DLA-96-P40192

BUSINESS CASE FOR NONCOMPETITIVE AUTOMATED PURCHASES

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FOR

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INSIGHT THROUGH ANALYSIS

DORO

DLA-96-P40192

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IN REPLY
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FOREWORD

DLA has an automated system for making small buys (under $2,500) on a noncompetitive basis called the Standard Automated Material Management System (SAMMS) Purchase by Electronic Data Exchange (SPEDE). The system is popular, in part because it requires very little time and attention from buyers, thus yielding a low cost to procure and a significantly lower administrative lead time. Nevertheless, despite the buying efficiencies and planned system improvements, many people believe that the Government pays, and will continue to pay, excessive prices in its noncompetitive automated buys.

The Defense Logistics Agency (DLA) Operations Research Office (DORO) was tasked by the DLA Procurement Directorate (AQP) to prepare a business case analysis that evaluates the costs and benefits of the current SPEDE system, planned noncompetitive automated systems, and planned and existing competitive systems for making small purchases. The costs compared are the vendor price and the cost to procure. The benefits compared are administrative lead time, production lead time, inventory turnover rate, backorder rate, and supply availability.

HAROLD BANKIRER
Colonel, U.S. Army
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EXECUTIVE SUMMARY

The Defense Logistics Agency has an automated system for making small buys (under $2,500) on a noncompetitive basis called the Standard Automated Material Management System (SAMMS) Purchase by Electronic Data Exchange (SPEDE). In FY 94, the hardware centers awarded 136,000 contracts totaling seventy six million dollars for these small purchases through SPEDE. The system is popular, in part because it requires very little time and attention from buyers, thus yielding a low cost to procure and a significantly lower administrative lead time (ALT). Nevertheless, despite the buying efficiencies and planned system improvements, many people believe that the Government pays, and will continue to pay, excessive prices in its noncompetitive automated buys.

The Defense Logistics Agency Operations Research Office was tasked by the DLA Procurement Directorate (AQP) to prepare a business case analysis that evaluates the costs and benefits of the SPEDE system with other planned noncompetitive and competitive systems for making small purchases. The main systems compared for each of the hardware centers are: (1) the current noncompetitive automated version of SPEDE (the status quo), (2) a semi-competitive version of SPEDE used at the Defense Industrial Supply Center, (3) a fully competitive version of SPEDE used at the Defense Personnel Supply Center for procurement of medical supplies (Medical SPEDE), (4) the DLA Pre-Award Contracting System by Electronic Commerce (DPACS-EC), which is a manual competitive system, and (5) a semi-automated competitive method of using DPACS-EC with SAMMS Automated Small Purchase Phase II solicitations. The costs compared for each alternative are the vendor price and the cost to procure. The benefits compared are ALT, production lead time, inventory turnover rate, backorder rate and supply availability.

The Medical SPEDE alternative shows the greatest promise in all the cost benefit attributes evaluated in this study, with the exception of inventory turnover rate. The DISC SPEDE alternative demonstrated the best performance in inventory turnover rate, but this is driven by higher vendor prices causing the system to order smaller quantities more frequently.

The high performance of the Medical SPEDE alternative is partially driven by a reduction in the percentage of awards rejected to the DPACS-EC alternative. All purchase requests (PRs) which enter into any of the SPEDE systems are not always awarded as a SPEDE buy. For various reasons, some PRs are rejected out of the SPEDE system and are then awarded through DPACS-EC. The two most common reasons a PR is rejected from the SPEDE system are unreasonable prices or no vendor response. DPACS-EC has a high cost to procure and has long lead time values. By competing an award, price unreasonableness or no vendor response are less likely to occur and fewer awards are rejected to the DPACS-EC system.

Furthermore, the benefits of full competition (vice semi-competition) are exhibited within the Medical SPEDE alternative in vendor price performance. Under a fully competitive automated system, DLA receives the cost benefit of competing an award plus the benefit of the vendor passing on a lower administrative overhead cost, thus, yielding the lowest prices.

In conclusion, Medical SPEDE combines the efficiency of an automated system with the price performance associated with competition. Medical SPEDE reaps the benefits of reducing rejects to a more costly system, receiving the best possible price performance, and reducing lead times for better supply support to customers. Therefore, we recommend the adoption of the Medical SPEDE system at the hardware centers for making small purchases under $2,500. The estimated savings associated with lower vendor prices for these small buys is approximately $16.5M per year.

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LIST OF ACRONYMS

ALT	Administrative Lead Time
AQP	DLA Procurement Directorate
AQPOS	DLA Procurement Systems Team
DCSC	Defense Construction Supply Center
DESC	Defense Electronics Supply Center
DGSC	Defense General Supply Center
DISC	Defense Industrial Supply Center
DLA	Defense Logistics Agency
DORO	DLA Operations Research Office
DPACS	DLA Pre-Award Contracting System
DPACS-EC	DLA Pre-Award Contracting System - Electronic Commerce
DPSC	Defense Personnel Support Center
DVD	Direct Vendor Delivery
FSS	Federal Supply Schedule
JLSC	Joint Logistics Systems Center
NSN	National Stock Number
PEARLS	Performance Evaluator And Requirements Level Simulator
PLT	Production Lead Time
PR	Purchase Request
SAMMS	Standard Automated Materiel Management System
SASP I	SAMMS Automated Small Purchase Phase I
SASP II	SAMMS Automated Small Purchase Phase II
SCR	System Change Request
SIS	Shipping Instruction Sheet
SME	Subject Matter Expert
SPEDE	SAMMS Purchase by Electronic Data Exchange

SECTION 1
INTRODUCTION

DLA had an automated system for making small buys (under $2,500) on a noncompetitive basis called the SAMMS Automated Small Purchase System Phase I (SASP I). In recent years, it has been upgraded to the Standard Automated Material Management System (SAMMS) Purchase by Electronic Data Exchange (SPEDE). All hardware centers now have SASP I upgraded to SPEDE. In FY 94, the hardware centers awarded 136,000 contracts totaling $76M for these small purchases through SPEDE. The system is popular, in part because it requires very little time and attention from buyers, thus yielding a low cost to procure and a significantly lower administrative lead time (ALT). Many other enhancements to SPEDE are planned. Nevertheless, despite the buying efficiencies and planned system improvements, many people believe that the Government pays, and will continue to pay, excessive prices in its noncompetitive automated buys.

The Defense Logistics Agency (DLA) Operations Research Office (DORO) was tasked by the DLA Procurement Directorate (AQP) to prepare a business case analysis that evaluates the costs and benefits of the SPEDE system with other noncompetitive automated systems and with other competitive systems for making small purchases. The costs compared are the vendor price and the cost to procure. The benefits compared include ALT, production lead time (PLT), inventory turnover rate, backorder rate and supply availability.

1.1 BACKGROUND

In 1990 the Defense Industrial Supply Center (DISC) began a headquarters DLA sponsored study to conduct a cost benefit analysis on using blanket purchase agreements via SASP I. The basic question to be addressed was whether the purported benefits such as reduced lead time and administrative cost offset the potentially higher unit prices associated with a noncompetitive system. The study was never completed. In the meantime, SASP I was upgraded with the SPEDE system. System Change Requests (SCRs) are in process that are designed to improve SPEDE performance, mainly by reducing the rate of rejects which require manual purchase. Also a survey was taken of users which resulted in several SCRs to improve the price performance of SPEDE.

In addition to these developments, derivatives of SPEDE have been developed. DISC developed a semi-competitive version of SPEDE whereby rejects are first recycled through SPEDE to multiple vendors prior to rejection to a manual purchase. A competitive version of SPEDE is used to purchase medical supplies at the Defense Personnel Supply Center.

Concurrently, alternative competitive methods are being developed. These are expected to improve the efficiency of competitive systems, in terms of both administrative cost and administrative lead time. Probably the system offering greatest promise is the DLA Pre-Award Contracting System - Electronic Commerce (DPACS-EC). Also of interest are SAMMS Automated Small Purchase System Phase II (SASP II) buys. SASP II is not a procurement

system per se, but it is an automated method for making solicitations. The evaluation and award is made through the manual system.

1.2 OBJECTIVE

The goal of this study is to prepare a business case analysis that compares the costs and benefits of the SPEDE system with other alternative noncompetitive automated systems and with planned competitive systems for making small purchases.

1.3 SCOPE

This study evaluates the costs and benefits for seven alternative procurement systems for making small buys under $2,500. Each alternative system is evaluated for the four hardware centers: the Defense Construction Supply Center (DCSC), the Defense Electronics Supply Center (DESC), the Defense General Supply Center (DGSC), and DISC.

1.3.1 ALTERNATIVES

The study assesses three noncompetitive alternatives (1-3, below), two competitive alternatives (4 & 5, below), one semi-competitive system (6 below), and one semi-automated competitive system (7 below). These are:

(1) Status Quo: Current version of SPEDE (base case).

(2) Enhanced SPEDE: SPEDE with system change requests (SCRs) designed to reduce the rate of rejects which require manual buys.

(3) Enhanced SPEDE Plus: Enhanced SPEDE with suggested changes designed to improve the price performance of SPEDE.

(4) DPACS-EC: The DLA Pre-Award Contracting System - Electronic Commerce.

(5) Medical SPEDE: The version of SPEDE used at the Defense Personnel Support Center (DPSC) for procurement of medical supplies.

(6) DISC SPEDE: Version of SPEDE currently used at DISC.

(7) SASP II: Current automated solicitation to multiple vendors with manual or automated awards.

1.3.2 COST AND BENEFIT ATTRIBUTES

Each of the alternatives for each of the centers is evaluated in terms of the following attributes:

(1) Prices paid to vendors.

(2) Supply center administrative cost per award.

(3) ALT.

(4) PLT.

(5) Lead Time variability.

(6) Supply availability rate.

(7) Backorder rate.

(8) Inventory turnover rate.

(9) Long supply rate.

Attributes 1-5 are evaluated for stocked buys and direct vendor deliveries (DVDs). Attributes 6-9 are only pertinent to stocked buys.

1.4 ASSUMPTIONS

(1) DPACS-EC is an enhanced version of the current DPACS system which will incorporate the use of electronic data exchange technology. To date, DPACS-EC has not been implemented and the impact it will have on the attributes evaluated in this study are unknown. Therefore, we assume the attributes for DPACS-EC are the same as for DPACS.

(2) Purchase Requests (PRs) which enter into the SPEDE system are not always awarded as a SPEDE buy. For various reasons, some PRs are rejected out of the SPEDE system and are then bought through DPACS. The DISC SPEDE (a semi-competitive system) system was tested during FY 94. Results of the test phase showed a drop in the reject rate due to competing the buys within SPEDE. Although the Medical SPEDE system has been in existence since the late 1980's at DPSC, the impact this system would have on rejects at the hardware centers is unknown. Therefore, we assume the reject rate improvement would be the same for the Medical SPEDE alternative as it is for the DISC SPEDE alternative.

(3) An initial analysis indicated that vendor prices for SASP II contracts and DPACS contracts were not significantly different. Therefore, the vendor price for DPACS-SASP II and DPACS-EC are assumed to be the same.

(4) Almost all of the Medical SPEDE buys are DVDs. We assume that the impact on the cost benefit attributes on the Medical SPEDE alternative is the same for stocked buys as it is for DVDs.

1.5 LIMITATIONS

This analysis is limited to purchases under $2500. Additionally, the administrative cost to award is restricted to the cost to procure. This includes the labor cost of a technical referral, processing a PR, and solicitation and award. In addition, it includes the cost of personnel benefits, leave entitlements, and indirect support. It does not include such costs as item manager review, technical review, and depot storage.

SECTION 2
METHODOLOGY

2.1 ALTERNATIVES

Of the seven alternative systems evaluated, four are in existence. They are: SPEDE, Medical SPEDE, DISC SPEDE, and SASP II. DPACS-EC is scheduled to be implemented in the summer of 1995. The other two alternatives, Enhanced SPEDE and Enhanced SPEDE Plus, are proposed changes to the current SPEDE system.

2.1.1 SPEDE

Purchase Requests (PRs) which enter into the SPEDE system are not always awarded as a SPEDE buy. For various reasons, some PRs are rejected out of the SPEDE system and are then bought through DPACS. (See Figure 2-1.) The two most common reasons a PR is rejected

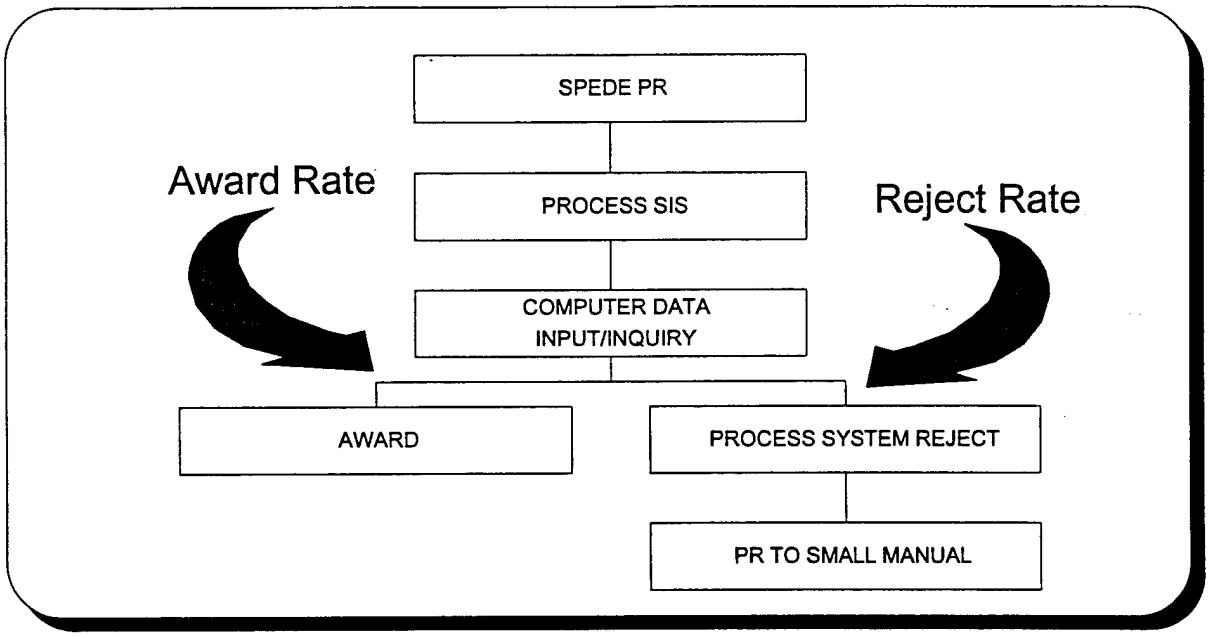

Figure 2-1. ***SPEDE Process***

from the SPEDE system are unreasonable prices or the vendor does not respond to the Shipping Instruction Sheet (SIS). Therefore, the vendor price, administrative cost per award, ALT, PLT, and lead time variability on all SPEDE systems were adjusted by the reject rate to reflect the expected value on these attributes. This was done as follows:

(1) Adjusted SPEDE vendor price = award rate * SPEDE vendor price + reject rate * DPACS-EC vendor price

(2) Adjusted SPEDE cost/award = award rate * SPEDE cost/award + reject rate * DPACS-EC cost/award

(3) Adjusted SPEDE ALT = award rate * SPEDE ALT + reject rate * DPACS-EC ALT

(4) Adjusted SPEDE PLT = award rate * SPEDE PLT + reject rate * DPACS-EC PLT

(5) Adjusted Minimum Lead Time = award rate * SPEDE min. lead time + reject rate * DPACS-EC min. lead time

(6) Adjusted Maximum Lead Time = award rate * SPEDE max. lead time + reject rate * DPACS-EC max. lead time

The award rate and the reject rate for the four hardware centers are listed in Table 2-1. These rates were derived from a SAMMS monthly report which details monthly statistics for the SPEDE system (the PF101-1 report). However, the statistics from DISC were not derived from the PF101-1 report. These reject rates were derived from an analysis provided by DISC because of errors in their PF101-1 report.

	Reject Rate	Award Rate
DCSC	22.01%	77.99%
DESC	38.90%	61.10%
DGSC	19.57%	80.43%
DISC (Status Quo)	41.33%	58.67%

Table 2-1. ***SPEDE Reject Rates***

2.1.2 ENHANCED SPEDE

As stated previously, Enhanced SPEDE and Enhanced SPEDE Plus are alternatives based on proposed changes to the current SPEDE system. Since these alternatives do not currently exist, it was necessary to perform an evaluation on how these alternatives would impact the cost and benefit attributes evaluated in this study. Each alternative was associated with a SCR and then interviews were performed with subject matter expert (SME) panels at DGSC and DISC to estimate the impact of these SCRs on the cost and benefit attributes and on the reject/award rate.

The corresponding SCR for Enhanced SPEDE was SCR USPON-916. The requirements for this SCR are listed in Appendix A. The SME panel viewed this SCR as being designed as a workload management tool and felt it would not impact any of the attributes evaluated in this study. Therefore, this alternative was not evaluated.

2.1.3 ENHANCED SPEDE PLUS

The corresponding SCR for Enhanced SPEDE Plus was SCR USPON-9XX, Draft Version. (See Appendix B.) Because this SCR was still in draft form, the SME panels were unable to determine how some of the requirements would be implemented. For example, the first

requirement states that first time buys would be routed to a competitive system. The SME panels felt this requirement would be of great benefit if the routing of first time buys was to a competitive SPEDE system. On the other hand, if the routing was to DPACS-EC, the panel felt this would have a negative impact. On the whole, the panel felt this SCR may or may not decrease the vendor price, but it would increase the cost/award and ALT. This was due to the belief that it would cause an increase in the reject rate. However, the panels were unable to estimate to what extent these attributes would be impacted. Therefore, this alternative was not evaluated in this study.

2.1.4 DISC SPEDE

The DISC SPEDE system is a semi-competitive system in that PRs which are rejected from the noncompetitive SPEDE system are rerouted back into SPEDE and then competed through SPEDE. The DISC SPEDE system went through a test phase from May 4, 1994 to August 15, 1994. The system was then fully implemented in December, 1994. The DISC competitive rebuy phase of SPEDE is viewed as an improvement to the SPEDE system because it reduces the reject rate of SPEDE buys which are rejected to a manual DPACS buy. Results of the test phase showed a drop in the reject rate from 41.33% to 20.24% due to competing the buys within SPEDE. This yields an improvement of 48.97% in the reject rate. Therefore, in evaluating the DISC SPEDE system as an alternative for each of the centers, it was estimated that the present reject rate of the center would improve by 48.97%. See Table 2-2 for the adjusted reject/award rate for each center for this alternative. A change in the reject rate consequently yielded a change in the expected values of the cost benefit attributes as discussed in Section 2.1.1.

	Reject Rate	Award Rate
DCSC	10.77%	89.23%
DESC	19.05%	80.95%
DGSC	9.58%	90.42%
DISC (Status Quo)	20.23%	79.77%

Table 2-2. ***DISC & Medical SPEDE Reject Rates***

2.1.5 MEDICAL SPEDE

Medical SPEDE is a fully competitive automated system. Because it is fully competed, Medical SPEDE is able to make awards up to $25,000. However, this analysis was limited to small buys and only Medical SPEDE buys under $2,500 were evaluated.

Additionally, because the Medical SPEDE system is fully competed, it was assumed that adoption of this alternative at the hardware centers would also cause a decline in the reject rate equal to that of the DISC SPEDE alternative. See Table 2-2.

Furthermore, the Medical SPEDE system awards contracts to Federal Supply Schedule (FSS) vendors. FSS vendors are vendors who have agreed to sell an NSN at a published catalog price and these NSNs are considered to have been competed already. Therefore, if an NSN has an FSS vendor, it is automatically awarded in the Medical SPEDE system. Due to this anomaly of the medical SPEDE system, all NSNs with an FSS vendor were eliminated from our analysis of the Medical SPEDE system.

Another anomaly of the medical commodity is that almost all the Medical small buys are DVDs rather than stocked buys. Thus, the impact on the cost benefit attributes on the Medical SPEDE alternative is assumed to be the same for stocked buys as it is for DVDs.

2.1.6 DPACS-EC

As was stated in Section 1.4, DPACS-EC is an enhanced version of the current manual DPACS system which will incorporate the use of electronic data exchange technology. To date, DPACS-EC has not been implemented and the impact it will have on the attributes evaluated in this study are unknown. Discussions with the DLA Procurement Systems Team (AQPOS) revealed that, while the Electronic Commerce technology will improve the DPACS system in some respects, in other respects it may degrade the DPACS system. For example, DLA's time to solicit an award will improve due to the electronic commerce. On the other hand, the time to evaluate a bid may increase due to an increase in the number of bids generated from the electronic commerce format. Therefore, it was the consensus of AQPOS and DORO that it was reasonable to assume the attributes for DPACS-EC are the same as for DPACS.

2.1.7 DPACS-SASP II

It must be noted that SASP II is not a procurement system but it is a process by which solicitations are made to multiple vendors through an automated system and then the award is made either through a manual or automated system. For this analysis, DPACS-SASP II is implied to mean a SASP II solicitation with a manual award with a dollar value under $2,500.

2.2 COST AND BENEFIT ATTRIBUTES

2.2.1 VENDOR PRICE

To determine the vendor price difference between a DPACS-EC and a SPEDE award, a comparison was made on that set of NSNs from the Active Contract File which were bought under both procurement types between FY 1989 and FY 1994. Comparisons were only made if the unit of issue codes and free on board codes were the same. To eliminate the effects of making pricing comparisons between buys with extreme quantity differences, the data was filtered to eliminate all buys where the quantity difference was less than 1/5 the average buy quantity or greater than 5 times the average buy quantity (see Figure 2-2 for a notional example).

Once the data was screened for quantity differences, all remaining buys were adjusted to FY 94 dollars using the Producer Price Index (PPI). Finally, the prices were rolled up by center and weighted by dollar value. To compute an overall percentage change, the total cost of SPEDE

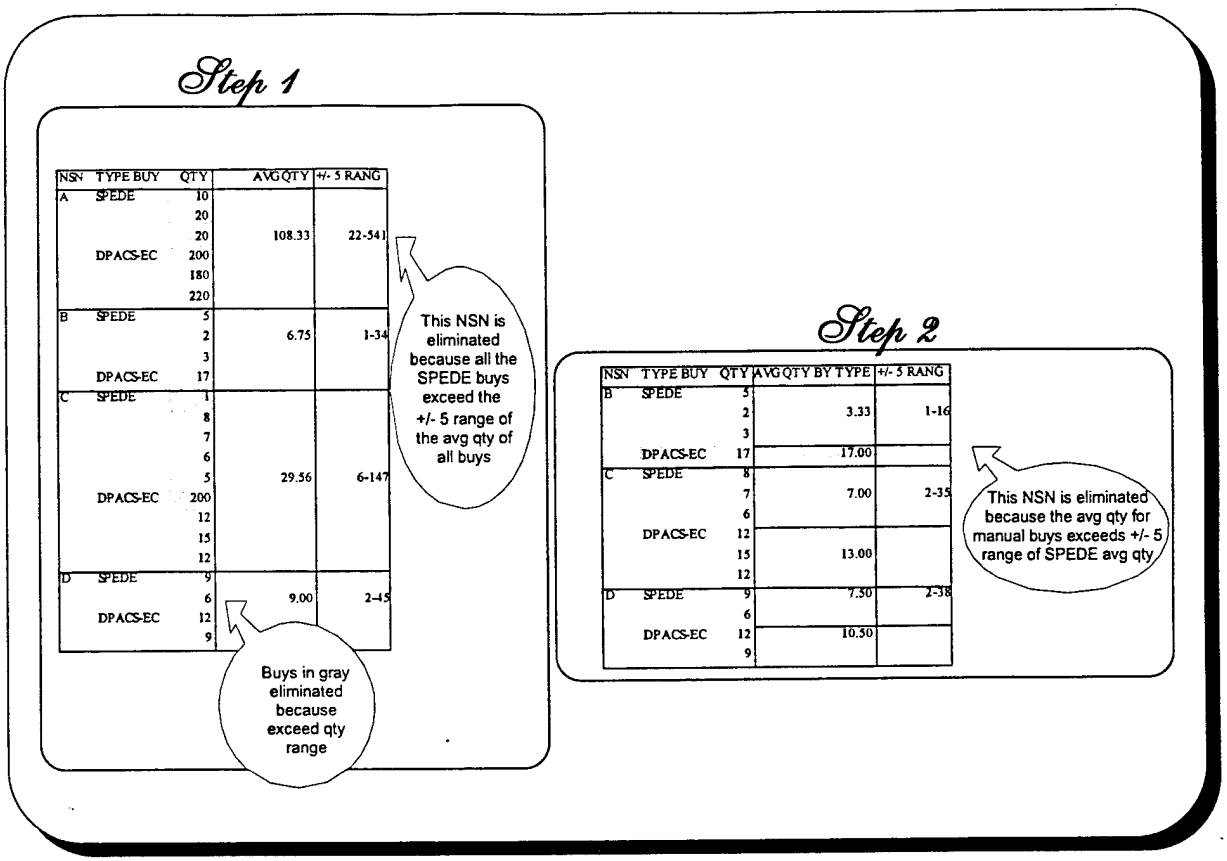

Figure 2-2. *+/- 5 Quantity Filter Example*

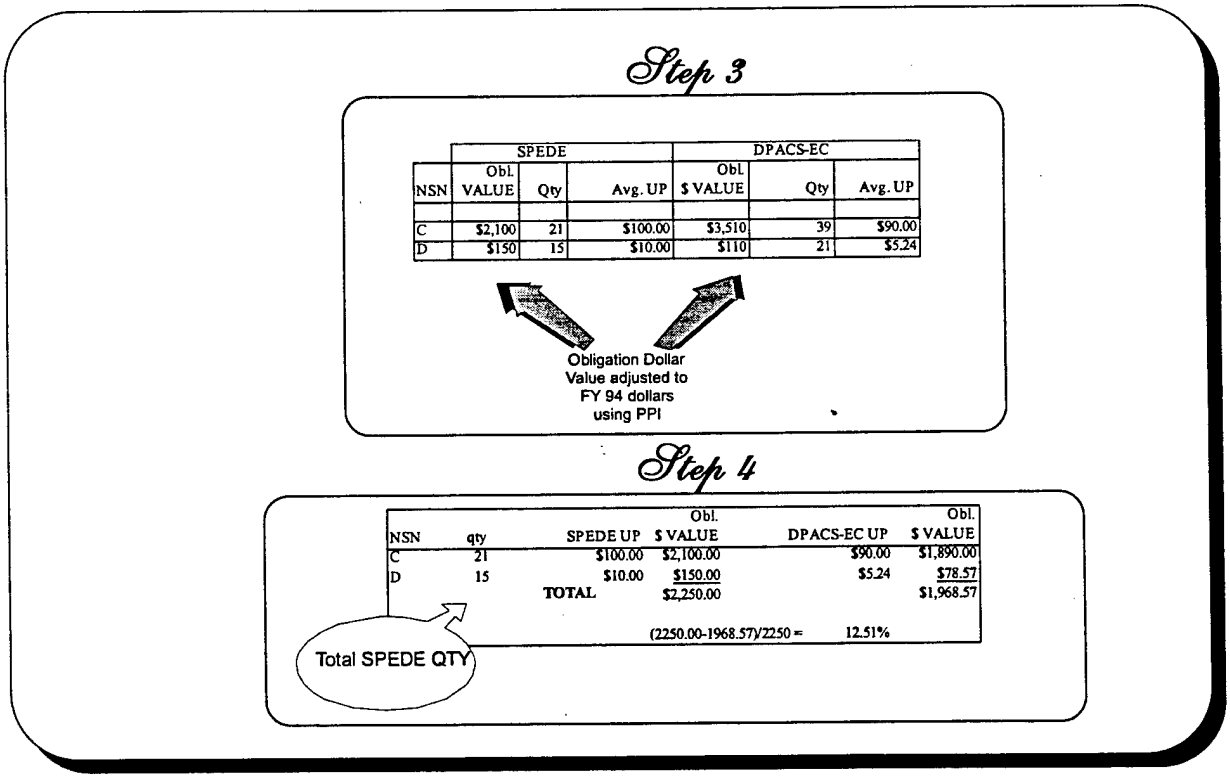

Figure 2-3. *Roll Ups Weighted by Dollar Value*

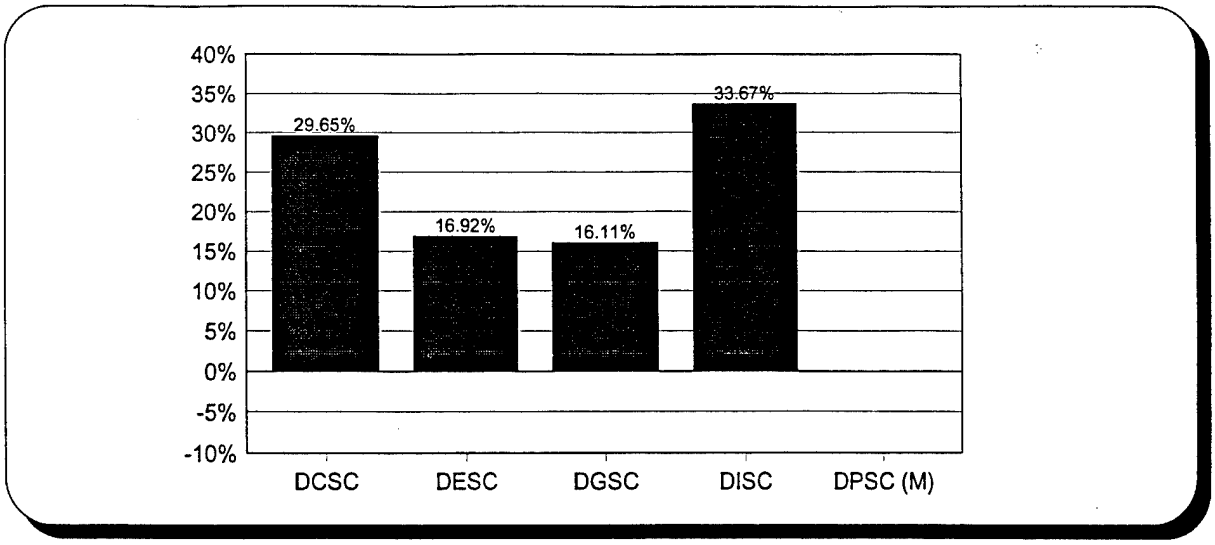

Figure 2-4. ***Price Difference SPEDE Stocked Buys vs. DPACS-EC Stocked Buys***

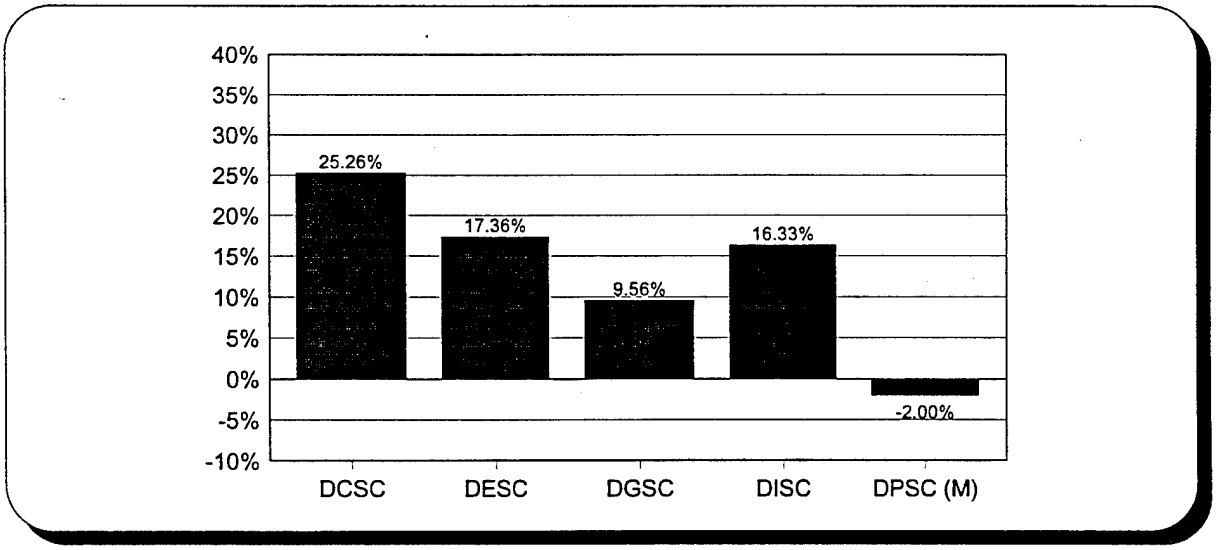

Figure 2-5. ***Price Difference SPEDE DVD Buys vs. DPACS-EC DVD Buys***

quantities were computed at SPEDE unit prices and at DPACS-EC unit prices. (See Figure 2-3 for a notional example of weighting by dollar value.)

Using this methodology, the price difference between SPEDE stocked buys and DPACS-EC stocked buys is shown in Figure 2-4. This table indicates that SPEDE prices are significantly higher, probably because of the noncompetitive nature of SPEDE. For example, at DCSC DPACS-EC buys were 29.65% less than DCSC SPEDE buys. The price difference between SPEDE DVD buys and DPACS-EC DVD buys is shown in Figure 2-5. With the base case being SPEDE, to determine the vendor price for the DPACS-EC alternative, the percentage shown in Figure 2-4 and 2-5 was subtracted from 100%.

As stated in the assumptions, an initial analysis, using the same methodology, indicated that there was no price difference between SASP II buys and DPACS-EC buys. Therefore, the vendor price between SPEDE and DPACS-EC SASP II is considered to be the same as the price difference between SPEDE and DPACS-EC.

For the Medical SPEDE alternative, the vendor price was considered to be 2% less than a DPACS-EC buy. (Notice in Figure 2-5 that the Medical SPEDE prices were found to be 2% lower than the Medical DPACS prices.) As stated earlier, all FSS buys were removed from the data.

The price difference between the SPEDE alternative and the DISC SPEDE alternative was calculated in a similar fashion. The only difference being the selection of data. For this study, DISC provided DORO with a list of PR numbers which were purchased using the DISC Competitive Rebuy SPEDE system. From this list of PRs, we were able to determine the price difference for the DISC SPEDE alternative vs. the DISC noncompetitive SPEDE system. Results of this analysis showed no vendor price difference between the DISC noncompetitive SPEDE and the DISC Competitive Rebuy SPEDE on stocked buys. On DVDs, the results showed that DLA pays 12% more through the DISC Competitive Rebuy SPEDE than through the DISC noncompetitive SPEDE. The higher prices could be due to some learning curve since the system had only been fully implemented for 3 months at the time this analysis was done. Therefore, to be on the conservative side, it is assumed that the DISC Competitive Rebuy SPEDE system does not adversely impact vendor price. Thus, for DISC SPEDE, the price attribute is the same as the status quo SPEDE.

Once the vendor price was established for each alternative for each center, the SPEDE alternatives were weighted by the appropriate reject/award rate. Then, the outcome was normalized so that the status quo (noncompetitive SPEDE) was equal to 100%. See Table 2-3 for an example of the calculations for DCSC for stocked buys.

2.2.2 ADMINISTRATIVE COST PER AWARD

Synergy Incorporated performed a study in 1989 which developed the administrative cost per award based on a time standard approach. This study estimated the cost per award by contract type. In 1994, DORO updated the Synergy study (Update to Contracting Cost Factors Used in the Contract Termination Model, DORO, July, 1994) using the latest time standards, wages and locality pay. The administrative cost per award used in this study is derived from this previously published DORO study and is limited to the cost to procure. As stated in Section 1.5, the cost to procure includes the labor cost of a technical referral, processing a PR, and solicitation and award. In addition, it includes the cost of personnel benefits, leave entitlements, and indirect support. It does not include such costs as item manager review, technical review, and depot storage. Furthermore, the administrative cost to award for all SPEDE alternatives was adjusted by the appropriate reject/award rate to reflect the expected value on this attribute.

Center	Alternative	Calculate Raw Attribute	Raw Attribute	Adjusted Vendor Price by Reject/ Award Rate		Normalized[10]
DCSC	Status Quo		1.00	1.00[1]*.7799%[2]+ .7035[3]*.2201%[4] =	93.4%	100.00%
	DISC SPEDE	same as SPEDE =	1.00	1.00[1]*.8923%[5] + .7035[3]*.1077%[6] =	96.7%	103.53%
	Medical SPEDE	1.00-.2965[8]-.02[9] =	.6835	.6835[7]*.8923%[5] + .7035[3]*.1077%[6] =	68.6%	73.04%
	DPACS-EC	1.00-.2965[8] =	.7035	.7035 * 100% =	70.4%	74.95%
	DPACS SASP II	same as DPACS-EC =	.7035	.7035 * 100% =	70.4%	74.95%

[1]Status Quo Raw Attribute
[2]DCSC SPEDE Award Rate (See Table 2-1.)
[3]DCSC DPACS-EC Raw Attribute
[4]DCSC Reject Rate (See Table 2-1.)
[5]DISC & Medical SPEDE Alternative Award Rate for DCSC (See Table 2-2.)
[6]DISC & Medical SPEDE Alternative Reject Rate for DCSC (See Table 2-2.)
[7]Medical SPEDE Raw Attribute
[8]Price Difference between SPEDE and DPACS-EC buys for DCSC (See Figure 2-4.)
[9]Price Difference between SPEDE and DPACS-EC Medical buys for DCSC (See Figure 2-5.)
[10]Adjusted vendor price divided by adjusted vendor price of Status Quo

Table 2-3. ***Example of Vendor Price Calculations***

2.2.3 OPERATING AND MAINTENANCE COSTS

Operating and maintenance costs (O & M) are the costs required to operate and maintain the physical aspect of each procurement system. Initially, these costs were to be evaluated in this analysis. However, DORO was unable to obtain the information needed to address this issue. Therefore, the O&M costs are not evaluated.

2.2.4 ALT

The ALT for DPACS, SASP II and SPEDE type contracts was calculated from data obtained in the Active Contract File. Buys with an obligation dollar value under $2,500 from FY 93 - FY 94 were identified and then grouped by contract type. Then an average ALT was calculated. For SPEDE buys, the ALT was calculated as (obligation date - recommended buy date). For DPACS-EC and SASP II buys, the ALT was calculated as (award date - recommended buy date).

For all of the SPEDE alternatives (Status Quo, DISC , and Medical), the ALT is initially assumed to be the same as the Status Quo. However, each SPEDE alternative is adjusted by its corresponding reject/award rate.

2.2.5 PLT

The PLT for each alternative was calculated using the same methodology as was used for vendor price. The only difference being that an average PLT was calculated for each alternative rather

than a price difference. The PLT was calculated for SPEDE buys as (ship date - obligation date). For DPACS-EC and SASP II, the PLT was calculated as (ship date - award date).

As with ALT, the PLT on all SPEDE alternatives is initially assumed to be the same as the Status Quo. However, each SPEDE alternative is adjusted by its corresponding reject/award rate.

2.2.6 SUPPLY AVAILABILITY, BACKORDER RATE AND INVENTORY TURNOVER RATE

DORO developed a simulation model for the Joint Logistics Systems Center (JLSC) called PEARLS (Performance Evaluator And Requirements Level Simulator). This simulation models DLA's current procurement and inventory policies. Variable inputs for the model included the vendor price, the administrative cost per award, ALT, PLT, and lead time variability for each of the alternatives for each of the centers. The model was originally designed to use a computational estimate of lead-time variability; however since there is a significant difference in lead time variability among the alternatives considered, the PEARLS model was adjusted for this analysis to handle this additional parameter. Using these inputs, 5 years of requisition history was "replayed" on that group of NSNs which were bought both through DPACS and SPEDE at each center. (i.e. The set of requisitions replayed is different from center to center.) The PEARLS model then estimated the supply availability, backorder rate, and inventory turnover rate for each alternative on this given set of requisitions for each center. The inventory turnover rate is defined as the average annual demand dollar value divided by the average annual on-hand dollar value. Supply availability is defined as the percent of time a requisition was made and the stock was available to fill the requisition. The backorder rate is defined as 1 minus the supply availability rate. It is important to note that the results from the PEARLS model only makes a comparison of "What if this set of requisitions of NSNs for this center had all been purchased through one of the alternative systems?" It is not a comparison of adding this set of NSNs with those already solely purchased by one of the alternatives.

2.2.7 LEAD TIME VARIABILITY

AQP was interested in the effects of lead time variability as it would affect supply availability, the backorder rate, and inventory turnover. These are outputs obtained from the PEARLS simulation model which was discussed in the previous section. For simulation modeling purposes, lead time variability was modeled using a triangular distribution which consisted of the minimum lead time, the average lead time, and a maximum lead time. The actual distribution of lead time was shaped like a normal distribution with a long slender right tail. When the actual maximum lead time was used in the model, the lead times generated were excessively high . In order to get a good fit on the distribution, the maximum lead time was adjusted to twice the mean lead time. Additionally, because the simulation stochastically modeled lead time variability, 10 iterations of each scenario were run on the PEARLS model.

2.2.8 LONG SUPPLY RATE

The long supply rate of each of the alternatives is addressed in this study qualitatively rather than quantitatively. A long supply situation occurs if the recent demand history for an NSN is substantially less than the on-hand supply availability. An example of long supply would be if

the current demand history for a particualr NSN is 10 hits per year. However, DLA has 100 of this NSN in stock. Then this NSN would have 10 years of stock on-hand and would be considered to be in long supply. Indicators of a higher incidence of long supply would be long lead times, low inventory turnover rate, and high supply availability.

SECTION 3
FINDINGS

The cost and benefit attributes for each alternative for each center are displayed in Table 3-1 and Table 3-2. Each table shows the attributes after they have been adjusted for the respective reject/award rates. Table 3-1 shows the attributes for stocked buys and Table 3-2 shows the attributes for DVDs. The best performance by center by alternative for each attribute is highlighted in white.

3.1 VENDOR PRICE

Critics of SPEDE have argued that SPEDE's noncompetitive nature lends itself to increased vendor prices. Proponents of SPEDE have argued that there is less red tape involved in a contractor obtaining an award and getting paid for a contract under SPEDE than under DPACS. And since the vendor's administrative overhead costs are lower, the vendor prices are just as comparable. In this study, the fully competitive alternatives yielded the lower vendor prices in all cases. However, the Medical SPEDE alternative, which is a competitive system, demonstrated the lowest prices paid. Under Medical SPEDE, DLA receives the benefit of competing an award plus the benefit of the vendor passing on a lower administrative overhead cost.

The dollar value of SPEDE buys for each hardware center in FY 94 was as follows: DCSC, $16.6M; DESC, $11.8M; DGSC, $26.8M; DISC, $20.8M. This totals $76M for all the hardware centers. By mutiplying each centers total dollar value by the vendor price difference for the Medical SPEDE alternative, this would reduce the total dollar value to $59.5M. Therefore, the Medical SPEDE alternative would yield a savings of $16.5M due to vendor price performance alone.

3.2 COST/AWARD, ALT, PLT, AND LEAD TIME VARIABILITY

For each center, the current version of SPEDE (the status quo) outperformed the DPACS-EC and the DPACS SASP II alternative in the attributes of cost to award, ALT, PLT, and lead time variability. The DISC SPEDE and the Medical SPEDE alternative showed the best efficiency in these attributes. Their high performance in these attributes is driven by a reduction in the percentage of awards rejected to the DPACS-EC alternative. The competition of awards that these two systems incorporate is assumed to be responsible for a reduction in the reject rate. By competing an award, price unreasonableness or no vendor response are less likely to occur. With fewer awards being rejected to the more costly and longer lead time values of the DPACS-EC system, the DISC SPEDE and Medical SPEDE alternative show the best performance for lead time and cost to award.

		Vendor Price	Cost to Award	Total Lead Time *	ALT	ALT Range	PLT	PLT Range	Inventory Turnover Rate	Supply Availability Rate	Back-Order Rate
DCSC	Status Quo	100.00%	$15.86	123	61	2-509	61	1-600	1.24	84.45	15.55
	DISC Spede	103.53%	$12.54	104	47	2-470	58	1-545	1.30	84.80	15.20
	Medical SPEDE	73.04%	$12.54	104	47	2-470	58	1-545	1.22	85.67	14.33
	DPACS-EC	74.95%	$70.57	253	165	6-789	88	1-986	0.87	83.64	16.36
	DPACS-EC SASPII	74.95%	$32.69	182	100	5-730	82	1-1028	1.02	84.51	15.49
DESC	Status Quo	100.00%	$21.04	139	59	2-417	80	1-812	1.38	85.50	14.50
	DISC Spede	103.54%	$14.80	117	43	2-323	75	1-761	1.49	85.64	14.36
	Medical SPEDE	87.15%	$14.80	117	43	2-323	75	1-761	1.43	86.12	13.88
	DPACS-EC	88.88%	$82.40	206	108	0-714	98	1-973	1.06	85.69	14.31
	DPACS-EC SASPII	88.88%	$31.85	171	76	0-813	95	1-924	1.22	85.71	14.29
DGSC	Status Quo	100.00%	$13.45	112	48	2-402	64	1-660	1.42	86.68	13.32
	DISC Spede	101.62%	$10.16	98	38	2-359	60	1-616	1.47	86.97	13.03
	Medical SPEDE	84.85%	$10.16	98	38	2-359	60	1-616	1.42	87.43	12.57
	DPACS-EC	86.71%	$75.34	228	136	1-755	92	1-1021	1.04	85.22	14.78
	DPACS-EC SASPII	86.71%	$37.57	231	136	24-591	95	1-672	1.13	83.41	16.59
DISC	Status Quo (old SPEDE)	100.00%	$23.09	125	49	2-392	76	1-848	1.12	87.46	12.54
	DISC SPEDE	103.70%	$16.43	112	38	2-340	74	1-843	1.17	87.43	12.57
	Medical SPEDE	68.95%	$16.43	112	38	2-340	74	1-843	1.09	88.28	11.72
	DPACS-EC	70.88%	$71.37	244	142	2-796	102	1-882	0.82	86.99	13.01
	DPACS-EC SASPII	70.88%	$39.77	212	118	2-717	94	1-1106	0.89	86.98	13.02

* Total Lead Time = ALT + PLT rounded to nearest days

Table 3-1. ***Cost and Benefit Attributes for Stocked Buys (Adjusted for reject rates)***

		Vendor Price	Cost to Award	Total Lead Time *	ALT	ALT Range	PLT	PLT Range
DCSC	Status Quo	100.00%	$15.86	110	51	2-663	59	1-639
	DISC Spede	102.91%	$12.54	100	43	2-625	57	1-634
	Medical SPEDE	77.48%	$12.54	100	43	2-625	57	1-634
	DPACS-EC	79.37%	$70.57	181	104	1-932	77	1-675
	DPACS-EC SASPII	79.37%	$32.69	180	104	5-730	76	1-837
DESC	Status Quo	100.00%	$21.04	115	49	1-463	66	1-554
	DISC Spede	103.54%	$14.80	101	38	1-386	63	1-476
	Medical SPEDE	87.15%	$14.80	101	38	1-386	63	1-476
	DPACS-EC	88.88%	$82.40	160	84	0-702	76	1-797
	DPACS-EC SASPII	88.88%	$31.85	153	73	2-707	80	1-771
DGSC	Status Quo	100.00%	$13.45	95	41	1-457	53	1-569
	DISC Spede	101.00%	$10.16	85	34	1-399	51	1-525
	Medical SPEDE	89.96%	$10.16	85	34	1-399	51	1-525
	DPACS-EC	91.80%	$75.34	176	105	1-929	71	1-935
	DPACS-EC SASPII	91.80%	$37.57	193	108	1-615	85	1-698
DISC	Status Quo (old SPEDE)	100.00%	$23.09	107	48	2-395	59	1-739
	DISC SPEDE	101.67%	$16.43	95	37	2-323	59	1-753
	Medical SPEDE	84.95%	$16.43	95	37	2-323	59	1-753
	DPACS-EC	86.81%	$71.37	212	139	1-956	73	1-631
	DPACS-EC SASPII	86.81%	$39.77	158	92	3-615	66	1-581

* Total Lead Time = ALT + PLT rounded to nearest days

Table 3-2. ***Cost and Benefit Attributes for DVD Buys (Adjusted for reject rates)***

3.3 INVENTORY TURNOVER RATE

The DISC SPEDE alternative demonstrated the best performance for inventory turnover rate for all centers. Interestingly, the variable inputs to the PEARLS model for DISC SPEDE and Medical SPEDE were the same, with the exception of vendor price. But because the DISC SPEDE has a higher vendor price, this forces the inventory to turnover quicker because there is a higher cost associated with holding the materiel. Essentially, higher vendor costs causes the system to buy more frequently and in lower quantities. It must be noted that the inventory turnover rate for the Medical SPEDE alternative does not lag very far behind the DISC SPEDE inventory turnover rate and, even though it is lower, it is still very respectable.

3.4 SUPPLY AVAILABILITY AND BACKORDER RATE

The Medical SPEDE alternative exhibited the best supply availability and backorder rate at all centers. This is no surprise, given that the Medical SPEDE alternative shows the best values in all the variables which drive the two attributes.

3.5 LONG SUPPLY RATE

As stated in Section 2.2.6, the long supply rate was not measured quantitatively in this study. However, it would be expected that the DPACS-EC and DPACS-EC SASP II alternatives would have more occurrences of long supply. That is because these two alternative exhibit longer lead times and lower inventory turnover. Conversely, the SPEDE alternatives would probably have fewer occurrences of long supply. Even though the DISC SPEDE alternative has a lower supply availability and a higher inventory turnover rate than Medical SPEDE, it could not be concluded with certainty that DISC SPEDE would have the best long supply rate. This is because the higher inventory turnover rate for the DISC alternative is driven by the higher vendor prices.

SECTION 4
CONCLUSIONS

The Medical SPEDE alternative shows the greatest promise in all the cost benefit attributes evaluated in this study, with the exception of inventory turnover rate. The DISC SPEDE alternative demonstrated the best performance in inventory turnover rate but this is driven by higher vendor prices causing the system to order smaller quantities more frequently.

It is noteworthy that the DISC SPEDE alternative tied with the Medical SPEDE alternative in the cost per award, ALT and PLT attributes. The high performance of these two alternatives in these attributes is driven by a reduction in the percentage of awards rejected to the DPACS-EC alternative. The competition of awards that these two systems incorporate is assumed to be responsible for a reduction in the reject rate. By competing an award, price unreasonableness or no vendor response are less likely to occur. With fewer awards being rejected to the higher cost per award and longer lead time values of the DPACS-EC system, the DISC SPEDE and Medical SPEDE alternative show the best performance for lead time and cost to award.

Furthermore, the benefits of full competition (vice semi-competition) are exhibited within the Medical SPEDE alternative in vendor price performance. Under a fully competitive automated system, DLA receives the cost benefit of competing an award plus the benefit of the vendor passing on a lower administrative overhead cost, thus, yielding the lowest prices. Based on the $76M value of all SPEDE buys at the hardware centers in FY 94, the estimated savings associated with lower vendor prices is $16.5M.

In conclusion, Medical SPEDE combines the efficiency of an automated system with the price performance associated with competition. Medical SPEDE reaps the benefits of reducing rejects to a more costly system, receiving the best possible price performance, and reducing lead times for better supply support to customers.

SECTION 5
RECOMMENDATIONS

We recommend the adoption of the Medical SPEDE alternative at the hardware centers for making small purchases under $2,500. The estimated savings associated with lower vendor prices for these small buys is approximately $16.5M per year.

SECTION 6
COORDINATION

Throughout the project, in-process meetings were held with representatives from the Hardware Centers and DPSC and most were visited and consulted with during the study effort. A draft of this report was distributed to these activities for review and comment. Each Center provided written comments to HQ DLA concerning the methodology, findings, conclusions and recommendations of this report. This section highlights the position taken by each Center regarding the report recommendation. In addition, significant concerns expressed by one or more Centers are summarized, along with an assessment of these comments furnished by HQ DLA.

Center Positions

DCSC: "The Medical SPEDE system seems to be the start of what could be a viable alternative. However, contact with Medical SPEDE personnel indicate enhancements are needed... DCSC would like to adopt Medical SPEDE with the following enhancements..." [Memorandum from Marilyn S. Barnett, Deputy Commander, Nov 7, 95]

DESC: "... we find that the operating environments of the hardware centers differ significantly from the environment at DPSC-Medical so as to make the statistical comparisons inappropriate. Given this "apples and oranges" comparison, we suggest that the tentative conclusion is inappropriate... From the hardware center perspective, USPOH4-913, SPEDE Rejects to DPACS, as proposed by Mr. Ralph Colavito (DISC-PER) [i.e., '*DISC SPEDE*' alternative as addressed in this study], appears to be an option which combines the best of the current SPEDE and the competitive processing of SPEDE rejects." [Memorandum from Jonathan W. House, COL, USA, Commander, Sep 20, 95]

DGSC: "... we concur that a competitive system similar to the Medical SPEDE shows the greatest overall promise for micro-purchases...combines the efficiency of an automated system with the price performance associated with competition. We plan to look at the operation of Medical SPEDE and determine what modifications we need...here at DGSC." [Memorandum from M.E. Finley, CAPT, SC, USN, Commander, Sep 21, 95]

DISC: "... DISC recently sent a team to observe the DPSC SPEDE Medical system. The team was extremely impressed with the functionality, system design, convenience, and administrative advantages... DISC will work with DPSC to determine if specific functional aspects of SPEDE Medical will enhance our automated small purchase system and improve procurement administrative lead time... If we can combine SPEDE Medical with a NSN-specific approach, we should then recognize improvement in the automated rejection rate. Our long-term, ideal solution would be to integrate SPEDE and DPACS-EC... DISC therefore makes the following recommendation... Develop a more sophisticated system in the near future that integrates the functionality of soliciting multiple vendor within a BPA environment with DPACS EC while

maintaining the same level of user-friendliness that currently exists for SPEDE Medical." [G.B. Higginbotham, BG, USMC, Commanding General, Oct 12, 95]

DPSC: For Medical SPEDE to become FACNET compliant, extensive modifications to the system will be required... The Medical SPEDE system has potential for further development that could greatly enhance its functionality. The subject report should address the costs involved with planned Medical SPEDE system improvements and the costs associated with Medical SPEDE becoming FACNET compliant." [George H. Allen, Acting Commander, Sep 26, 95]

Significant Concerns

1. Rejection rates used in study are not in agreement with Center statistics.

Comment: This study used rejection rates based on the standard report F101 because data from this report was available across all Centers and therefore provides a consistent measure. Each Center internally uses different methods to report rejection rates. Since no Center provided statistics on the degree of difference between the F101 and other sources, the impact cannot be assessed.

2. DPSC Medical commodity is unique and significantly different. The assumption that the Hardware Centers would experience the same effect with Medical SPEDE as DPSC was challenged.

Comment: By eliminating FSS contracts from the Medical SPEDE case, some of the concerns should be minimized. However, there is always a danger that commodity differences could increase or decrease an observed effect in the analysis.

3. The assumption that DPACS-EC will have the same performance as DPACS was challenged.

Comment: This assumption was extensively addressed in In Process Reviews (IPR) as necessary. There was no credible data to support how the study parameters would change under DPACS-EC. DPACS-EC was under development at the time of the study and no actual data existed. At the IPR's concern about the differences between DPACS and DPACS-EC were centered around ALT and administrative cost. The assumption was made on the premise that DPACS-EC would significantly reduce solicitation time and cost but that the savings may be offset by increasing evaluation and award cycle times.

4. The analysis does not take into consideration post award refunds/price adjustments for SPEDE buys.

Comment: Refunds/price adjustments occur on a very small percentage of SPEDE buys. Also, the amount reported for refunds represents an insignificant proportion of the total SPEDE award dollars. Additionally, refunds savings should be offset by the administrative cost to

research and obtain refunds/price adjustments. Since the administrative cost is unknown, factoring in refunds would introduce a bias in favor of SPEDE. To include SPEDE refunds into the analysis would also require an effort to determine refunds from DPACS and other alternatives as well. Given the estimated magnitude of the effect and minimal significance, DORO properly chose not to pursue this issue.

5. There are costs associated with modifying Medical SPEDE for Hardware Center use as well as needed system changes that will make Medical SPEDE more functional.

Comment: This is addressed in Section 2.2.3 of the report. We were unable to obtain reliable cost estimates for Operating and Maintenance costs. It is understood that any change to existing systems and procedures requires an up front investment along with potential recurring costs. However, compared to the projected potential price savings and administrative cost reductions, these costs are believed to be small.

In summary, despite the above and other concerns, three of the four hardware centers expressed the desire to investigate adopt Medical SPEDE with modifications. DPSC, likewise, seeks to continue its Medical SPEDE, with modifications to improve its functionality.

APPENDIX A

SCR USPON-916

APPENDIX A
SCR USPON-916

The requirements for this SCR are as follows:

(1) Provide the capability for a center to ignore the buyer assignment and allow any buyer to work any PR. Also, provide a report similar to the "Buyer Actions Report" from Medical SPEDE.

(2) Provide the capability of processing "minimum buy" cancellations in SPEDE. When indicated, prompt for a quantity & create a YPE-D cancellation transaction for SAMMS.

(3) Provide for sending info from SPEDE to DPACS for those PR's referred for manual buys.

(a) Send the PR History Report, created by SPEDE when the PR is referred to manual buy, to the DPACS buyer in the appropriate directory.

(b) Modify the way (time) SPEDE creates the PR history Report for those PR's referred to manual buy. Create the PR history Report at the time the referral transaction is created. Send the PR History Report to DPACS at the same time the referral transaction is sent to SAMMS.

(c) Provide for access to the PR History Report through the side bar menu in DPACS so the buyer can review the information available to the SPEDE buyer up to the time of referral.

(d) Provide an indicator on the DPACS Home Screen that SPEDE referral data is available.

APPENDIX B

SCR USPON-9XX, Draft Version

APPENDIX B
SCR USPON-9XX, Draft Version

The requirements for this SCR were as follows:

(1) Automatic routing of first time buys to a competitive system.

(2) Automated route screening/referral of PR's to the most cost effective alternative system (SPEDE, DPACS, etc.) considering the most recent prices paid under each system.

(3) Requirement for SPEDE and DPACS respondents to separately identify any minimum charge(s), the next price break, range and the CAGE/part number to be supplied.

(4) Automated price review/referral for reissue of a SPEDE failure/buyer withdrawal through a competitive SPEDE or routing to DPACS-EC as necessary when the vendor response to a SPEDE order/call includes a price that fails an automated/manual pricing review.

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This is an analysis that evaluates the costs and benefits of several noncompetitive systems for making purchases under $2,500. The costs evaluated are the cost to procure and the vendor price. The benefits compared are administrative lead time, production lead time, inventory turnover rate, backorder rate, and supply availability. The major systems evaluated for these attributes are an automated noncompetitive system known as the Standard Automated Material Management System Purchase by Electronic Data Exchange (SPEDE), a semi-competitive version of SPEDE used at the Defense Industrial Supply Center, a fully competitive version of SPEDE used to purchase medical supplies at the Defense Personnel Supply Center, and a manual competitive system known as the DLA Pre-Award Contracting System by Electronic Commerce (DPACS-EC). The results of this study showed that the Medical SPEDE system shows the greatest promise in all the cost benefit attributes evaluated, with the exception of inventory turnover rate. The Medical SPEDE alternative combines the efficiency of an automated system with the price performance associated with competition. Therefore, recommendations were made that the Defense Logistics Agency should adopt the Medical SPEDE system for making purchases under $2,500 at its four hardware centers.

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