPARTMENT OF THE AIR FORCE AT THE FOREFRONT OF DOD COMPUTING

Government Computer News

February 20, 1989

THE AIR FORCE HAS PURCHASED AND CONTROLS MORE NDI COMMUNICATION AND COMPUTER SYSTEMS THEN ANY OTHER SERVICE. WE CURRENTLY MANAGE 14% OF THE DOD COMPUTER SYSTEMS WITH AN ANNUAL INFORMATION RESOURCES BUDGET OF OVER $8 BILLION DOLLARS. PERHAPS THE MAJOR REASON FOR OUR EXTENSIVE USE OF NDI COMPUTERS IS THE NATURE OF OUR MISSION. AIR FORCE COMMUNICATION, COMPUTER AND INTELLIGENCE REQUIREMENTS ALLOW THE EXTENSIVE USE OF NDI SYSTEMS. THE WORKING ENVIRONMENT THE AIR FORCE WILL FIND ITSELF FIGHTING IN ALLOWS US GREATER USE OF NDI SYSTEMS. IN ANY WARTIME ENVIRONMENT THE NAVY AND ARMY WILL REQUIRE RUGGEDIZED FIELD OR SHIP MOBILE SYSTEMS ABLE TO WITHSTAND THE RIGORS OF THE BATTLEFIELD, WHERE AS THE AIR FORCE WILL KEEP THE MAJORITY OF ITS SYSTEMS AT EXISTING BASES. EVEN AT DEPLOYED SITES AND BARE BASE ENVIRONMENTS, SHELTERS AND AVAILABLE FACILITIES WILL PERMIT OPERATION OF NDI SYSTEMS WITH A MINIMUM OF MODIFICATION.

AS NOTED BY THE ABOVE HEADLINE THE AIR FORCE HAS TAKEN THE LEAD IN INTRODUCING NDI COMPUTER SYSTEMS INTO THE DEPARTMENT OF DEFENSE.

SLIDE 3

IN 1985 IT BECAME APPARENT THE AIR FORCE REQUIRED A SINGLE POINT OF CONTROL TO MANAGE THE ACQUISITION OF NDI COMMUNICATION AND COMPUTER SYSTEMS. AS A RESULT, IN 1986 AIR FORCE COMMUNICATIONS COMMAND JOINED AIR FORCE SYSTEMS COMMAND AND AIR FORCE LOGISTICS COMMAND TO BE THE THIRD MAJOR COMMAND INVOLVED IN AIR FORCE WIDE

ACQUISITION. TWO MAIN FACTORS SPURRED AFCC'S ASSIGNMENT AS AN ACQUISITION COMMAND. FIRST, THE AT&T BREAKUP TRANSFORMED THE TELECOMMUNICATION WORLD FROM A PREDICTABLE, MONOLITHIC ONE TO A HIGHLY COMPETITIVE, OFTEN CONFUSING ENVIRONMENT, OFFERING MANY POSSIBLE SERVICE ALTERNATIVES. SECOND, THE EQUALLY CONFUSING PROLIFERATION OF COMMERCIAL COMPUTERS SYSTEMS HIGHLIGHTED THE NEED FOR ONE COMMAND TO MANAGE NDI ACQUISITION.

AFCC MEETS AIR FORCE NEEDS THROUGH READILY AVAILABLE, OFF THE SHELF SOURCES INSTEAD OF DEVELOPING NEW, MILITARY-UNIQUE SYSTEMS. SINCE ASSUMING IT'S ACQUISITION RESPONSIBILITIES, AFCC HAS PROCURED OVER $1 BILLION IN NDI SYSTEMS FOR THE AIR FORCE AND DOD. COMMAND LEADERS PREDICT CONTINUED GROWTH IN NDI SYSTEMS TO EXCEED $7 BILLION BY 1993.

IN ONE OF ITS MAJOR ROLES AS THE NDI MANAGER, AFCC HAS ACTED AS THE EXECUTIVE AGENT IN AWARDING THE STANDARD REQUIREMENTS CONTRACTS. TO DATE OVER 400,000 MICRO COMPUTERS HAVE BEEN PURCHASED UNDER THIS PROGRAM

SLIDE 4.

THIS SLIDE SHOWS SOME OF THE MAJOR AIR FORCE NDI SYSTEM ACQUISITIONS CURRENTLY IN PROCESS.

THE $1 BILLION BASE INFORMATION DIGITAL DISTRIBUTION SYSTEM KNOWN AS BIDDS, WILL GIVE AIR FORCE COMMANDERS MORE EFFICIENT , INTEROPERABLE COMMUNICATIONS-COMPUTER SYSTEMS. THIS STATE OF THE ART SYSTEM INVOLVES INSTALLING NEW CABLE, SWITCHES, AND SYSTEM CONTROL EQUIPMENT TO LINK ALL BASE VOICE AND DATA COMMUNICATIONS REQUIREMENTS. USING OFF THE SHELF COMMERCIALLY AVAILABLE EQUIPMENT BIDDS WILL REPLACE OUTDATED ELECTROMECHANICAL TELEPHONE SYSTEMS PROVIDING RELIABLE, LOW NOISE CIRCUITS.

ANOTHER NDI ACQUISITION EFFORT IS THE AIR FORCE COMMAND AND CONTROL SYSTEMS (AFC2S). THIS PROGRAM COMPLEMENTS EFFORTS TO MODERNIZE THE WORLD WIDE MILITARY COMMAND AND CONTROL SYSTEM BY UPGRADING AND INTEGRATING AIR FORCE NDI HARDWARE AND SOFTWARE. WITH AN ESTIMATED VALUE OF 500 MILLION AFC2S IS EXPECTED TO SAVE THAT MUCH BY REDUCING CURRENT SOFTWARE MAINTENANCE COSTS BY 50%.

THE STRATEGIC WAR PLANNING SYSTEM WILL PROVIDE NDI HARDWARE, SOFTWARE, DATA, MAINTENANCE, INTEGRATION SUPPORT AND TRAINING TO THE JOINT STRATEGIC TARGET PLANNING STAFF AND STRATEGIC AIR COMMAND MISSION PLANNERS. THE PROGRAM INCLUDES ASSOCIATED DEPLOYABLE AND DISTRIBUTED DATA PROCESSING SYSTEMS WHICH IN AGGREGATE CONSTITUTES THE TOTALITY OF THE NATIONS STRATEGIC NUCLEAR WAR PLANNING RESOURCES.

DOD RED SWITCH WILL PROVIDE UP TO 300 SECURE SWITCHING FACILITIES FOR WORLDWIDE VOICE AND DATA COMMAND AND CONTROL TELECOMMUNICATIONS.

THE COMBAT AMMUNITION SYSTEM WILL PROVIDE UP TO 90 SYSTEMS DESIGNED TO TRACK STATUS OF MUNITIONS INVENTORY AND LOCATIONS.

PERHAPS OUR MOST VISIBLE AND SUCCESSFUL NDI ACQUISITIONS HAVE BEEN THE AIR FORCE'S SERIES OF STANDARD REQUIREMENTS CONTRACTS. WE BEGAN IN EARLY 1983 WITH STAND ALONE MICRO COMPUTERS SUCH AS THE ZENITH Z - 100, TEMPEST Z - 150, AND MOST RECENTLY THE Z-248. WE ARE CONTINUING THESE MICRO BUYS WITH DESK TOP III AS THE PLANNED COMPETITIVE REPLACEMENT FOR THE EXPIRED Z - 248 CONTRACT, AND TEMPEST II REPLACING THE Z - 150 TEMPEST CONTRACT. TO DATE OVER 400,000 OF THESE MICRO COMPUTER SYSTEMS HAVE BEEN PURCHASED BY DOD AND CIVILIAN AGENCIES AT DISCOUNTS OF UP TO 70% OFF COMMERCIAL LIST PRICES. WE RECENTLY AWARDED A STANDARD MULTI-USER CONTRACT TO AT&T KNOWN AS AFCAC 251. SUPPORTING UP TO 64 USERS THIS MINI COMPUTER SYSTEM CAN BE ORDERED BY ALL FEDERAL AGENCIES. AGAIN, THROUGH COMPETITION, THE AIR FORCE OBTAINED DISCOUNTS OF OVER 70% OFF THE GOVERNMENT'S ESTIMATES. IT IS OUR POLICY THAT UNLESS A WAIVER IS GRANTED BY HEADQUARTERS AIR FORCE, A REQUESTING ACTIVITY MUST FIRST LOOK TO USE THE STANDARD CONTRACTS IN SATISFYING THEIR COMPUTER REQUIREMENTS.

SLIDE 5

IN PURCHASING NDI SYSTEMS THE AIR FORCE MAKES EXTENSIVE USE OF SOURCE SELECTION TECHNIQUES. UNDER A SOURCE SELECTION OFFERORS PROPOSE AGAINST THE GOVERNMENT'S REQUIREMENTS AS STATED IN THE REQUEST FOR PROPOSAL. UNLIKE A LOW BIDDER ACQUISITION. THE PROPOSALS ARE EVALUATED AGAINST TECHNICAL, MANAGEMENT AND COST CONSID-

ERATIONS. IN MOST NDI SYSTEMS THE EVALUATION CRITERIA IS LISTED IN DESCENDING ORDER OF IMPORTANCE AS SHOWN HERE. THIS TELLS THE OFFERORS WHERE THE GOVERNMENT IS PLACING IT'S EVALUATION EMPHASIS SO THEY CAN SELECT NDI EQUIPMENT WHICH BEST MEETS OUR REQUIREMENTS, NOT NECESSARILY THE LOWEST PRICE. A SENIOR LEVEL OFFICIAL DESIGNATED AS THE SOURCE SELECTION AUTHORITY IS THEN FREE TO SELECT THE OFFEROR WHOSE PROPOSAL REFLECTS THE BEST VALUE PRICE AND OTHER FACTORS CONSIDERED.

IN ORDER TO VALIDATE PROPOSAL PROMISES THE AIR FORCE MAKES EXTENSIVE USE OF LIVE TEST OR BENCHMARK TESTING. PURCHASING NDI EQUIPMENT HARDWARE AND SOFTWARE ALLOWS US THE OPPORTUNITY TO FLY BEFORE WE BUY AND TEST DRIVE THE SYSTEM BEFORE WE SELECT THE BEST PROPOSAL.

SLIDE 6

WE HAVE APPLIED SOME INNOVATIVE CONTRACTING TECHNIQUES TO OUR NDI COMMUNICATION AND COMPUTER ACQUISITIONS. FIRST WE USE MULTIPLE YEAR CONTRACTS. THESE CONTRACTS ARE WRITTEN WITH A BASE YEAR AND ANNUAL OPTIONS FOR OUT YEARS. THIS ALLOWS US TO PROVIDE CONTRACTUAL STABILITY DURING THE SYSTEM LIFE. WE HAVE TESTED AND ARE NOW DEVELOPING A STANDARD TECHNOLOGY REFRESHMENT PROVISION FOR OUR NDI CONTRACTS. THIS PROVISION WILL ALLOW US TO UPGRADE EQUIPMENT AND NDI SOFTWARE AS NEW IMPROVED PRODUCTS ARE ANNOUNCED BY THE INDUSTRY. FINALLY, THE AIR FORCE EMPHASIZES ACQUIRING OPEN SYSTEMS - THOSE WHICH AREN'T LIMITED TO ANY PARTICULAR VENDOR'S HARDWARE, SOFTWARE OPERATING SYSTEM OR COMMUNICATIONS NETWORK. OPENNESS OR INTEROPERABILITY IS ESSENTIAL AS OUR HARDWARE AND SOFTWARE MUST BE ABLE TO INTERFACE WITH EACH OTHER, REGARDLESS OF WHO MANUFACTURES THEM. OTHERWISE , IN SOME OFFICES OUR PEOPLE WILL FIND THEMSELVES FLANKED BY TWO OR MORE COMPUTER TERMINALS. STANDARDS ARE THE KEY TO ACHIEVING OPENNESS IN COMMUNICATIONS- COMPUTER SYSTEMS. FOR INSTANCE THE AFCAC 251 CONTRACT WHERE WE WILL PURCHASE UP TO 20,000 STANDARD MULTI-USER COMPUTER SYSTEMS FOR DOD SPECIFIES THAT THESE SYSTEMS MUST FEATURE A NDI UNIX LIKE OPERATING SYSTEM. UNIX IS A VERSATILE, WIDELY AVAILABLE NDI SOFTWARE OPERATING SYSTEM THAT CAN BE USED IN A VARIETY OF COMPUTERS. THIS OPENNESS ENSURES WE ARE NOT LOCKED INTO A SINGLE VENDOR'S PRODUCT ALLOWING COMPETITION TO TAKE PLACE

FOR EITHER A FOLLOW ON OR UPGRADE PURCHASE. WE ARE A "COMMERCIAL CUSTOMER" BUT LIKE MANY PRIVATE INDUSTRIES, WE ARE ALSO A DEMANDING CUSTOMER.

TO THE MAXIMUM EXTENT POSSIBLE WE UTILIZE THE CONTRACTORS COMMERCIAL MAINTENANCE AND PARTS SUPPORT. DEPLOYABLE AND COMBAT SYSTEM CONTRACTS CONTAIN WARTIME CONTINGENCY CLAUSES WITH "SPARE PART KITS" AND "BLUE SUIT" TRAINING PROVIDED TO SYSTEM OPERATORS.

SLIDE 7

IN SUMMARY YOU CAN SEE THE AIR FORCE HAS ALREADY MADE EXTENSIVE USE OF, AND IS IN FACT EXPANDING IT'S PURCHASES OF NDI COMMUNICATION AND COMPUTER SYSTEMS. WE ARE RECOGNIZED AS THE LEADER WITHIN THE FEDERAL GOVERNMENT FOR USE OF NDI SYSTEMS.

Appendix 8

Pilot Program

Proposed Legislation

A BILL

To establish a pilot program to test the viability and effectiveness of using truly commercial style competitive practices for the acquisition of commercial products for the Department of Defense (DoD).

Be it enacted by the Senate and the House of Representatives of the United States of America in Congess assembled.

Sec. 1 This act may be cited as the "Commercial Acquisition Pilot Program Act of 1989".

Sec. 2 FINDINGS

(a) The Congress finds that certain laws relating to Federal and Defense acquisition mandate procedures that differ significantly from commercial buying practices and, as a result, discourage competitors, thereby limiting DoD's competitive acquisition opportunities and reducing DoD's access to efficiencies and economies of the commercial marketplace.

(b) Congress has determined that, due to the nature and the magnitude of the changes involved in the adoption of commercial buying practices for DoD acquisitions, a pilot program be authorized in order to evaluate the effect of the above mentioned changes. The pilot program

(1) shall be for the duration of two years,

(2) shall include one major buying activity of each the Army, Navy, Air Force, Marine Corps, Defense Logistics Agency, and one other Defense Agency, and

(3) shall require annual reports to the USD(A) and to the Congress.

Sec. 3 COMMERCIAL ACQUISITION PILOT PROGRAM

(a) ESTABLISHMENT -- There is established a commercial Acquisition Pilot Program (hereafter referred to as the "Program") to provide for the testing of innovative procurement methods and procedures in the acquisition of commercial products.

(b) PURPOSES -- The purposes of the Program are to --

(1) Test the full emulation of commercial buying practices in the DoD's acquisition of commercial products,

(2) demonstrate and measure the benefits in acquisition efficiency, quality of products acquired, cost differences, etc., and any possible negative impact, of the use of such practices on other National goals, and

(3) develop changes to laws and regulations to permanently implement the practices judged to be of optimum value.

(c) PROGRAM TERM -- The program shall be conducted over a period of two years, beginning on the date of publication of the regulations called for in section 5(b).

(d) APPLICATION -- The program shall apply to contract solicitations for the procurement of commercial products by the major buying activities designated in section 2(b)(2).

Sec. 4 PROCUREMENT PROCEDURES

(a) COMMERCIAL PRACTICES -- Notwithstanding any other provision of law, each contract opportunity with an anticipated value of $25,000 or more for the procurement of commercial products shall be solicited pursuant to the modified commercial practices and the regulation established by the Secretary during the term of the Program.

(b) REGULATIONS -- The Secretary of Defense shall prescribe regulations to carry out this Act within 90 days of the date of enactment of this act. The regulations issued under this section shall --

(1) Authorize contracting officers to establish appropriate commerciality test requirements on a case by case basis;

(2) Require each contract opportunity identified by section 4(a) to be advertised by a notice in the Commerce Business Daily. The notice shall include --

(A) Notice that the contract will be awarded pursuant to the Program requirements;

(B) A functional description and other necessary information which will allow interested sources to understand the needs;

(C) The time period during which the solicitations will be issued;

(D) The criteria to be used to determine the commerciality of the product being acquired; and

(E) The name, business address, and telephone number of the official to whom submissions are to be made and from whom solicitations are to be obtained.

(3) Require the use of best value evaluation for all commercial products acquired during the test program;

(4) Require the use of a standard form solicitation and contract that contain terms and conditions similar to the terms and conditions used in the commercial marketplace. The standard form solicitation and contract shall provide commercial terms and conditions for, but not limited to the following --

(A) Technical data rights

(B) Software rights

(C) Pricing data requirements

(D) Contract disputes

(E) Termination

(F) Warranty;

(5) Require that the product solicited be described in the most general functional terms appropriate for the product;

(6) Require solicitations to be issued to all sources responding to the public notice within the specified time period;

(7) Require the contracting officer to reject an offer that --

(A) is submitted by a source not required to be issued a solicitation;

(B) is not submitted within the time period specified in the solicitation;

(C) is not responsive to the solicitation, including the requirement for commercial market acceptability as defined by the contracting officer;

(D) is submitted by a source that is determined not to be a responsible source, notwithstanding a determination by the Small Business Administration of responsibility; and

(8) Permit the waiver, upon documented finding and determination of the head of the contracting activity that it will be in the best interests of the government, any of the requirements above.

Sec. 5 COMMERCIAL ACQUISITION OMBUDSMAN

(a) APPOINTMENT -- The Secretary shall appoint a Commercial Acquisitions Ombudsman within the Office of the Under Secretary of Defense for Acquisition to serve during the term of the program. The Ombudsman may not have been a federal employee for one year prior to his or her appointment and shall have extensive familiarization with commercial contracting terms and conditions.

(b) RESPONSIBILITIES -- The commercial ombudsman shall provide assistance as needed to contracting officers conducting acquisitions pursuant to the Program and shall be the final arbitrator in any bid protest filed by a contractor pursuant to a solicitation issued under the program.

Sec. 6 BID PROTESTS

(a) The exclusive administrative remedy for any alleged solicitation or procedural irregularities shall be the filing of a protest first with the contracting officer. Appeal from the contracting officer decision may be made to the head of the contracting activity. Appeal from the head of the contracting activity decision may be made to the Commercial

Acquisition Ombudsman. At each level of appeal, the protest must be acted on within 30 days of receipt.

(1) During a protest, award of a contract shall be stayed.

(2) If the Commercial Acquisition Ombudsman finds that a vendor's protests are consistently frivolous, that vendor may be required to pay the costs associated with defense of the contract action, and may be sanctioned from further participation in the Program.

Sec. 7 DEFINITIONS

(a) COMMERCIAL PRODUCTS -- "Commercial Products" means products substantially developed at private expense for sale in the commercial marketplace. Such products are generally available from more than one source, and are generally sold in significant quantities to the general public.

(b) MAJOR BUYING ACTIVITY -- Activity responsible for a proportionately high volume of commercial product buys, in terms of either number or dollar value of contracts awarded.

(c) COMMERCIALITY TEST REQUIREMENTS -- "Commerciality Test Requirements" means those solicitation requirements established by a contracting officer in order to determine whether an offered product is to be considered a commercial product. The requirements may vary by product in order to meet the specific needs and protect the interests of the government.

(d) BEST VALUE EVALUATION -- "Best Value Evaluation " means the evaluation of a commercial product, system, or service based on all reasonable factors including, but not limited to, initial price, life-cycle costs, available extended warranties, prior product experience, product improvement, availability of distribution and service channels, past producer performance, past vendor performance, and so forth, for the purpose of procuring a product, system, or service that provides optimum satisfaction of the mission need.

(e) COMMERCIAL TERMS AND CONDITIONS -- for the purpose of this program, commercial terms and conditions shall include, but not be limited to:

(1) TECHNICAL DATA RIGHTS -- "Technical Data Rights" means that the DoD shall have access to technical data normally supplied to a customer by a supplier and in the event the contractor goes out of business, ceases to make the item or does not ensure its continued availability for a reasonable period of time, that the DoD shall have access to all technical data associated with that product.

(2) SOFTWARE RIGHTS -- "Software Rights" means that the DoD shall have access to the same software rights provided to preferred customers in the commercial marketplace, and shall accept commercially acceptable means of protecting those rights.

(3) PRICING DATA REQUIREMENTS -- "Pricing Data Requirements" for solicitations where two or more sources are expected to submit offers shall limit pricing data to be supplied pursuant to the solicitation to the actual prices of the products being offered. Pricing data requirements for solicitation where only a single source is expected to submit an offer shall limit pricing data to a certification that the price offered for the commercial product is the lowest price for which it has been sold in the commercial marketplace under similar terms and conditions.

(4) CONTRACT DISPUTES -- "Contract Disputes" means that any dispute arising from the administration of the contract shall be subject to the contract dispute act.

(5) TERMINATION -- Termination means that DoD shall have the right to terminate any contract for convenience of the Government.

(6) WARRANTIES -- "Warranties" means that standard commercial warranties shall be acceptable to DoD although variation in available warranties may be an evaluation factor.

Sec. 8 WAIVERS -- During the conduct of the Program, any contract awarded under the Program shall be awarded without regard to any other Federal Statute.

Sec. 9 EVALUATION AND REPORTING -- Assessment of the various provisions and statutory exclusions provided by this pilot program must not be based exclusively on improvements to acquisition effec-

tiveness, but also on the impact on other National goals such as maintenance of a robust industrial base, and encouragement of small and minority business.

(a) The Secretary of Defense shall report to the Armed Services Committees of the Senate and the House of Representatives upon issuance of the regulations required by section 4, and annually thereafter until one year after conclusion of the pilot program.

(b) The Service Acquisition Executives shall report to the Under Secretary of Defense for Acquisition nine months after issuance of the regulations required by section 4, and annually thereafter until one year after conclusion of the pilot program.

(c) The reports shall include, but not be limited to:

(1) an evaluation of improvements to the acquisition process including --

(A) quality of product acquired;

(B) price and, as appropriate, life-cycle-cost;

(C) changes to acquisition lead time;

(D) increases (or decreases) in competition.

(2) an evaluation of the impact on indirectly related programs including, but not limited to --

(A) small & small disadvantaged business

(B) domestic industrial base

(3) a summary and evaluation of the use of these commercial practices including, but not limited to --

(A) improvements in statement of requirements,

(B) contract administration, and

(C) dispute resolution.

(4) recommendations for changes to the program, and for legislation to permanently implement certain changes.

Appendix 9

Draft Statutory Proposal,

Commercial Products Acquisition Act

A BILL

To improve Federal procurement by authorizing commercial-style, competitive procedures for the acquisition of commercial products.

Be it enacted by the Senate and the House of Representatives of the United States of America in Congress assembled,

Sec. 1 That this Act may be cited as the "Commercial Products Acquisition Act of 1989."

Sec. 2 Findings and Purposes.

(a) The Congress finds that the economy, efficiency, and effectiveness of product acquisition by the executive agencies would be improved if they purchased off-the-shelf products available in the commercial market whenever such products will satisfy agency requirements. Many of the specifications and other requirements in Government solicitations and contracts are unique and serve no commercial purpose. These specifications and requirements result in additional costs to the seller of the products as well as the agency buying them. As a result, many sellers of commercial products do not compete for Government contracts, and the Government is unable to take advantage of the vigorous competition, large economies of scale, short delivery times, market-driven efficiency and innovation, and high value products that are available in the commercial market.

(b) The purpose of this Act is to require the development of commercial-style purchasing procedures to be used by executive agencies to better utilize market research, avoid over-specification and otherwise facilitate the acquisition of commercial products.

Sec. 3 (a) The Administrator of the Office of Federal Procurement Policy, jointly with the Administrator of the General Services Administration, the Secretary of Defense, and the Administrator of the National Aeronautics and Space Administration, shall develop regulations that set forth commercial-style procedures for the acquisition of commercial products. These regulations shall be incorporated into the Federal Acquisition Regulation. For the purpose of this section, commercial products are products that are: (1) competitively available and sold in significant quantities in the commercial market; and (2) required in the same form as they are available in the commercial market or with only minor modification that does not alter their essential performance or functional characteristics. Contracts for commercial products may include those incidental services

that are normally provided with sales of such products in the commercial market.

(b) The regulations issued under subsection (a) shall --

(1) require procurements conducted under this section to be advertised by a public notice in the Commerce Business Daily. The notice shall include --

(A) a product description;

(B) in a case where the agency expects to issue a series of solicitations under one notice, the time period during which solicitations are expected to be issued;

(C) at the discretion of the contracting officer, a brief summary of --

(i) the performance requirements, tests, essential physical characteristics, or other requirements that will be used to ensure that offered products are suitable for the agency's use; and

(ii) any other criteria which the contracting officer determines are appropriate; and

(D) the name, business address, and telephone number of the official to whom any submissions required by the notice are to be made and from whom solicitations issued under the notice may be obtained.

(2) authorize the contracting officer to require offerors to demonstrate, in accordance with criteria prescribed by the contracting officer, that products being offered have achieved a level of market acceptance necessary to indicate that the products are suitable for the agency's use or that the processes used to manufacture the products meet established commercial or other specified standards; and when such criteria are specified, prohibit the award of a contract to any offeror who has not made the required demonstration to the satisfaction of the contracting officer.

(3) authorize the contracting officer to include in the public notice a provision that waives the requirement that a product be sold in significant quantities in the commercial market in order to qualify as a commercial product, provided that the product --

(A) has been satisfactorily supplied under current or recent contracts for the same requirements;

(B) otherwise meets the product description, specifications, and other criteria prescribed by the public notice and solicitation; and

(C) is evaluated on an equal basis with the commercial products offered.

(4) authorize the contracting officer, after publication of the public notice, to take one or a combination of the following actions --

(A) issue solicitations;

(B) review the responses to the notice and then --

(i) issue solicitations;

(ii) adopt additional specifications or other criteria and issue solicitations prescribing those specifications or other criteria; or

(iii) establish a list of sources that will be issued a series of solicitations during the period of time specified by the notice; or

(C) determine that suitable commercial products are not available and cancel the notice.

(5) except as provided for in paragraph (6), require solicitations that are issued under subparagraph (4)(B) or synopses of such solicitations to be issued to all sources that --

(A) make the submission required by the public notice either --

(i) within the time period specified by the notice; or

(ii) sufficiently in advance of the issuance of a solicitation, as specified in the notice, to ensure the submission can be adequately evaluated before a solicitation is issued; and

(B) are not notified that --

(i) their submission is not responsive to the notice; or

(ii) they are not responsible sources.

(6) authorize the contracting officer, in issuing solicitations to sources on a list established under paragraph (4)(B)(iii), to rotate among such sources whenever the number qualifying for inclusion on the list is extensive.

(7) require the contracting officer to reject an offer that --

(A) is submitted in response to a solicitation issued under subparagraph (4)(B) by a source that is not required to be issued a solicitation under paragraph (5);

(B) is not submitted within the time period specified in the solicitation for the submission of offers;

(C) is not responsive to the solicitation; or

(D) is submitted by a source that is determined not to be a responsible source.

(8) require the contracting officer, in establishing deadlines for submissions required by the public notice and for offers, to ensure that interested sources have a reasonable opportunity, consistent with the needs of the agency, to participate in the competition.

(9) require the evaluation of offers and selection for contract award to be based solely on the factors specified in the solicitation. Such factors shall include price and any other factors

which the contracting officer determines are necessary to identify the offer that constitutes the best value to the agency. The past performance of products and sources may be among the factors used to determine best value.

(10) authorize the award of a contract without discussions or a request for best and final offers.

(11) require prompt publication in the Commerce Business Daily of a notice announcing the award of a contract to a source on a list established under subparagraph (4)(B)(iii).

(12) require the use of commercial-style contract terms and conditions to the maximum extent consistent with the interests of the Government.

(c) The provisions in this section governing the publication of public notices announcing procurements, the issuance of solicitations, and the time periods for submitting offers shall apply to procurements conducted under this section in lieu of such requirements in other provisions of law; and to the extent any other provisions in this section are inconsistent with any other provision of law, the provisions in this section shall govern the conduct of procurements under this section. However, this section shall not be implemented in a manner that would violate any United States obligation under the Agreement on Government Procurement negotiated pursuant the General Agreement on Tariffs and Trade.

Sec. 4 (a) Title III of the Federal Property and Administrative Services Act of 1949 is amended by adding at the end thereof the following:

"Sec. 311. Acquisition of Commercial Products

"(a) The contracting officer shall use commercial-style procedures to procure commercial products unless the contracting officer purchases them under simplified small purchase or multiple award schedule procedures or determines and documents that another authorized method of acquisition is more appropriate.

"(b) For the purposes of this section --

"(1) 'Commercial products' are products that are --

"(A) competitively available and sold insignificant quantities in the commercial market; and

"(B) required in the same form as they are available in the commercial market or with only minor modification that does not alter their essential performance or functional characteristics. Contracts for commercial products may include those incidental services that are normally provided with sales of such products in the commercial market.

"(2) 'Commercial-style procedures' are those prescribed in the regulations issued pursuant to section 3 of the Commercial Products Acquisition Act of 1989.

"(c) Purchases of commercial products made pursuant to the commercial-style procedures required by this section or simplified small purchase or multiple award schedule procedures shall be exempt from any other requirement of law that --

"(1) prescribes terms and conditions to be included in contracts,

"(2) prescribes contracts to be set aside for any source or class of sources, or

"(3) prescribes requirements to be imposed on the contractor that relate to the contractor's performance of the contract, and which requirements of law are not equally applicable to contracts to which the United States Government is not a party.

"(d) This section does not waive the requirement in section 111 of the Federal Property and Administrative Service Act for a delegation of authority from the Administrator of the General Services Administration before an agency may purchase automatic data processing equipment under this section."

(b) The table of contents of such Act is amended by adding at the end of Title III the following new section:

"Section 311. Acquisition of Commercial Products."

Sec. 5(a) Chapter 137 of title 10 of the United States Code is amended by adding at the end the following new section:

"Sec. 2329. Acquisition of Commercial Products

"(a) The contracting officer shall use commercial-style procedures to procure commercial products unless the contracting officer purchases them under simplified small purchase or multiple award schedule procedures or determines and documents that another authorized method of acquisition is more appropriate.

"(b) For the purposes of this section --

"(1) 'Commercial products' are products that are --

"(A) competitively available and sold in significant quantities in the commercial market; and

"(B) required in the same form as they are available in the commercial market or with only minor modification that does not alter their essential performance or functional characteristics. Contracts for commercial products may include those incidental services that are normally provided with sales of such products in the commercial market.

"(2) 'Commercial-style procedures' are those prescribed in the regulations issued pursuant to section 3 of the Commercial Products Acquisition Act of 1989.

"(c) Purchases of commercial products made pursuant to the commercial-style procedures required by this section or simplified small purchase or multiple award schedule procedures shall be exempt from any other requirement of law that --

"(1) prescribes terms and conditions to be included in contracts,

"(2) prescribes that contracts be set aside for any source or class of sources, or

"(3) prescribes requirements to be imposed on the contractor that relate to the contractor's performance of the contract, and which requirements of law are not equally applicable to contracts to which the United States Government is not a party.

"(d) This section does not waive the requirement in section 111 of the Federal Property and Administrative

Service Act for a delegation of authority from the Administrator of the General Services Administration before an agency may purchase automatic data processing equipment under this section."

(b) The table of contents at the beginning of such chapter is amended by at the end the following new item:

"Section 2329. Acquisition of Commercial Products."

Sec. 6 Effective dates. The regulations required by section 3 shall be issued 270 days after the date of enactment of this act. Sections 4 and 5 shall become effective 90 days after the regulations required by section 3 are incorporated into the Federal Acquisition Regulation.

Appendix 10

DLA Commercial Practices

Commercial Buying Practices

In the Defense Science Board 1986 Summer Study report "Use of Commercial Components in Military Equipment," the panel determined that they could not address the issue of increasing the use of commercial equipment for military needs without also looking at the differences between how commercial items are bought, and how defense equipment is specified and purchased. This determination led to an expansion of the panel's charter to consider both commercial products and commercial practices. The panel identified eleven "principal commercial practices."

The following is a synopsis of Defense Logistics Agency (DLA) Directorate of Contracting efforts to identify and apply commercial style-best value buying practices in its operations.

The DLA Directorate of Contracting, has an ongoing program to identify commercial style-best value practices that can be applied uniformly to all potential suppliers while meeting the current requirements of law and national policy relative to the manner in which we conduct business and with whom we conduct business. DLA has programs or initiatives in each of the "principal commercial practices" identified in the 1986 study. In addition to these practices, the DLA Directorate of Contracting is also reviewing the applicability of other logistics techniques and practices such as just-in-time deliveries; direct integration of requirements with vendor production facilities for more rapid response; reliance on vendor quality control through source inspection, and reduced operating and safety stocks. The Directorate of Contracting has undertaken this review as these initiatives will operate through the contracting function and possibly require specialized buying practices to be implemented.

The DLA is an active participant in the regulatory reform program established by former Under Secretary of Defense (Acquisition) USD(A), Mr. Godwin and continued by USD(A) Dr. Costello. The Pilot Contracting Activities Program (PCAP) encompasses more than a reduction of the regulatory burden on our contracting officers and industry. In seeking a give contracting officers more authority to make business decisions, the ultimate goal is to obtain quality supplies from quality vendors when we need them. To accomplish this, the program stresses the use of innovative contracting techniques, more in line with commercial practices, in the acquisition of both commercial and noncommercial products and services. To date, DLA has granted 26 PCAP deviations.

Three DLA Supply Centers have adopted the Air Force Logistics Command "Competition for Performance" initiative, which provides the contracting officer with the flexibility to award at a price up to twenty percent higher than the low price offer in order to place an award with a "quality vendor" (a vendor having a history of on time delivery of quality products). Under this initiative, vendors of particular Federal Stock Classes are invited to apply for inclusion on a qualified vendor (or similarly-named) list on the basis of their delivery and quality history. This initiative was developed in response to the Packard Commission recommendation that the Department of Defense provide for increased use of commercial-style competition, emphasizing quality and established performance as well as price. The Defense Construction Supply Center (DCSC), Defense Electronics Supply Center (DESC), and Defense Industrial Supply Center (DISC) have together made a total of 31 awards (as of May 1, 1989) using the Competition for Performance analysis. In a related effort, the Defense General Supply Center (DGSC) has developed a "Value Based Award" program. This program addresses items identified as having

a history of quality and/or delivery problems and provides for award to a contractor who has a good quality ad on-time delivery history.

The DLA Directorate of Contracting and the Office of Policy and Plans, Operations Research and Analysis Office are jointly endeavoring to develop tools for evaluating and quantifying how much it costs the government to do business with less-than-stellar performers. The evaluation factors are designed to show that it costs us a certain amount to perform a preaward survey, or to accept supplies late, or to perform source inspections, or to have to contend with nonconformances. Because taking any of these actions is an additional expense to the government, an amount which is the equivalent of the average cost of the type survey require, the source inspection, or so forth will be added to the otherwise-successful offer of a contractor on whom such an action will nevertheless have to be taken. Use of any of these factors could make the differences between awarding or not awarding a contract to a particular company. To date, the DLA contracting activities have been provided source inspection evaluation factors for both large and small purchases. Eventually, there will be a total of five evaluation factors: those pertaining to source inspections, preaward surveys, nonconforming supplies, delinquent deliveries, and the overall cost of doing business with any given contractor.

Source selection techniques are one way to "buy smart" rather than "buy cheap." The DLA contracting activities are proving that using source selection procedures is worthwhile for other than special, highly complex item procurements. Continued use of source selection will be encouraged through familiarizing contracting activity personnel with the benefits and procedures of source selection. To achieve this, the Directorate of Contracting is currently researching materials for incorporation into a source selection guidebook. One section of the guidebook will cover nontraditional uses of source selection procedures. This section will address critical items with a history of delivery problems or with no delivery history which are considered prime candidates for a simplified source selection technique under which the offeror's ability to perform (as distinct from responsibility) and cost would be the only evaluation factors. Fewer people would be involved in evaluation and selection, and documentation requirements would be reduced.

Several DLA contracting activities participated in Phase II of the DoD Contract Simplification program which included a test of a new solicitation cover sheet, a simplified contract format, and the use of annual representations and certifications. At the conclusion of a test, DLA participated with the Military Services in preparing a Defense Acquisition Regulatory Council case proposing changes to the Federal Acquisition Regulation. The proposed change would permit use of the simplified contract format for firm-fixed price and fixed-price with economic price adjustment acquisitions of noncomplex supplies or services. The case is currently under review.

The Defense Personnel Support Center (DPSC), a field activity of DLA, is currently conducting a "Commercial Contracting Experiment" to streamline acquisition procedures while satisfying supply requirements with commercial items. For the test case, DPSC has developed a function/performance oriented specification that is geared toward the commercial marketplace. Other commercial practices included in the solicitation are a definition of commercial defects as those affecting form, fit, function or appearance as recognized by the industry trade organization; a request for the commercial industry's best commercial method of

packaging including commercial palletization; and the requirement for a warranty similar to the type offered to the vendor's best commercial customers.

The DPSC is using "formal source selection" techniques in the acquisition of defibrillators and other medical equipment. These techniques include "Greatest Value Source Selection" and the "Low Cost, Technically Acceptable" approach, and focus on factors (technical, management) in addition to price. The DPSC Clothing and Textile Directorate is also awarding multiple indefinite-delivery contracts as a means of buying quality products and ensuring good delivery performance. When this approach is used for a particular solicitation, DPSC awards three contracts. Each contractor is guaranteed a minimum of ten percent of the total contract requirements. The balance is ordered from that contractor or contractors who demonstrate the most timely delivery and the best quality product.

Long-term contracting arrangements with quality suppliers are recognized as effective means for saving money and man-hours. The use of various long-term (one-year or more) contracting techniques has been steadily increasing in DLA. Many of our petroleum contracts now run for two years. One particularly noteworthy technique is our Paperless Order Placement System (OPOS). Under this system, indefinite delivery contracts are written for a one-year period with options to renew for two, three, or four additional years. These contracts provide for direct electronic ordering from contractor stocks for shipment direct to requisitioning activities. POPS is operational at the DLA Hardware Centers (DCSC, DESC, DGSC, and DISC). Each center is attempting to expand its POPS its POPS to include more contractors and products. Current activity at each Hardware Center is as follows:

Center	Number of Contracts	Dollar Value
DCSC	10	$ 1,400,000
DESC	7	600,000
DGSC	36	60,000,000
DISC	6	1,800,000

In order to promote greater use of long-term contracting techniques, we are developing enhanced systems capability to identify and handle groups of items in both the supply and contracting functions. We also are in the process of setting goals for use of long-term contracting for FY 1990 in terms of percentage of contract obligations and number of items.

DLA continues to stress the use of debarments for poor performance as one tool for achieving its goal of dealing only with contractors committed to quality. These debarments are recommended by Contracting and Contracting Management personnel.

DLA is also trying to ascertain where, and under what conditions, contractors can be required to institute statistical process control techniques in their production processes.

As with the industry, DLA contracting activities have implemented a number of Electronic Data Interchange initiatives. These initiatives combine features such as the capability to electronically issue delivery orders directly with contractors, and utilizing commercially available distribution systems in lieu of maintaining large inventories at the defense supply

depots. Included are the POPS and Standard Automated Material Management System (SAMMS) Procurement by Electronic Data Exchange (SPEDE).

Appendix 11

Glossary

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Acronyms

CHS - Common Hardware and Software

DLA - Defense Logistics Agency

DFARS - DoD Federal Acquisition Regulation Supplement

DSB - Defense Science Board

FAR - Federal Acquisition Regulation

GOSIP - Government Open System Interconnection Profile

IC - Integrated Circuit

ISO/OSI - International Organization for Standards / Open Sytem Interconnection

NDI - Nondevelopmental Item

NGCR - Next Generation Computer Resources

OFPP - Office of Federal Procurement Policy (a part of the Office of Management and Budget, Executive Office of the President).

PCAP - Pilot Contracting Activities Program

POPS - Paperless Order Placement System

QML - Qualified Manufacturers List

SMD - Standard Military Drawing

USD(A) - Under Secretary of Defense for Acquisition

Terms

Back Plane - (or Back Plane Standard) - a set of specifications that define physical and electrical attributes, and some functional and protocol properties, of electronic modules for interconnection to a common interface.

Best Value - the evaluation of a commercial product, system, or service based on all reasonable factors including, but not limited to, initial price, life-cycle costs, available extended warranties, prior product experience, availability of distribution and service channels, past producer performance, past vendor performance, and so forth, for the purpose of procuring a product, system, or service that provides optimum satisfaction of the mission need.

Commercial Buying Practices - Long term relationships with relatively small number of suppliers selected on the basis of past performance, quality, financial strength, quality of management, etc. Awards are based on "best value" determinations which may or may not be objectively supportable. Minimal oversight or audit, no protests, minimal implementation of "social" programs. (Commercial Buying Practices" is not a precise term with a definitive -

that is, excluding all others - definition. The definition offered here should allow the reader to infer the concept intended when the phrase is used in this report.)

Commercial Item - Item sold or traced to the general public in the course of normal business operations at prices based on established catalog or market prices. (Paraphrased from FAR). (Commercial item is defined in many different ways for many different circumstances. The term "Commercial Item" frequently includes services as well as products. This is not intended to be an all inclusive or overriding definition, but rather one to convey, generally what is meant when the term is used in this report.)

Nondevelopmental Item - Item, which may or may not require minor modification, available in the commercial marketplace; or previously developed and in use by another Federal Agency, state or local government, or friendly foreign government; or which is in production but is not yet in use or available in the commercial marketplace. (Paraphrased from section 907, Defense Acquisition Improvement Act of 1986)

Open Systems Architecture - a systems oriented, multi-level, nonproprietary architecture (normally in the public domain) able to support simultaneously, products or systems from different manufacturers.

Packard Commission - Presidents Blue Ribbon Commission on Defense Management. Mr. David Packard was the Commission chairman.

Total Quality Management (TQM) - The DoD management of continuous quality improvement in all processes - administrative, regulatory, manufacturing, etc.