AD-A134 841 SPARE PARTS ACQUISITION VOLUME 2 PROBLEMS AND RECOMMENDATIONS(U) AIR FORCE MANAGEMENT ANALYSIS GROUP MMCLELLAN AFB CA OCT 83 1/3

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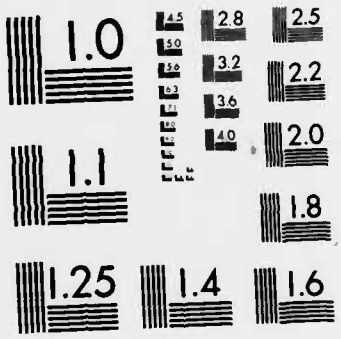

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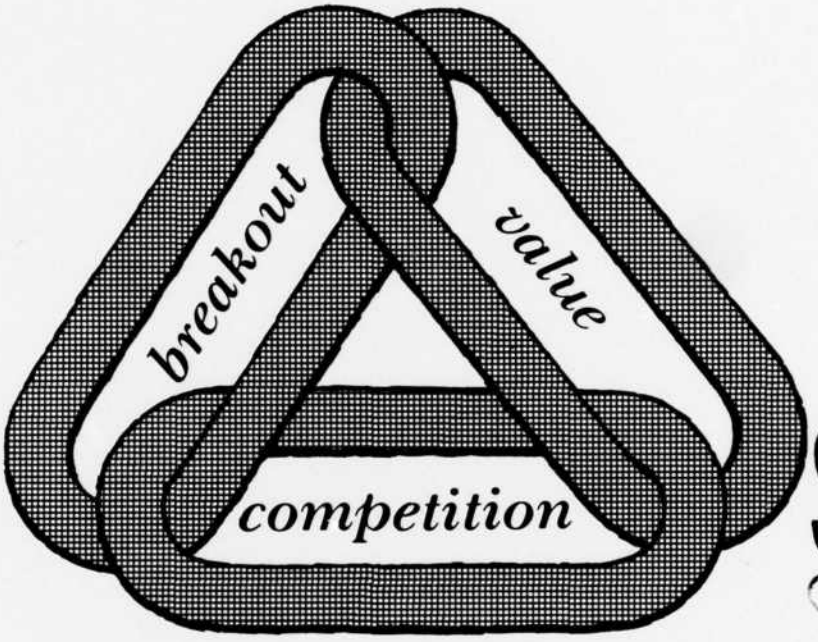

Spare Parts Acquisition

Final Report
October 1983

VOL II
Problems & Recommendations

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

* REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO. A134841	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Air Force Management Analysis Group, Spare Part Acquisition, ~~Final Report~~ Vol ~~I~~ Vol II		5. TYPE OF REPORT & PERIOD COVERED Final Report
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Air Force Management Analysis Group		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Same as #7 Above		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS HQ USAF/IG Pentagon WASH DC 20330		12. REPORT DATE Oct 83
		13. NUMBER OF PAGES Vol I - 62 Vol II - 257
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclas
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public Release, distribution unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Spare Parts
Competition
Requirements Computation
Funding Impact
Provisioning
Pricing Techniques
Program Management
Data Rights

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

A detailed study of Air Force spare parts acquisition process, systemic problems, and recommended corrective action. Includes evaluation of AF requirements, financial, budgeting, data, provisioning, contracting, pricing, and post production systems in support of spare parts.

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INTRODUCTION

The Air Force Management Analysis Group (AFMAG) was established in June 1983 to identify and resolve long-standing spare parts acquisition problems which have resulted in limiting competition and inordinate price increases for some of the spare parts the Air Force has purchased. This volume contains the specific, detailed issue papers of the AFMAG effort. This volume is organized in parallel with Volume I, Section 3 which summarized the major recommendations found in this volume. Issue papers are grouped into the same 5 major areas as in Section 3 of Volume I:

Requirements, Financial Policy, and Budgeting
Front End System Development and Acquisition Decisions
Contracting and Pricing Techniques
Post Production Support, and
Management Resources and Equipment.

Each issue paper identifies a problem, discusses that problem, then specifies recommended actions and identifies the Offices of Primary Responsibility (OPRs) and Offices of Collateral Responsibility (OCRs) for appropriate action. The issue papers are followed by a consolidated bibliography and 2 appendices containing proposed draft language for the Air Force Defense Acquisition Regulation Supplement regarding technical data rights.

TABLE OF CONTENTS

REPLENISHMENT SPARES POLICY

PROBLEM

DOD does not have a special Department of Defense Instruction for reparable spares requirements. However, there is DOD policy (DODI 4140.39) for nonreparable spares that states it can be used for reparables when feasable. The Air Force's interpretation of this policy, also applied to reparable spares, has contributed to uneconomical buy quantities. This has caused small quantity, repetitive buys which increase unit prices and restricts competition.

DISCUSSION

Department of Defense requirements computation policy in "Procurement Cycles and Safety Levels of Supply for Secondary Items," DODI 4140.39, states that normally support objectives will range from a three month procurement cycle to a three year procurement cycle. The policy objective is to minimize cost to order and cost to hold. DOD policy allows deviation in selected cases where economic factors, other than cost to order and cost to hold apply. For reparable spares the Air Force established a one year support period rather than use an Economic Order Quantity approach which would have constrained most reparable items to a three month procurement cycle. For nonreparable spares the Air Force established a six month minimum procurement cycle. Table II-1 illustrates the current Air Force support periods that fall within the OSD policy range.

SUPPORT PERIOD BUY OBJECTIVES

CATEGORY	SUPPORT PERIOD
REPARABLE SPARES BP1500 Aircraft Spares BP2500 Missile Spares BP1700 Tanks, Racks and Pylons BP8100 Munitions Spares BP8200 Vehicular Equip Spares BP8300 Elec/Telecomm Equip Spares BP8400 Other Base Maint & Support Equip Spares	1 year
NONREPARABLE SPARES* Systems Support Division Stock Fund	High Annual Dollar Demand - 6 months Medium Annual Dollar Demand - 6 months to 1 year Low Annual Dollar Demand - 1 to 3 years

*The AFMAG recommended and the Air Force instituted a minimum one year support period for nonreparable spares.

TABLE II-1

Data on repetitive buys of small quantities are shown in tables II-2 and II-3 below.

REPARABLE
SPARES QUANTITIES PER PURCHASE
REQUEST

Quantity Range	Year 1981	1982	1983 (thru May)
1-5	11,463(46%)	10,828(50%)	3,645(50%)
6-10	3,838(15%)	3,107(15%)	1,046(14%)
11-20	2,975(12%)	2,435(11%)	834(11%)
21-30	1,468(6%)	1,214(6%)	404(5%)
30 +	5,329(21%)	3,948(18%)	1,432(19%)

TABLE II-2

NONREPARABLE
SPARES QUANTITIES PER PURCHASE
REQUEST

Quantity Range	YEAR 1981	1982	1983
1-5	12,730(13%)	13,258(14%)	5,687(16%)
6-10	10,032(10%)	9,789(10%)	4,186(11%)
11-20	12,573(13%)	12,058(13%)	4,647(13%)
21-30	8,475(9%)	8,078(9%)	3,168(9%)
30 +	54,444(55%)	50,337(54%)	18,400(51%)

TABLE II-3

Nonreparable Items

The Air Force Logistics Command has established a program for nonreparable items to pursue the economics of larger quantity buys. The Quantity Discount Program authorizes the item manager to request bids for expanded support periods. Only high annual demand, stable configuration items are considered. Higher quantities are bought where it makes economic sense. This program was used for eight months in FY82. After this period, the program was temporarily discontinued due to funding constraints. The results were a net savings of $4 million. Had the program been continued through the entire fiscal year, the AFMAG estimated that savings would have grown to $5.3 million.

Based on the results of this program, the AFMAG recommends that purchase requests be initiated on all stable demand and configuration nonreparable items for quantity options to cover the following support periods: 5 years. 10 years and 15 years. Fifteen years was selected as this is the period authorized for economic retention.

Reparable Items

While programs of this nature have been and are being used for nonreparable items, there is no similar program for assessing unit cost price breaks for reparables. AFMAG analysis of the economics of such expanded procurements indicates that price breaks of 17% to 37% could be obtained and the best breaks occur in the three to five year range. Figure II-1 reflects the details of this analysis.

QUANTITY DISCOUNT SAVINGS IN UNIT COSTS
5 WHEELS & BRAKES EXAMPLES

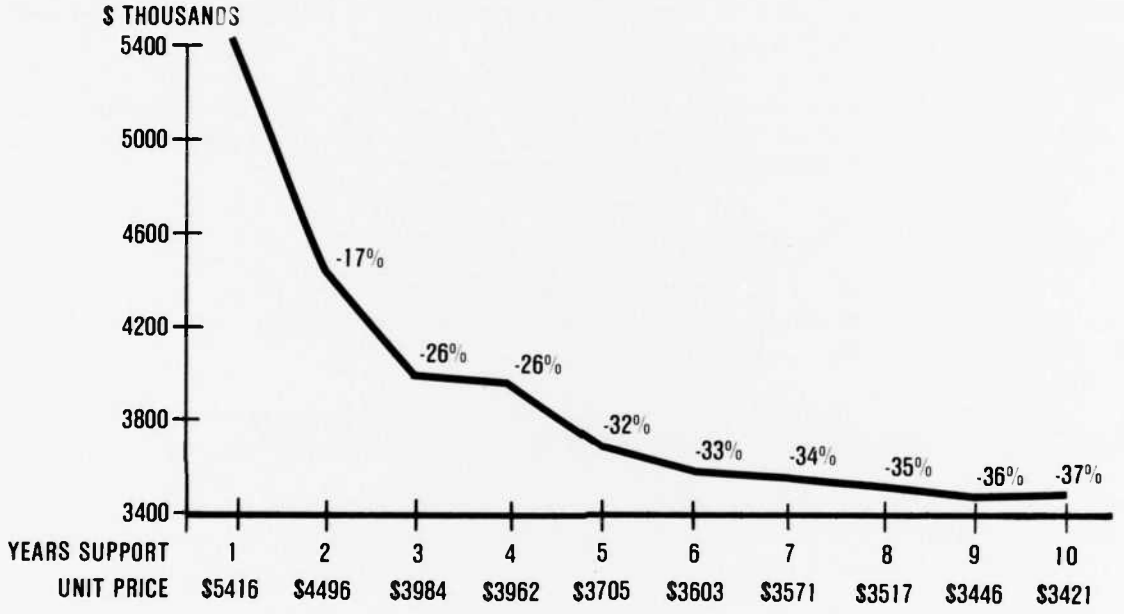


FIGURE II-1

However, the AFMAG considered the projected underfunding of spares for FY84 and analyzed several stock classes with a high potential for quantity price breaks. This analysis indicated that the Air Force Logistics Command should begin asking for expanded support periods for selected Federal Supply Classes (FSCs). A Quantity Discount Program applied to these FSCs provides a high potential for cost savings. For example, for FSC's 5826 and 5895, 45 and 62 percent of the total number of buys in FY82 were in quantities of five or less. These buys involved over 750 procurements valued at over $9 million. Other FSCs which appeared to offer high potential for quantity discount application were 5841 and 5865, for which over $8 million was spent on buys of five or less.

The Quantity Discount program should be expanded to cover all Federal Supply Classes in future years as budgeting and funding permit. The AFMAG recommends support periods of: 3 years, 5 years, 10 years and 15 years for reparables. When larger quantities are procured, Item Managers will need to input Quantitative Requirements to ensure that termination or disposal actions are not taken against these more economical buys.

The Quantity Discount program for items with stable design and demand will reduce workloads, provide a greater depth of inventory for contingencies and most importantly, achieve reduced unit prices.

RECOMMENDATIONS

1. Establish a Quantity Discount Program for spares. The policy must restrict application to only demand based, stable design items. (OPR: HQ USAF/LEY, OCR: HQ AFLC/MM)

2. Use the support periods recommended by the AFMAG for nonreparable items in FY 1984. (OPR: AF/LEY, OCR: AFLC/MM)

3. Limit expanded support periods for reparable items to Federal Supply Classes 5826 and 5895 in FY 1984. In future fiscal years request, expanded support periods for all Federal Supply Classes. (OPR: AF/LEY, OCR: AFLC/MM)

REPARABLE SPARES COMPUTATION SYSTEM

PROBLEM

Quarterly computations for reparable spares produce significant changes in buy quantities which generate multiple buys and termination notices. This reduces the amount of time which could be used in pursuing competition and fair and reasonable prices.

DISCUSSION

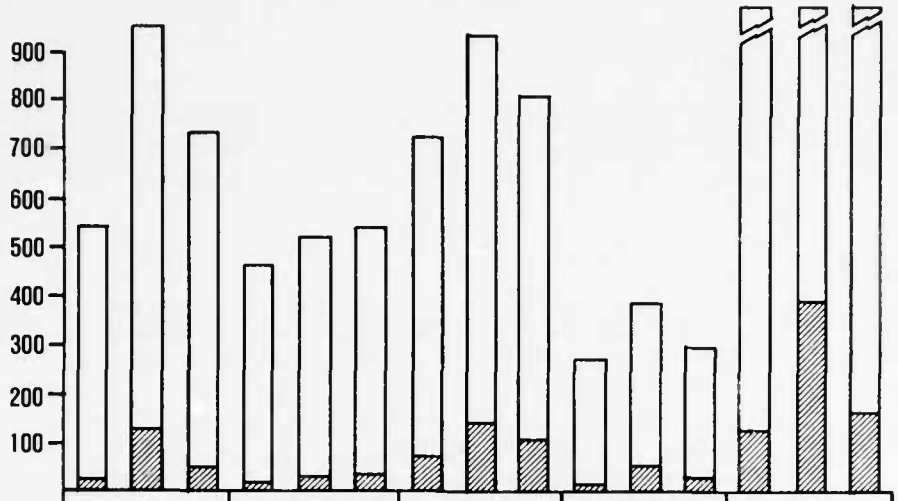
In the summer of 1982 the Air Force Logistics Command chartered an analysis of the reparable spares computation system; "Recoverable Consumption Item Requirements System" (DO-41). This analysis led to the recommendation that only two cycles of the quarterly computation be used for buy/termination initiations. This recommendation was accepted by the Air Force Logistics Command. However, the policy developed by AFLC/MMM to implement this recommendation provides full flexibility for each Air Logistics Center to use all four quarterly cycles if desired for buy or termination actions. If only two cycles are used, the Air Force Logistics Command has developed a management notice system which highlights significant changes in buy requirements.

There is a concern that without quarterly visibility of changes in requirements, the Item Manager may not react quickly to changes in the computed requirement. This would translate into future operational impacts or generate the potential for future audit findings of buying too early. Audit findings have focused on buying too early and large inventory levels. As a result, Item Managers are reluctant to lose quarterly visibility. However, the concern with knowing the precise quantity to buy on a quarterly basis appears unrealistic. From a practical perspective, by the time the procured quantities are delivered the requirement will change. Variables causing this change include, among others, flying hour, failure rate, and leadtime changes.

The Peacetime Operating Stock (POS) inventory level for reparable spares is comprised of two segments: Pipeline and Variable Safety Level. The Pipeline segment ensures that "on average" a requisition will be filled. The Variable Safety Level segment is used to increase inventory level to bring the average requisition fill rate to 85%. Additionally, a War Reserve Materiel (WRM) inventory level is sized for reparable spares and the largest portion of the WRM inventory level is for WRSK/BLSS. The combination of POS and WRM represent the total inventory requirement for spares.

There are two segments of the total inventory requirements which fluctuate dramatically from quarter to quarter: Variable Safety Level and WRSK/BLSS. Figures II-2 and II-3 illustrate the changes in requirements.

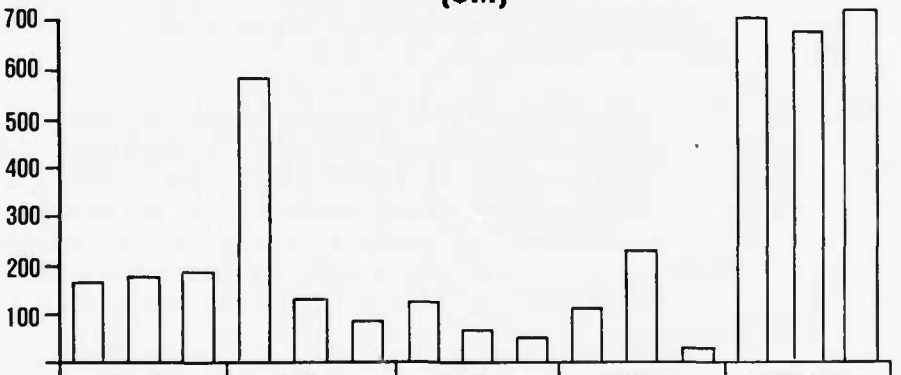
VARIABLE SAFETY LEVEL
($M)



	OC-ALC			OO-ALC			SA-ALC			SM-ALC			WR-ALC		
REQUIREMENT	$543	952	728	459	517	541	724	936	808	272	388	299	1.155	1.762	1.692
SHORTFALL $	26	130	50	18	25	26	68	140	104	12	56	25	131	387	164
COMPUTATION OATE	MAR 1982	SEP 1982	MAR 1983	MAR 1982	SEP 1982	MAR 1983	MAR 1982	SEP 1982	MAR 1983	MAR 1982	SEP 1982	MAR 1983	MAR 1982	SEP 1982	MAR 1983

Figure II-2

WRSK/BLSS REQUIREMENTS
($M)



ALC	OC-ALC			OO-ALC			SA-ALC			SM-ALC			WR-ALC		
REQUIREMENT SHORTFALL $	157	158	180	596	128	75	126	65	49	106	244	33	622	600	630
COMPUTATION OATE	MAR 1982	SEP 1982	MAR 1983	MAR 1982	SEP 1982	MAR 1983	MAR 1982	SEP 1982	MAR 1983	MAR 1982	SEP 1982	MAR 1983	MAR 1982	SEP 1982	MAR 1983

Figure II-3

As these figures illustrate the requirements fluctuate dramatically. The crux of an even flow of initiations and obligations in any fiscal year is a stable requirement. Instability drives additional buys, terminations and adjusted quantities.

In order to even out the buy requirements from the DO 41, buy quantities should be initiated from the March computation each year and then adjusted from the September computation. Only significant changes in requirements should be output from any other computation. This stability would reduce perturbations which generate workloads for an already overburdened workforce.

RECOMMENDATIONS

1. Restrict buy requirement computations to the March and September computations output. Use only management notices of significant changes in buy requirements from the June and December requirement computations. (OPR: HQ AFLC/MM; OCR: Air Logistics Centers/MM)

2 Analyze the Variable Safety Level and WRSK/BLSS requirements to determine underlying factors which cause significant changes and corrective actions taken. (OPR: HQ AFLC/XR; OCR: HQ USAF/LEY, HQ AFLC/MM/LM)

NONREPARABLE SPARES BUY COMPUTATION SYSTEM

PROBLEM

Many factors used in computing nonreparable spares requirements are outdated or inaccurate. These factors limit buy quantities and cause higher unit prices and decrease competition.

DISCUSSION

DOD policy requires a total cost approach in computing nonreparable spares requirements. Included in the total cost is the Cost to Order and Cost to Hold. The Air Force has adapted the industry-wide "Wilson Lot Size Formula" to compute these requirements.

$$EOQ = \sqrt{\frac{2AC}{H}}$$

A = Annual Dollar Demands
C = Cost to Order
H = Cost to Hold

This formula assumes buying large quantities of items on a recurring basis. The most economical buy quantity is attained when total order and hold costs are minimized. Additionally, the annual dollar demand (A) value influences the buy quantity and is dependent on unit price. A high unit price decreases quantities and a low unit price increases quantities.

Factors

The Cost to Order Factor is based on a 1975 Manpower Evaluation Team, Integrated Management Engineering System study. The factor has been updated each year by the annual civilian pay salary increases. However, since that time the direct labor functional mix has changed in the Material Management and Contract and Manaufacturing Directorates because of automation and organizational changes.

The Cost to Hold Factor contains two OSD directed factors and one Air Logistics Center peculiar factor.

1. Cost of Capital is set at 10% of the average on-hand inventory value. This is based on July 1970 data. (OSD factor)

2. Storage Costs are set at 1% of average on-hand inventory value. This is based on studies prior to 1970. (OSD factor)

3. The Obsolescence Factor is the ratio of the total value of disposed items plus potential disposal items to the average on-hand inventory value. These are updated yearly by HQ AFLC/MMM using a five year average. For FY 83 these factors were:

Obsolescence Factors

Center	Factor
OC-ALC	4%
OO-ALC	7%
SA-ALC	7%
SM-ALC	11%
WR-ALC	7%

TABLE II-4

When all Cost to Hold Factors are combined, each Air Logistics Center includes a Cost to Hold Rate in the EOQ calculation. Table II-5 lists the Cost to Hold Factors for each Air Logistics Center which were operative in FY 1983.

Total Cost to Hold Factors

Center	Cost to Hold Factor
OC-ALC	15%
OO-ALC	18%
SA-ALC	18%
SM-ALC	22%
WR-ALC	18%

TABLE II-5

These Cost to Order and Cost to Hold Factors have a significant influence on the EOQ calculation. Table II-6 illustrates quantity changes which result when these factors change.

EOQ Changes Based on Factor Changes

	Current EOQ	EOQ With 10% Decrease In Cost To Hold	EOQ With 25% Increase In Cost To Order
ITEM A	117ea	175ea	130ea
ITEM B	4ea	6ea	5ea

TABLE II-6

The theoretical factor changes generated EOQ increases of from 11% to 50%. Clearly, if the factors are wrong then the Air Force procures the wrong quantity each time.

The AFMAG focused on the Obsolescence Factors as potentially the most inaccurate used. At each Air Logistics Center their unique Obsolescence Factor is sized on past and potential excesses and applied across all items. The standard is applied regardless of individual item demand or configuration stability. The result is that the Air Force buys too many items with a high Obsolescence Rate and too few items with a low Obsolescence Rate.

Sample of Disposal Actions

Each Air Logistics Center was asked to provide a random sample of 50 items sent to disposal during the past year. Based upon these inputs, the AFMAG catagorized the disposal actions based upon Federal Supply Group and reason for disposal. The matrix below illustrates the sample distribution.

DISPOSAL SAMPLE OF ACTIONS (FY 83)*
($ Thousands)

Federal Stock Group	Condemnation	Declining Demands	Obsolete	% of Sample
15 Aircraft Structural	$307,209	$147,622	$ 73,046	15%
16 Aircraft Accessories	113,235	78,002	55,404	21%
28 Engines & Components	2,649	45,220	48,262	3%
58 Communication/ Radar	263,262	57,544	84,326	11%
61 Elec Wire & Power Distribution	132,277	4,041	13,828	4%
66 Instruments & Laboratory	32,188	175,975	14,211	6%

*The total value of disposal actions from the sample of 18 Federal Supply Groups was $3,523,785. The matrix above includes 6 Federal Supply Groups which comprised 61% of the total sampled.

TABLE II-7

Additionally, a review of procurement actions over the last four fiscal years indicated that there were several thousand EOQ items which were bought four years in a row. This indicates that the obsolescence risk on these items was low. Therefore, had the Air Force bought larger quantities which would have been the true requirement the opportunities for achieving lower unit prices would have existed.

RECOMMENDATIONS

1. Update the Cost to Order Factor developed in 1975. (OPR: HQ AFLC/AC, OCR: HQ AFLC/PM/MM)

2. Request DOD to update the Cost of Capital and Storage Cost Factors. (OPR: HQ USAF/LEY, OCR: OSD/MRA&L)

3. Develop a methodology to establish variable commodity or weapon system Obsolescence Factors and apply these variable factors in computing EOQ requirements. (OPR: HQ AFLC/XR, OCR: HQ USAF/LEY, AFLC/MM)

4. Explore the feasibility of including a quantity price break formula in the EOQ Buy Computation System (DO62) to take advantage of price breaks of larger quantity buys. (OPR: HQ AFLC/XR, OCR: HQ USAF/SA/LEY)

NONREPARABLE SPARES FILL RATE OBJECTIVES

PROBLEM

The inadequate fill rate objective for nonreparable items approved by the Department of Defense (DOD) impacts the operational readiness of the Air Force. The fill rate also leads to low quantity buys which causes higher unit prices and reduces competition.

DISCUSSION

The Air Force computes nonreparable spares (stock fund) items to an inadequate 85% fill rate. This inadequate fill rate limits the operational readiness of Air Force weapon systems. This limit in fill rate began with a FY 76 OSD Program Budget Decision which limited Air Force funding to an arbitrary 55 days stockage in terms of stock fund sales. In effect this translated into an 85% fill rate. As a consequence of this Program Budget Decision the Air Force Logistics Command constrained stock fund requirements computations.

In contrast, the Defense Logistics Agency is authorized to compute a 93% fill rate for comparable weapon system related items.

Illustrated below is FY83 data for the Air Force System Support Division and those DLA centers which manage comparable items.

COMPARISON AF/DLA STOCK FUNDS (FY 83)
($M)

	Fill Objective	Required Funding	Approved Funding	% Funded
AF System Support Division	85%	$2,527	$1,955	77.3%
DLA Commodity				
Electronics		873	795	91.1%
General Supplies	93%	1,026	909	88.5%
Industrial Supplies		682	2370	91.8%

TABLE II-8

The low Air Force fill rate objective and funding shortfall has had a detrimental impact on the Air Force. A very high percentage (over 80%) of nonreparable items managed by the Air Force are repair parts catagorized as highly technical, weapon system related. The low Air Force 85% fill rate objective, compared to the DLA 93% objective, has a more profound impact on the ability to rapidly repair reparable spares. Since over 90% of base level demands are filled through repair, it is essential that items are repaired as quickly as possible to meet operational needs.. Table II-9 below illustrates the number of unserviceable reparable items awaiting parts during the six month periods depicted.

REPARABLE ITEMS AWAITING PARTS (AWP) *

	Jan-Jun 81	Jul-Dec 81	Jan-Jun 82	Jul-Dec 82
Items Held	230,000	225,000	220,000	210,000
Value of Items	$ 1.5B	$ 1.5B	$ 1.4B	$ 1.4B
$Value Repair parts needed	$68M	$68M	$63M	$63M

* Sources M-32 Monthly Base Supply Management Report and "G" coded assets at Air Logistics Centers.

TABLE II-9

Over 90% of problem repair parts are attributed to Air Force System Support Division items. Additionally, Air Force operational commands have stated that DLA support is "better." Since a relatively minor investment in repair parts will return over $1 Billion of reparable assets to serviceable status, increasing the Air Force fill rate to 93% would significantly improve the reparable spares posture. This improvement would directly improve the unacceptable level of cannibalization and War Reserve Material withdrawals which the Air Force uses to satisfy aircraft grounding conditions. Figure II-4 below depicts these levels.

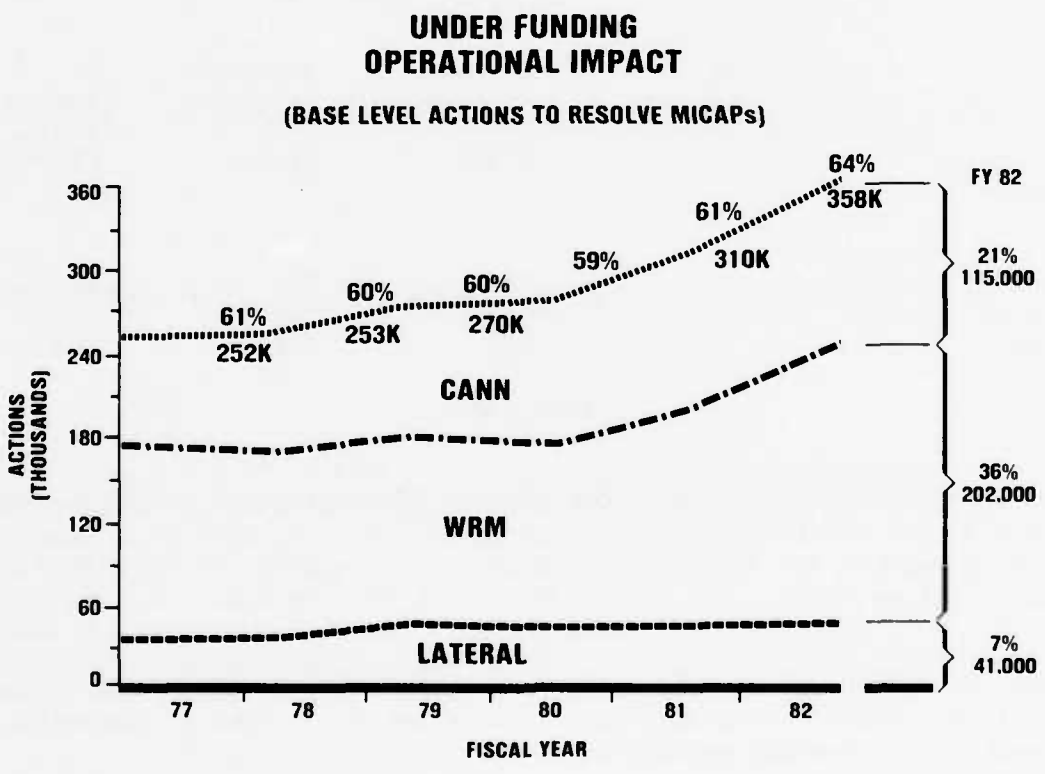


Figure II-4

In order for the Air Force to obtain the funding to support a 93% fill rate, these funds must be programmed in the FY86-90 Program Objective Memorandum (POM) and approved by OSD/OMB and Congress as an authorized "inventory augmentation to increase Air Force readiness".

RECOMMENDATIONS

1. Determine the funding requirement to achieve a 93% fill rate for the Systems Support Division. (OPR: HQ AFLC/MM)

2. Program funding necessary to achieve and sustain the 93% fill rate as an "inventory augmentation to increase Air Force Readiness" requirement in the FY 86-90 Air Force POM. (OPR: HQ USAF/LEX, OCR: HQ USAF/LEY, Air Force Board Structure, HQ AFLC/MM)

3. Establish consistent fill rate objectives among the services and the Defense Logistics Agency to ensure balanced weapon system support. This should be negotiated with OSD(MRA&L) and OSD(C) prior to the FY 86 Program Budget Decision Cycle. (OPR: HQ USAF/LEY, OCR: HQ USAF/LEX/ACB, OSD(MRA&L), OSD(C))

MODIFICATION PROGRAM
SPARE PARTS REQUIREMENTS

PROBLEM

The Air Force does not have a comprehensive system to plan, program and budget for replenishment spares to support modification programs. This limits the ability to consolidate spares buy requirements to achieve price reductions.

DISCUSSION

Air Force policy currently requires planning, programming, budgeting and buying only initial spares for modification programs. The governing regulations, AFR 800-2, Acquisition Program Management, AFR 57-4, Modification Program Approval, and AFLCR 57-21 Modification Program Approval, do not provide guidance on full spares support. As a result, neither AFLC nor the Air staff include projected replenishment spares requirements in programming modifications. For example, from the Corona Require Report an estimate of $100M of the $874M growth was for modification surprises and there is a current $256M WRSK/BLSS shortfall attributed to modifications. In addition, item managers do not get sufficient modification planning data to establish the proper buy mix between the old and new configurations. The end result is piecemeal acquisition of spares instead of combining requirements to get quantity price breaks.

RECOMMENDATIONS

1. Revise AFR 800-2, AFR 57-4 and AFLCR 57-21 to include guidance for programing, budgeting and acquiring replenishment spares for modification programs. (OPR: HQ USAF/LEY, OCR: HQ USAF/LEX/RDX, AFLC/MM)

2. Expand the current modification tracking system to include replenishment spares funding and acquisition actions. (OPR: HQ AFLC/MM, OCR: HQ USAF/LEY/LEX)

PROCESSING SMALL QUANTITY, LOW DOLLAR VALUE REQUIREMENTS

PROBLEM

Increased unit prices and high purchase request workload are, in part, caused by an excessive number of small quantity, low dollar value buy requirements generated by the Air Logistic Centers.

DISCUSSION

Discussions with industry associations and Air Force spare parts contracting personnel result in the consensus that small quantity buys are one of the major reasons for apparent excessive unit prices for spare parts. This is caused by two factors: amortization of set-up costs over a small quantity and, the effect of a low learning curve on labor-intensive items.

The AFMAG evaluated J041 Procurement History Records (J041) on 427,948 nonreparable and 94,127 reparable line items acquired during the period of 1 October 1977 through 30 June 1983. Fifty-one percent of the reparable line items and 18 percent of the nonreparable line items were for a quantity of five units or less. An additional 14.7 percent of the reparable and 11.2 percent of the nonreparable line items were for a total quantity of between six and ten units.

Additionally, of these low quantity procurements 136,101 (31.8%) of the nonreparable items and 16,273 (17.3%) of the reparable items had a total line item value of less than $1,000. Foreign military sales (FMS) were excluded from this analysis. Figure II-5 displays this data.

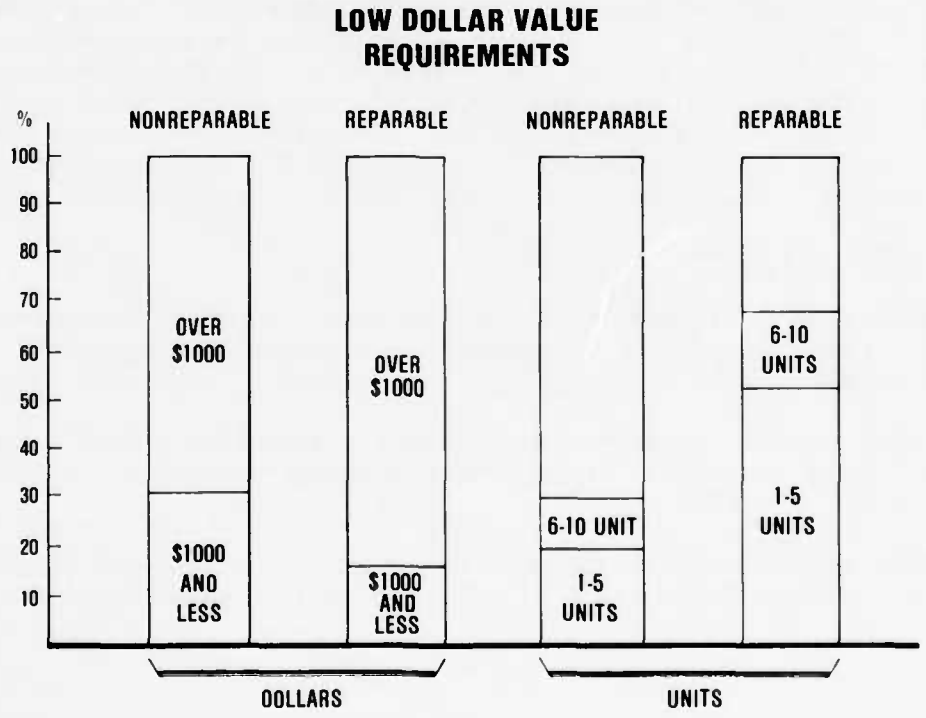


Figure II-5

During FY 82 alone, there were 20,522 of nonreparable and 3,822 reparable line items of spares with an extended line item value of less than $1,000. The nonreparable spares had an average line item value of $396.24 compared to $266.72 average for the reparable spares.

The cost of processing a purchase request is estimated between $300 and $400. Furthermore, the cost to industry (which is ultimately passed back to the government in the form of overhead) associated with processing a Request for Quotation (RFQ) or Request for Proposal (RFP) and resultant order into their system is estimated at least equal to the cost to the Air Force. Therefore, the total cost of processing a requirement to contract approaches $1,000.

In discussing the potential to increase purchase requests to a minimum of $1,000 on reparable items, ALC personnel indicated that an Item Manager would be able to work with the current DO41 product to increase quantities to achieve the $1,000 minimum since PRs for reparable spares are manually prepared by the Item Manager. The only limit was that Item Managers do not now have policy authority to extend support periods beyond one year, thus quantities were limited.

Nonreparable item requirements are computed under the Economic Order Requirements System (DO62) and the majority of PRs are prepared by the Automated Purchase System (JO23). Therefore, increasing PRs to a $1,000 threshold would require a heavy manual workload. The only efficient solution would be to modify the DO62.

Since HQ USAF/LEYS is considering an independent study of the DO62 system, the issue of small quantity low dollar value procurements could be made a part of that study.

The AFMAG believes that reparable items which have stable demand and configuration are the type of item which should be procured in sufficient quantities to at least equal the cost of processing a PR through contract award. However, the quantity should not exceed a 15 year support period or life of the system supported, whichever is shorter. The AFMAG recommendation in the Replenishment Spares Policy write-up addresses the need for flexible support periods.

RECOMMENDATIONS

1. Include an analysis of the impact of increasing quantity requirements to achieve a minimum $1,000 per purchase request in the proposed DO62 study. (OPR: HQ USAF/LE)

2. Adjust the DO41 computed requirements on stable demand and configuration items to buy a minimum of $1,000 or up to a 15 year support period, whichever is less. (OPR: AFLC/MM)

3. Take aggressive action to consolidate requirements wherever possible after purchase request (PR) receipt to achieve $1,000 minimum purchases. (OPR: AFLC/PM)

PURCHASE REQUEST CONSOLIDATION

PROBLEM

Too many repetitive and single line item Purchase Requests (PRs) are processed at each Air Logistics Center. This results in inefficient use of scarce manpower resources.

DISCUSSION

In FY 1982 over 190,000 purchase requests were processed by the Air Logistics Centers. These PRs contained an average of 1.2 line items per PR. This low average indicates that Item Managers were not consolidating spares line items on PRs to any significant degree. Discussion with Item Managers indicated that single item PR's were easier to track thru the procurement process and were processed faster. Additionally, they were concerned that the time to consolidate PR's was not included in current administrative leadtimes and greater consolidation would result in non-support at a future point in time. However, the benefits of consolidation of noncompetitive and competitive items far outweigh the efficiencies of single line item PRs.

There are two areas which could be changed to affect greater consolidation. These could be implemented without increasing Material Management (MM) workload while reducing Contracting and Manufacturing (PM) workloads. The Automated Purchase System (JO23) is programmed to produce PRs with up to ten line items. The number of line items could be expanded to unlimited line items thru DAR-LOG-PMX-J83-037. Additionally, the JO23 has been programmed for multi-day batch PR processing. In effect, this process holds nonreparable PRs for 14 days in order to consolidate line items on PRs. Warner Robbins Air Logistics Center has used this process and they average two line items per PR, the highest of all the Centers. However, the JO23 system cannot produce PRs with a National Stock Number sub-line item for different fund cites (POS, WRSK/BLSS, FMS, etc.). In contrast, the Acquisition and Due-in System (JO41) can accept PRs with multiple sub-line items for the same stock number.

The Air Force Logistics Command (AFLC) was advised by the AFMAG to implement multi-day processing at each Air Logistics Center and to correct the differences between the JO23 and JO41 systems.

The AFMAG assessed the potential workload reduction which could be achieved through greater consolidation. Table II-10 illustrates the potential.

POTENTIAL WORKLOAD REDUCTION
"LINE ITEM CONSOLIDATION"

LINE ITEMS PER PR	PRs	PR REDUCTION	PERCENT REDUCTION
1.2	191,128 (FY 82 Actual)		
1.5	149,360	41,768	22%
2.0	112,020	79,108	42%
2.5	89,616	101,512	53%

TABLE II-10

If each Air Logistics Center achieved an average of two line items per PR this would reduce the workload so that manning to authorization in Contracting and Manufacturing would increase from 76.7% to approximately 80%.

Another recommendation passed to AFLC and implemented for the FY 84 buy was to procure nonreparable items only once a year. This should decrease workload by approximately 11,000 PRs. This reduction, if combined with achieving an average of 2.0 line items per PR at the earliest possible date (by the end of FY84), would increase Contracting and Manufacturing Directorate percent manning to authorization to approximately 81%. additionally, item manager workload will also decrease by 11,000 PR's.

In addition to programatic consolidation through multi-day batch processing, a coordinated effort between Air Logistics Center PM and MM to consolidate competitive line items into generic categories would also increase the number of line items per PR and reduce overall workload.

RECOMMENDATIONS

1. Use multi-day batch PR processing and generic consolidation of competitive items to achieve greater consolidation of line items on purchase request. (OPR: AFLC/MM; OCR: AFLC/PM, ALCs/MM/PM)

2. Change the JO23 and JO41 systems to ensure compatability of sub-line items to achieve greater consolidation. (OPR: AFLC/LM; OCR: AFLC/MM/PM)

3. Expedite DAR-LOG-PMX-J83-037 which allows unlimited line items per PR and corrects other PR processing problems. (OPR: AFLC/PM; OCR: AFLC/LM/MM/XR)

4. Change Air Force policy to buy a minimum of one years requirement on stable design high demand nonreparable items. (OPR: AF/LEY)

ADVANCE PROCUREMENT POLICY

PROBLEM

Department of Defense full funding policy prohibits advance procurement funding for spares. This contributes to higher unit costs of spares and delays availability of spares to support Air Force readiness.

DISCUSSION

Current Department of Defense Directive "Full Funding of DOD Procurement Programs" (DODD 7200.4) states that "...advance procurement requests for long leadtime items shall be limited to end items of major procurement appropriations". The OSD comptroller has repeatedly reiterated the policy that spares are specifically prohibited from advance procurement consideration. The concern expressed in a letter dated 13 Oct 81 from the OSD Comptroller (Program/Budget) to USAF/ACB was that application to spares would proliferate advanced procurement and control would be lost.

The Air Force, in a Fiscal Year 1983 Major Budget Issue, proposed advance procurement for spare engines. The rationale was two fold. Advance Procurement is authorized for engines bought as Government Furnished Equipment (GFE) to support the aircraft production line. Moreover, GFE engine requirements and spare engine requirements are bought under the same contract. Since both requirements for engines were included on the same contract then funding approaches should be the same. Additionally, advance procurement for spare engines would reduce near year budget requirements. Table II-11 reflects the fund profile differences under the advance procurement proposal and the full funding restriction.

SPARE ENGINE
ADVANCE PROCUREMENT VERSUS FULL FUNDING
PROFILE (PBD 167C2 FY83)
($M)

	FY83	FY84	FY85	FY86	FY87
Full Fund	$812.7	$1051.6	$1378.7	$2126.9	$1879.8
Advance Procurement	585.1	804.5	1442.7	2019.6	1883.4
Delta	-227.6	-247.1	+64.0	-107.3	+3.6

TABLE II-11

Additionally, without an advance procurement option for long lead materials (castings/forgings) the Air Force Logistics Command is forced into inefficient procurement options and, in an underfunded environment, less than required quantities are procured.

Under advance procurement, the end item producer procures long lead material in larger quantities with the assurance that in following years funding to finish the castings/forgings would be contracted for resulting in a decrease in leadtime and reduced total cost to the government. Figure II-6 illustrates an actual advance procurement of a long lead, high cost spare requiring castings and forgings. This procurement action was pursued to acquire the required quantities and reduce unit costs.

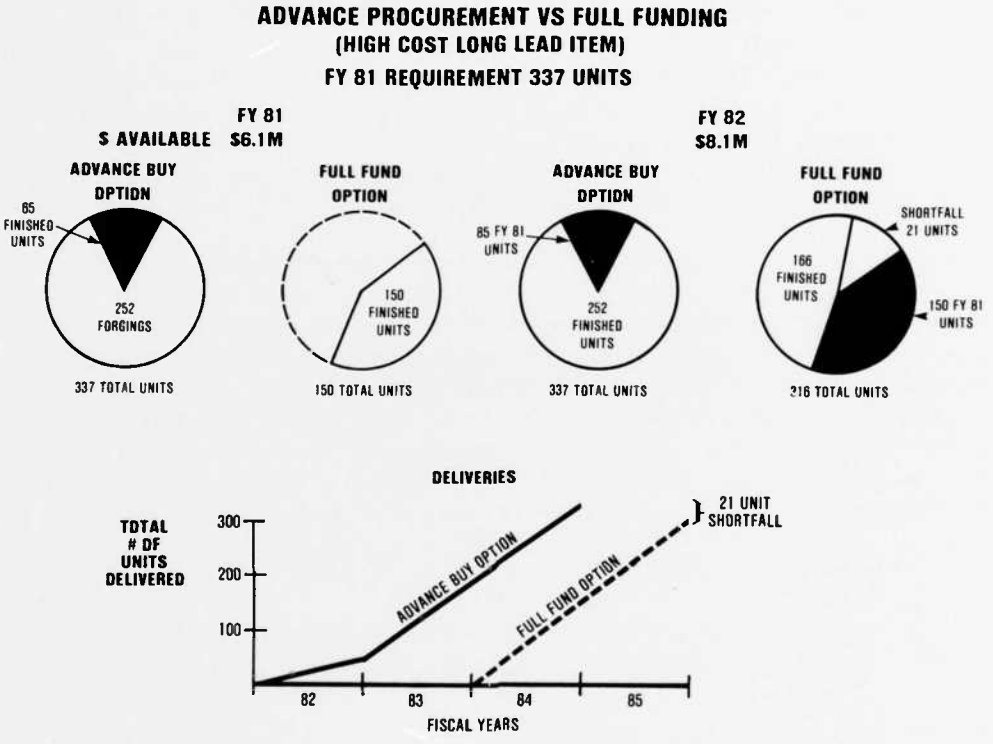


Figure II-6

In this actual example, the Air Force received delivery of the required 337 units one full year prior to the projected full fund delivery which would have been 21 units short. Under full funding the Air Force would have had to spend $900,000 more to acquire the 337 units. Advance Procurement saved leadtime and dollars.

ADVANCE PROCUREMENT ON SELECTED ITEMS MAKES SENSE

RECOMMENDATIONS

1. Change OSD policy to allow selective application of the advance procurement option on spares procurements where leadtime and cost savings accrue. (OPR: AF/AC, OCR: AF/RD/LE)

2. Develop a policy for advance procurement of spares. This policy must focus on long lead, high cost spares. The procedure to obtain approval for advance procurement options must be delegated to the Air Logistics Centers and a simplified reporting system developed to document the savings of this approach. (OPR: AF/RD, OCR: AF/AC/LE)

REALISTIC INFLATION INDICES

PROBLEM

DOD inflation rates used to forecast spares requirements in the budget and the Program Objective Memorandum (POM) ensures a funding shortfall during the actual year that replenishment procurements occur.

DISCUSSION

The Corona Require report documented the need to use realistic inflation rates in budgeting for aircraft reparable spares. In developing the Corona Require recommendations, aerospace actual inflation indices were compared to OSD indices since 1973-4. Figure II-7 shows the Corona Require comparison.

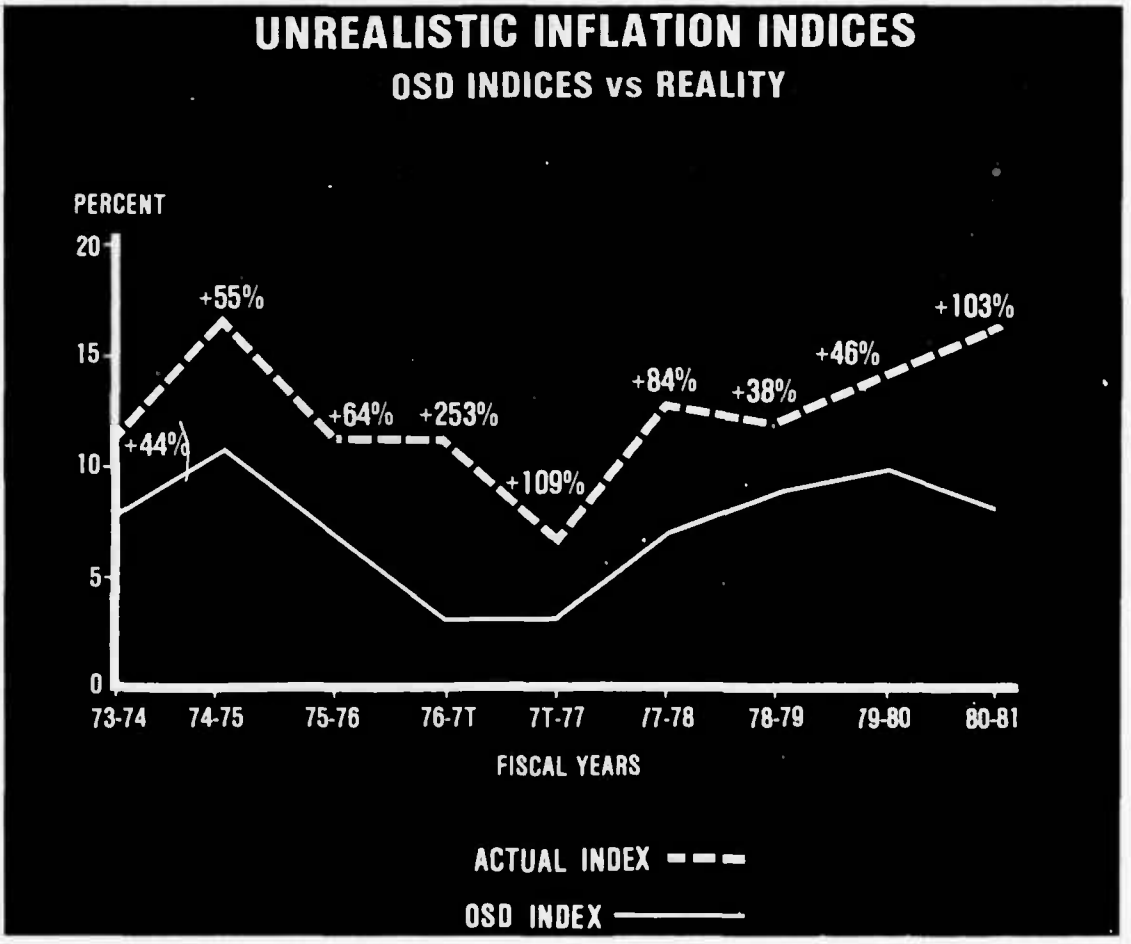


FIGURE II-7

The Air Staff solved part of this problem in March 1983 when the Air Force Logistics Command was authorized to update unit prices from the year the item was last bought to the current year using the actual inflation rate rather than OSD indices.

However, the Air Force Director of Budget did not authorize use of realistic indices in forward pricing estimates for the Budget or POM because of the Office of Management and Budget (OMB) policy to use OMB directed indices for the outyears. This policy will continue the dichotomy between cost estimates of future budget year requirements for weapon systems and future cost estimates for spares.

Weapon System program managers consider future labor and material costs and include known increases such as negotiated hours, tooling and manufacturing changes, etc. These estimates, which are "more realistic" based on known changes, are used to estimate future costs in current year dollars. The OSD indices are then used as a deflator to bring the estimates back to base year dollars.

In contrast, spares forecasted requirements for the budget and POM use past experience and future program factors such as force structure changes, equipment months to support, and flying hours. These future estimates provide base year dollars which have not considered realistic inflation factors. Historically, using this procedure, the projection of future costs has been lower than actuals. The resultant underfunding causes the Air Force to buy in smaller quantities to match available dollars. For example, in Fiscal Years 1981 and 1982 over 60% of reparable spares were procured in quantities of 10 or less. These low quantity buys contribute to high unit costs, particularly for items out of production which require high set up costs.

The AFMAG requested Data Resources Inc. (DRI) to develop a composite index for aircraft reparable spares. This composite index used Department of Labor data. Figure II-8 shows the range of dollar requirements projected for aircraft spares using the difference between the aerospace indices, the composite index developed by DRI and the Air Force POM. In each Fiscal Year the Air Force POM projection falls outside the expected range.

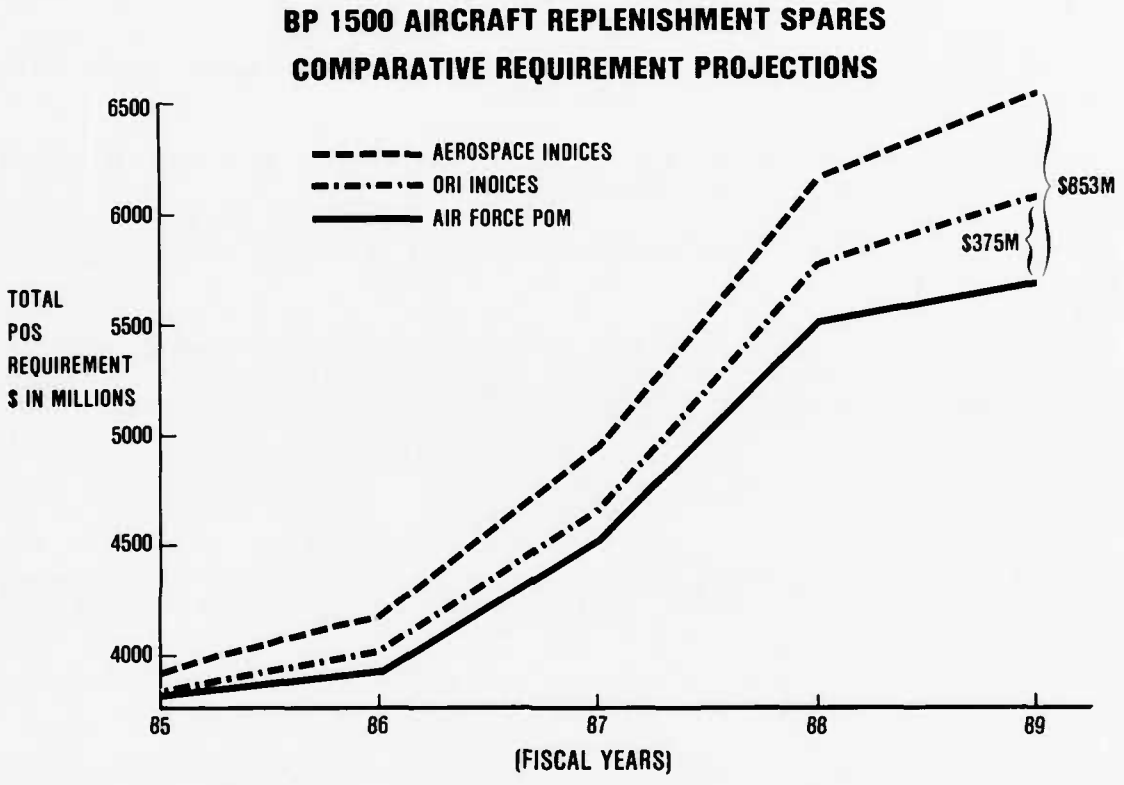


FIGURE II-8

MORE REALISTIC INFLATION FORECASTS ARE NEEDED FOR SPARES BUDGETING.

All three indices used in this discussion are averages of averages and, at best, provide a macro sizing. A more precise micro estimating technique is required. The Air Force Logistics Command has initiated a project to develop generic commodity leadtime forecasts to improve outyear spares requirement forecasts. This project should be expanded to include inflation for the generic commodity catagories under study. Indices for these catagories could be developed using accepted Department of Labor factors.

Until the Air Force and OSD recognize that spares represent a select "market basket" comprised of many sub-sets (avionics, engines, instruments, electronic counter measures, etc) and authorize use of realistic indices in budget and POM forecasts, the spares accounts (aircraft, missiles, communications/electronics, etc.) will continue to be underfunded. This will perpetuate low quantity buys resulting in higher unit costs.

RECOMMENDATIONS

1. Seek approval from OSD(C) to use realistic inflation indexes for spares budgeting in the FY86 POM. (OPR: AF/ACB; OCR: AF/LEX)

2. Use the composite indices developed by DRI for aircraft spares in the FY86 POM. (OPR: AF/ACB; OCR: AF/PRP/LEX)

3. Develop composite indices for the other than aircraft spares for the FY86 POM. (OPR: AF/ACM; OCR: AF/ACB/LEX)

4. Expand the AFLC "generic" leadtime project to include inflation indices. (OPR: AFLC/MM)

5. Use "generic" inflation indices in all budgets and POMs beginning with the FY87 POM and FY87 budget estimate. (OPR: AF/ACB; OCR: AF/LEX; AFLC/MM)

MANAGEMENT RESERVE

PROBLEM

The requirements forecasts for reparable spares do not include projected costs of technical surprises or increased funds to implement a cost-saving quantity discount program. This results in repetative small quantity buys which increases unit costs.

DISCUSSION

Corona Require included an analysis of growth in aircraft spares requirements in the FY82 peacetime operating stock BP1500 aircraft spares program.

The AFMAG reviewed the elements which contributed to growth and determined that those asterisked items in Table II-12 could be considered "technical surprises." These surprises comprised 37 percent of the total growth and 10.8 percent of the pre-growth requirement.

FY1982 POS AIRCRAFT SPARES REQUIREMENTS GROWTH
(Mar 81 Comp - Mar 82 Comp)

Price Increases	$384.0M
Enhancements*	60.7
Reliability/Maintainability*	129.8
Levels	1.0
Engine Policy	36.9
100% Replacement Items*	115.8
Lead times	13.0
New Items*	16.6
Other	35.7
Total Growth	873.5M

Final FY82 BP1500 POS Requirement - $3,321.8M	
Total "surprise" (Asterisked) Items	322.9M
"Surprises" as a percent of pre-growth FY82 requirement	10.8%

TABLE II-12

The Corona Require report recommended a 5 to 10 percent management reserve in aircraft spares funding to cover the technical surprises which always occur. AF/LEX attempted to include a reserve in the FY85-89 POM requirement but it was not approved. A joint Air Staff/AFLC group is working on a policy and methodology to compute management reserve requirements and include them in the FY86 -90 POM.

The second aspect of the management reserve requirement - funds for a quantity discount program - was not addressed by Corona Require. Until now only the Air Force System Support Division, Stock Fund, has used quantity price discounts for nonreparable spares. The increased funding necessary to capitalize on quantity price breaks has been taken out of the Air Logistics Centers limited stock fund obligation authority. Actual additional funds spent by AFLC to take advantage of quantity discounts and the resulting unit price savings, was $18.2M in FY82.

The result was the acquisition of over $22.7M in spares for the $18.2M investment. The program was stopped in April 1982 because of a funds shortage. Never the less, this limited application of price discounts resulted in a 22.6 percent return on investment.

With a management reserve, a similar opportunity exists in reparable spares acquisition. A review of the total number of 1-5 quantity buys and the dollar value of these buys in FY81 and FY82 is displayed in Table II-13 below.

REPARABLE 1-5 QUANTITY BUYS AND DOLLAR VALUES ($M)

	FY81		FY82	
CENTER	QTY	DOLLAR VALUE	QTY	DOLLAR VALUE
OO-ALC	670	$17	494	$18
OC-ALC	1965	33	1855	45
SA-ALC	1657	40	1853	29
SM-ALC	2069	33	2340	44
WR-ALC	2301	48	2243	32
		$171M		$168M

Table II-13

If a management reserve were available the Air Force could have doubled the quantities procured for an added investment of only $154M in FY81 and $151M in FY82. This is based on an estimated 10% unit price reduction which the AFMAG developed using spares with high set up costs from a prenegotiated requirements contract. Increasing quantities from 1 - 5 to 6 - 10 yielded a 10% unit price reduction.

Combining the technical surprise and quantity discount reserve funding equals 13-16% of spares requirements.

RECOMMENDATIONS

1. Establish a management reserve of 13% for all replenishment spares accounts to cover technical surprises and price discount opportunities. (OPR: Air Force Board Structure; OCR: AF/LE)

2. Quantify the technical surprise portion of the Management Reserve and develop guidelines to size a price discount management reserve. (OPR: AF/LE/; OCR: AF/AC/AFLC/MM/AC/PM)

IMPACT OF UNDERFUNDING REQUIREMENTS

PROBLEM

Underfunding replenishment spares accounts causes repetitive buys of small quantities and results in higher unit prices.

DISCUSSION

Funding spares requirements is critical since requirements are only computed to 85% fill rates. Fifteen percent of the time operations needs a spare, it won't be available from the depot. Therefore, even if the requirements are funded the Air Force has less than 100% fill of spares shortages.

The Corona Require report documented past underfunding of aircraft replenishment spares and the Systems Support Division stock fund. However, many other replenishment spares accounts have been underfunded as well. See Figures II-9 through II-16.

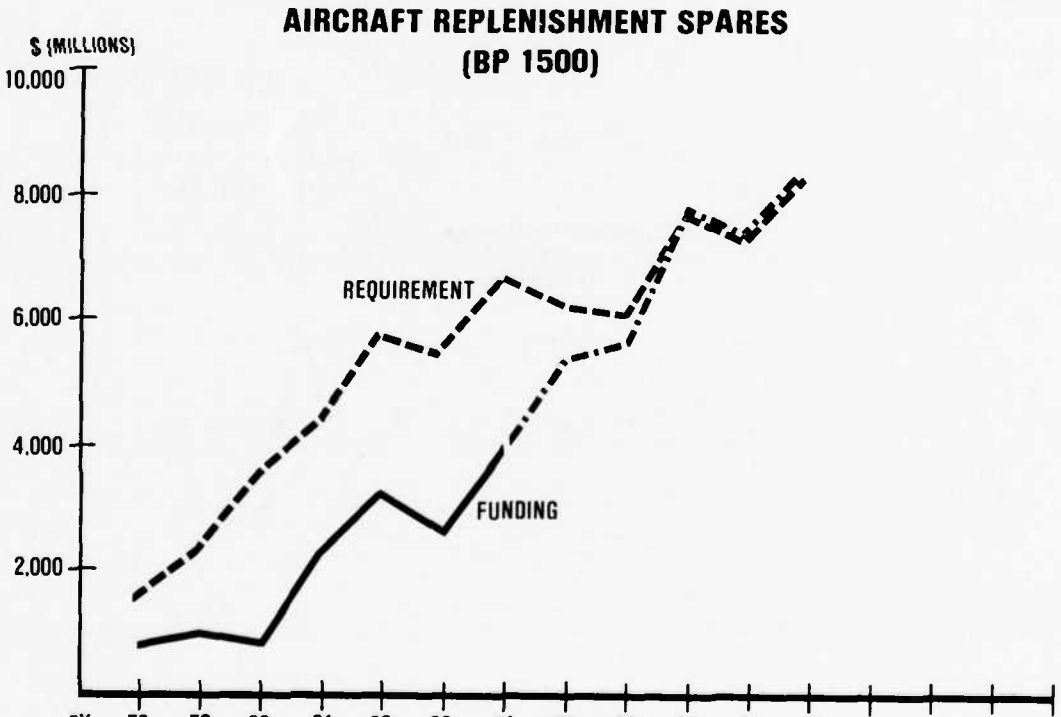
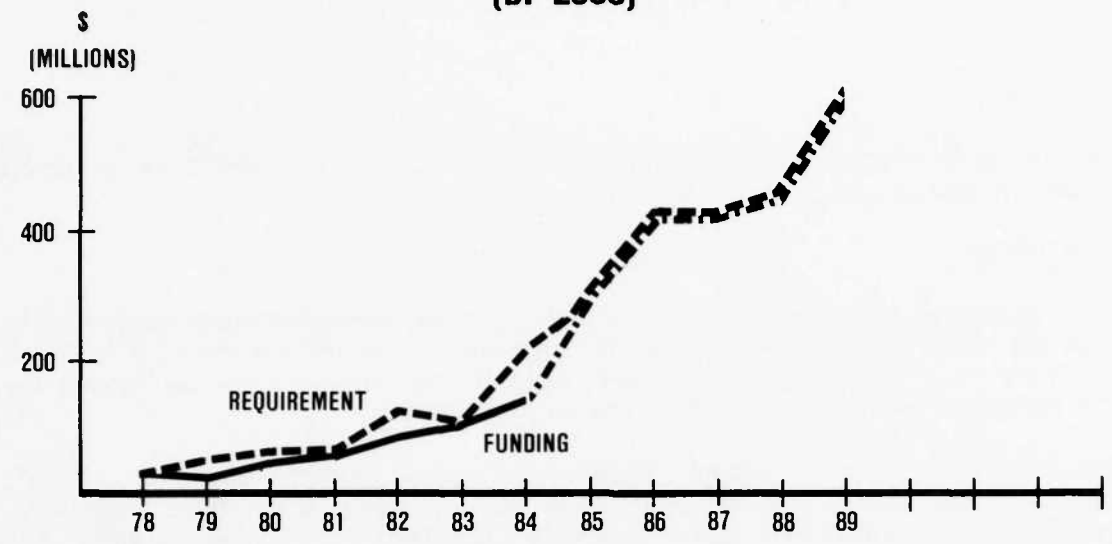


Figure II-9

MISSILE REPLENISHMENT SPARES
(BP 2500)

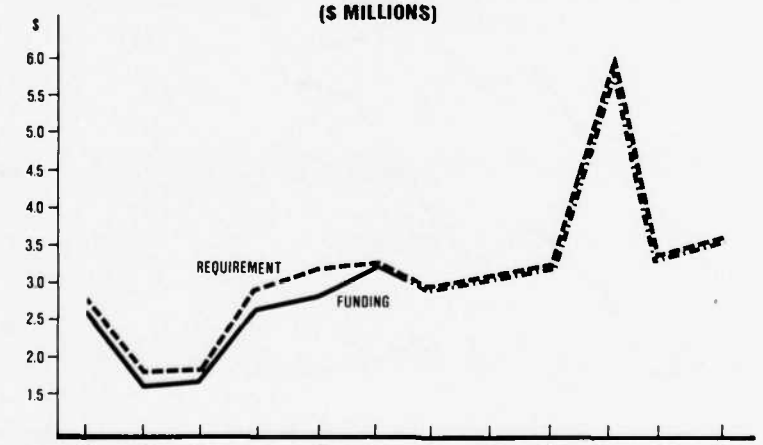


(MILLIONS)	78	79	80	81	82	83	84	85	86	87	88	89
RQMT	28.3	54.4	66.7	65.3	124.5	109.2	225.2	278.4	420.4	421.2	457.4	600.0
FUNDED	27.8	27.7	53.3	64.9	90.8	104.0	114.5	278.4	420.4	421.2	457.4	600.0

SOURCE: AF/LEX AND AFLC/MMC

Figure II-10

MUNITIONS SPARES
BP8100
($ MILLIONS)



FY	78	79	80	81	82	83	84	85	86	87	88	89
REQMT	2.6	1.6	1.8	2.9	3.1	3.2	2.7	2.9	3.1	5.9	3.4	3.6
FUNDING	2.6	1.6	1.7	2.6	2.9	3.2	2.7	2.9	3.1	5.9	3.4	3.6

Figure II-11

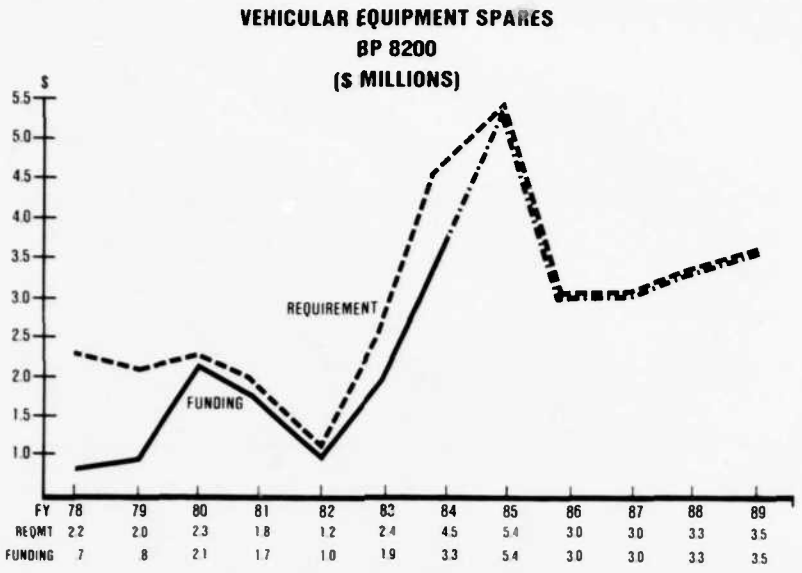


Figure II-12

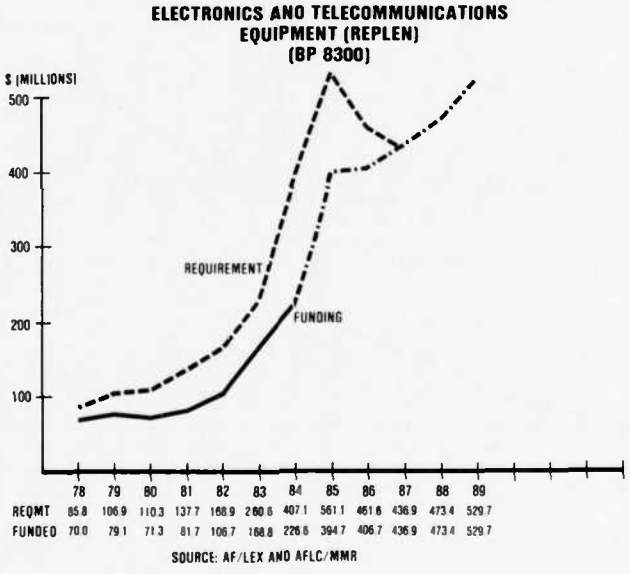


Figure II-13

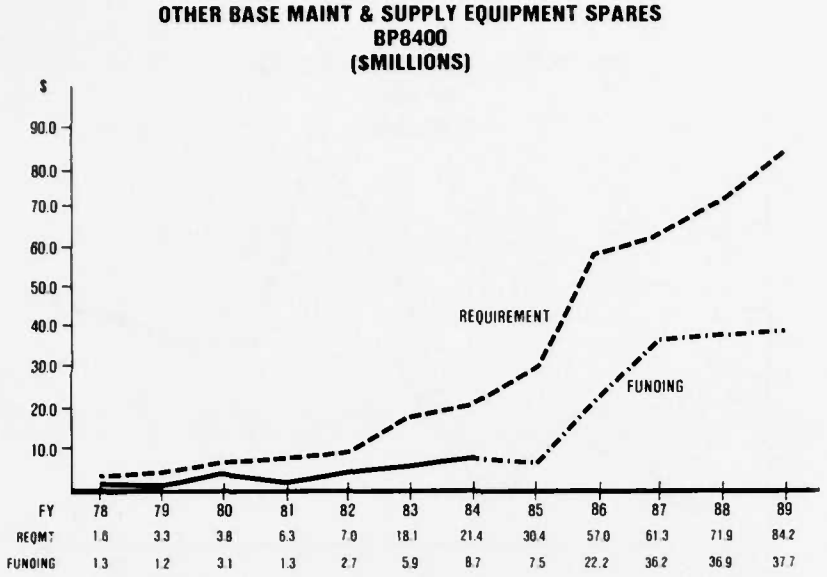


Figure II-14

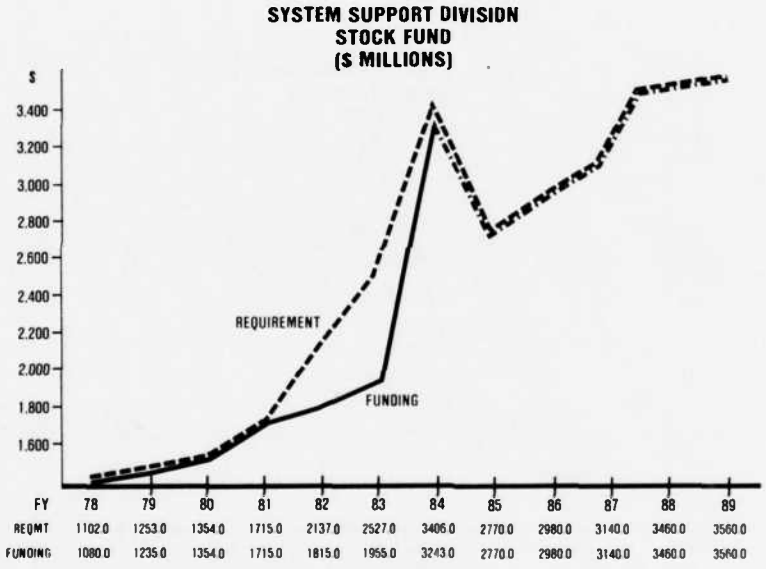
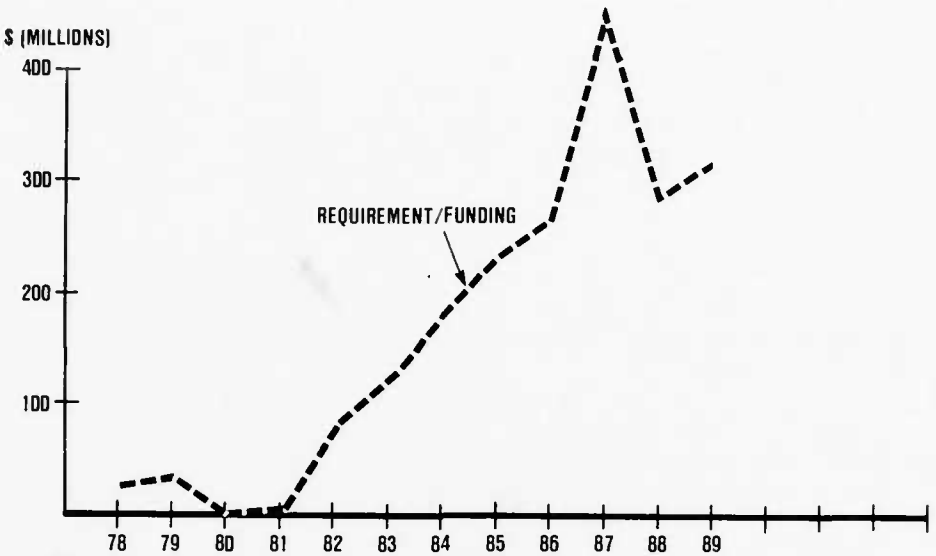


Figure II-15

TANKS, RACKS, AOAPTERS AND PYLONS

(BP 1700)



	78	79	80	81	82	83	84	85	86	87	88	89
REQMT	28.8	34.1	1.8	6.9	83.8	123.9	180.5	235.2	269.4	450.9	290.1	329.1
FUNDED	28.8	34.1	1.8	6.9	83.8	123.9	180.5	235.2	269.4	450.9	290.1	329.1

(MILLIONS)

SOURCE: AF/LEX AND AFLC/MMR

Figure II-16

The underfunding of spares occurs for many reasons. For example, in FY 82, there was a $1.1B shortfall in the aircraft replenishment spares account. The Air Force's antiquated requirements system, which was not designed for budget forecasting purposes, did not project an $874M growth; Congress reduced funding by $85M; and, both Congress and the Air Force approved several special programs without providing funding which cost $141M.

In the other spares accounts underfunding has occurred for many reasons: corporate Air Force decision to defer funding (BP8300 and BP8400); OSD/OMB funding reductions (BP2500 and System Support Division); and, inaccurate budget forecasts (BP8200).

Reparable Spares

To accommodate the funding shortfalls, the Air Force and Air Force Logistics Command issue restrictive buy guidelines to the Air Logistics Centers. These guidelines, by weapon system or mission (strategic, tactical, airlift), are designed to balance funding shortfalls across 80,000 to 90,000 items. For example, in FY 83 there was a projected $1B shortfall in aircraft replenishment spares. To accommodate this, the Air Logistics Centers were authorized to procure only minimum pipeline quantities. In essence, this represented only 65%-75% of the computed requirement or reduced buy quantities for each item.

Nonreparable Spares

The System Support Division (stock fund) was only funded at 77%. Buy guidelines placed tight constraints on the percent of requirements that could be procured. Table II-14 reflects these constraints.

FY 83 INITIAL
BUY QUANTITY CONSTRAINTS
SYSTEMS SUPPORT DIVISION

Mission Application	Percent Quantity to Buy
Airlift and Strategic	77%
Tactical	68%
All Others	58%

TABLE II-14

Impacts of Underfunding

Table II-15 depicts a theoretical quantity reduction for both a reparable (aircraft spare) and nonreparable (stock fund) item in terms of the FY 83 buy guidelines.

FY 83
UNDERFUNDING IMPACT ON QUANTITY BOUGHT
(REPARABLE/NONREPARABLE EXAMPLES)

REQUIREMENT	BUY RESTRICTION	QUANTITY BOUGHT
	REPARABLE ITEM	
* 8	65%	5
	NONREPARABLE ITEM	
**15	77% (Airlift)	12
	68% (Tactical)	10
	58% (Other)	9

* In FY 82/83, 50 percent of reparable buys were for 5 or less.
** In FY 82/83, 39 percent of nonreparable buys were for 20 or less.

Table II-15

The above table illustrates the impact on reducing the quantity procured when requirements are underfunded.

Additionally, reduced quantities have an impact on unit price. Table II-16 depicts an actual example of a nonreparable item bought in FY 83.

IMPACT ON UNIT PRICES

Required Quantity	- 266
Unit Price	- $285.00
	15% Unit Price Increase
Restricted Quantity	- 78
Unit Price	- $328.00

TABLE II-16

Not all items would have this level of price increase — most would be greater. Since 50% of reparables are bought in quantities of 5 or less and 39% nonreparables are bought in quantities of 20 or less, low quantity buys have a significant impact on the unit prices the Air Force pays. For example, low quantities of items with high setup costs, particularly for those items that are no longer associated with a weapon system in production, incur high per unit cost until the setup cost is spread across several units. In the long run total spares costs are driven up.

UNDERFUNDING CAUSES HIGH UNIT COSTS AND MORE FREQUENT BUYS.

RECOMMENDATIONS

1. Spare parts requirements provide only 85% fill of operational needs. Therefore, fund these requirements in the Budget and Program Objective Memorandum. (OPR: Air Staff Board Structure)

2. Develop a methodology to estimate the economic impact of underfunding the spares accounts. (OPR: HQ USAF/SA, OCR: HQ USAF/ACM/RDC/LEK, HQ AFLC/ MM/AC/PM)

PROBLEM

Delayed funding allocations and buy guideline changes cause inefficient starts and stops to procurement actions at the Air Logistics Centers and results in higher unit prices.

DISCUSSION

Each fiscal year the allocation of spares funding to the Air Force Logistics Command and the Air Logistics Centers is influenced by many variables: Congressional Budget Enactment, Continuing Resolution Authority, Budget Supplementals, Air Staff or Air Force Logistics Command buy objectives, and level of funding. Historically, one or more of these variables has had a negative impact on an even flow of initiations and obligations.

Fiscal Year 1982 was almost a model year for aircraft replenishment spares. The continuing Resolution Authority for FY 1982 did not restrict the allocation of funds, funding was almost 100% of requirements, Air Staff and Air Force Logistics Command buy guidelines were general and funds were allocated by Oct 1981. Figure II-17 illustrates the initiation and obligation rates which were achieved with the early allocation of funding.

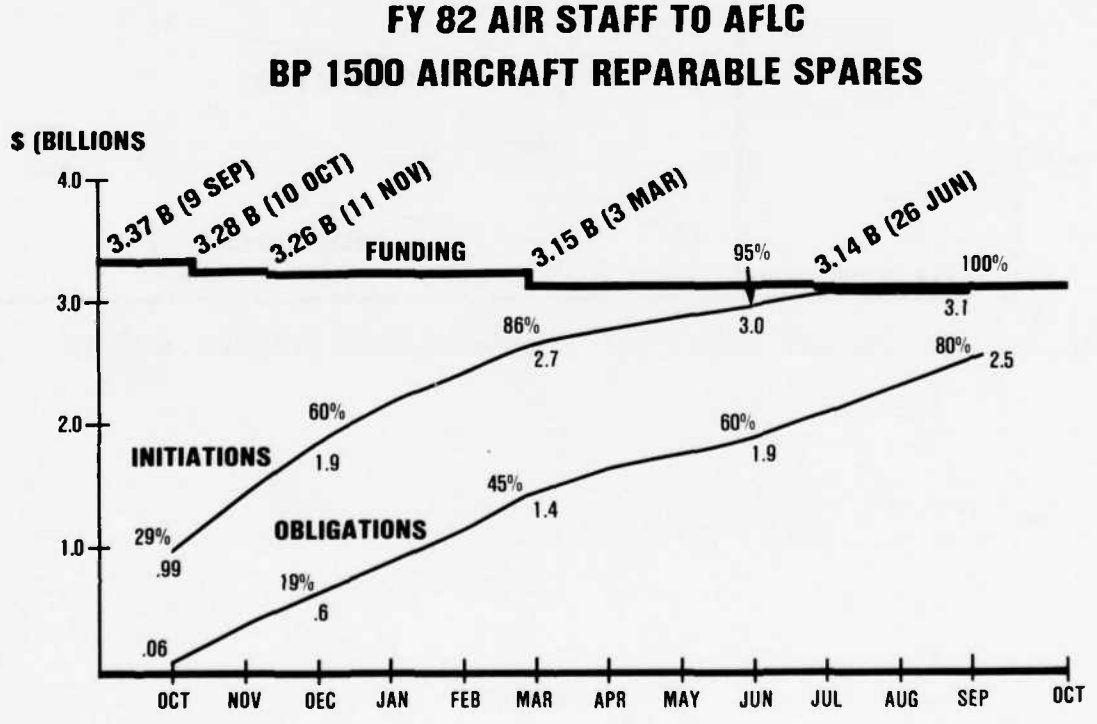


FIGURE II-17

Fiscal Year 1983 was an aberration. Figure II-18 graphically depicts the tardiness in funds allocation, the issuance of buy guidelines to the Air Logistics Centers, and the consequential delays in initiating and obligating the dollars allocated.

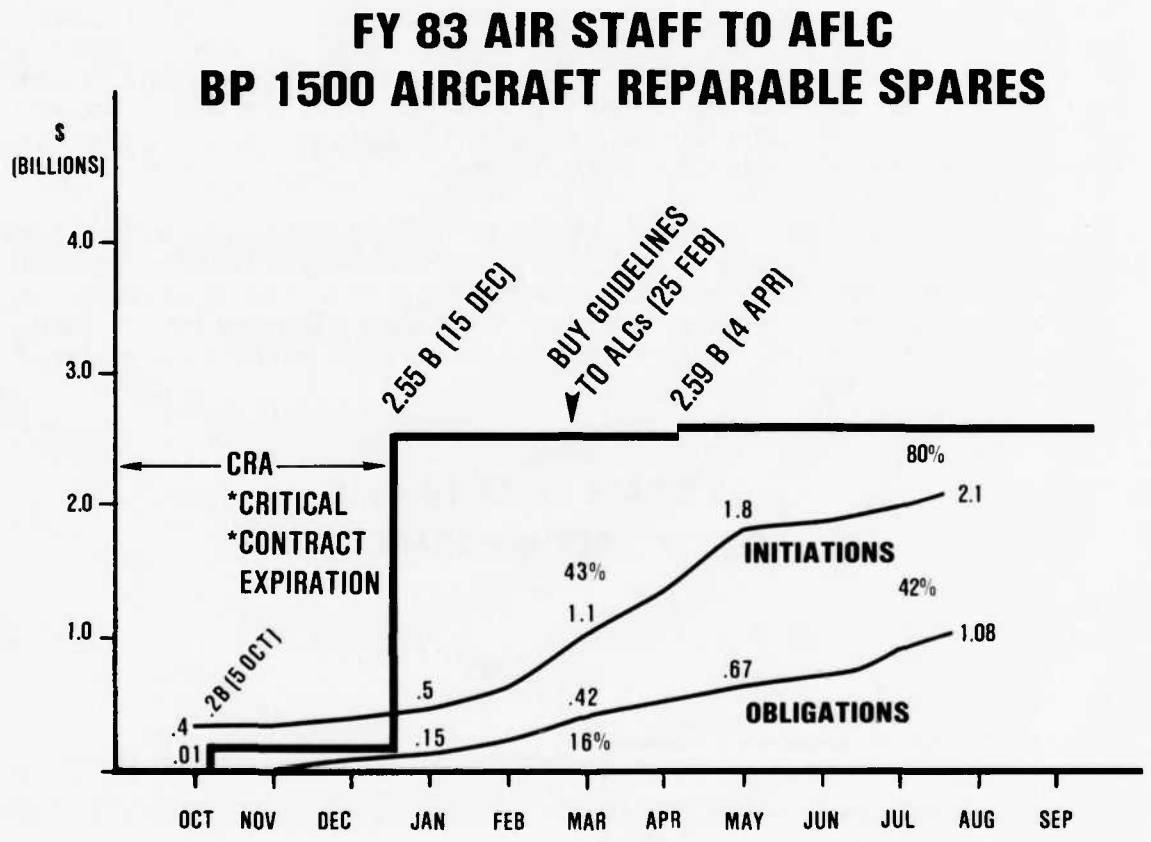


FIGURE II-18

Three factors contributed to the FY83 delay in funds allocation. Table II-17 highlights these factors and their impact.

FACTORS IMPACTING FY 83
INITIATIONS/OBLIGATIONS

FACTOR	CAUSE	IMPACT
Continuing Resolution Authority (CRA)	AF/ACB, Aug 82 stipulated funding emergency needs or contracts that would slip	Air Staff allocated only $200 million until 15 Dec
Weapon System Fenced Allocation	AF/LE directed that FY83 funds be fenced by Weapon System	AFLC required to estimate Weapon System requirements
Requirement Computation not useable (Jun 82)	AFLC converted from IBM 7080 to AMDAHL Computer	Delayed AFLC estimates of Weapon System Requirement to Mid-Nov

TABLE II-17

These factors effectively delayed initiating procurement actions until February 1983. Coupled with the delay in funds allocation, Air Force Logistics Command issued a series of "buy guidelines" for aircraft spares. Between July 1982 and July 1983, six sets of buy guidelines were issued. Not until April 1983 did the Air Logistics Centers receive approved funding by Weapon System. The changes in buy guidelines and the uncertainty of the level of Weapon System funding caused the Air Logistics Centers to start, stop and modify purchase requests each time new guidelines were received.

Coupled with the delays in funds allocation and frequent changes in buy guidelines was the push to obligate the FY 1983 program at the same rate as FY1982. In essence the Air Logistics Centers have been tasked to obligate a full years procurement actions in approximately six months. However, when extenuating circumstances occur, the system should be flexible enough to adjust to realities. When the FY 1983 budget estimate was developed (Sep 81) no one could have predicted:

1. A strict interpretation of a Continuing Resolution Authority
2. The policy change of fencing funds by Weapon System; or
3. A computation failure based upon an equipment conversion.

Each of these realities was operative in FY 1983, yet obligation goals were not adjusted.

In preparing for the FY 1984 buy, both Air Staff (AF/LEX) and the Air Force Logistics Command (AFLC/MM) have taken action to prelude the problems experienced in FY 1983. The Air Logistics Center were provided broad funding targets and a plan of attack should a Continuing Resolution Authority impact FY1984. However, the Air Logistics Centers have not been provided initial Weapon System funding targets which are critical to initiating the FY 84 buy.

Additionally, the Air Force Logistics Command in August 1983, had developed a purchase request initiation plan. The plan was to initiate 50%, 70%, 90% and 100% at the end of each quater FY 84. The AFMAG analysis of initiation targets is higher and more agressive. Figure II-19 illustrates the initiation and obligation objectives recommended.

RECOMMENDED BUY PROGRAM EXECUTION
(REPARABLES)

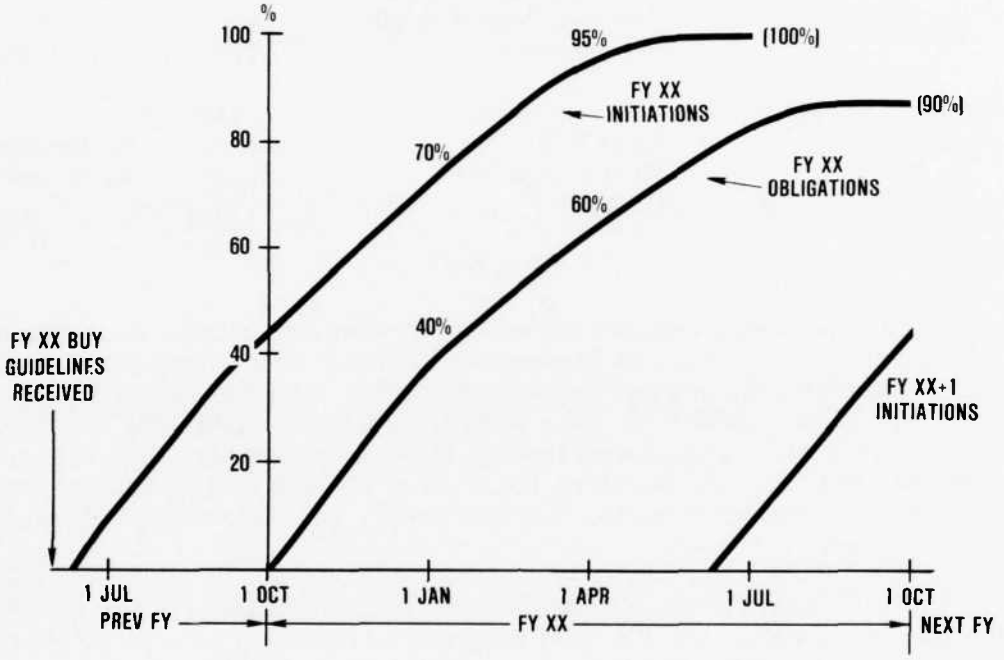


FIGURE II-19

RECOMMENDATIONS

1. Establish Weapon Systems buy objectives and maintain these objectives throughout the applicable fiscal year. (OPR: HQ USAF/LEX; OCR: HQ USAFLC/MM)

2. Provide initial buy guidelines to the Air Logistics Centers by June of each fiscal year to facilitiate early initiation of purchase requests. (OPR: HQ AFLC/MM/AC; OCR: HQ USAF/LEX/ACB)

3. Allocate funds early in the fiscal year to provide for an even flow of initiations and obligations. (OPR: HQ USAF/LEX/RDX/ACB; OCR: HQ AFLC/MM)

4. Adopt the AFMAG suggested plan in the establishment of initiation and obligation targets. (OPR: HQ AFLC/MM/AC; OCR: ALCs/ MM/PM)

ACQUISITION DATA AND UNLIMITED RIGHTS

PROBLEM

There is no standard Air Force policy for acquiring Acquisition Data Packages and rights in technical data in a competitive environment which has impeded the ability of the Air Force to competitively acquire spare parts.

DISCUSSION

The Air Force is required to competitively acquire, operate and maintain each product produced under its research and development contracts. Contractors and their subcontractors, prepare technical data, including engineering data, as an integral part of their design, development and production effort. The Air Force relies on this technical data throughout the life cycle of the documented hardware to perform management, engineering, maintenance, modification, competitive reacquisition of spares, test and other logistics functions. Therefore, procuring contract officers must plan from the outset of the acquisition process to guide contractors and subcontractors to make sure that accurate and acceptable technical data with appropriate data rights are delivered when needed at the minimum life cycle cost.

The Air Force must have adequate technical data and rights in technical data for breakout and competitive acquisition. Since DAR 7-2003.61, Predetermination of Rights in Technical Data and Computer Software clause only requests that a contractor identify its limited rights data, there can be no penalty if limited rights data is not identified. Furthermore, neither the Predetermination clause, nor the DAR 7-104.9(b), Notice of Certain Limited Rights clause, are mandatory for solicitations and contracts, therefore, these clauses are usually omitted, resulting in the unrestricted use of proprietary items with accompanying limited rights technical data by contractors. In a survey at Aeronautical Systems Division we found that even though the DAR 7-104.9(b) and DAR 7-2003.61 clauses are included in 100% of the solicitations, only 10% of the contracts contain the Notice clause and there were no negotiated predeterminations found.

Specific contractual provisions for competitive acquisition of spare parts at the outset of program development have been rarely used and when used have not adequately covered the need for and future use of Acquisition Data Packages (ADP). Data requirements and tasks, including rights in data, should be tailored to each acquisition or modification program through a Statement of Work (SOW). A contractor's priced proposal should include the cost of technical data, including appropriate rights and should be submitted while competition exists to keep the total purchase price to a minimum. The evaluation of proposals for purposes of award should include and take into account the total price of an option to acquire rights in technical data and computer software and the availability of technical assistance to meet life cycle needs for operation, maintenance and competitive acquisition of the entire system.

The appropriate mechanism for institutionalizing Air Force policy concerning ADPs and data rights is the Air Force DAR Supplement. The AFMAG has prepared a proposed Air Force DAR Supplement 9-202, Acquisition of Rights in Technical Data (Appendix 2), to define recommended policy and procedures for acquiring acquisition data packages for competitive acquisition. Proposed model Air Force DAR Supplement clauses and appropriate accompanying guidance for

Principal Contracting Officers, Program Managers and Engineering Data Management Officers will provide consolidated Air Force policy concerning technical data requirements with appropriate rights in data for competitive acquisition.

The proposed Air Force DAR Supplement 9-202 will require the use of the following two clauses in every solicitation, especially at the Full Scale Development phase, or as a minimum, the last phase of a program where competition still exists. The clause provides:

Breakout and Competitive Acquisition

The Air Force intends to provide for maximum practical breakout and competitive acquisition of any part; subassembly or component (hereinafter called Parts) as provided in DAR 1-313 and 1-326. Also the Air Force intends to be able to fully cooperate and support Foreign Military Sales (FMS) of hardware, technical data and computer software and joint U.S. - Foreign Government programs including production in a foreign country by or for a Foreign Government. To accomplish this intent, the Air Force seeks to either:

1. acquire acquisition data packages with sufficient rights for competitive acquisition or manufacture of such parts world-wide; or

2. provide for multiple qualifications of sources of such parts.

Acquisition of Additional Technical Data and Computer Software

1. The Air Force has the right during the term of this contract or any future contract related to (.....) that is subsequently awarded to the contractor, to purchase from time to time "Acquisition Data Packages" (ADPs) for breakout and competitive acquisition of parts defined above, together with the required technical data and computer software rights as described in the Predetermination of Rights in Technical Data, Computer Software and Technical Assistance clause below. Upon written notice of the Government's intent to purchase ADPs, the contractor shall within .... days after receipt of such notice, submit a proposal for the furnishing thereof, which proposal shall include the preparation and reproduction costs of such data, and as applicable, the amount to be paid as compensation for data rights as priced in the Predetermination clause below.

Upon receipt by the contractor of an order for such ADP and for payment of the fixed price and/or the establishment of a royalty arrangement, the contractor shall make delivery of the ADP with unlimited rights in accordance with a schedule agreed upon.

2. The contractor's rights to compensation for data rights shall apply only to data which the contractor would be entitled to mark with the limited rights legend of the General Provision of the contract called "Rights in Technical Data and Computer Software." The contractor's entitlement to mark the data shall be established during the initial predetermination and shall be reviewed at the time the contractor receives notice of the Air Force intent to purchase ADPs.

The following clause should be included in all Air Force Requests for Proposals, Section L., Instructions to Offerors:

Predetermination of Rights in Technical Data and Computer Software

(a) The offeror is requested to identify in the proposal the technical data or computer software (including data or computer software to be furnished in whole or in part by a subcontractor), which will be identified as being limited rights data or restricted rights computer software according to paragraph (b) of the "Rights in Technical Data and Computer Software" clause of this solicitation. This identification need not be made for data or computer software that relates to standard commercial items that are manufactured by more than one source of supply. Identification of restricted rights computer software should include identification of the proposed restrictions to be placed upon such computer software items. The restrictions will be subject to limitations of paragraph (b)(3) of the "Rights in Technical Data and Computer Software" clause.

(List here that technical data and/or computer software which the contractor proposes to deliver subject to limited or restricted rights. Data and software that clearly comes within paragraph (b)(1) of the "Rights in Technical Data and Computer Software" clause and would therefore be acquired with unlimited rights should not be listed.)

(b) Limited rights data and restricted rights computer software may be identified as such, pursuant to (a) above only if it pertains to items, components, or processes developed at private expense. Nevertheless, it cannot be so identified if it comes within paragraph (b)(1) of the "Rights in Technical Data and Computer Software" clause. At the request of the contracting officer or his representative, the offeror agrees to furnish clear and convincing evidence that the data, which will be so identified, comes within the definition of limited rights data, or restricted rights computer software, as appropriate.

(c) The listing of a data or computer software item in (a) above does not mean that the Government considered such item to come within the definition of limited rights data or restricted rights computer software.

(End of Clause)

The predetermination (option) includes the right to acquire technical data and any technical assistance necessary to produce the desired item, etc. The options must be specifically drafted, with substantial input from the project engineer, to be sure that they will meet the future needs for the particular program. The proposed Air Force DAR Supplement 7-2003.61, Appendix 1, should be used as the initial model predetermination. Guidance for challenging limited rights assertions by proposers are contained in the proposed Air Force DAR Supplement 9-202, Appendix 2.

RECOMMENDATIONS

1. Issue an Air Force DAR Supplement to require the use of the model clauses, Air Force DAR Supplement 1-313, Breakout and Competitive Acquisition and Air Force DAR Supplement 7-2003.61, Predetermination of Rights in Technical Data and Computer Software, Appendix 1. (OPR: HQ USAF/RDC)

2. Issue an Air Force DAR Supplement 9-202, Acquisition of Rights in Technical Data, Appendix 2, to institutionalize Air Force policy for acquiring Acquisition Data Packages in a competitive environment. (OPR: HQ USAF/RDC)

DATA RIGHTS FLOWDOWN

PROBLEM

Competitive acquisition is being impeded by restrictive legends placed on technical data by subcontractors because prime contractors are not flowing down DAR data rights clauses.

DISCUSSION

When DOD formulated its current data policy in 1964, it focused on the problem of protecting subcontractors in their dealings with contractors. The main technique devised was the requirement that the basic clause be used without alteration in subcontracts. The basic clause permits contractors and subcontractors to submit data pertaining to items, components or processes developed at private expense with limited rights legends. In addition, subcontractors were permitted to furnish data directly to the Government, thus bypassing the contractor. Paragraph (g)(1) of the DAR 7-104.9(a) clause is not intended to preclude other arrangements between the contractor and his subcontractors. The drafters hoped that the bypass procedure would ease the relationship between contractors and subcontractors. This procedure has been difficult to implement, however, because most contractors need to check on the technical data prepared by subcontractors to assure it meets contract requirements and meshes with the data that has been prepared by the contractor. Provisions need to be incorporated into the DAR to require subcontractors and vendors to comply with the same contractual provisions concerning data rights as required of the prime.

Subcontractors and Vendors

1. The contractor is responsible for securing compliance by his subcontractors and vendors with the requirements of this clause. The contractor shall use diligent efforts to contract only with suppliers who will accept this clause. In cases in which the contractor, after diligent efforts, is unable to persuade a subcontractor or vendor to accept this clause, the contractor shall report the entire circumstances, including alternate approaches to resolving the problem, to the Contracting Officer, who after consideration of the circumstances and alternatives, will within thirty (30) days direct the contractor as to action to be taken. The contractor shall follow the course of action directed by the Contracting Officer.

2. In addition, the contractor shall consider the programs including, but not be limited to, disabled veterans and/or handicapped workers, veterans of the Vietnam Era, small business concerns, and woman owned businesses when selecting items for breakout and qualification of additional vendors.

RECOMMENDATIONS

1. Include in the Air Force DAR Supplement the requirement for subcontractors and vendors to comply with the same data rights clauses contained in the prime contract. Make the prime contractor responsible for securing compliance with the requirements of the clause and require contractors to use stringent efforts to contract only with suppliers who will accept the clause. Implement this requirement in the proposed model Air Force DAR Supplement 7-2003.61(m) and 1-313(e) clauses in Appendix 1. (OPR: HQ USAF/RDC)

2. The Air Force submit a DAR case to institutionalize the recommended clauses in the DAR. (OPR: HQ USAF/RDC)

REVIEW OF LIMITED RIGHTS LEGENDS

PROBLEM

Technical data with limited rights legends are not adequately reviewed for potential competitive acquisition of spare parts because the Air Force does not have sufficient technical and engineering resources to review the data and also accomplish all priority engineering missions.

DISCUSSION

Without adequate numbers of technically qualified Air Force personnel to review restrictive markings, the Air Force has to seek other alternatives to meaningfully review technical data to determine if it is appropriate to release the data for competitive acquisition of spare parts. Some of the alternatives are to authorize additional manpower, redirect current, scarce resources from high priority missions, or contract out this task. The AFMAG is recommending a limited implementation of the first two alternatives, however, contracting out needs to be a viable alternative. It is the current General Counsel's legal opinion that if an engineering support contractor, who is not a manufacturer, is hired to review technical data, properly marked proprietary, without the permission of the owner, the Air Force may have breached its contract with the rightful owner. Although the current problem of unauthorized markings is difficult to resolve, the Air Force should adopt a procedure to solve the problem in future contracts by requiring the use of the following clause in all contracts:

> Review of Limited Rights Data
>
> The contractor hereby grants its permission to disclose and release any data submitted hereunder marked with a Limited Rights Legend to a contractor retained by the Government to review the propriety of such a marking; provided that such contractor shall be prohibited from further releasing, disclosing or otherwise using such data. The contractor shall include this clause in all subcontracts hereunder calling for data.

With respect to the current problem of having thousands of items of technical data marked with limited rights legends contained in the data repositories, the Air Force should attempt to obtain the written permission of the Contractors, in accordance with DAR 9-109(a)(8), to hire an engineering support contractor, who is not a manufacturer, to review the technical data. The permission to have the technical data reviewed outside the Government would be subject to the same limitations contained in the AFMAG clause.

RECOMMENDATIONS

1. That the Air Force establish a policy to obtain a contractual right to contract out the review of limited rights legends on technical data in all future contracts. Implement this requirement in the proposed model Air Force DAR Sup 1-313 (d) and Air Force DAR Sup 7-2003 (r) in Appendix 1 of this report. (OPR: HQ USAF/RDC)

2. That the Air Logistics Centers request permission, from selected contractors, to release limited rights data to an engineering support contractor to review the technical data for possible competitive acquisition. (OPR: HQ AFLC/JA)

EFFECTIVE PERIOD OF LIMITED RIGHTS LEGENDS

PROBLEM

Items with limited rights data can never be competitively procured since current acquisition regulations and directives allow the protection of technical data marked with limited rights legends for the life of the technical data even though technological advances or other events nullify the justification for the limited rights legends.

DISCUSSION

Our analysis of approximately 364,000 PMC coded parts indicated that approximately 29,000 parts contain limited rights restrictions. Without a drawing by drawing review, there is no way to determine whether a single drawing or all of the drawings pertaining to each of the 29,000 parts are marked with limited rights legends. In either case, the existence of at least one limited rights legend in a data package precludes its use for competitive acquisition. Thus, thousands of items marked with limited rights legends can never be competed. This protection will continue long after any statutory protection provided by the Patent Laws, which expire after 17 years. Setting a period of 5 years from acceptance of the first production article should provide sufficient time for the contractor to recoup its investment plus a reasonable profit.

Although the current problem of indefinite life of limited rights legends is difficult to resolve, the Air Force should adopt a policy of establishing a reasonable time limit of 5 years by requiring the use of the following clause in all Air Force R&D contracts:

Time Limits for Limited and Restricted Rights

Notwithstanding any other provision of this contract, it is the intent of both the Government and the Contractor that ___*___ months after the first delivery of production items under this contract, the Government shall have unlimited rights, as defined in subsection (a)(7) of this clause, in all technical data and computer software used by the Contractor, including subcontractors and suppliers at any tier, in all phases of the development and manufacture of production items including, but not limited to, all components, modules, assemblies or parts thereof. For purposes of this subsection (h), the Government shall have the right at any time following the ___*___ after delivery of the first production item(s) and within two (2) years after either acceptance of all items (other than data or computer software, in a format prescribed by the Contracting Officer, necessary to reprocure from another contractor(s) either an entire production item in the production configuration then-current or any component, module, assembly or part thereof. When the Contracting Officer directs delivery of technical data and computer software under this subsection (h), to the extent not otherwise previously compensated for delivery of such technical data or computer software, the Contractor shall be compensated for converting the data or computer software into the prescribed form, for reproduction and delivery.

* Insert a period which shall not exceed 60 months.

RECOMMENDATIONS

1. Establish a 5 year time limit from date of acceptance of the first production article, by issuing the Air Force DAR Supplement 7-104.9(a)(8), Appendix 1 to this report. (OPR: HQ USAF/RDC)

2. Submit a DAR case to institutionalize the 5 year time limit within DOD. (OPR: HQ USAF/RDC)

DATA WARRANTY

PROBLEM

The lack of an Air Force policy to require contractors to warrant that acquisiton data packages will be complete, accurate and adequate for competitive acquisition has resulted in recurring problems in obtaining technical data of high quality.

DISCUSSION

The DOD has issued optional warranty clauses to be used in the acquisition of technical data (DAR 7-104.9(o)). There is no specific guidance in the DAR with regard to the use of the warranty clauses. It is important to consider the nature of the item and its end use in determining whether a warranty is appropriate. The benefits to be derived from a warranty must be related to the cost of the warranty to the Government. Essential to the effectiveness of any warranty is the Government's ability to enforce the warranty. As a general rule, there must be some assurance that an adequate administrative reporting system for defective items exists or can be established. There has been no reported litigation involving warranties and it is not known how widely they have been used.

One of the problems encountered in controlling the quality of technical data is maintenance of the data in a current status. One means of addressing this problem is the deferral of either delivery or ordering of data. Another means of dealing with the problem is data packaging where data is separately packaged for a single purpose. There has not been a great deal of emphasis on the concept of data packaging in recent years. There has, however, been some acquisition of reprocurement data packages by DOD. The Army provides a management course on Technical Data Package Development and Management and the Navy has issued Navy Procurement Directive 1-2101 which provides guidelines for the purchase of technical data for competitive acquisition. The Air Force guidance may be found in AFLCP/AFSCP 800-34, however, since it is only a pamphlet, it does not require compliance.

To ensure the quality of technical data for competitive acquisition, the Air Force should establish policy to require the contractors to warrant that the Acquisition Data Package will be complete, accurate and adequate for competitive acquisition. The policy should require the use of the following clause in all contracts:

Warranty of Data

1. The contractor warrants that the data provided under this contract will be complete, accurate, and adequate as of the time of delivery for the purpose for which it was procured, and that he will promptly correct or furnish, as applicable, any data required hereunder which the contracting officer determines is incomplete, inadequate or deficient for those purposes, provided that the contracting officer notifies the contractor of the contracting officer's determination within three (3) years after the last data has been delivered under this contract or subsequent follow-on contracts. This will be done at no increase in contract price.

2. Further, the contractor agrees, that if the Government uses any of the data supplied under this contract for competitive reprocurement purposes and such data turns out not to be suitable for that purpose, to reimburse the Government any additional costs incurred as a result of using said defective data, including costs incurred in getting it corrected by another contractor. Any data not complete, accurate and adequate as of the time of delivery for the purpose for which it was procured shall be subject to the Technical Data - Withholding of Payment Clause set forth in Section I.

RECOMMENDATION

Issue an Air Force DAR Supplement to implement the policy contained in model clause AF DAR Supplement 1-313(f), Appendix 1. (OPR: HQ USAF/RDC)

DEVELOPED AT PRIVATE EXPENSE DEFINITION

PROBLEM

The DAR does not adequately define the term "developed at private expense," thus permitting unconstrained use of restrictive markings and thereby inhibiting competitive acquisition.

DISCUSSION

The policy as to a mixture of private and Government funded effort and its relationship to rights in technical data is not addressed in the DAR. There is evidence that contractors may be making proprietary claims based on a lack of understanding of the intended policy.

The DAR Rights in Technical Data and Computer Software clause (7-104.9(a)), paragraph (b)(1)(i) gives the Government unlimited rights in:

> (i) Technical data and computer software resulting directly from performance of experimental, developmental or research work which was specified as an element of performance in this or any other Government contract or subcontract.

Paragraph (b)(1)(iv) gives the Government unlimited rights in "technical data necessary to enable manufacture of end-items, components and modifications, or to enable the performance of processes...., except technical data pertaining to items, components or computer software developed at private expense." This is the only category of unlimited rights in technical data that is subject to the limited rights exceptions.

The purpose of paragraph (b)(1)(iv) is to give the Government rights to data packages which will permit other companies to manufacture the equipment developed with Government funds. The key words in the clause are that the Government is entitled to unlimited rights, "unless" the technical data "pertains to an item, component, or process developed at private expense." Contractors frequently maintain that limited rights apply if the "data" was developed at private expense and that it is not necessary to have actually built the hardware.

The Air Force should adopt a policy which will reduce the potential for unauthorized markings by including the following definitions in all Air Force R&D contracts:

> Developed, as used in the phrase "developed at private expense," means actually reduced to practice. To be considered developed, an item or component must have been constructed, a process practiced, and computer software used, and in each case must have been tested to the extent necessary to determine that it is capable of accomplishing the practical purpose for which it was developed. When an item, component, process or software does not meet these criteria, separable portions thereof that do meet these criteria will be considered to have been developed.

At private expense, as used in the phrase "developed at private expense," means that completed development (100%) was accomplished without Government funds and at a time when no Government contract required the performance of the development effort. Independent research and development funds compensated by the Government under IR&D agreements will be considered as private funds.

RECOMMENDATIONS

1. Issue an Air Force DAR Supplement to implement the definitions of "developed" and "at private expense" in the model clause, Appendix 1, AF DAR Supplement 7-2003.61(o)(5) and (6). (OPR: HQ USAF/RDC)

2. Recommend a DAR case to implement the proposed Air Force definitions throughout DOD. (OPR: HQ USAF/RDC)

PROBLEM

The process of defining contract requirements for acquisition data packages is complex and unwieldy, often resulting in incomplete and unusable data. This limits the Air Force's ability to competitively acquire spare parts.

DISCUSSION

1. Introduction

One finding common to most studies and audits of competitive acquisition of spare parts is the lack of adequate reprocurement data. Without such data, a part cannot be adequately described to allow manufacture. This problem is not new and has persisted for many years. One of the key factors causing this problem has been the ambiguous methods of describing what constitutes an adequate acquisition (reprocurement) data package.

Underlying any discussion of an acquisition-data package for a hardware item is the engineering description of the item, as portrayed by its engineering data. To ensure clarity of discussion the following distinction is made for these data.

> "Acquisiton Data: Acquisition data for a hardware item includes all data necessary to describe an existing design item such that it can be acquired on a competitive basis."
>
> "Engineering Data: Engineering data is the master baseline documentation for a system. It describes parts, assemblies, and equipments and the way they go together to make up a system."

a. Changing Methodology for Defining Requirements

Over the past 10-12 years, there has been a constant change in the methods and techniques used to define engineering data requirements in directives, regulations, and other policy documentation. Prior to 1975, the primary description of the engineering data was contained in MIL-D-1000, Engineering Drawings and Associated Lists. This document established requirements for drawings in terms of categories of use (content) and form (format). Description of data was provided by individual data item descriptions for each of ten separate categories of use. In 1975, a major change was made to MIL-D-1000 to clarify and simplify the description of engineering drawings. This directive, MIL-D-1000A, described drawing content in terms of levels of program development. It describes the development of an engineering drawing system as an evolutionary process progressing in greater detail through the concept (level 1), prototype production (level 2), and production phases (level 3) of a system development. Further, instead of ten separate data item descriptions under the pre-1975 system, one data item description would be used to obtain drawings. Details are provided in attachment one.

This turbulence during the 1970s in the procedures for specifying engineering data led to many problems. Audits of major programs such as the A-10 and F-15 identified problems with contractual definition of engineering data requirements

which have had to be corrected at government expense. Most of the engineering data we now have in our repositories was generated under the old "forms and categories" and in many cases is insufficient to support competitive acquisition. Drawings generated on programs using the new DOD-D-1000B are just beginning to enter the repository system. Initial evaluation by AFLC personnel is positive. However, studies and findings over the past few years continue to point out ambiguities in the way we define engineering data.

Compounding the problems associated with changes in basic definition documents is the complicated process used to put data requirements on contract. The process depicted in attachment two shows the many steps needed to develop data requirements, including engineering data, for a program. Such a process requires expertise and overall planning to ensure proper requirements are eventually placed on contract. This has not always been the case and has led to problem in programs such as the F-15.

b. Relationship Between Engineering Data and Acquisition Data Packages

The acquisition data package for a specific hardware item includes the engineering data for item but may also require and include additional data, such as item peculiar test data or packaging data, needed to acquire the part competitively. An adequate engineering data package is essential to form the basis of a usable acquisition data package. Therefore, a primary objective of the acquisition process is to ensure that adequate engineering data is properly developed to support acquisition data packages, in addition to the other long-term logistics functions of engineering data. These other functions include engineering, management, initial provisioning, government manufacture and maintenance/ modification.

Engineering data requirements for specific contracts must be viewed in terms of the total program and the eventual uses to which the data will be put. Present procedures don't emphasize the need to review engineering data in this light. Policy and procedures need to reflect an overall coordinated strategy for the acquisition of engineering data which reflects logistics support uses. Individual contract requirements must be reviewed and established within this overall strategy. This strategy needs to be included in program management planning documents such as Acquisition Plans, Program Management Plans, Integrated Logistics Support Plans, and Engineering Data Management Plans.

Acquisition data packages, on the other hand, are typically not developed until after items to be spared are selected during the provisioning process--normally in the production phase.

Based on the above, there are two distinct processes to be followed: (1) the process of obtaining engineering data and (2) the process of obtaining acquisition data packages. The policy and procedures for obtaining engineering data flow through the 800-series Air Force regulations (primarily AFR 800-34, Engineering Data Acquisition); DOD-D-1000B, Engineering Drawings and Associated Lists; DOD-STD-100C, Engineering Drawing Practices; and the data item descriptions contained in the engineering functional breakout of data. The policy and procedures for obtaining acquisition data packages flow from the 310 series of Air Force regulations (specifically AFR 310-3, Acquisition and Management of Data for Follow on Procurements); MIL-STD-885B, Procurement Data Packages; and data item descriptions associated with this process.

There is currently a lack of cohesive, coordinated policy and procedures embodied in the above documents. Some are outdated, others are ambiguous; there is a clear need for a topdown review/revision effort. Details of recommended changes are provided in section 2, Engineering Data, and section 3, Acquisition Data Packages.

2. Engineering Data

a. The Need For Engineering Data

Engineering data is the master baseline documentation for weapon systems; it is needed for many uses during the acquisition and operational cycles of systems. These uses include system and price analysis, design reviews, configuration management, provisioning, cataloging, management, manufacturing, maintenance, modification, spares acquisition, inspection, test, and standardization. These needs dictate that, in most systems, the Air Force have access to a complete engineering data package.

b. Obtaining Engineering Data

The following factors inhibit adequate acquisition of engineering data (these factors are addressed further in paragraphs c(1) - c(4)).

(1) There is a lack of consolidated guidance in Air Force directives.

(2) The basic definition of engineering data is not standardized in policy.

(3) Engineering data is treated inadequately in acquisition program planning efforts and documentation.

(4) Procedures and guidance for obtaining engineering data are not yet complete or uniform.

(5) The numerous data item descriptions presently used to obtain engineering data lead to confusion and, often, omitted requirements.

(6) Present in-process review procedures are inadequate to ensure that engineering data will satisfy logistics support requirements.

c. Revision of Policy and Procedures

In order to streamline and clarify policy and procedures for obtaining engineering data the following paragraphs define the steps which must be accomplished.

(1) Implement AFR 800-34, Engineering Data Acquisition, 11 April 1983. This establishes consolidated overall policy and guidance and a requirement to make engineering data acquisition an integral part of program planning, documented in program planning documents. It also requires the designation of Engineering Data Management Officers (EDMOs) in program offices. The EDMOs will be responsible for including engineering data requirements in contracts and managing its acquisition.

An implementing joint AFLC/AFSC supplement is required, and is presently being drafted. AFR 800-34 and its supplement are essential for obtaining adequate engineering data. Key elements recommended for inclusion in this supplement are contained in attachment three.

(2) Define Engineering Data. The basic definition of engineering data generally accepted at the present time is contained in paragraph 719 of DOD-STD-100C, Engineering Drawing Practices. It is:

> "Engineering Data: Engineering documents such as drawings, associated lists, accompanying documents, manufacturer specifications, and standards, or other information prepared by a design activity and relating to the design, manufacture, procurement, test, or inspection of items or services".

The AFMAG recommends two additional elements for inclusion in the definition. First, data prepared not only by the design activity but also by his contractors, subcontractors and vendors should be included. Second, we recommend that the uses of data should be included. The recommended definition is:

> "Engineering Data: Engineering documents such as drawings, associated lists, accompanying documents, manufacturing specifications and standards, and other information prepared by the design activity, contractors, subcontractors, or vendors required to define and control a specific engineering design baseline."

(3) Plan engineering data acquisition. Engineering data evolves over a period of time, commensurate with the development of the system's design. The eventual content of the engineering data is dependent on the information needed to design, produce, manufacture, and support the system. There is a clear requirement for program plans to address the development of engineering data for its eventual use in logistics functions. The new regulation, AFR 800-34, now requires that engineering data be addressed in program planning documents. Specific procedures to do so have not yet been developed. This should be covered in the AFLC/AFSC supplement to AFR 800-34.

(4) Strengthen Policy and Procedures. AFR 800-34 and an AFLC/AFSC supplement thereto; DOD-D-1000B, Engineering Drawings and Associated Lists, and DOD-STD-100C, Engineering Drawing Practices, are the master documents involved with the acquisition of engineering data. In addition to recommendations concerning those documents, AFSC and AFLC functions must establish local policies and procedures to effectively implement them.

Basic requirements for the preparation and content of engineering drawings and associated lists are in DOD-D-1000B, Engineering Drawings and Associated Lists, and DOD-STD-100C, Engineering Drawing Practices. Both documents need to be revised to more clearly define engineering data. In addition, the AFLC/AFSC supplement to AFR 800-34 must clearly spell out the need to tailor the use of these documents and provide procedures to do so.

(a) Improvements In DOD-D-1000B, Engineering Drawings and Associated Lists, 28 Oct 78. This needs to be made the primary document for defining engineering data requirements. It needs revision to orient it toward

"engineering data" and not just "engineering drawings and lists". Within DOD-D-1000B, further clarification is recommended of the three levels of engineering data, particularly Level 3, which provides the description of data which would be used to support competitive acquisition of spare parts.

At present, DOD-D-1000B indicates in paragraph 6.4 that the use of Level 3 data is "to provide engineering data for support of quantity production to permit competitive procurement for items substantially identical to original items." However, the description of Level 3 data contained in paragraph 3.3.3 indicates that drawings prepared to Level 3 provide definition sufficient to enable a competent manufacturer to produce item(s) interchangeable with the original designs and, in conjunction with other related reprocurement data, permit the competitive procurement of items substantially identical to the original. At issue is whether Level 3 implies "form, fit and function" (interchangable) or "complete design disclosure" (substantially identical).

The following recommended changes incorporate the latter definition:

1. Expand the scope of the document to cover engineering data, not just drawings and lists.

2. Clarify the content of the various levels of data such that engineering data prepared to Level 3 will provide engineering definition "... sufficiently complete to enable competent manufacturers to produce and maintain quality control of item(s) to the degree that physical and performance characteristics substantially identical to the original item(s) are obtained without resorting to additional product design effort, additional design data, or recourse to the orginal design activity."

This will provide a "complete design disclosure" of the system as produced. However, this will not eliminate, in all cases, the need for additional data to competitively acquire a spare part. An example might be additional test procedures for a part acquired as a spare, vice testing of that part as assembled into its higher assembly during production (the additional data should be obtained in an acquisition data package for that part).

b. Improvements in DOD-STD-100C, Engineering Drawing Practices, 22 Dec 78. General changes are required throughout, including an improved definition of engineering data as discussed above and inclusion of descriptions of Master Engineering Document Lists. No substantial policy changes are needed.

c. Improvements in the Application of Data Item Descriptions (DID). There are over 100 data item descriptions contained in the Acquisition Management Systems and Data Requirements Control List (AMSDL) which can provide engineering data. It is difficult to determine if all necessary engineering data is being obtained on a program with the diverse data item descriptions presently being used. There is a need to obtain a consolidated description of engineering data required on a contract. The AFMAG recommends that the primary data item descriptions used on Air Force procurements be DI-E-30142, Master Engineering Document List (MEDL) and DI-E-7031, Engineering Drawings and Associated Lists. The MEDL provides a complete list of all engineering data for a description of the system. DI-E-7031 needs to be tailored to ensure that all engineering data needed to support the system is either delivered under that DID or any DID used to describe additional data is cross-referenced to DI-E-7031.

d. Improved In-Process Reviews The basic vehicle used in acquisition programs to audit and review the development of systems is a series of formal reviews, tests, analyses and other exchanges to ensure that specified performance is being achieved. Although engineering data, per se, is reviewed as part of configuration management and design efforts, the development of a final engineering data package in incremental levels of complexity is not.

AFR 800-34, Engineering Data Acquisition, 11 April 1983, provides overall guidelines for in-process reviews of engineering data. The development of the engineering data package should be emphasized as a part of the formal review process by the program office. Detailed guidelines must be developed for use throughout the review process and incorporated in the AFLC/AFSC supplement to AFR 800-34.

3. Acquisition Data

a. Recent changes to requirements for obtaining engineering data (AFR 800-34, Engineering Data Acquisition), combined with other needed changes outlined above will help to ensure that the Air Force has access to most of the data required for acquisition data packages to support competitive acquisition of spare parts. However, to enable competition, there will sometimes be additional data required such as item-level test procedures, handling requirements, and purchasing data. The need for this additional data is normally not known until after the provisioning process has identified items to be spared. Following this, requirements for acquisition data can be developed.

b. The Air Force policy for acquisition data is contained in AFR 310-3, Acquisition and Management of Data for Follow-on Procurements, 4 Nov 1968. This document should be changed to bring it in line with present requirements for engineering data. Implementing procedures and guidance are provided in an AFSC/AFLC supplement to AFR 310-3. A general update to AFR 310-3 is required to ensure coordination and compatibility with related policy. An important element of Air Force policy need to be emphasized that is adequate Acquisition Data Packages (ADP) will be obtained in order to maximize competition to include, for spares selected for competition, any technical data required to complete an ADP over and above the basic engineering data. References should also be made to overall Data Management Policy contained in AFR 310-1 and the relationship of Acquisition Data Package policy within overall policy.

c. The data item description used to obtain acquisition data packages is DI-E-3472, Procurement Data Packages. Its parent document is MIL-STD-885B, Procurement Data Packages; 22 Oct 1971. This standard is outdated and needs revision. Recommended changes to MIL-STD 885B are listed below:

(1) Include changes discussed previously for AFR 310-3.

(2) Change the definition of engineering data in section 3.4 to agree with that recommended for DOD-STD-100C and DOD-D-1000B: "Engineering Data: Engineering documents such as drawings, associated lists, accompanying documents, manufacturing specifications, standards, and ther information prepared by the design activity, contractor, subcontractor, and vendors required to define or control a specific engineering design baseline. This data may have to

be augmented with additional purchasing data, manufacturing data, verification data, and shipping and storage data to make it sufficient for acquisition of a hardware item."

(3) Update to reflect the content of engineering data packages as described in DOD-D-1000B, Engineering Drawings and Associated Lists.

RECOMMENDATIONS

Engineering Data

1. That the Air Force adopt the definition of engineering data that includes all the information required to define and control a specific engineering baseline. (OPR: HQ USAF/XOX)

2. That a supplement to AFR 800-34 be developed and implemented as required in AFR 800-34 (See Attachment 3). (OPR: HQ USAF/LEY)

3. That appropriate changes be made to DOD-D-1000B to describe engineering data and clarify the description of data contained in the three levels of engineering data. Pending formal change, develop a supplement to DOD-D-1000B for Air Force use providing clarification. (OPR: HQ USAF/LEY)

4. That the Air Force request a revision to DOD-STD-100C to incorporate needed changes and align this standard with the revision of definitions and DOD-D-1000B. Pending formal update, develop and include necessary changes in the AFLC/AFSC supplement to AFR 800-34. (OPR: HQ USAF/LEY)

5. That changes be made to Data Item Description DI-E-7031 to ensure either that all engineering data needed to support the system can be delivered under that DID or that any additional applicable DIDs be cross-referenced to DI-E-7031. (OPR: HQ USAF/RDX)

6. That guidelines for review of engineering data development be incorporated in the AFSC/AFLC supplement to AFR 800-34. (OPR: HQ USAF/LEY)

7. That MIL-STD-1521A be revised to include engineering data development as a review item. (OPR: HQ USAF/RDX)

Acquisition Data

1. That AFR 310-3 be revised to include a general update and emphasis of a policy that the Air Force shall obtain adequate acquisition data packages for selected items as part of acquisition programs. (OPR: HQ USAF/RDX)

2. That the Air Force request revision of MIL-STD-885B, Procurement Data Packages, to correlate it with engineering data policy, and provide updated guidance for the content of acquisition data packages. (OPR: HQ USAF/RDX)

3 Attachments

FORMS AND CATEGORIES

(MIL-D-1000, Drawings, Engineering and Asociated Lists, 1 Mar 65)

Intended Use Categories:

Category	Use	Data	Item	Description
A	Design Evaluation			DI-E-3145
B	Interface Control			DI-E-3145
C	Service Test			DI-E-3146
D	Logistics Support			DI-E-3147
E	Procurement (Identical Item)			DI-E-3151
F	Procurement (Interchangeable Item			DI-E-3151
G	Installation			DI-E-3148
H	Maintenance			DI-E-3149/51
I	Government Manufacture			DI-E-3149/51
J	Interchangeability Control			DI-E-3150

Forms of Drawings:

Form 1	Drawings to Military Standards
Form 2	Drawings to Industry Stndards (Partial Military Control)
Form 3	Drawings to Industry Standards (Minimum Military Control)

LEVELS
(DOD-D-1000B, DRAWINGS, ENGINEERING AND ASSOCIATED LISTS, 28 OCTOBER 1977)

Level 1, Conceptual and Development Design

Conceptual Design

To verify preliminary design and engineering and confirm that the technology is feasible and the design concept has utility against stated military requirements in order to reduce technical uncertainty.

Development Design

Developmental design is directed toward hardware, for test or experimentation and provide for a specific design approach. In addition, the data shall be suitable for analytical evaluation of the inherent ability of the design to attain the required performance.

Level 2, Production Prototype and Limited Production

Designs that approach the final form factor, employ standard parts (or non-standard parts approved by the agency concerned), take into consideration full military requirements with respect to performance, and can support limited production of models in final form and suitable for field test, deployment and logistic support.

Level 3, Production

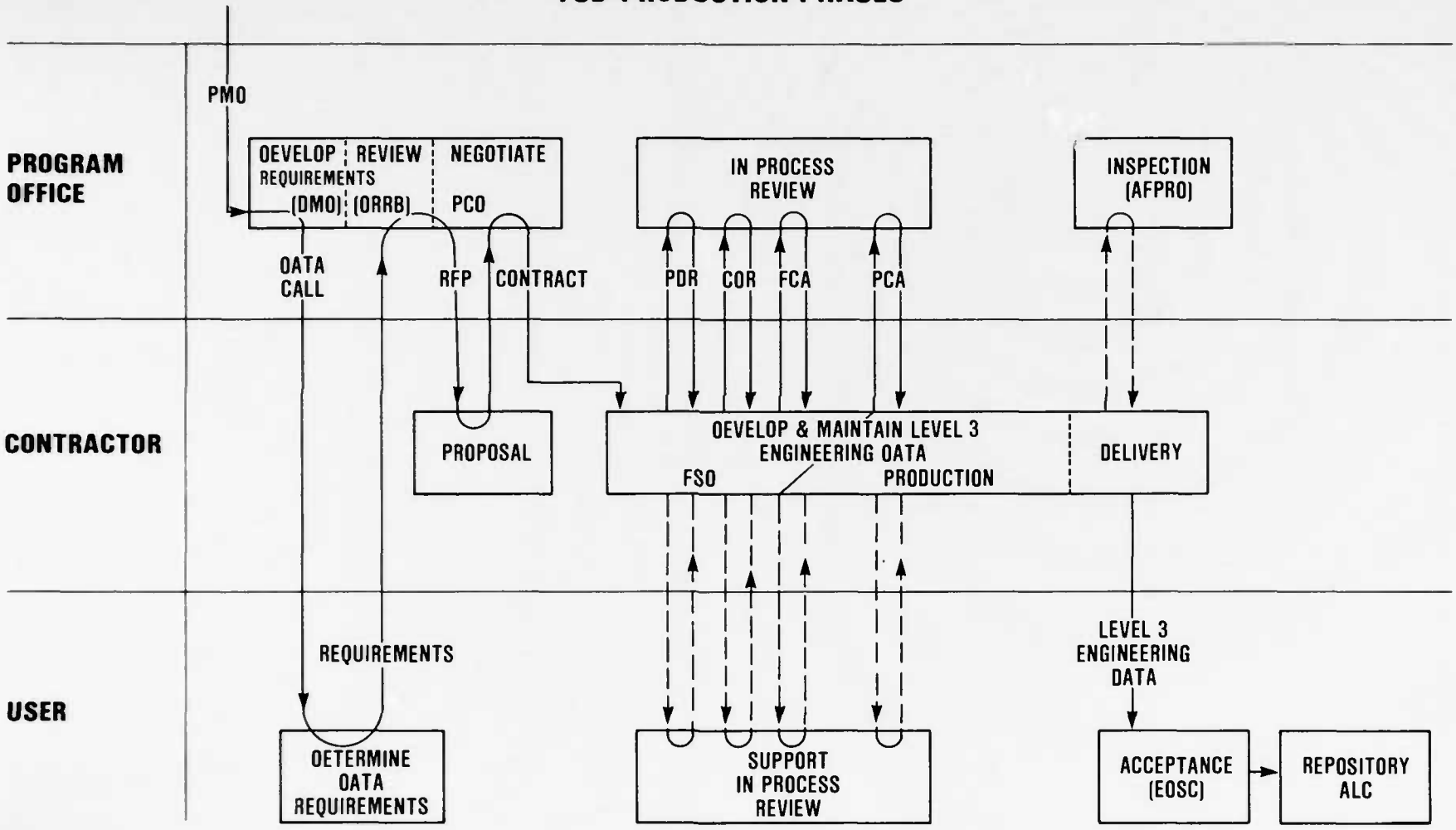
To provide engineering data for support of quantity production to permit competitive procurement for items substantially identical to original items. These engineering drawings reflect technical data possessing the highest level of confidence.

Data Item Description

Level 1	
Level 2	DI-E-7031, Engineering Drawings and Associated lists.
Level 3	

ENGINEERING DATA REQUIREMENTS PROCESS

FSD-PRODUCTION PHASES



FACTORS TO BE INCLUDED IN AFSC/AFLC SUPPLEMENT TO AFR 800-34

The AFSC/AFLC supplement to AFR 800-34 should be a comprehensive guide for the acquisition of engineering data. It should include the following:

1. Delineation of responsibility and authority for the acquisition of engineering data in Air Force acquisition efforts.

2. Detailed guidance in the description of engineering data applicable specification and standards, and guidance for their use.

3. Guidance on tailoring DOD-D-1000B to provide standardized procedures.

4. Requirements, description of content, and examples of an Engineering Data Management Plan.

5. Guidance and direction for incorporation of engineering data in program planning.

6. Detailed discussion and guidance on preparation of solicitations and contracting document inputs including:

   a. Guidelines for statement of work preparation.

   b. Guidelines and applicable Data Item Descriptions (DIDs) to be considered in obtaining engineering data.

7. Checklist to be used in the evaluation of engineering data development.

8. Requirement for and duties of EDMOs at System Program Offices and Air Logistics Centers (ALC) (AFR 800-34 does not specify an ALC supporting EDMO but para 6.e suggests there is a requirement for one).

9. Provide policy and procedures for using deferred methods of delivery of engineering data.

DELIVERY OF DATA

PROBLEM

In many system acquisition programs the Air Force directs delivery of engineering data and acquisition data packages sooner than needed and while designs are still unstable. This results in maintaining and using inaccurate data as well as incurring unnecessary costs of maintaining and updating the data.

DISCUSSION

Engineering data is generated during development of the hardware item and forms the master baseline documentation for the system. As the system progresses through the acquisition cycle, the engineering data evolves to maturity. The progressive definitions of levels of engineering drawings in DOD-D-1000B, Drawings, Engineering and Associated Lists, 15 October 1975, recognize this evolution. Level 1 depicts the conceptual and developmental design; Level 2 the production prototype and limited production design. These two levels are used primarily by HQ AFSC for engineering design and configuration management purposes. Level 3 drawings are production drawings that are adequate to support quantity production of items substantially identical to the original items.

Methods of Delivery

There are several options for delivery of data outlined in AFR 310-1, Management of Contractor Data, 8 March 1983. These include deferred ordering, deferred delivery, and deferred requisitioning of engineering data (DRED). In addition, AFSCR/AFLCR 310-2, Deferred Requisitioning of Engineering Data, January 1969, contains additional guidance on the DRED procedure. Also, the Defense Acquisiton Regulation addresses deferred ordering and deferred delivery .

Deferred ordering defers selection and delivery of data until actual requirements are determined and is not priced or listed on the DD Form 1423, Contract Data Requirements List. The deferred delivery technique places the data requirement on the DD Form 1423, but the times and place of delivery are deferred. When the times and place are determined, the DD Form 1423 is revised by contract amendment to establish the requirement and most often the price of the data is negotiated at this time. With the DRED procedure, the basic contract specifies the range and kinds of engineering data the contractor is obligated to deliver when ordered by the government. This also permits the contractor to retain the master temporarily, in the prescribed format, and to deliver the copies direct to the user at the time they are specifically requisitioned under the prescribed order conditions and pricing terms. In all these methods, however, the underlying policy is that the data will be delivered to the Air Force sometime in the production phase of the program.

Current Procedures

Traditionally, contracts tie delivery of engineering data to a specific event during the production phase. For example, a B1-B production contract specifies delivery of Level 3 engineering data 60 days after initial operational capability (except for Interim Contractor Support Items which should be delivered 30 days prior to transition to organic support). Similarly, the delivery of T-46 Level 3 engineering data is tied to 60 days after delivery of the first production aircraft. In both of

these cases delivery of data is tied to program events without being a function of specific needs for the data. When data is delivered in this manner, it requires costly maintenance and updating effort within the Government to be usable. It also duplicates the engineering data file the contractor must maintain for program manufacturing and management purposes. Both the B1B and T-46 programs will have several additional years of production remaining after complete Level 3 engineering data is delivered. AFLC will not have occasion to use most of this data for several years because the contractor and SPO will be doing most of the functions the data supports, such as configuration control. In both programs, however, tens of thousands of drawings will have to be maintained both at the contractor and the AFLC repositories.

Air Force delivery policy is contained in AFR 800-34, Engineering Data Acquisition, 11 April 1983. It encourages the use of the DRED technique, but also recommends a firm termination date with a specified delivery schedule. However, for many programs, particularly major programs with large prime contractors, it might be prudent not to specify a delivery schedule, but to contract for maintenance of the engineering data base during post production support with the Air Force requisitioning it based on a specific need. This appears particularly attractive for systems with long production runs, long term modification and upgrade potential, and those with high levels of contractor interest and involvement. This will insure current data is used and eliminate the duplicative system with the attendant additional cost to the Air Force. Further, this procedure would permit the pricing of the development and maintenance of the engineering data base as an option by the contractor upfront, as part of his proposal and could be made a subject of negotiation, especially during competition. The cost to the Air Force for delivery of specific engineering data would simply be in the administrative reproduction and mailing costs. This procedure would be applicable for all uses of data, not limited just to Acquisition Data Packages (ADP) for spare parts.

Pricing and Development of ADPs

ADPs for the most part, consist of Level 3 engineering data developed and maintained by the contractor and which can be priced upfront. However, in some cases, additional data such as testing and packaging information will be needed to complete an ADP. This data is not known until the design becomes stable, usually well after contract award. Similarly, which items will be spared is not determined until the Source, Maintainability and Recoverability (SMR) coding occurs, again usually after contract award. When the spares are identified and the design becomes stable, the contractor can then be required to identify which spares require information in addition to Level 3 engineering data, the specific additional data needed, and the price for data. On those ADP's where the government elects to exercise the option to purchase the additional data, the contractor must also be required to develop and maintain that additional data, deferring its delivery until requested by the Air Force. A contract amendment would be necessary to formalize these requirements after the spares determination is made. The Procurement Method Coding (PMC) conference is one point where both spares requirements determination and a stable design are often available. This concept insures readily available, complete, and updated ADP's at a known price and also allow improved planning and budgeting procedures.

It must be clear that contracting for post production data base maintenance is one additional option for determining delivery of data, and will not be appropriate for

all programs. Near-term delivery of the total Level 3 package may be prudent when dealing with small, less stable contractors and on small programs with limited life expectancy. The decision on delivery of engineering data and acquisition data packages must be based on thorough analysis of need. These decisions should be made as early as practical in the development phases of a program and the resultant delivery strategy must be included in appropriate program management planning documentation. Policy for delivery of data should be included in AFR 800-34.

RECOMMENDATIONS

1. Change AFR 310-1 to include a Deferred Requisition of Engineering Data (DRED) option permitting contractor maintenance of engineering data through post production to be provided on demand of the Air Force. (OPR: HQ USAF/RDX)

2. Change AFR 310-3, Acquisition and Management of Data for Follow-on Procurements, 4 Nov 1968, to incorporate Acquisition Data Packages (ADPs) pricing, development, and delivery procedures for acquiring data needed for ADP's which exceeds the previously contracted and priced Level 3 engineering data. (OPR: HQ USAF/RDX)

3. Require Command Supplements to AFR 310-1 to include specific implementing guidance on engineering data and acquisition data package delivery options. (OPR: HQ USAF/RDX)

COST OF ENGINEERING DATA

PROBLEM

The true cost of data (including engineering data needed for acquisition of spare parts) on past and current systems, is unknown, therefore trade-off decisions are made which can result in inadequate data for competitive acquisition of spare parts.

DISCUSSION

It is frequently alleged that data costs too much and that adequate data is not bought because of prohibitive costs. More precisely, engineering data bought is inadequate because of cost cutting efforts, which ultimately restricts competitively acquiring spares. The AFMAG analysis reveals the Air Force often does not know the true data costs and almost always does not know the cost of engineering data. For example, the Program Management Directive for the F-15 required the acquisition of aircraft, specific hardware items, "and data". Within "and data" are a variety of data (including engineering data for procurement of spare parts) for various uses. Data on the original F-15 contract were not separately priced (NSP) and preparation costs were included in the hardware Contract Line Item Number (CLIN). Delivery of the data was unpriced and deferred. The current F-15 proposed data prices include effort associated with software tapes. The engineering data price quoted for FY 73 through FY 82 is approximately $47M. The price for software cannot be extracted from existing documents and this is not unique to the F-15, but to other weapon systems as well. Without knowing the cost of engineering data, rational decisions are impossible.

Data Pricing of Solicitations and Contracts

The three current approaches for addressing the pricing of data are: (1) not Separately Priced (NSP) but included in the pricing of hardware (2) lot pricing of the Contract Data Requirements List (CDRL); and (3) separate pricing of individual data items. Each is discussed below in the terms of solicitation and contracting practices:

1. Not Separately Priced (NSP) But Included in the Price of Hardware. This data pricing method occurs most frequently and totally obscures visibility of data costs:

a. Solicitation: Separate pricing of data is not required by the solicitation and proposed price of the data is included in the price of the hardware.

b. Contract: The contract includes an unpriced Contract Line Item Number (CLIN) for delivery of data in accordance with the CDRL. For example: The solicitation for the B-1B did not require separate pricing of data and data pricing was not addressed during negotiations. One unpriced CLIN was established for data delivery in accordance with CDRL and all cost of the data was included in another CLIN which is associated with the equipment.

When data is NSP, its cost becomes buried in the hardware CLIN. The data cost is then pro-rated across hardware items often causing the individual hardware item cost to be artifically inflated.

2. Lot Pricing of the Contract Data Requirements List (CDRL). This is the next most frequently used approach and provides the cost of all data, but does not breakout the cost of engineering data:

a. Solicitation: Separate pricing (hardware vs CDRL) required by the solicitation. The proposed price for the CDRL (all data) is one "lot price."

b. Contract: The contract includes a priced CLIN for all data at a "lot price." For example, all data for the "Pave Tack" program was lot priced in the contractor's proposal and appears as one CLIN, lot priced, on the contract.

When data is separately priced by this method (total CDRL data cost segregated from hardware cost), total data is frequently used as a negotiation tool (i.e., if the overall price quoted for the CDRL appears too high, agreements between the Program Manager and the contractor may be made to reduce the overall price (consequently reducing data quantity, quality or format) without regard to the individual data items. Conversely, the agreement may be to delete single data categories (such as engineering data) to reduce the overall CDRL price.

3. Separate Pricing of Individual Data Items. This approach provides a clear view of the cost of data items and can be accomplished by the application of DAR 3-814 "Estimated Data Prices (DD Form 1423)."

a. Solicitation: Separate pricing of specific groups or each CDRL data item required by the solicitation. In this mode a separate price would be proposed for each category (engineering data) or for each individual data item (e.g., DI-E-7031). DAR 3-814 is included in the solicitation.

b. Contract: Using this method, the contract may then include a priced CLIN for specific categories of data using a lot price for each category. For example, engineering data was defined in Statement of Work tasks and DI-E-7031/M for the NGT (T-46) Request for Proposal. The proposal instructions contained a requirement for each DD Form 1423 to be separately priced; however, only certain items were subjected to fact finding and negotiations. Engineering data per se was not addressed as a separate element. Data as a whole (which includes design and parts control drawings (levels 1 and 2) was separately priced, as a lot, under one CLIN. Another CLIN separately priced technical orders and level 3 drawings. This CLIN was priced at $3.34M.

It is rare for individual data items to be separately priced (segregating data from hardware and further segregating data by categories): however, this strategy would increase the visibility of engineering data and, as a consequence, management decisions would be visible to all parties and the impact on out-year support and spares acquisition evaluated. It is not recommended that a separate CLIN or sub-CLIN be established for each DD Form 1423. This would create unnecessary administrative difficulties on contracts and hamper the efforts to visualize data. Since there is no industry wide standardized system to address the cost of data, or engineering data, development of an overall government standard for data pricing is not feasible. However, it is feasible to separately price data for individual acquisition programs using criteria or rationale for pricing data

based on certain known factors. For instance, the T-46 program was able to solicit and obtain separate pricing for Source Selection use and subsequently transfer the pricing to a combined contract line item for Technical Orders (TO) and Engineering Drawings. This division could have been extended to segregating between TOs and Engineering Data.

Data Cost Evaluating Factors

There are no formal Government cost factors for estimating or negotiating data prices. As a consequence, the Air Force is unable to adequately estimate the value of the Air Force requested data or evaluate the contractor's proposed price for the data. Six factors bear directly on this issue: (1) Air Force data users are not required to consider the cost of the data they are requesting; (2) historical information on which to estimate and evaluate data costs are limited; (3) data is not a major consideration for contract award resulting from competition; (4) industry standards for estimating costs vary; (5) In the mid to late 1970's, the Air Force Institute of Technology (AFIT) compiled a document (LS-24) containing variables which could be applied for analyzing the cost of technical data; (6) experienced, trained personnel for estimating and evaluating data prices are limited. Each of these factors is addressed below:

1. Air Force data users are not required to consider the cost of the data they are requesting. Further there is no requirement for data costs to be considered during the Data Requirements Review Board (DRRB), therefore, the monetary value of data to the Government for any one program is generally unknown. AFR 310-1, "Management of Contractor Data", 8 March 1983, provides a standard AF Form 585 "Contractor Data Requirement Substantiation" to be used for substantiation of users data requirements. Previously, different formats were used by different organizations, some of which required a cost estimate. While the standard form is useful, it does not provide for a cost estimate of the requested data. In the past, the requirement to provide an estimated cost of individual data items (e.g., how much does the user consider a reasonable amount for the data based on its intended use) was not enforced and was rarely a major topic of the DRRB. At this time, it is recognized that the data estimates are, at best, a compiliation of individual experience factors plus limited use and cost history. In time, given that good industry estimates, price, and cost information can be gathered, compiled and disseminated, the confidence level for these estimates should increase.

2. Historical information on which to estimate and evaluate data costs is limited. Actual records are few and inaccessable. Historically, any data pricing information received in response to a solicitation is regarded as sensitive and is included in Source Selection files, stored in a controlled environment; thus discouraging subsequent programs from using the information to formulate cost estimating factors.

3. Data is not a major competition consideration for contract award. There are no set rules for evaluation of data management requirements nor expressing a need to separately price data during competition. Data management is usually included as a factor (and sometimes as an item) under the more general heading of "Management" in Source Selection Criteria and is rarely a consideration for contract award. In fact, there is evidence of only one instance (an SM-ALC communications equipment acquisition, "Pacer Bounce") where the price of engineering data was included as a criterion for contract award.

4. Industry standards for estimating costs vary. There are no set rules governing industry's method for proposing cost of data. There are differences in business practices, differences in accounting systems, differences in use of factors or rates, differences in application if effort is common to more than one proposed task, and differences in data preparation methods. The lack of a standardized industry procedure futher obscures the cost of engineering data. Some companies absorb the cost of drawing preparation in cost areas other than the data items (i.e., Engineering, General and Administrative and Overhead) and show only the costs of reproduction as the total cost for the delivery of data to the Government. Other companies include the cost of drawing preparation, and meticulously estimate according to the size and number of drawings to be generated and changed, and the number of drawings that need to be redrawn. Recognizing that contractors use different costing methods for data estimates, the key is to determine what method is being used. Once it is understood how the data is being priced, it is possible to estimate data cost. There is evidence available to substantiate that, on a case-by-case basis, criteria, rationale, or standards for the separate pricing of data can be devised; industry can and does respond to Air Force requests for separate pricing of individual data items; and data prices can be segregated at least by groups.

5. In the mid-to-late 1970s, AFIT compiled a document (LS-24) containing variables which could be applied for analyzing the cost of technical data. This effort was the basis for an Air Force Business Research Management Center Project N80-15 and needs refinement and updating (a summary of this research project is at Attachment 1). This is not being pursued currently as a priority project due to a lack of funds. A representative of the Air Force Business Research Management Center indicated that "based on the objective, a modest estimate would be one man-year at approximately $75 to 100K."

6. Experienced, trained personnel for estimating and evaluating data prices are limited. There is no systematic way of applying skilled personnel for source selection and there are no specific training courses or incentives for developing future expertise. The responsible individual varies with each program. In some instances, the cost of data will be addressed by the data manager or individuals from Comptroller or Pricing organizations, and in others the Principle Contracting Officer. Experience is essentially the only factor considered, since no specific formal training courses are available. The System PPM 370 Data Management course at AFIT does provide some limited instruction, but no comprehensive insight into pricing of technical data.

Centralized Data Cost Data Base

There is a need for establishing a central location where historical Government data estimates, contract data prices, industry's data cost estimating procedures, and actual data cost information can be received, stored and utilized by the Air Force. The establishment of a centralized data cost data base will:

1. Provide the necessary visibility to aid in justifying the data acquisition requirement.

2. Allow the Source Selection Evaluator to ascertain, to a degree, the type of data the offeror expects to furnish to meet contract obligations.

3. Form the basis for meaningful negotiations.

4. Would (in time) permit the establishment of a solid data base for determining government data estimates and costs.

RECOMMENDATIONS

1. Require an estimated cost of each DD Form 1423 during the Data Requirements Review Board (DRRB). To do this, amend AF Form 585 to require an Air Force estimated cost as well as substantiation of the requested data. (OPR: HQ USAF/RD)

2. Supplement the DAR to require mandatory use of DAR 3-814 "Estimated Data Prices (DD Form 1423)" in all Air Force solicitations. This would provide separate pricing of each data item of the solicitation CDRL. In addition, each data item should require a separate DD Form 633 to shred-out individual data costs. This will provide insight into both individual data prices and the contractor's cost estimating and accounting procedures which can be utilized in the formation of a data cost base. (OPR: HQ USAF/RD)

3. Revise source selection policy to include data management (including the CDRL and its associated costs) as a major evaluation scored item. (OPR: HQ AFSC/PM)

4. Increase the priority and provide funds for Air Force Business Research Management Center Project N80-15 "Determining the Cost of Technical Data." (OPR: HQ USAF/RD)

5. Expand the present AFIT course PPM 370, Data Management, to provide indepth data estimatng and pricing training. (OPR: AFIT)

6. Define a central location where the information gathered through the implementation of Items 1-5 above can be compiled and refined to form a data cost data base. (OPR: HQ USAF/LEYE)

7. Use three separate "lot" priced CLINs on negotiated contracts for 1) Technical Orders, 2) Engineering data, and 3) Management Data. (OPR: HQ AFSC/PM)

1 Attachment

Summary AF Business Research Management Center Project N80-15

Topic: DETERMINING THE COST OF TECHNICAL DATA

Objective: Develop an improved methodology for determining the cost of technical data which addresses all variables affecting data costs. Methodology must have practical application on a day-to-day basis in the acquisition environment.

Background: Realistic cost estimating for data to be acquired on Department of Defense (DOD) contracts has been an area of concern for many years. The chief problem with costing technical data is the lack of interest in and knowledge of data on the part of most individuals involved in the acquisition process for the DOD. Since estimates of DOD data acquisitions are usually no less than $2 billion per year, all involved individuals must perform a highly professional and thoroughly proficient analysis on each data item sequence number specified on the DD Form 1423.

A practical methodology for determining the cost of technical data (including software and software documentation) does not exist today. Different types of technical data may require different techniques to build an accurate cost estimate. For example, a technique that lends itself to estimating the cost of computer software may not be appropriate for estimating the cost of technical manuals. In addition, a host of variables must be considered in any estimating methodology. These include:

1. Completeness and adequacy of the data requirement definition.
2. Availability of input data.
3. Degree of quality expected.
4. Complexity of this data.
5. Format of the data.
6. Skill level of the user for certain data.
7. Type and size of specific submission (hard copy or microfische).
8. Number and complexity of revisions.
9. Number of copies required.
10. Leadtime to required submitted date.
11. "Price-Group" from DD Form 1423 that the data falls into from the contractor's standpoint."

Attachment 1

ACCEPTANCE OF ENGINEERING DATA

PROBLEM

The Air Force procedures for accepting engineering data are inadequate resulting in the Air Logistics Centers (ALC) regularly experiencing missing, incomplete, inadequate, or restricted engineering data for compiling spare parts bid sets.

DISCUSSION

The Air Force's central repository, the Engineering Data Support Center (EDSC) located at Wright-Patterson AFB, is responsible for formally accepting engineering data, and distributing it to the appropriate ALC for further use including the ALC's preparation of bid sets for competing spare parts. However, the EDSC lacks the technical expertise to know if the data delivered is all that is needed for competing spare parts and if the content of the data is adequate for its intended use. The Air Force manages over 834,000 parts. Procurement Method Codes (PMC) have been assigned to approximately 364,000 of these parts. Approximately 16% of the source coded parts, about 57,000, have data which are illegible, inadequate, or incomplete. As a consequence most of these spare parts are invariably then purchased from the prime contractor. In addition, the EDSC is unable to determine if all ordered data is actually received or if the limited data rights legends are legitimate. The ALC repositories, in some cases, have also been unable to fill requests for missing data and have been unable to determine if the data was ever delivered.

Over the years, engineering data has been marked with "limited rights in data" legends when in fact the data is not limited. This data is accepted and no challenge as to the validity of the legends is made. The Contract Administration Office (CAO) has DAR responsibility to evaluate and monitor contractor's procedures concerning restrictive markings on technical data, but has not been fully utilized in an authentication role to validate the accuracy of restrictive markings. This responsibility is normally accomplished under management system evaluation concepts; it is policy-procedure-compliance oriented. CAOs are seldom requested by buying offices to initially, or subsequently, review restrictively marked data for authentication and validation. The Air Force data users must assume that the legends are correct.

The causes of the problem of accepting inadequate engineering data are related to the process of defining, contracting, developing, reviewing, and delivering the engineering data. The formal acceptance procedures of checking for only format and legibility are predicated on the assumption that the development and production processes in and of themselves ensure the adequacy of the technical content of the engineering data for its intended use including acquisition of spare parts.

Current Methods for Accepting Data

The Systems Program Office (SPO) with the help of AFLC engineers attempt to review the technical content and useability of the data as it is being developed through a series of design reviews. However, the SPO is primarily concerned that the data reflect the hardware as built. The Physical Configuration Audit which occurs at the beginning of production is the main verification that the data

accomplishes this. However, development time schedules usually do not permit very thorough reviews of the adequacy of data for reprocurement. In actual practice, verification that the data is actually useable for competing spares buys may not occur until many years after the data has been developed: When the ALCs prepare bid sets to buy spares, and subsequently when prospective vendors, other than the original manufacturer, actually attempt to build and test them.
The EDSC's inability to know many times what data is in the repository, or when it is to be delivered, stems from the fact that a data list and status schedule have not been placed on contract. Such a data list and schedule may not have been originally requested by the AFLC organization, or may have been deleted by the SPO during the Data Requirements Review Board. Data Item Descriptions (DIDs) exist that can be placed on contracts to enhance the ability of the EDSC to track data submissions/delivery. AFR 800-34, Engineering Data Acquisition, 11 April 1983, has established the requirement that data lists be included on all programs, and DI-E-30142, the Master Engineering Document List, is a DID that can fulfill this requirement, however, it is not frequency used. The SPO should also provide data delivery schedules to the data recipients (including the EDSC) in order for them to determine when the data is due in and available.

The Government performs two tasks to accept the data. The CAO inspects the data on a sample basis before shipment and the central EDSC inspects 100% of the data upon delivery. However, both organizations accomplish this task by reviewing the data only for format and legibility: The data is accepted if the appropriate MIL-STDs are met. No check is made of the useability of the data for reprocurement purposes.

The EDSC reviews 100% of the data upon receipt because experience shows that some data is illegible and therefore unuseable and can only be replaced by the contractor. The best time to replace this data is while the contractor is still contractually responsible. Records of the EDSC showed that 4.7% of the data received from July 1982 through July 1983 was illegible and therefore rejected. The review also revealed that other data is incorrectly formatted and likewise unuseable. However, most of this data is corrected at the EDSC by making key punch corrections of the aperture cards.

The content of the data cannot be effectively verified at the EDSC. It is not staffed with the technical or engineering personnel to review the adequacy of the data, nor is it responsible for that function. The problem of inadequate and unuseable data, because of content, must be resolved at the source, at the contractor's facilities. In order for the engineering data to be useable for the ALC, the formal acceptance of engineering data must account for the steps taken in developing and demonstrating the useability of the data.

An analogy can be made between preparing and inspecting data and the steps taken in developing, demonstrating and delivering the hardware. During development, the hardware is tested to determine if it meets the needs of the user. When it has been tested sufficiently, acceptance procedures are agreed upon and the contractor builds the hardware, then verifies it against the acceptance procedures before delivery. The Plant Representative inspects for contractor's compliance with the established procedures and plans.

Criteria to Verify Useability

In order for engineering data to be developed and inspected, to the extent of verifying useability, by the CAO the Air Force must functionally define the criteria that the data must satisfy and state this in the contract. The contractor must, in turn, develop a specific program to be included in his management planning, that will provide for the development of engineering data meeting the criteria. The SPO and CAO should monitor the development of the data so they can establish acceptance criteria that assures useability of the engineering data (when it is ready for delivery). The Program Office and Plant Representatives must include appropriate responsibilities in their memorandum of agreement.

Ensuring that programs are managed to produce adequate engineering data requires that the proper instructions be included in Program Management Directives and other program documents. AFR 800-34 provides the basis for establishing plans for managing engineering data acquisition, as well as establishing criteria for reviewing the development. Provisions must be included in the AFLC/AFSC supplement to AFR 800-34 that require Program Offices to establish criteria for insuring engineering data is useable for its intended purpose...reprocurement, repair, training.

The preceding discussion and the following recommendations focus on actions to be taken during early acquisition phases of a program. It is recognized, however, that action must also be directed to resolving existing data deficiencies which preclude possible competition. These actions normally take place during breakout screening reviews. A more detailed discussion of these actions can be found in the issue paper entitled "Competition Advocate" on page 144 of this volume.

RECOMMENDATIONS

1. Require DI-E-30142, Master Engineering Document List, and delivery schedules be placed on contracts calling for delivery of engineering data. Include this policy in the AFSC/AFLC supplement to AFR 800-34. (OPR: HQ USAF/LEY)

2. Include specific direction in the AFSC/AFLC supplement to AFR 800-34 requiring the System Program Offices (SPO) to include criteria in the contract for accepting engineering data that verifies its useability. Include in the Statement of Work the requirement for the contractor to develop a program, to be included in his management planning, that will provide for the development of engineering data meeting the SPO criteria. (OPR: HQ USAF/LEY)

3. Include in the memorandum of agreement between the Program Office and the CAO that the CAO shall monitor the development of the contractor's program; and the SPO should establish acceptance criteria that account for the useability of the engineering data. (OPR: HQ AFSC/SDX)

4. Incorporate in the Air Force DAR supplement that the memorandum of agreement between the program office and the CAO includes procedures to evaluate 100% of restrictively marked data. The original copy of each restricted document, drawing, etc. should be required to have government certification thereon to "validate" the Government's acceptance of such markings. Without this certification, restrictively marked data should be considered for formal challenge by the Government. The data should then be properly marked as determined by the results of the challenge or the additional investigation. (OPR: HQ AFSC/SDX)

IDENTIFICATION OF ACTUAL MANUFACTURERS

PROBLEM

The Air Force often does not know the actual manufacturer of a part. When this exists, replenishment spares must be acquired from the design source rather than the actual manufacturer, allowing the design source to wrap his costs around the actual manufacturer's costs without adding value.

DISCUSSION

When prime contractors or subcontractors subcontract fabrication of their own designs to sub-tier manufacturers (specialty houses, job shops etc.), visibility of the manufacturer is only as far as the firm that made the drawing. This eliminates the real manufacturer as a readily accessible source of replenishment spares.

There are various methods of recording the actual manufacturers which vary in acceptability and retrievability:

1. Inclusion on engineering drawings. This would provide a permanent record through listing manufacturing activities along with the design activity. Engineering drawings are the source most used by engineers and AFR 57-6 (DOD High Dollar Spares Breakout Program) screeners. They are also the master source for other system and equipment documentation.

2. Inclusion in the Logistics Support Analysis Record (LSAR) "H" Sheet (MIL-STD-1388, Logistic Support Analysis). This is a record of contractor generated source information for other documents such as provisioning documentation and technical orders. While it is provided to the Air Logistics Centers (ALC) for information purposes during acquisition, it does not remain in permanent records.

3. Inclusion in spares provisioning documentation (MIL-STD-1561A, Uniform Provisioning Procedures, DOD). This documentation, used during initial provisioning efforts, is perishable after provisioning is completed. It does not remain in permanent records.

4. Introduction of a new type of data requirement (AFR 310-1, Management of Contractor Data). This could provide a document specifically designed to furnish actual source information. However, it would also aggravate the proliferation of engineering oriented data items, and a new Air Logistics Centers storage, retrieval and usage scheme would have to be developed to accommodate it making it a less practical and economical than some other approaches.

5. Inclusion in Illustrated Parts Breakdown (IPB) technical orders. This would provide a readily accessible source of the information in permanent documentation.

RECOMMENDATIONS

That identification of actual manufacturer be placed on engineering drawings and implemented by:

1. Issuing the following proposed AF DAR Supplement 7-104.9(1):

   Identification of Technical Data and Qualified Sources and Actual Manufacturers. Technical data (as defined in the "Rights in Technical Data and Computer Software" clause of this contract) delivered under this contract shall be marked with the number of this contract, name of contractor, name of any subcontractor who generated the data, names of qualified sources and actual manufacturers of the item or component described in the data. (OPR: HQ USAF/RDC)

2. Revising DOD-STD-100C, Engineering Drawing Practices, to require that actual manufacturers' identifications by federal supply code for manufacturers (FSCM) be included on engineering drawings, along with those of design activities. (OPR: HQ USAF/LEY)

AN IMPROVED PROVISIONING PROCESS

PROBLEM

Provisioning is the process used to identify and buy the spares and repair parts needed for the initial operation and maintenance of a weapon system. The time available from award of a production contract until delivery of the first operational system is inadequate to achieve competition in the procurement process or to assure prices are fair and reasonable. In addition, long range supply support and spare parts acquisition strategies, which would lay the groundwork for competition and fair and reasonable pricing for follow-on procurements, are not developed and implemented.

DISCUSSION

Overview

The Air Force emphasis in weapon system acquisition has been on early production delivery and the establishment of organic support capability to coincide with initial fielding of the system. This has forced provisioning to be accomplished in an extremely compressed time frame. While some success has been achieved in having spare parts on hand, it has virtually eliminated our ability to establish competitive sources or assure fair and reasonable pricing of these spare parts. If the Air Force is to support weapon systems as they are delivered into the inventory and obtain spare parts at fair and reasonable prices using competitive procedures, some radical changes in the weapon system acquisition process will be required. We believe improved integrated planning and increased use of planned contractor support can help achieve these objectives.

Case Histories

The current standard Air Force Provisioning process is defined in DOD Directive 4140.40 (Provisioning of End items of Materiel), AFR 65-2 (Provisioning of End Items of Material), AFLCR 65-5 (Air Force Provisioning Policies and Procedures) and other related directives. In order to gain a thorough understanding of how that current process is actually planned and implemented on acquisition programs, we reviewed four programs - - F-15, F-16, B-1B and Peacekeeper. The result of this review was the establishment of a baseline scenario of the major milestones and events as they occur in the provisioning process. The following sections contain a summary of our review.

The F-15 Program

1. Program Schedule (see Attachment 1)

Concept definition for the F-15 began in May 1967 and finished one year later. Full Scale Engineering Development (FSED) began in December 1969 and extended through December 1975. In this phase, the contractor began work on the maintenance concept, identification of items and planning for supplementary provisioning documentation. The Air Force established a logistics support cadre at the contractor's plant in June 1969 and developed provisioning plans and strategies. However, the timing of this activity was too late to realize any competitive advantage that may have accrued prior to award of FSED. A

guidance conference on provisioning was held in May 1972 and contractual requirements established in July 1972. Provisioning documentation began to flow to the Air Force at this time. However, no orders were released until March 1973 when the DSARC production decision was made. In spite of the early start (eight months prior to award of production contract) on documentation, initial spares orders were still being released to the contractor in March 1973 - - only six months prior to the spares need date and eight months prior to first operational aircraft delivery. Eight months proved to be inadequate lead time and initial spares deliveries extended through June 1976 - - 21 months after the spares need date. It should be noted that 92% of the range of items required to support an F-15 at base level were delivered by the need date.

Physical Configuration Audit (PCA) on the F-15 was completed in November 1974 - - eleven months after the initial provisioning of the air vehicle was completed. While not the only factor, this undoubtably contributed to the 40,000 Design Change Notices (DCNs) processed between January 1973 and December 1976. Every item affected by these DCNs had to be reviewed again and appropriate revisions made to the initial provisioning actions.

2. Observations.

There are 324,000 items on the F-15. The provisioning process requires a whole host of decisions on each of these items: will the item fail frequently enough to warrant stockage (100,000 items were selected on the F-15); will the item be repaired or discarded upon failure; if repaired, what is the level of repair; where does the item need to be stored; is it already in government inventories; how many are needed; how will it be managed and who will manage it; will it be procured and, if so, from what source. Each of these decisions entails review and analysis of data and have subsets of supporting decisions that must be documented in some form. This process was not completed on the F-15 before the spares need date. As a result, alternate support arrangements had to be made on a crisis basis. The contractor provided a daily shuttle to the base to deliver critical parts and maintenance services. He likewise had to rob assets from the production line to provide many of these critically needed spare parts.

The preplanning and strategy for provisioning did not occur until after award of the FSED contract. Planning was basically limited to establishment of a resident Logistics Support Cadre and application of a new requirements model for depot repair items.

The Air Force was able to achieve some cost benefits from consolidation of production and spare parts requirements. This resulted from the contractor allowing us to take advantage of option clauses he had in contracts with his vendors rather than any preplanning on the part of the Air Force.

The F-16 Program

1. Program Schedule (see Attachment 2)

Concept definition for the F-16 began in August 1972 and extended through January 1975. FSED started in January 1975 and ended in December 1978. During this phase the contractor worked on generalized maintenance concepts and provisioning strategy. In September 1976, the Air Force established a Resident Integrated Logistics Support Activity and conducted a provisioning guidance

conference. Based on some lessons learned from the F-15 program, provisions were also made to incorporate requirements for avionics Interim Contract Support (ICS), Reliability Improvement Warranties (RIW), and Spares Acquisition Integrated with Production (SAIP) in the production contract. Unfortunately, the SAIP requirement was not passed down to the vendor level and the link between clauses in the production and spare parts contracts were weak. Provisioning documentation began to flow to the Air Force in January 1977 and orders for long lead time items were released in the same month. Initial provisioning of the air vehicle continued through September 1978 - - three months beyond the spare parts need date. Orders for these spare parts and the spare parts for the ground support equipment continued through December 1981. Deliveries started in March 1978 and are still being received. PCA for the F-16A was complete in August 1978 and in October 1978 for the F-16B. DCNs began in March 1977 and are continuing.

2. Observations.

The eighteen months between production contract award and the spare parts need date on the F-16 were inadequate to provision the 325,000 items in the system. The contractor had to rob assets from production to support spare parts requirements and provide expedited service to meet spare parts deliveries.

The pre-planning accomplished for avionics ICS and RIW provided a systematic method of support for the spare parts covered.

The SAIP program enjoyed limited success because the second and third tier sources had not been committed prior to production award and in many cases refused to participate.

The B-1B Program

1. Program Schedule (see Attachment 3)

Concept definition for the B-1B dates back to a series of studies which were undertaken on the original Advanced Manned Strategic Aircraft in the 1960's. The B-1A planning effort was re-energized in 1980 and completed in October 1981. Full Scale Development (FSD) will extend, concurrent with production, from an initial start in October 1981 through June 1986. The Statement of Operational Capability contains the outline for the maintenance concept being used by the contractor and will transition into repair level analysis on an item-by-item to be completed in December 1985. The production contract for a quantity of one with options for an additional seven aircraft was awarded in January 1982 - - two months after FSD started. Provisioning strategy and planning began concurrent with award of the production contract with documentation beginning in January 1983. The first orders were released in January 1983 with completion of ordering projected for January 1985. Deliveries are scheduled to begin in June 1984, with completion of deliveries projected for June 1985 - - three months after the spare parts need date. Physical Configuration Audit completion is projected for April 1985. Design Change Notices (DCNs) are projected to run from February 1983 through April 1986.

2. Observations.

The high degree of concurrency in the B-1B schedule in order to achieve early delivery of the weapon system severely constrains the time available for

development and implementation of an optimum provisioning strategy and plan. To the extent that efforts on the original B-1A program can be recouped, this situation may be offset. However, given our experience in the F-15 and F-16 programs, the B-1B provisioning program will require an extensive Air Force and contractor infusion of manpower and provisioning resources to successfully meet program objectives. For example, twenty-four months are projected to process 270,000 items through provisioning on the B-1B airframe. It took thirty-eight months to process 324,000 items on the F-15 and fifty-seven months to process 325,000 items for the F-16. In terms of delivery, the last airframe initial spares are projected to be received seven months after the end of provisioning on the B-1B. This occured after thirty months on the F-15 and is not yet complete on the F-16 after twenty-two months.

The Peacekeeper Program

1. Program Schedule (see Attachment 4)

Concept definition for the Peacekeeper program began in September 1978 and finished in December 1979. Full Scale Development started in September 1979 and is scheduled for completion in September 1987. The development of maintenance concepts, provisioning strategy and plans all preceded award of the full scale development contract. In addition, ICS management plans and rough order of magnitude prices for ICS have been requested from the major associate contractors. They have also been asked to identify a date when they must be notified of the Air Force's decision to use ICS so they will have time to gear up support for the operational program. The production contract is forecast to be awarded in May 1984, with first operational delivery in January 1986 and a spare parts need date of July 1986. Provisioning for the guidance and control system spare parts is scheduled to begin in March 1984 with immediate release of long lead items. Documentation will begin in January 1985 and the process is scheduled to be completed in August 1985. Orders will be completed by November 1985 with deliveries beginning in June 1986 and completed in July 1986.

2. Observations.

The schedule for provisioning, placing orders, negotiating prices and completing deliveries on the Peacekeeper program is extremely optimistic. The entire process is projected to be completed in twenty-eight months. Although the program objective is for full organic support, the planning for ICS has been well done and should prove invaluable in overall support of the operational program. This situation points up the benefit of integrated plans to assure spares availability at the time of first weapon system delivery.

Typical Planning Deficiencies in Provisioning

Planning for spares acquisition within a System Program Office (SPO) is generally assigned a relatively low priority. Consequently, contract requirements to support spares are limited in nature and usually are not considered prior to the production phase. As a result, initial spare parts are usually bought from the prime contractor using unpriced orders. Breakout and competition considerations get deferred to the replenishment process and pricing is determined on a statistical sampling basis, not by individual item.

Air Force regulations (AFR 800-series, AFR 65-2 and AFLCR 65-5) do not require competitive acquisition of initial spare parts. The current process for provisioning has essentially removed initial spare parts purchases from competitive considerations.

Provisioning technical documentation, engineering drawings and specifications are not effectively reviewed for adequacy, completeness, accuracy or data rights at time of delivery. As a result, much of the information upon which provisioning decisions are made is either not available early enough or not usable for later replenishment spare parts acquisition.

Data required for Logistics Support Analysis (LSA) in MIL-STD-1388, duplicates much of the Provisioning Technical Documentation called for by MIL-STD-1552. However, little progress has been made in integrating these requirements or in the use of LSA data to accomplish provisioning.

The Air Force emphasis has been on early weapons delivery and the establishment of organic support capability to coincide with the first delivery. This has forced provisioning to be accomplished in a compressed time frame. While some success has been achieved in having spare parts on hand, it has virtually eliminated our ability to establish competitive sources or assure fair and reasonable pricing of these spare parts.

There has been very limited preplanning of provisioning or the development of integrated spare parts acquisition strategies. Spare parts are generally not considered until after the production contract has been awarded; they are procured from the prime rather than direct or competitive sources; they are not integrated with production orders; and they are frequently delivered after established need dates.

Interim Contractor Support is required on most programs and can be useful in making up initial weapon system support shortfalls. ICS is also a useful technique for extending the time available for provisioning activities by assuring support to meet spare parts need dates. However, since ICS and provisioning planning is seldom integrated, as part of a long-range support strategy, we must acquire ICS on an urgent basis at premimum prices.

A Proposal for a Phased Support Program

1. If the Air Force is to support weapon systems at time of delivery into the inventory and obtain spare parts at fair and reasonable prices using competitive procedures, some radical changes in the current spare parts acquisition process will be required. Recognition must be given to the fact that spare parts cannot be adequately provisioned and delivered in the time available between award of a production contract and delivery of the first system.

2. To realize the benefits of competitive leverage and assure vendors as well as prime contractors are aware of and committed to the support plan, this plan must be developed and specified in the full scale development phase and carried through production. An integrated spare parts acquisition and support plan must be specified at the beginning of the FSD process which establishes, as a minimum, the following requirements:

Identify actual sources for spare parts, integrate production and spare procurements and establish pricing parameters.

Establish a phased contractor support plan with specific performance targets and related pricing parameters. The support plan should be tailored to individual program needs with options for various levels of performance and options on total logistics support, supply support or maintenance support. The plan should address preoperational (test), initial, and follow-on spares support requirements. In addition, it should include CFE/GFE and post production support planning.

Define an orderly process and schedule for effective transition from contractor to an organic support posture. The timing for transition should be geared toward Air Force ordering of spares coincident with completion of physical configuration audit and an anticipated two year lead time for delivery. Air Force assumption of support activities would overlap contract performance for periods up to a year, depending on the function, with actual turnover occuring with demonstration of a full organic capability.

Concurrent with the contractor performance of phased support, the Air Force would accomplish the standard provisioning tasks up to the release of spare parts orders. Orders would be released lead time in advance of the period planned for transition to organic support.

Attachment 5 provides a graphic representation of the milestones and events associated with this proposed support concept as it would relate to the overall program development, acquisition and fielding schedule.

3. The proposal outlined above is similar in many respects with the approach taken by the U.S. Navy to provision the F-18. It is too early to assess all of the economic and readiness aspects of this approach on the F-18 program. However, comparison of results in terms of initial weapon system support for the F-18 and the F-15 is shown on Attachment 6. We have already noted that use of contractor support on a planned basis for the F-16 proved to be very successful. Not withstanding these experiences, it may be desirable to further test the proposed approach before a full scale implementation is undertaken. A test implementation could be used to refine details of this concept as well as assess results in terms of cost and benefits in the area of system readiness and support effectiveness.

RECOMMENDATIONS

1. Establish weapon system baselines for each acquisition/modification program which define specific support requirements to be achieved at initial fielding and during the follow-on Operation and Support (O&S) phase. Include these requirements and identify the support resources required to achieve them in Program Management Directives (PMDs) beginning at the start of full-scale development. (OPR: HQ USAF/RD, OCR: HQ USAF/LE)

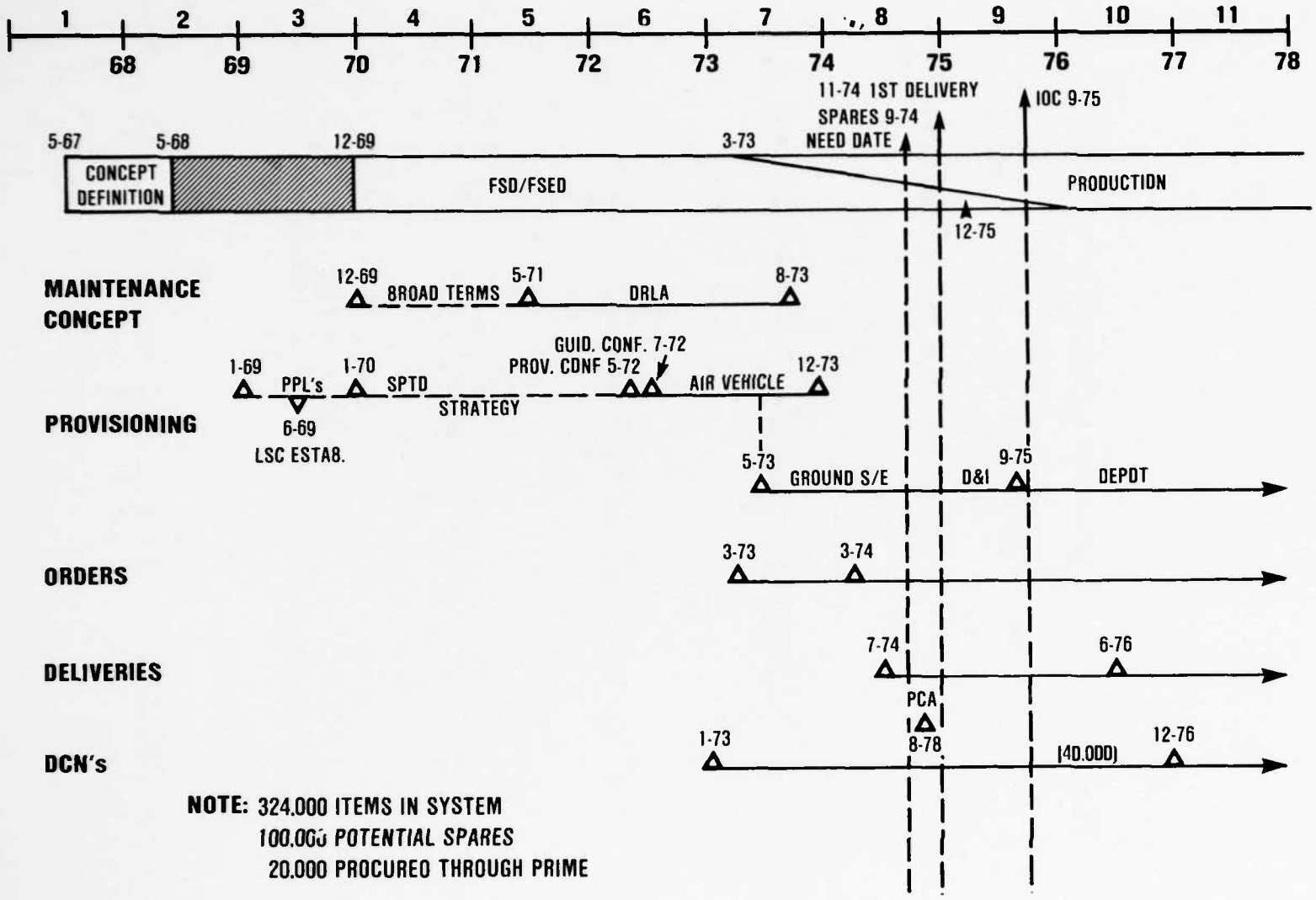
2. Develop an Integrated Spares Acquisition and Support (ISAS) plan for each acquisition program which defines spares support program requirements along with the specific spares acquisition strategies to be used. This document should be developed at the beginning of full-scale development and include plans for pre-operational spares support, the GFE/CFE program, breakout and competition goals, data requirements and acquisition, initial provisioning, Interim Contractor Support (ICS), and the replenishment spares acquisition strategy. These plans must also define the actions required for an orderly transition of the program to an organic support posture. (OPR: HQ USAF/RD, OCR: HQ USAF/LE)

3. Develop a Phased Support Program Concept and revise AFR 800-8, AFR 800-21 and AFR 65-2 (currently under revision as AFR 800-XX) to reflect this concept as an authorized method for initial support of Air Force weapon system programs. The concept should be defined to include the following features: contractor performance of selected provisioning tasks; a phased Interim Contractor Support (ICS) program for spares and maintenance with an orderly transition to an organic support posture; and deferred ordering/delivery of spares until major design changes are stablized and initial operational reliability and maintainability factors are established. (OPR: HQ USAF/LE, OCR: HQ USAF/RD)

4. Implement a Phased Support Program on some selected new acquisition programs and determine the economic and readiness benefits derived from application of this concept. (OPR: HQ USAF/RD, OCR: HQ USAF/LE)

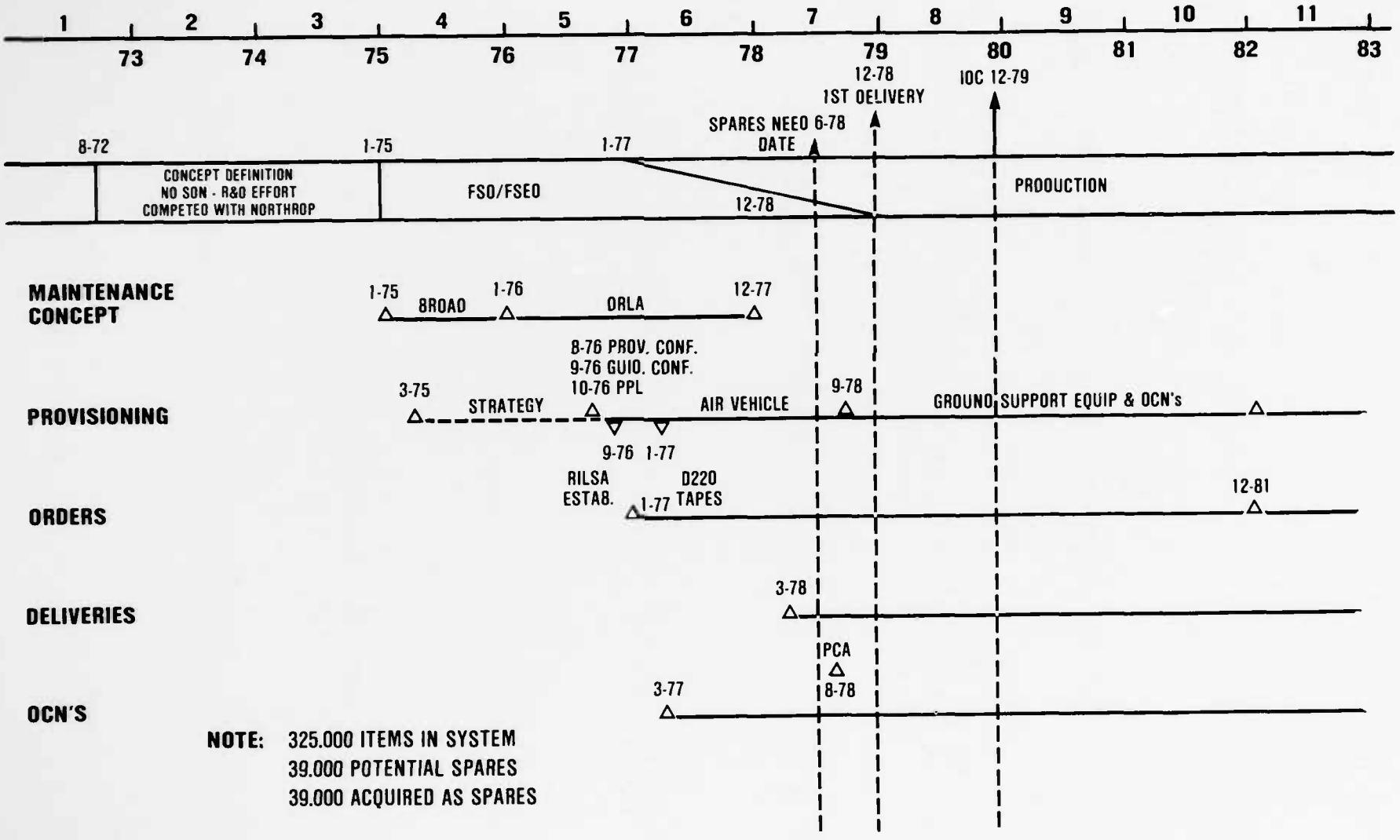
6 Attachments

F-15
MC DONNELL



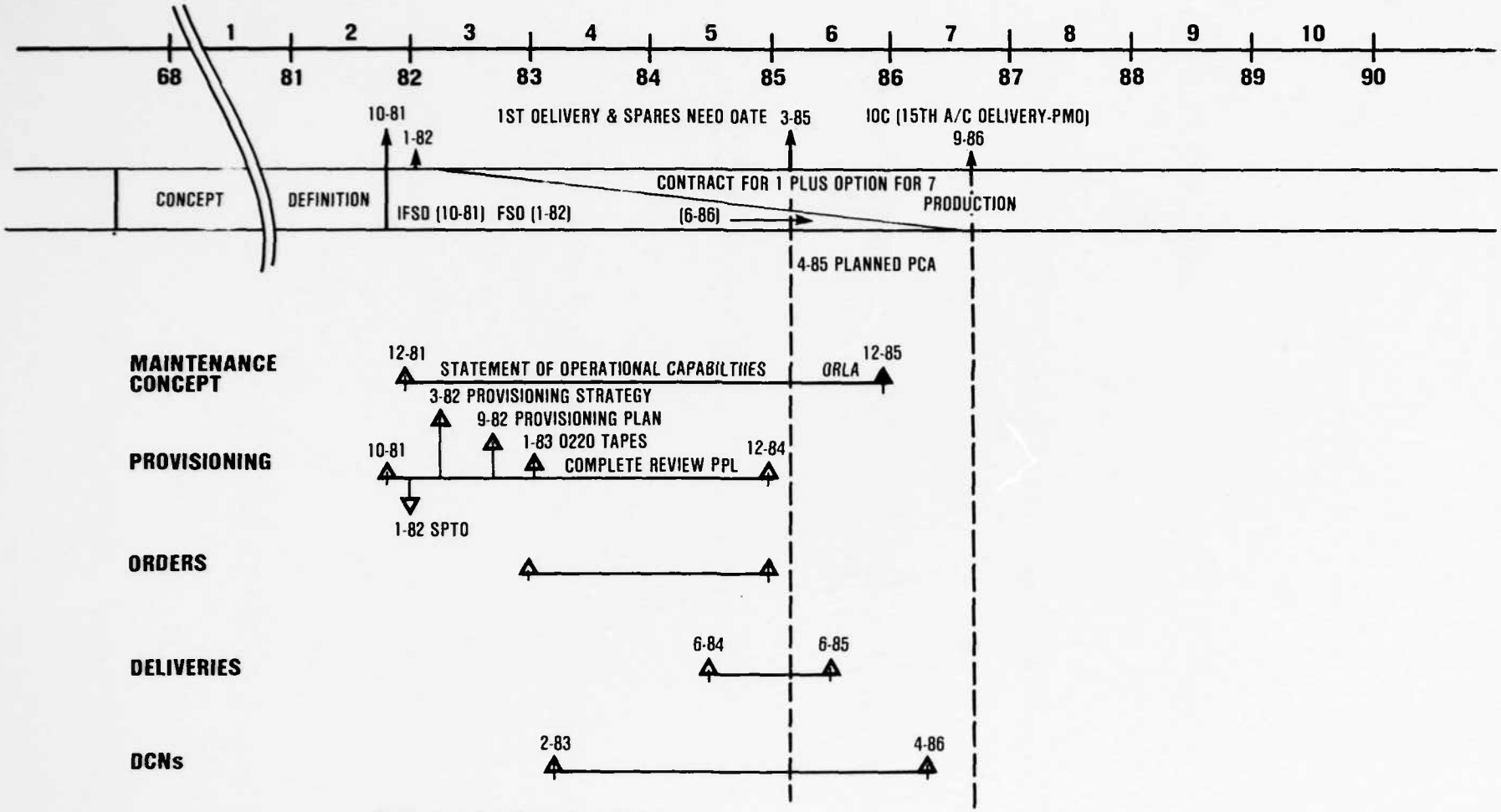
NOTE: 324.000 ITEMS IN SYSTEM
100.000 POTENTIAL SPARES
20.000 PROCURED THROUGH PRIME

F-16
GENERAL DYNAMICS



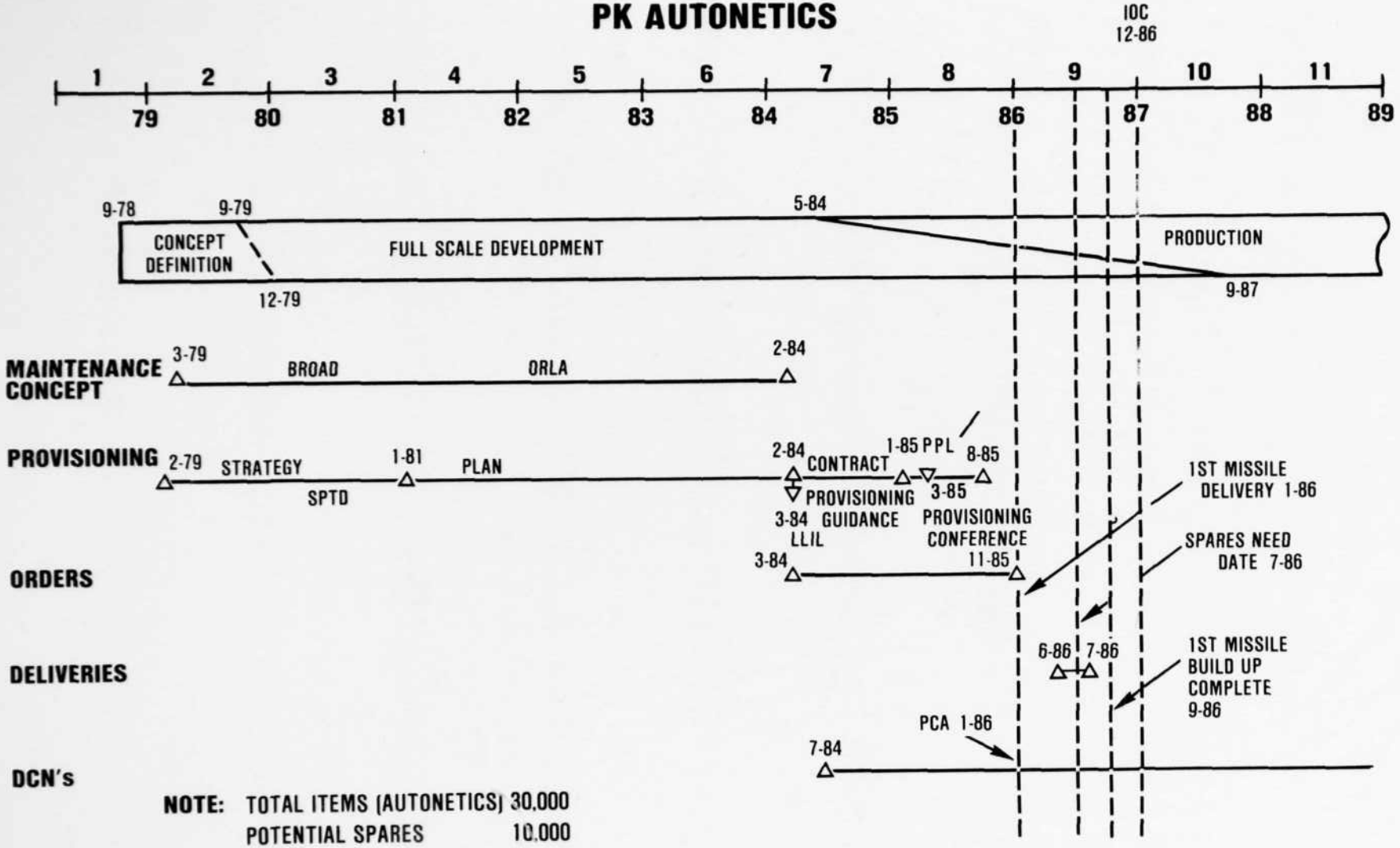
NOTE: 325.000 ITEMS IN SYSTEM
39.000 POTENTIAL SPARES
39.000 ACQUIRED AS SPARES

B-1B
ROCKWELL



NOTE: 270,000 ITEMS IN SYSTEM
55,000 POTENTIAL SPARES

PK AUTONETICS

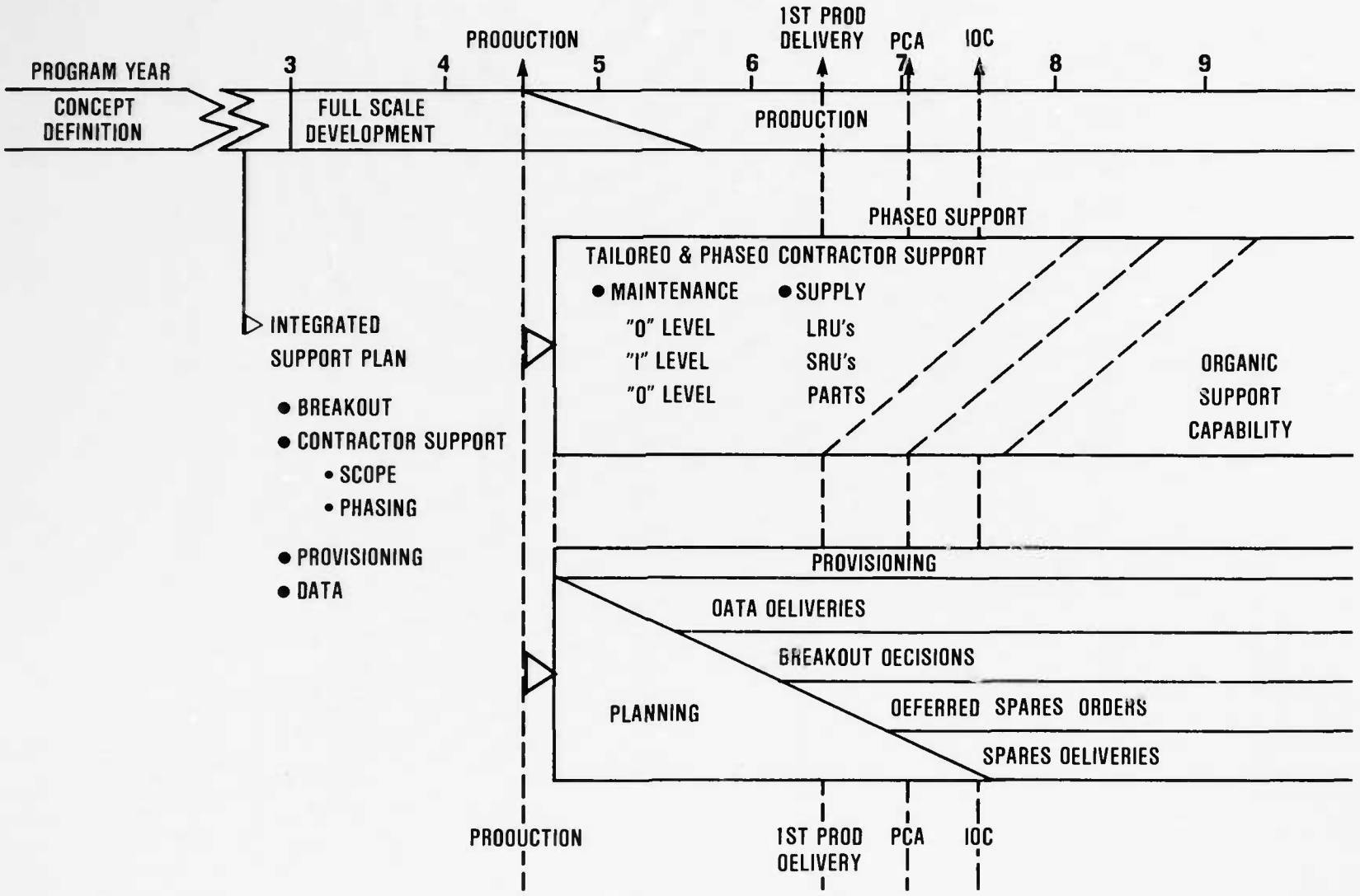


NOTE:

TOTAL ITEMS (AUTONETICS)	30,000
POTENTIAL SPARES	10,000
POTENTIAL BUY	3,000

PHASED SUPPORT CONCEPT

(PROPOSAL)



AD-A134 841 SPARE PARTS ACQUISITION VOLUME 2 PROBLEMS AND RECOMMENDATIONS(U) AIR FORCE MANAGEMENT ANALYSIS GROUP MMCLELLAN AFB CA OCT 83 2/3

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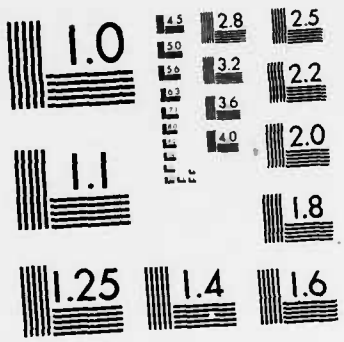


F-15 and F-18 SUPPORTABILITY COMPARISON

	YEAR 1		YEAR 2		YEAR 1 & 2	
	F/A-18	F-15	F/A-18	F-15	F/A-18	F-15
FMC RATE	33.0	31.6	51.7	41.6	48.7	38.8
MC RATE	51.2	42.6	62.0	46.2	60.3	45.2
MMCS RATE	10.7	17.8	11.3	20.9	11.2	20.0
PMCS RATE	4.9	6.9	5.2	3.3	5.1	4.3
SORTIE RATE	321.5	158.1	315.4	163.9	316.5	162.0
AVG # OF AIRCRAFT	3.16	14.2	16.67	37.1	9.91	25.7
K-RATE/100 SORTIES	2.2	40.1	6.4	53.9	5.7	50.2
FLIGHT HOURS	1344.9	2844.7	6985.3	8080.4	8330.2	10596.1
UTILIZATION RATE	425.6	200.3	419.0	217.8	420.3	212.6

NOTES:

F/A-18: Year 1 = Feb 81 - Jan 82; Year 2 = Feb 82 - Jan 83; includes data on VFA-125 only.
F-15: Year 1 = Dec 74 - Nov 75; Year 2 = Dec 75 - Nov 76; Luke AFB only.

Attachment 6

SUPPORT EQUIPMENT

PROBLEM

The Air Force does not develop comprehensive support equipment acquisition plans concurrent with Full Scale Development (FSD) of a weapon system. This results in proliferation of different types of support equipment and reduces opportunities for quantity price discounts and competition. Additionally, Air Force policy is not clear on programming and budgeting responsibilities between AFSC and AFLC for peculiar support equipment.

DISCUSSION

Weapon System Acquisition

Historically a new weapon system requires hundreds of peculiar support equipment items costing millions of dollars. For example, the Air Force has bought approximately $614M of "peculiar" support equipment for the F-15 and over $900M "peculiar" support equipment items for the F-16. These are hardware costs only.

During weapon system acquisition, the prime and subcontractors are required to identify support equipment requirements through a Support Equipment Recommendation Data (SERD). Because a support equipment acquisition plan is not developed during FSD, to include breakout, the SERDs are normally submitted by the prime contractor. They identify a variety of equipment ranging from holding fixtures to automatic test equipment (ATE) to be used at organization, intermediate and depot level. The SERD identifies the item to be repaired and tested, description, quantity recommended and cost to include both development and unit price.

The SERDs are forwarded to the System's Program Office (SPO), the Air Force Logistics Command, Air Logistics Centers, and using major command for review and concurrence. The suspense for approval or disapproval is normally fifty (50) days from date of submission. The delayed development of SERDs, lack of support equipment acquisition plans, short suspenses, and immediate operational requirements limits the Air Force's ability to challenge the requirement, attain standardization, plan organic repair capabilities and obtain quantity price discounts. To overcome this support impact problem, the Air Force should plan phased identification of support equipment for all maintenance levels concurrent with the design stability and acceptance process. This would give the Air Force the flexibility to consider use of available in-house equipment, standardization between intermediate and depot support equipment and the opportunity to negotiate competitive contracts. The time phased approached in Figure II-20 illustrates the recommended phasing.

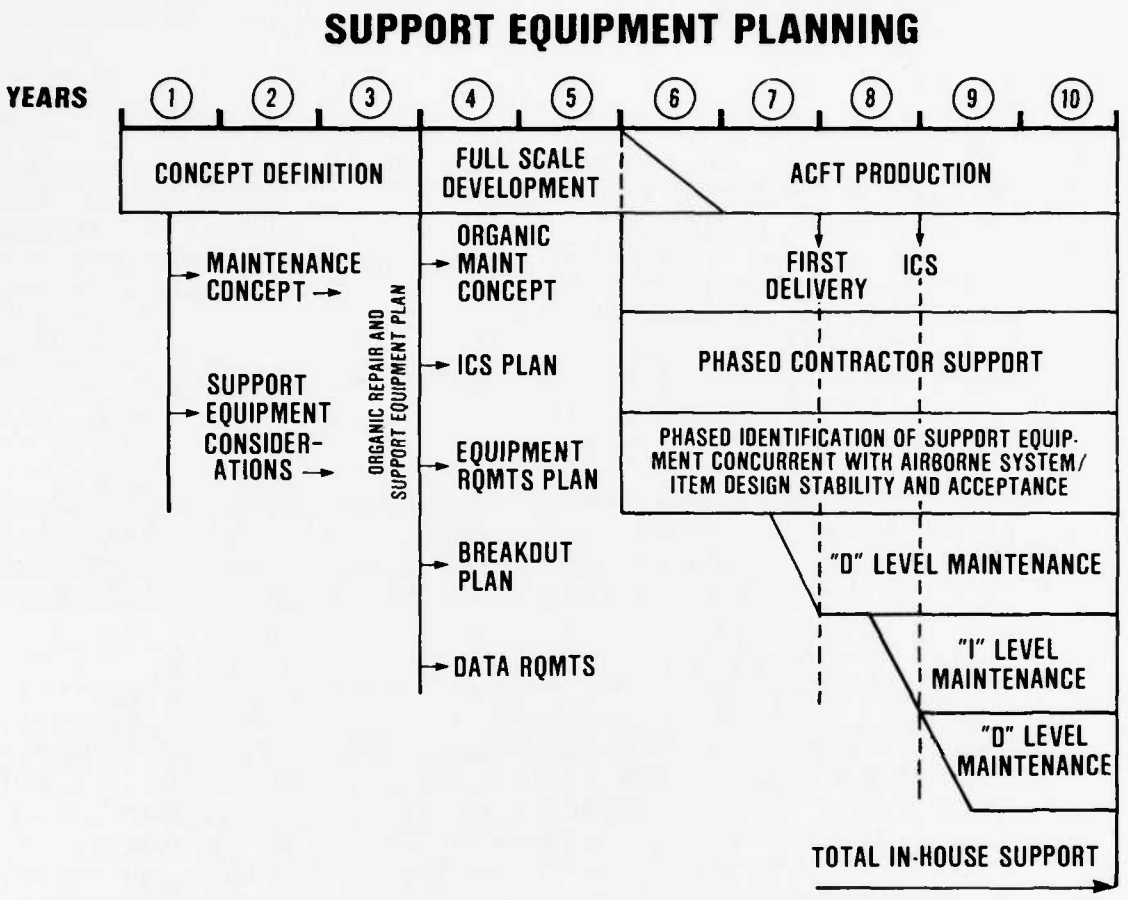


FIGURE II-20

Financial Policy

For new weapons systems the SPO is responsible for programming and budgeting for peculiar support equipment. The Air Force Logistics Command is responsible for common support equipment. AFR 800-4, Acquisition Management Responsibilities and AFM 172-1, Air Force Procurement Appropriations provide guidance on "budgeting and funding" for peculiar and common support equipment. The guidance is broad and open to interpretation. This has caused confusion between AFSC and AFLC as to when the SPO stops funding and AFLC starts funding for peculiar support equipment.

One of many examples, is the A-10 peculiar engine trim analyzer, NSN-4920-01-018-2403. This equipment item was the basis of a controversial issue for over a year. Program Management Responsibility for this item transfered to SA-ALC in

January 1981, the total weapon system Program Management Responsibility Transfered in Jan 1982 and the weapon system is scheduled to go out of production in Feb 1984. In Aug 1982, the USAF/AFLC budget review team directed SA-ALC to attain funds from the SPO. After one year of negotiations between the Air Staff, AFLC and AFSC it was finally agreed that AFLC would agree to fund (although unprogrammed) the engine trim analyzer plus some sixty-six (66) additional A-10 peculiar support equipment items with a value of approximately $5M. The Air Force needs a clear delineation of weapon system support responsibility for peculiar support equipment.

RECOMMENDATIONS

1. Require Program Management Directives to include a support equipment acquisition plan during Full Scale Development of weapon systems. (OPR: AF/RD; OCR: AFSC/PM, AFLC/MM)

2. Revise AFR800-4 and AFM172-1 to clearly define that AFSC has total programming and budgeting responsibilities for all peculiar support equipment until Program Management Responsibility Transfer (PMRT) of the total weapon system. And, that AFLC assumes this responsibility after PMRT of the total weapon system. (OPR: AF/AC; OCR: AF/LE/RD)

INAPPROPRIATE AIR FORCE PRACTICES FOR ORDERING NONCOMPLEX PARTS

PROBLEM

Inappropriate ordering of noncomplex parts appreciably increases Air Force acquisition costs.

DISCUSSION

During major weapons systems manufacturing, the prime and subcontractors frequently develop simple manufacturing aids and holding fixtures to assist in assembly, disassembly or alignment. These items have a tendency not to appear in the formalized listings of tools, equipment or machinary, but are frequently useful to Air Force maintenance operations, primarily at the depot level. When they are identified, the contractors are customarily asked to submit Ground Support Equipment Recommendation Data (GSERD) in accordance with Data Item Descriptions (frequently DI-S-6176) under the respective contracts. With some items, however, it appears the GSERD process amounts to severe overkill; i.e., the costs associated with obtaining the hardware and attendant data far outweigh the needs of the Air Force. The two attachments to this report represent classic examples of this problem.

It appears the Air Logistics Centers, during their review/screening process, are electing to acquire these items through the structured support equipment acquisition process.

In the attached examples, the items were recommended by a subcontractor to the prime who, in turn, recommended them, in GSERD format, to the Systems Program Office (SPO) who sent them to the ALC for concurrence/nonconcurrence in procurement. In each instance, the ALC "concurred in the requirement" to procure. The quoted prices from the subcontractor to the prime contractor and the prime's prices to the Air Force are:

SERD	SUB	PRIME	PRICE TO USAF
74970	$13,012	$6,562	$19,574
74966	6,005	4,620	10,625
74967	5,618	4,512	10,130
74971	14,131	6,852	20,983
74972	6,972	4,878	11,850
74973	5,383	4,448	9,831
74974	5,383	4,448	9,831
74975	5,915	4,595	10,510
74978	5,390	4,451	9,841
74979	6,090	4,643	10,733
	$73,899	$50,009	$123,908

The contractors listed the following components in their price quotes:

Subcontractors

a - MIL-D-100 drawings are required

b - Design Engineering required

c - Engineering Authorization to Manufacturing required

d - Manufacturing planning required

e - Shop follow-up

f - Material purchase requisition required

g - Compatibility Test Procedure

h - Compabibility Test

i - Compatibility test report

j - Engineering and program management communications

k - Packaging requirements

l - Participation in design reviews

Prime Contractor:

a - System Safety Hazard Analysis Report

b - Parts engineering in support to subcontractor

c - Support system staff

d - Establish data requirements

e - Review and concur in vendor concept

f - Design Analysis for physical/functional compatibility

g - Assure drawings contain acceptance and compatibility test requirements

h - Monitor design test status

i - Reaffirm configuration of prime equipment item

j - Review/analyze acceptance criteria and test procedures

k - Compliance test run

l - Review and submit compliance test report

m - Review vendor prepared calibration summaries

n - Support equipment program staff support

o - Computer Aided Design

The prime's tasks were essentially to duplicate and expand upon the functions already performed and documented by the subcontractor. However, for the prime to deliver to the Air Force, he must certify, by appropriate acceptance documents, the form, fit, function and operating conditions.

The AFMAG believes the Air Force is making inappropriate decisions when procuring simple maintenance aids/holding fixtures through the prime contractors. Significant costs are being incurred unnecessarily.

SERD 74977 (Attachment 2) should not have been a support equipment candidate. It is a modified hand tool and should have been displayed on a "standard/modified Hand Tools List" per DI-V-6185A. The remaining items within the attachments may be fabricated or easily modified from commercially available items within the depot according to instructions shown in technical order illustrations. It is the AFMAG's opinion that the GSERD process was followed because of misconceptions within the Air Logistics Center community. The lack of knowledge of local manufacturing capability, and the lack of training on the process.

DOD contractors demonstrate a gross lack of cost consciousness which damages their credibility with both the Air Force and the taxpayer when they propose and expect to be paid $9,841 for a three inch piece of wire (item 74978).

Discussions with the Air Logistics Center technicians disclosed the belief the first item, "should be procured from the contractor". This belief has no basis in fact, and if such an opinion is widespread, the Air Force's interests are not being properly protected. It is the AFMAG's opinion that good business practices should have resulted in withdrawal of these items for procurement in favor of a requirement for the contractor to display sketches and explanation of the tools in the depot repair Technical Order, with the annotation they are to be manufactured by the depot.

RECOMMENDATIONS

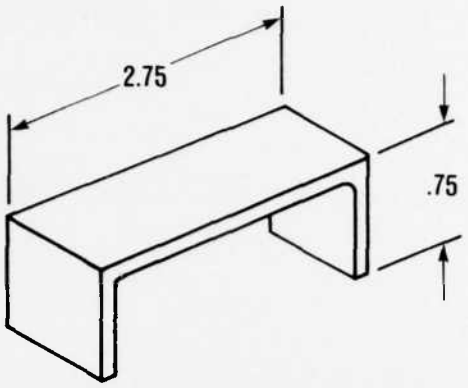
1. Immediately initiate a training program at the respective ALC's and SPO's to sensitize the personnel to the cost impacts of their decision making. Further, the ALC's have extensive capabilities to fabricate specialized repair/maintenance aids and tools such as those identified within this finding. Education to insure our engineers and technicians are aware of our in-house capabilities is required. (OPR: HQ AFLC/MM. OCR: HQ AFSC/PM)

2. Require Contractors, both prime and subs, as part of proposal process to identify all such items to the Air Force and recommend alternate, more cost effective methods of acquiring noncomplex bit and piece parts, as part of the proposal process. (OPR: HQ AFLC/PM, OCR: HQ AFSC/PM)

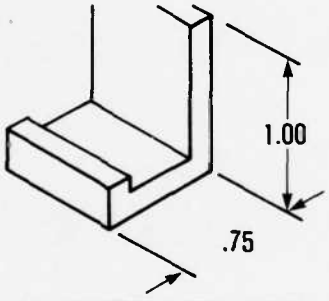
3. Require the Systems Program Offices (SPO's) on a quarterly basis to solicit opinions from Air Force Plant Representatives offices and Air Logistic Centers regarding their opinions of the contractors application of good business practices in the proposal of noncomplex parts to the Air Force. This feedback should be used by AFSC/AFLC in the establishment of weighted guideline targets, specifically contractor productivity and management, for application of profit during continuing negotiations. (OPR: HQ AFSC/PM, OCR: HQ AFLC/PM)

4. Compliance with "good business practice" approach as well as regulatory requirement, as to hand tools and noncomplex items should become part of the IG checklist. (OPR: HQ AFLC/PM, OCR: HQ AFSC/PM)

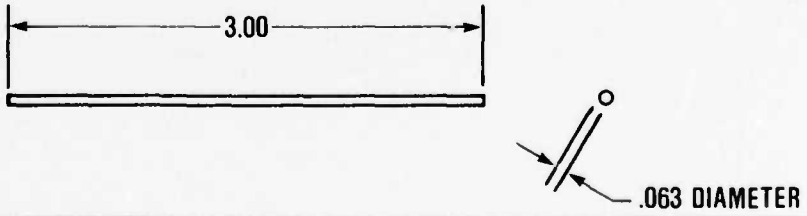
2 Attachments



ITEM NO.	ITEM NAME		
74972	HEIGHT GAUGE. ANTENNA PULLEY	P/N 3426B79601	$6.972

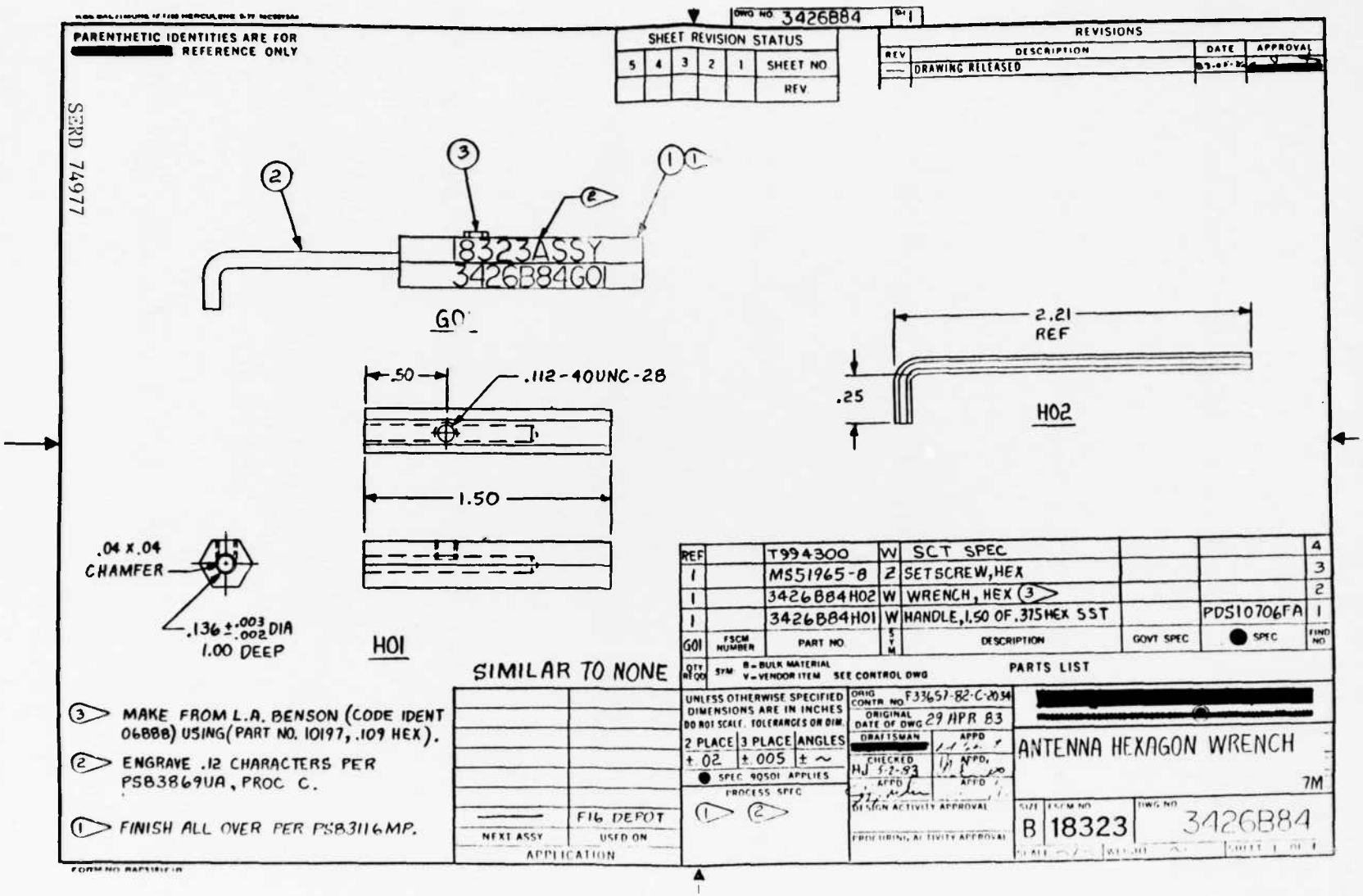


ITEM NO.	ITEM NAME		
74975	ANTENNA TAPE BLOCK TOOL	P/N 3426B82601	$5.915



ITEM NO.	ITEM NAME		
74978	ALIGNMENT PIN. ANTENNA MOTOR ASSY	P/N 3426B85601	$5.390

ATTACHMENT 1



Attachment 2

MANAGEMENT RESPONSIBILITIES FOR PROVISIONING

PROBLEM

Fragmented management tasking and lack of program manager control over provisioning resources (manpower and funding) have impeded the development and execution of effective provisioning strategies that promote competition and ensure fair and reasonable spare parts prices.

DISCUSSION

Current Management Policy

DOD Directives (5000.1 and 5000.39) and AFRs (800-2 and 800-8) clearly require program managers to manage Integrated Logistics Support programs. In a January 1982 letter to the Commanders of AFSC and AFLC, the AF Chief of Staff reaffirmed program manager responsibility for acquisition logistics and the delivery of supported weapon systems. Initial spare parts, acquired through the provisioning process, are clearly a critical element of a supported system.

Provisioning typically begins at the time a weapon system production contract is signed. The process is essentially managed and implemented through the combined efforts of provisioning personnel, item managers, equipment specialists and production management personnel at the various AFLC Air Logistics Centers. In addition, funding for initial spares is planned, budgeted and allocated by HQ USAF, HQ AFLC and individual item managers. As a result of these conditions, most program managers do not attempt to actively manage the provisioning of their systems because they are not given the clear tasking and direct control of the resources (manpower and funds) to do the job. Confusion often exists regarding organizational responsibilities and proper resources are not applied at the most crucial point in the system life cycle — prior to and during Full Scale Development (FSD). In the final analysis, accountability for overall management of the provisioning process is lost.

Timely Application of Resources

AFLC assumes a truly active role in the provisioning process only after the production decision and essentially does not participate as a full team member prior to this point. Lack of up-front ALC involvement offers limited opportunity for shaping decisions which impact spare parts prices. Initial planning should begin prior to the start of full scale development and must involve the full spectrum of provisioning activities if the process is to be effective.

The ability to adequately plan, program, and budget resources for developing programs depends on the early assignment of Weapon System Program Managers (WSPM) within AFLC. Frequently, these assignments are not being made in time to influence provisioning planning and strategy for full scale development. The Next Generation Trainer (T-46A), Special Air Mission Aircraft (CSAM), and LANTIRN HUD are all examples where WSPM assignments were late. AFLC has recognized the need to improve the process for designating the lead or system manager ALC and chartered the Command Mission Assignments Study Group in 1981 for that purpose. Implementation of this group's recommendations should resolve this problem.

Lack of early AFLC management assignments tends to deny access to item manager, equipment specialist and production management expertise, setting the stage for later disruptions to the spares support program established by the program manager.

Control Over Resources.

Program managers who try to provide strong central management of the provisioning process face severe difficulties. Less than 20 qualified provisioning personnel are assigned to the five AFSC product divisions providing support to over 230 acquisition programs. As a result, program managers cannot count upon sufficient internal resources to perform essential provisioning planning. External resources are also difficult or impossible to obtain on a dedicated basis because AFLC does not usually assign Weapon System Program Manager (WSPM) responsibility at this early point in the program.

In the event the program manager is able to obtain skilled provisioning expertise early in the program, execution of a well-planned provisioning program is usually thwarted by lack of management control and visibility over initial spares funds which are budgeted by AFLC. AFLC's control of these funds is not complete either. Current Air Force policy prohibits expenditure of provisioning funds prior to award of a production contract. In addition, since initial spares dollars are not fenced by weapon system, funding profile changes by the Air Staff may totally destroy all prior program planning. In the B1 program, as an example, provisioning plans provided for acquisition of long-lead spares during FY82. When FY82 provisioning funds were zeroed, prior plans had to be abandoned and work-arounds devised. Further, because supply support shortfalls can usually be made up through AFLC funded Interim Contractor Support (ICS), the program manager has little or no incentive to ensure that the provisioning process proceeds on schedule and results in timely support when fielding new weapon systems. It is clear that initial provisioning and ICS planning go hand-in-hand in determining the initial program support posture.

RECOMMENDATIONS

1. Assign single-point management responsibility for initial provisioning and Interim Contractor Support (ICS) to the program manager (for acquisition programs) or to the weapon system program manager (for modification programs). Document specific responsibilities for provisioning and ICS in Program Management Directives (PMDs). (OPR: HQ USAF/RD, OCR: HQ USAF/LE)

2. Baseline initial support planning, programming, and budgeting for all major programs-fully coordinate with using support and development commands with full AF Acquisition Logistics Center participation. (OPR: HQ USAF/LE, OCR: HQ USAF/RD)

3. Allocate initial spares and ICS funds to the implementing commands for all acquisition and modification programs. Provide these funds directly to program managers in accordance with established support resource baselines. (OPR: HQ USAF/AC, OCR: HQ USAF/LE/RD)

4. Establish staff level provisioning organizations through the resources of the Joint Air Force Acquisition Logistics Center (AFALC) at each AFSC Product Division to provide direct support to program managers in the development and implementation of provisioning programs with full coordination and technical support from responsible logistic center(s) and using commands. (OPR: HQ AFSC/AL, OCR: HQ AFLC/AQ)

5. Assign Air Logistics Center (ALC) management responsibilities within AFLC at the beginning of full scale development. Assure Weapon System Program Managers (WSPMs), item managers, equipment and production specialist provide timely support to program managers in the provisioning process. (OPR: HQ AFLC/XR, OCR: HQ AFLC/MM/AQ)

BETTER PRICES FOR INITIAL SPARE PARTS

PROBLEM

Initial provisioned spare parts are being acquired at unrealistic unit prices as a result of current provisioning price methodologies, small quantity buys and lack of effective value analysis. Distorted initial price estimates frequently enter the supply system and remain through one or more replenishment spare parts buys. Acquisition of provisioned spare parts, based on unreasonable price levels, results in a reduced weapon system support posture within the given levels of program funding.

DISCUSSION

Establishing the Price for Initial Spare Parts

The spare parts to support new or modified weapon systems are identified and acquired through the provisioning process. Contractors develop an estimated price for each new part introduced into the inventory as a result of this provisioning process. This estimated price is developed based on a unit quantity of one in accordance with MIL-STD-1552 "Uniform Procedures for Provisioning Technical Documentation", and used for administrative and budget planning purposes by the Air Force. The estimated price is entered by the contractor in the provisioning documentation provided to the Government. A Provisioned Item Order (PIO), containing the estimated price, is returned to the contractor for those items that the Air Force chooses to procure. Since spare parts are occasionally delivered prior to negotiation of the PIO, the budgetary estimate is frequently entered into price catalogs used by the Government. These catalog prices often serve as the basis for follow-on procurement of spare parts and tend to create a false sense of price reasonableness.

Unrealistic Price Estimates

The estimated price for an initial spare part often exceeds by a large margin the intrinsic value of the spare part. The inflated price results from contractor compliance with the price estimating procedure, defined in MIL-STD-1552, which requires the contractor to enter the estimated price for unit one of the learning curve, regardless of the economic production quantity or anticipated buy quantity. The estimated price is made even more unrealistic by rolling all production, overhead and administrative costs into the estimate for a single spare part.

Customer Impact

The distorted estimated prices often become the "administrative" price the supply system charges to its customers for each spare part ordered by an organization. For the base level customer, the operation and maintenance funds are charged for stock fund items at the time of delivery. If the customers' accounts are under budget limitations, which is a normal situation, the customer may be forced to defer future purchases of needed spares in order to operate within the limitations. The vast majority of spares requested by the customer from AFLC do not require reimbursment. However, when AFLC comes into a buy position for these new items, sufficient funds may not be available to "buy out" the requirements. At this point, difficult management decisions must be made about

which requirements to buy with available funds.

Lack of Value Analysis

Contract Administration Offices (CAO) are responsible for definitizing estimated prices and negotiating the actual price for the spare parts on each PIO. In negotiating PIOs, the CAO may or may not analyze and negotiate prices for each item on the PIO. Often, only a "bottom-line" price is negotiated and individual line item prices are established through an allocation process. While the procedure may obtain fair and reasonable prices for the total PIO, the allocation process can easily distort the price for individual spare parts and can set the stage for later overpricing of an item.

Small Quantity Buys

Initial spare parts requirements computation practices, combined with limited funding profiles, have resulted in very low quantity purchases of individual items. With few items to amortize costs, the unit price is frequently much higher than would be the case if the spare part were to be bought in optimum production quantities. An examination of 1,069 line items ordered for the B-52 OAS/CMI modification program between June 1982 and May 1983 revealed that 769 (or 72%) of the total line items were ordered in quantities of 5 or less. This situation is driven in large part by current provisioning policy which attempts to reduce risk through purchase of a minimum range and quantity of spare parts.

Zero Overpricing Program

The Air Force Zero Overpricing Program was initiated in 1979 to ensure that the Air Force does not pay more than a fair price for items we require to be combat ready. Using this program, base level personnel can identify suspected overpriced spare parts and challenge the catalog list price through appropriate channels to the supply source. The supply source can then take appropriate action to correct the mistake, prevent repetition and determine if recovery is possible. In addition, validated challenges may result in a cash award to the individual that identifies the overpriced item.

A Typical Case

Most of the conditions cited above were highlighted in a recent Air Force Zero Overpricing review of 170 provisioned item spare parts acquired under the B-52 Offensive Avionics Systems/Cruise Missile Integration (OAS/CMI) and Air Launch Cruise Missile (ALCM) modification program. These items were discovered by SAC supply specialists at Griffiss AFB, N.Y. involved in the ALCM Site Activation effort. Table II-18 provides a history of estimated and initial negotiated prices on a typical sample of the 170 items reviewed. In a few isolated case, the negotiated price was higher than the estimated price. This situation was blamed on poor contractor price estimating techniques. The vast majority of items (over 98%) experienced a reduction from the estimated price to the negotiated price—despite the typical small quantity initial buys. The reductions ranged from 3% to 1683%. It is important to note that the SAC base supply account was being charged at the ML-C catalog price, even though the Air Force never paid these prices to the contractor.

COMPARISON OF ESTIMATED PRICES WITH
NEGOTIATED PRICES (ALCM PROGRAM)

ITEM	MIL-STD-1552 ESTIMATE	CATALOG PRICE	NEGOTIATED PRICE	BUY QTY
Pylon Stop	$3520.53	$4041.57	$592.89	2
Screw	$ 41.52	$ 49.40	$ 0.48	500
Stud	$3646.00	$4185.64	$387.26	9
Bolt	$ 165.14	$ 202.31	$ 1.59	100
Knob	$1996.97	$2845.10	$399.97	2
Pylon Seal	$1120.00	$1285.76	$194.82	8

TABLE II-18

RECOMMENDATIONS

1. Revise MIL-STD-1552 to require price estimates which more realistically reflect the intrinsic value of each spare part. Estimated prices should be based on a range of quantities, including the anticipated buy quantities and an optimum production quantity (OPR: HQ AFLC/MM, OCR: HQ AFSC/AL)

2. Issue PIOs for the largest quantity of spare parts that can reasonably be procured at the point in time the PIO is released. To the extent possible, maximum use should be made of AFR 800-26, Spares Integrated with Production (SAIP) techniques for combining spare parts production with production of equipment or systems. Wherever possible, orders for pre-operational, initial and war readiness/war reserve spare parts should be aggregated to form economical production quantities. (OPR: HQ AFLC/MM, OCR: HQ AFSC/AL)

3. Apply value analysis to each PIO line item to ensure that each line item price accurately represents the value of the spare part being acquired. Any questionable price should be thoroughly reviewed by appropriate contracting, manufacturing, logistics and program management personnel. No questionable price should be entered into price catalogs used by the military services or DOD agencies. (OPR: HQ AFSC/PM)

4. Emphasize the Air Force Zero Overpricing Program (AFR 400-17) as a special interest item for Air Force Inspector General (IG) visits. (OPR: HQ USAF/IG, OCR: HQ USAF/LE)

5. Whenever possible, discontinue use of Bid and Proposal (B & P) prices in consolidated management lists (ML-C) and record only final negotiated prices in all price catalogs. If estimated prices must be entered, provide an (E) designation beside the item price so that supply customers will understand that it is not the final negotiated price. (OPR: HQ AFLC/MM, OCR: HQ DLA/CB)

INTEGRATION OF PROVISIONING TECHNICAL DATA AND LOGISTICS SUPPORT ANALYSIS

PROBLEM

A lack of adequate understanding of the interface between Logistics Support Analysis (LSA) and Provisioning Technical Documentation (PTD) requirements by Air Force personnel has resulted in a duplication of the technical information provided to support the provisioning process, increased program costs and missed opportunities to breakout spare parts for increased competition.

DISCUSSION

PTD consists of an extensive range of data on the specific spare parts and components which make up a weapon system. This data is defined in MIL-STD-1552A and includes technical identification, stock class assignments, stock numbers, standardization review results, recommended SMR codes, maintenance factors, projected reliability and replacement factors, estimated prices, and manufacturing codes. This data, in conjunction with the supplemental Provisioning Technical Documentation (SPTD), is the basic information used in the provisioning process to identify and acquire initial spare parts. Generally, the PTD is collected and delivered through the D220 provisioning data system. Pertinent information from this data base is subsequently transfered to other applicable logistics management data bases.

LSA, as defined in MIL-STD 1388, is a collection of methods and techniques used to determine and assess the logistics characteristics of a weapon system design. The outputs from this process, called the LSA Record (LSAR), contain virtually all of the MIL-STD-1552A items that the Air Force acquires as PTD. In addition, the LSA process facilitates interactive reviews between the users, the contractor and individuals responsible for the various functional logistics elements. In many instances, both the LSA and PTD are placed on contract generally resulting in a high degree of contractor duplication of efforts.

Provisioning data requirements generally lack uniformity and consistency for given commodities and provisioning strategies. Contractors are faced with a steadily changing and increasingly complex set of rules in the creation and submission of provisioning data. Some of this confusion is attributed to the lack of specific Air Force implementing guidance to DODI 4151.7, Uniform Technical Documentation for Use in Provisioning of End Items of Material. This contributes to a lack of understanding by ALC's in the use of Provisioning Requirements Statements and causes requirements to vary significantly from contract to contract, even for the same type commodity from the same contractor.

The current deficiencies in the application of the LSA/LSAR generally stem from a lack of Air Force personnel adequately trained in the use and implementation of the LSA. Current training courses teach the Army techniques that do not universally apply to Air force LSA applications. Although Space Division and Electronic Systems Division have contractually applied LSA/D220 interface programs to the provisioning process, most Air Force programs have no mechanized process for extracting provisioning data from the LSA/LSAR. Frequent changes to the LSA have resulted in many programs funding

modifications to LSA software. This has resulted in an extensive duplication of efforts by numerous programs and, in all but one known instance, has failed to produce a timely product for use by the Air Force when provisioning a system.

Now that several programs have demonstrated and applied an LSA/D220 interface, the Air Force needs to formalize and promulgate these interface tools along with the necessary guidance and training. This program should effectively eliminate duplication of provisioning data requirements.

RECOMMENDATIONS

1. Develop and publish implementing Air Force guidance to DODI 4151.7, Uniform Technical Documentation for Use in Provisioning of End Items of Material. The guidance should eliminate duplication of efforts and be compatible with proposed improvements to the Air Force provisioning process. (OPR: HQ USAF/LE, OCR: HQ AFSC/AL, HQ AFLC/AQ)

2. Define uniform procedures for interfacing provisioning data requirements between MIL-STD-1552A (Provisioning Technical Data) and MIL-STD-1388 (Logistics Support Analysis) to reduce duplication of effort and avoid unnecessary data costs. (OPR: HQ USAF/LE, OCR: HQ AFSC/AL, HQ AFLC/AQ)

ENHANCED ADP SUPPORT OF PROVISIONING

PROBLEM

Deficiencies in the current AFLC Automated Provisioning System (D220) have resulted in a system which does not provide required management information, is not effectively integrated with other logistic and acquisition management systems and is not sufficiently responsive to meet current provisioning milestones.

DISCUSSION

The D220 System

The primary automated system for support of provisioning is the AFLC D220 Provisioning System. This system was developed in the middle 1970s to support critical F-16 initial provisioning milestones and alleviate the impacts associated with the previous labor and paper intensive manual provisioning process. The objective to concurrently develop and operate a new data system on the F-16 program was further impacted by the computer conversion from IBM to CYBER equipment. The D220 is designed to process and track the status of provisioning technical documentation from the contractor to various logistics management decision systems within the Air Force until final action is taken.

The D220 system is hosted on obsolete main frame computer hardware. It is a batch intensive system which is slow and lacks compatible interfaces with other management decision systems such as requirements, procurement, cataloging, pricing, financial management, and asset control.

A significant problem exists in an effective interface between the Logistics Support Analysis provisioning "H" record and the D220 system. The D220 system was designed for use after production contract award and therefore provides no support to the provisioning planning process during the full scale development (FSD) phase as directed in DODD 4140.40, Provisioning of End Items of Materiel. The deficiencies described impact the ability of the Air Force to obtain and effectively use technical data information and analysis developed during FSD. The overall effect is a degraded capability to execute provisioning strategies that could incorporate improved screening for items already in the DOD inventory, failure factors from development test data and price advantages gained by combining spare part and production orders.

Despite these deficiencies, the comment most frequently noted during our visits to both contractors and Air Force activities was "...recognizing the many (D220) system limitations, we still could not have provisioned recent major systems in a timely manner without it".

AFLC has a major progr m effort already underway to alleviate many of the deficiencies noted above. This effort is divided into two phases. The near term initiative (D83-021) includes the augmentation and integration of desk and suitcase terminals to reduce manual input into the present D220 system. The long term initiative (D81-284) addresses development of a new stand alone data system, acquiring computer hardware to match data system requirements and upgrading telecommunications capabilities. It will also replace the D169 supply support system that is presently used to pass requirements to integrated materiel managers in DLA and the other services. Top-level Air Force management

attention must be maintained to assure that critical resources are applied to meet milestones in this important upgrade program. These improved capabilities are urgently required to support a number of major provisioning efforts over the next 2 - 4 years, including B-1B, T-46A, and Peacekeeper.

Both D220 and the application of LSA are mandated requirements on all acquisition contracts. However, operational interfaces between these two programs have yet to be fully tested and implemented. Until a proven interface is completed, the Air Force is expending duplicate resources to place both LSA and MIL-STD-1552 requirements on contract to ensure timely receipt and automated processing of required provisioning technical data. Once this interface is defined, an accellerated ADP effort is required to implement necessary data system updates.

RECOMMENDATIONS

1. Expedite upgrade of the D220 system and fund the development of the long term improvement initiative in D81-284. (OPR: HQ USAF/LE, OCR: HQ AFLC/LM)

2. Establish a task group to resolve the current ADP interface deficiencies between LSA and the D220 system and provide necessary ADP improvements to implement the interface. (OPR: HQ AFLC/AQ, OCR: HQ AFSC/AL)

SOURCE SELECTION CONSIDERATIONS

PROBLEM

Inadequate attention is paid to spare parts competition, breakout, and pricing during systems acquisition source selections.

DISCUSSION

Many of the factors which are degrading the Air Force spare parts breakout and competition statistics have their origin during Full Scale Development (FSD) of weapon systems.

Tradition, institutional biases, funding constraints and management emphasis have focused program development attention on technical advancement and production cost consciousness without a systematic way of designing and planning for the breakout and competition of initial and replenishment spare parts.

Spares vs Initial Acquisition Cost

Operation, maintenance and support costs provide a major portion of the total life cycle cost (LCC) of systems. AFMAG believes that the spares portion of these costs must be put in perspective. Table II-19 shows that over two different 10 year periods (FY 1973-1982, FY 1979-1988), the combined initial and replenishment spares funding was of 43% of aircraft acquisition costs and 9% of missile costs. Since the spares that support the aircraft, engine and avionics systems appropriation category are significantly more than those in the other categories, we concentrated further statistical analysis on aircraft acquisition and support.

PROCUREMENT VERSUS SPARES COST ($B.)

	AIRCRAFT (3010)		MISSILES (3020)	
	FY73-82	FY79-88	FY73-82	FY79-88
TOTAL PROCUREMENT	31.9	104.8%	7.0	31.7
INITIAL SPARES	3.3	10.8	.2	.8
REPLENISHMENT SPARES	10.7	34.8	.4	.9
TOTAL SPARES	14.0	45.6	.6	2.7
% SPARES TO PROCUREMENT	43.9%	43.5%	8.7%	8.7%

TABLE II-19

Table II-20 indicates that spares costs are 38%, 39%, and 37% of the acquisition (research, development and production) cost of the A-10, F-111, and the F-4 respectively. When the stockfunded spares used at both the depot and base level are included, the total spares costs increase to 60%, 55% and 68%. This relatively large expenditure on spares supports the notion that the Air Force must consider spares acquisition during source selection.

SYSTEMS ACQUISITION VS. SPARES COST
(MILLIONS - FY84$)

Aircraft Series	A-10	F-111	F-4
Qty Produced	727	461	2591
Spares			
Replenishment	$2585	$5337	$6112
Initial	368	2611	2526
Subtotal	2953	7948	8638
Stock Funded Material			
Depot	604	1212	2728
Base	1132	1986	4582
Subtotal	1736	3198	7310
Total Spares	4,689	11,146	15,948
Acquisition			
R&D	397	3013	2470
Production	7403	17396	20850
Total	7,800	20,409	23,320
Spares (Rep+Initial/ Acquisition	38%	39%	37%
Total Spares/ Acquisition	60%	55%	68%

TABLE II-20

Planning

The Program Management Directive (PMD), Business Strategy Panel (BSP), Contract Strategy Paper (CSP), Program Management Plan (PMP), and Acquisition Plan (AP) do not normally address the factors that form and impact the Integrated Spare Parts Acquisition Strategy. These factors include the make or buy plan, acquisition data rights, initial provisioning approach, second sourcing, breakout timing and upfront spares funding.

This lack of government, and resulting contractor, emphasis has resulted in incomplete acquisition data packages, inadequate make or buy plans and a lack of visibility into actual manufacturing sources.

An approach needs to be developed which incorporates both industry and government front end planning. This approach must be taken while there is still competitive leverage. The contractors should include as part of their proposal a detailed Integrated Spares Acquisition and Support approach with specific plans in such areas as:

1. Make or Buy Plan

— Make vs buy evaluation process.
— Make item identification and criticality.
— Buy items, vendors, lead times, and contracting approach.
— Time phasing for transitioning any make items to buy.

2. Engineering and Acquisition Data

— Contractor plans to incorporate commercially available and/or common military developed components.
— Plan to develop and maintain the engineering data base
— Contractor plans to challenge sub-tier proprietary parts coding.
— The indentification of any limited rights data and/or processes that the government will need under the proposed breakout and competition plan to include:

- cost of the data rights
- cost of data preparation
- justification of rights limitation

—Plan to develop and obtain acquisition data packaages
— Proposed means to validate acquisition data adequacy.
— Proper time-frame or milestones at which each data item should be ordered
— Extent to which spare parts and material used in production are competitively available.

3. Second Source Plan

— Indentify the high cost drivers (top dollar value items from a life cycle cost aspect)
— Which of these items are recommended to be dual sourced and, why the remaining ones are not.
— What it will cost to develop the second source and what is the optimum time phasing for the development.
— How to maintain the competitive base and keep both sources qualified.
— Indentify mechanism for identifying all vendors for each item.

4. Subcontractor Management - Breakout Plan

— Breakout phasing that considers:
- risk assessment by major critical item
- relationship/timing of items shredded out by category of design stability
- comparison of initial provisioning breakout versus integrating the initial provisioning with the primes production buy (SAIP)
- proposed integration of production requirements with initial and replenishment spares to include multiyear and/or continuing yearly competitive buys.
- overall philosophy and plan for enhancing the competitive vendor base
- method for providing all interested contractors an opportunity to become qualified to compete for follow-on buys

— Time phasing of breakout schedule to provide benchmark points against which progress can be measured over the life of the breakout schedule.

5. Three Staged Provisioning Approach

- Phased Contractor Support
  - — Performance target and cost options
  - — Supply
  - — Maintenance
  - — Weapon system

- Integration of production, preoperational, initial and follow on support including Contractor Furnished Equipment (CFE) and Government Furnished Equipment (GFE)

- Transition to AF support
  - — Time phasing
    - — Provisioning
    - — Physical configuration audit
    - — Facilities, support equipment, training and spares
    - — Demonstrated organic capability
    - — Spares orders

- Post Production Support
  - — Configuration accounting
  - — Source availability
  - — Factory equipment accounting

Source Selection Approach

The contractors must know that the competition leading to award of the FSD contract can depend on the Air Force's evaluation of their integrated approach to the "spares" aspect of their weapon system. This will be the case if the source selection criteria are structured such that the Source Selection Advisory Council (SSAC) reviews each contractor's approach and the Source Selection Authority (SSA) is specifically briefed on details of each proposal.

One way to do this would be to structure a separate and distinct source selection criteria area to address "spares acquisition". Source selection areas are the highest order of criteria and are usually ranked in descending order of importance with each area briefed separately in detail to the SSA. The "spares acquisition" area would include specific items (the next lower order of source selection breakdown) such as the make-or-buy plan, engineering and reprocurement data, second sourcing, initial provisioning, and subcontractor/breakout management subjects addressed in the planning section above. The contractor's proposal for each of these items could be addressed and integrated in a separate proposal volume called the "Integrated Spares Acquisition and Support" plan.

A compilation of recent AFSC Major Source Selection ranked areas is shown in Table II-21. In summary, the general area of logistics was included in approximately 40% of the efforts (mostly ASD) but in only several of the 49 programs were any of the subjects (discussed above) included at the item level. The Alternate Fighter Engine (AFE), still in source selection, was the only program reviewed where industry and the Air Force were addressing the breakout and competition of spares. The AFE criteria includes both program adequacy and competition (area 4) and readiness and support (area 2) as ranked criteria with dual sourcing/reprocurement data/breakout as an item within the former and spares provisioning as an item within the later.

AFSC SOURCE SELECTION CRITERIA *

	AREAS	1	2	3	4	5	
	TECH	41		6	2	-	-
	COST	3		17	22	5	2
	MANAGEMENT	6		18	12	5	1
**	LOGISTICS	-		4	7	4	4
	MANUFACTURING	1		2	4	4	-
***	OPERATIONAL UTILITY	3		-	-	-	-
****	PROGRAM ADEQUACY	-		-	1	2	-

* Based on 49 conducted source selections (11 ASD, 10 AD, 8 BMO, 10 ESD, 10 AD)
** Also called readiness and support on several ASD programs
*** Operations Utility (ASD area) is comprised primarily of operational and logistics items.
**** Program Adequacy (ASD area) is comprised primarily of Logistics, Manufacturing and Management items.

TABLE II-21

The AFMAG has found that the logistic criteria actually played an insignificant role in most of these programs. Everyone interviewed and involved with the AFE competition however, recognized that logistics, the competition/breakout of spares in particular, are being addressed in earnest by both industry and the Air Force. We must make that happen in all programs in which the program and system managers forecast substantial spares costs over the life cycle of that system.

Contract

The resulting contract must be structured to insure maximum contractor motivation to accomplish his plan. Currently, prime contractors are incentivized to keep the maximum number of spare parts in-house. The spare parts business expands their base for overhead and G and A application, helps recapture their initial R&D investment and substantially influences profits.

The Air Force must develop a structure which will counter these negative incentives. The Integrated Spares Acquisition and Support plan must be incorporated within the statement of work. The contractor's efforts in developing the second sources, and either breaking out or combining the spares with production install buys should be a separately priced line item that would directly fund the prime contractor's additional engineering and management effort. This provision could be flowed down to the subcontractor/vendor level.

In addition, the Full Scale Development (FSD) and production contracts should include an incentive which focuses management attention on the contractors progress. The specific provision should be tailored for the individual program. One approach might be to use an award fee with high Government officials comprising the fee determination panel. Specific aspects could include periodic evaluations, written critiques from the Award Fee Authority to the contractor's Chief Executive Officer, and immediate payment of the earned fee with no rights of appeal. Another approach could be a performance incentive based on the contractor's progress toward reaching the breakout and competitive goals established within the FSD contract.

The contractors must be incentivized to carry through and maintain the plan once the follow-on replenishment buys begin to offset their loss in workload and profit from the reduction in follow-on spare parts business. One alternative is to provide the prime a license fee for any contract awarded through use of limited rights data. The details of the arrangement could be developed during the FSD source selection negotiation and be incorporated in a detailed Memorandum of Agreement (MOA). The MOA would establish an agreed to percentage or flat fee for all contracts with vendors developed through use of the prime's acquisition data.

RECOMMENDATIONS

1. The program manager must designate an Integrated Spares Acquisition and Support strategy with assistance of the system manager prior to FSD competition. This strategy must be a mandatory item within all program management documentation such as the PMD, BSP, CSP, PMP, and AP. It must be tailored on a case by case basis but structured such that it is a major source selection criteria area. (OPR: HQ USAF/RDC; OCR: HQ USAF/LEY)

2. Revise The Air Force Acquisition Program Management Regulation, AFR 800-2, and DAR 1-2101, to incorporate the requirement to include spares acquisition strategy as a mandatory item in all PMDs, PMPs and Acquisition Plans. (OPR: HQ USAF/RDX/RDC; OCR: HQ USAF/LEY)

3. Revise The Air Force Source Selection Regulation, AFR 70-15, to require that spares acquistion be a ranked source selection criteria area unless specifically waived by the Source Selection Authority. Detailed rationale for dropping below the area level must be included in the source selection plan. (OPR: HQ USAF/RDC; OCR: HQ USAF/LEY)

4. Revise The AFSC Contract Strategy Paper Directive, AFSC DAR Supplement 1-403.57, and the AFSC Business Strategy Regulation, AFSCR 70-2, to include the requirement to address the spare parts acquistion strategy for the program. The entire logistics strategy should be briefed by the Deputy Program Manager for Logistics as a mandatory agenda item at all HQ AFSC BSPs. (OPR: HQ AFSC/PM; OCR: HQ AFSC/AL/SD)

MULTIYEAR CONTRACTING OF REPLENISHMENT SPARES

PROBLEM

The Air Force Logistics Command has not effectively used multiyear contracting to reduce the unit price of spares.

DISCUSSION

Multiyear contracts for Weapon Systems have resulted in significant savings and industry has stated that multiyear contracts are the best way to achieve unit price savings on spares.

Historically the Air Force Logistics Command has been reluctant to use multiyear contracting for spares procurements. Inability to accurately predict requirements and the uncertainty associated with funding allocations have been used as the rationale. Although there has been a reluctance to apply multiyear contracting to spares, the Air Force Logistics Command has negotiated a limited number of multiyear procurements on other types of items. In Fiscal Year 1982 they reported 22 multiyear contracts with a total investment of $597.5M and a reported saving of $111.4M. Items on these contracts include 370 gallon fuel tanks, 370 gallon F-16 external fuel tank and a KS-153A Camera Set.

Recently, the Air Force Logistics Command did initiate a plan to extend multiyear procurements to spares. Each Air Logistics Center was asked to provide 50 candidates (reparable or nonreparable) that meet multiyear criteria. Additionally, HQ USAF/LE has begun to investigate the application of multiyear contracting for spares.

Multiyear Opportunities

The AFMAG used the Procurement History Records (J041) tapes to isolate spares line items which had been procured four years in a row (1980-1983). Table II-22 is a summary of the number of items that met the four years in a row criteria and had quantities sufficient to consider for a multiyear contracts.

SPARES PROCURED 4 YEARS IN A ROW (80-83)

AIR LOGISTICS CENTER	TOTAL ITEMS 4 YEARS IN A ROW	*MULTIYEAR CANDIDATES
Oklahoma City	1856	238
San Antonio	1696	220
Sacramento	595	64
Ogden	800	89
Warner-Robins	580	84
TOTAL	5527	695

*87.5% are non reparable items.

TABLE II-22

Included in the multiyear candidates in Table II-22 above are the following:

		FY80	FY81	FY82	FY83
2nd Stage Turbine Nozzle J79-15A	Qty	702	168	794	759
	$	7.9M	2.1M	10.8M	11.0M
Cone (Augmentor Module) F100 Engine	Qty	132	147	169	128
	$	198K	174K	159K	98K

Item managers of these two items stated that future demands would be stable and that multiyear contracts would be feasible.

The AFMAG believes that there are sufficient line items with stability of demand and enough funds (projected funding for spares growing from $8.9B in FY 84 to $14B in FY 89) to rapidly expand the use of multiyear contracting for spares.

RECOMMENDATIONS

Expand the use of multiyear contracting for spares to reduce unit prices and track unit price and total costs savings. (OPR: AFLC/PM, OCR: AFLC/MM, ALCs/PM/MM)

FREEDOM OF INFORMATION REQUESTS

PROBLEM

Many contractors are using pricing information obtained throught the Freedom of Information Act (FOIA) regarding prices on negotiated procurements to dilute the effects of competition and charge higher prices.

DISCUSSION

There are a large number of contractors who request copies of abstracts of proposals/quotations on negotiated procurements, even if they may have been the successful offeror. There are many negotiated procurements where competition is limited to two or three approved manufacturing sources (items with technically restricted Acquisition Method Codes). Analysis of the abstract of proposals/quotations on such procurements often indicates that there is a significant difference in the proposals submitted. This is particularly true when one of the approved sources is the prime design manufacturers (large business) and the only other approved source is a relatively small company. If the successful offeror obtains a copy of the abstract he can then adjust his proposed price on future procurements upward to a point just under his competitor's prior proposal. Manipulation of proposed prices using Freedom of Information data in this way increases the cost the Air Force pays for supplies and services. It is doubtful if that this was the intent of Congress when it passed this legislation.

Discussions with AFSC and AFLC personnel indicate that both commands have provided contractors abstracts on negotiated procurements upon receipt of contractor requests.

Informal discussions with AF General Counsel personnel have confirmed that the most desirable method of protection of abstracts would be through enactment of appropriate legislation. However, as an alternative, a working copy of the abstract could be used to contain prices from all offerors. Since the Government will not enter into contracts at the unsuccessful offeror's prices, it could be argued that those prices are not, in fact, public information and therefore are exempt from release under Freedom of Information.

Information obtained from the Air Logistic Centers indicates that during the month of August 1983, approximately 1150 separate requests under Freedom for Information for abstracts were received. The number of similar requests received by AFSC is relatively small.

RECOMMENDATIONS

1. Amend the Freedom of Information Act (5USC552(b)) to protect abstracts of proposals/quotations on negotiated procurements from public disclosure. Information released to offerors should be limited to the proposal prices only for the successful offeror's prices. (OPR: HQ USAF/RDC)

2. Issue an AF DAR supplement excluding unsuccessful offeror price information from official abstracts. (OPR: HQ USAF/RDC)

SMALL BUSINESS SET-ASIDES

PROBLEM

Small business set-asides may not produce fair and reasonable prices if the set-aside occurs before a market price has been established through open competition with large and small business.

DISCUSSION

DAR 1-706.5(a)(1) requires that acquisitions be set aside when at least two responsible small business concerns can be expected to submit bids/offers which will result in an award at reasonable prices. As more items are broken-out to the actual manufacturers, many vendors, large and small, will have an opportunity to bid directly to the Air Force.

It is recognized that generally small business firms are lower cost producers than large firms. However, for some specific parts, because of tooling, equipment, and or technology, there are some cases where large firms cost of production would be lower than that of a small business. Until any item is acquired through open competition, i.e. large and small firms, there cannot be a marketplace price for determining "fair and reasonable price."

The Small Business Administration Procurement Center Representatives at the AFLC Air Logistics Centers apply a great deal of pressure to achieve maximum number of small business set-asides and have a tendency to set aside items broken-out from actual manufacturers, for first time competition. To overturn a set-aside, the buyer has to go through a time consuming and a normally unsuccessful process. Consequently prices may not be reasonable because the set-aside will be measured against the previous sole source price and not a price established through open competition. In most cases the price will be lower than the prime's but may not be reasonable in comparision with an open market price. As a result the Air Force may pay a higher price than otherwise obtainable.

RECOMMENDATION

The DAR be revised to require open, unrestricted competition to establish a marketplace price prior to initiating a small business set-aside. (OPR: HQ USAF/RDC)

SEPARATE CONTRACTS FOR SPARE PARTS AND SUPPORT SERVICES

PROBLEM

Many prime contractors are unable to compete effectively for spare parts buys because their indirect overhead includes the costs of services.

DISCUSSION

The Air Force expects the prime contractor to provide a broad range of support services for his system. Typically, these services include the following:

- Integrated Logistic Support
  - — Configuration Control
  - — Analytical Condition Inspections
  - — Teardown Reports
  - — Repair Procedure Development
- Accident/Incident Investigative Support.

The cost of these types of services are normally included in burden rates and allocated against production contracts. One prime contractor estimates that 20% of the spare parts selling prices are for the cost of these services. Obviously it is difficult, if not impossible, for the prime to be competitive with vendors who do not provide these same services to the Air Force. Because of this, most prime contractors are reluctant to break out items for competition or to approve alternate manufacturing sources. By doing so, they would be unable to be competitive and win a share of spare parts production contracts while providing the expected services.

These charges also distort the "true" cost of parts. This results in a perception of overpricing.

It can be logically argued that if a method could be developed to segregate these types of support services into a separate contract the prime contractors would be more willing to approve alternate sources and then enter a competitive arena with those sources. Parts would also be priced closer to their value.

Implementation of this concept would require the joint establishment of a statement of work for the support required between AFLC and AFSC. It would then be possible to develop an estimate for this support and funding through the POM process.

RECOMMENDATIONS

Initiate a joint AFLC/AFSC project to evaluate the long range impact of this concept and a manageable program for implementation. (OPR: HQ USAF/RD; OCR: HQ USAF/LE)

PROCEDURES FOR COMPETITIVE SMALL PURCHASES

PROBLEM

The AFLC manpower required for maintenance of the mechanized bidder's list and recording quotations on small purchases is excessive and could be better utilized for improving the quality of contractual actions.

DISCUSSION

AFLCR 70-2 controls the J014 mechanized bidder's list. This regulation requires the buyer to annotate the mechanized bidder's list with information relative to each prospective bidder who requested a bid set and each quotation received. It also stipulates that bidders who fail to either submit a quotation or a "no-bid" response will be removed from the mechanized bidders list. In a competitive procurement utilizing small purchase procedures (less than $25,000 total estimated value) it is not unusual to receive fifty or more requests for bid sets and twenty or more quotations. Furthermore, buyers are required to abstract all quotations received, as well as "No Bids" responses. It frequently takes the buyer several hours to accomplish this file maintenance/abstract effort. This effort could be more productively used to improve the quality of contracts written.

RECOMMENDATIONS

1. Amend AFLCR 70-2 to delete the requirement for file maintenance of the mechanized bidder's list on all procurements using small purchase procedures. (OPR: HQ AFLC/PM)

2. Amend the requirements concerning "no-bids" to the extent that offerors are not required to submit a "no-bid" to remain on the bidder's list. They will remain on the mechanized bidder's list until they specifically request removal. (OPR: HQ AFLC/PM)

3. Publish policy guidance which requires that only the low three quotations be posted on competitive small purchase abstracts. (OPR: HQ AFLC/PM)

COST AND PRICING DATA ON LESS THAN $500,000.00

PROBLEM

Sole source contractors routinely refuse to discuss the basis or provide details for price proposals under $500,000.00. This practice increases the possibility of overpricing.

DISCUSSION

When buyers are confronted with price increases that they feel exceed reasonable quantity and inflation adjustments, they are put in a "take it, or leave it" position by those contractors. Many contractors contend that DAR 3-807.3(b) does not require them to furnish cost and pricing data on acquisitions of less than $500,000.00. Attempts to elevate the situation are time-consuming and most often to no avail. Eventually, the time runs out, the proposed price is accepted, and the buyer undertakes some form of price justification that ignores the increase in price from the previous buy. The more frequently this happens, the less often elevation is attempted and the more frequently the buyer immediately proceeds to price justification.

RECOMMENDATION

1. Revise DAR 3-807.3(b) to specifically require contractors to furnish cost or pricing data for any quote or proposal upon request of the contracting officer. (OPR: HQ USAF/RDC)

SPECIAL TOOLING

PROBLEM

Air Force review of contractor submission of residual special tooling listings requires improvement to assure capability to support post production spare parts requirements.

DISCUSSION

DAR 7-104.25 Special Tooling, requires the contractor to provide a list of all special tooling acquired or manufactured by the contractor for use in the performance of the contract. The first submission, if requested by the contracting officer, may be required sixty (60) days after delivery of the first production end item. The second submission is required (mandatory) upon completion or termination of the contract, unless waived by the contracting officer. In order for the Air Force to properly direct disposition for use in the breakout program and to assure post production support of weapon systems, the contracting officer must make timely and informed decisions on contractor retention, disposal or the governments exercising of it's right to take title to the special tooling. This action is required to assure ultimate placement of special tooling in the proper physical location to support future spares requirements.

RECOMMENDATION

1. Revise DAR 7-104.25 to require mandatory submission of special tooling lists at both the "sixty day" and "completion" points. (OPR: HQ USAF/RDC)

2. Establish specific procedures to assure the special tooling lists receive complete review to identify those tools which must be retained to support competitive spares acquisition and post production requirements. (OPR: HQ USAF/RDC)

MINIMUM BUY CRITERIA

PROBLEM

The Air Force frequently places orders for items in quantities less than are economically practicable, especially during initial provisioning.

DISCUSSION

The Air Force Logistics Command (AFLC) Item Manager (IM) identifies requirements based upon formulas which do not include minimum buy criteria considerations. Contractors often know that order quantities can be increased at little or no increase in the price of the order. This information needs to be communicated to the Air Force in order to gain the price/quantity advantage.

One major weapons system initial provisioning contract incorporates a clause which addresses this issue and which has been successful in practice. The clause reads as follows:

> When in the course of releasing low-dollar items, the contractor is informed by his vendor/sub-vendor that the minimum buy quantity/minimum billing exceeds the Government on-order quantity, the contractor shall request ACO approval in writing to increase the order to the stated minimum buy/minimum billing quantity. The ACO's approval of such increases shall be disseminated by the ACO to the appropriate Government Agencies to reflect the increased order quantity against the original ELIN. No other data shall be required from the contractor to reflect the increased order quantity other than the proposal which definitizes the price for that ELIN.

RECOMMENDATION

Incorporate a clause in all future initial provisioning contracts to take advantage of economic buys. (OPR: HQ AFSC/PMP)

MULTIPLE SOURCING

PROBLEM

Competition of spare parts is often times restricted to sole source from the original producer because of the extended time and extra cost of qualifying a second source for manufacture of critical components.

DISCUSSION

Unless qualification of additional sources is started early in the program, there is generally insufficient time to qualify a second source during spare parts breakout. The exacting performance requirements of specially designed military equipment may demand that parts be closely controlled and have proven capabilities of precise integration with the system in which they operate, to a degree that precludes the use of even apparently identical parts from new sources. Two essential elements for spare parts breakout are: an adequate acquisition data package, including any necessary data developed at private expense, and sufficient lead time to qualify a second source to produce the acceptable part. Qualification of second sources should begin as early as FSD and should be continued throughout the procurement process. It is generally too late to qualify a second source when the part is actually needed.

One recommended approach to start the vendor qualification process early is to require the proposer to submit a list of parts suitable for breakout, the names of proposed additional sources and the estimated overall dollar savings potential. The Air Force should adopt a policy establishing multiple sources by including the following clause in all R&D contracts:

Qualification of Additional Vendors

1. The contractor shall submit a list of parts suitable under paragraph a. above (those parts the Air Force intends to breakout for competitive acquisition and acquire acquisition data packages for) and having the stability of design for qualification of at least one additional source. This list shall indicate, for those selected parts having only one source, an estimate of the cost for which one or more additional vendors will be fully qualified. The list shall clearly identify each part by name or title, drawing number(s), function and location in the system, the suitability for qualification and names of proposed additional sources or vendors to be qualified and estimated overall dollar savings potential.

2. It is further agreed that the Government has the right to require the contractor to qualify at least one additional competitive source for all listed parts, to permit the competitive purchase of the parts by the Government. This right may be exercised from time to time for the term of this contract. Upon written notice from the Contracting Officer, the contractor shall, to the extent possible, promptly proceed with, and complete, the qualification of parts as required at prices to be negotiated. In qualifying vendors, the contractor shall use the same basis or standard to the extent possible, in order that no competitive advantage or disadvantage is given to any vendor. The additional vendor or source shall be other than the prime contractor, unless the

contracting officer specifically approves the prime contractor as the additional source. Any disagreements as to price, terms or enforcement of this provision shall be resolved using the procedures of the General Provision entitled, "Disputes."

3. The prices to be paid by the Government for the purchase of Acquisition Data Packages and the Qualification of Additional Vendors are not included in the incentive price provisions of this contract, but shall be subject to fixed price orders as provided under the provisions of this clause.

RECOMMENDATION

Issue Air Force DAR Supplement 1-313(c), Qualification of Additional Vendors (see Appendix 1 for text of the clause). (OPR: HQ USAF/RDC)

FORMULA PRICING AND COST ALLOCATION

PROBLEM

Non-value based cost allocations within formula pricing and other contractual agreements contribute to the apparent overpricing of spare parts. Little effort has been made to assure unit price integrity.

DISCUSSION

Formula pricing agreements are negotiated between Air Force contracting agencies and defense contractors. The primary purpose of these agreements is to expedite the pricing of a high volume of low dollar spare parts orders. The pricing formula defines the cost elements and the allocation procedures for these elements necessary to arrive at a price for the parts. Cost elements such as material overhead, packaging and inspection labor, fringe benefits, scrap, and product support are separately estimated, in total, for the duration of the agreement. The cost allocation procedures then determine how much of each cost element will be allocated to each part. It is the allowability of each cost element, coupled with the procedures for cost allocation, that determines the price of each part.

Assuming the cost elements to be allocated to each part are allowable, the procedure or "formula" for cost element allocation will establish the unit price for each part. When costs are allocated equally to each purchased part, unit prices will not be value based. On the other hand, when costs are allocated on a value or "worth" basis, each part will receive its fair share of allocated costs. This is the key to unit price integrity - value based cost allocation.

Industry's main concern has been that the entire cost pool be recovered. Little concern has been placed to assure that each spare part receive the appropriate portion of the pool.

Two examples serve to illustrate the situation. Table II-23 depicts how per-unit allocation of material handling labor hours can distort the true value of two different spare parts; one a diode, the other a power supply. This example allocates material handling labor hour costs evenly to each unit. Table II-24 shows the allocation of the same costs on a "value" basis; i.e. on the basis of total purchased parts cost. In the first table the diode is grossly overpriced at $110.34 per unit while the power supply is underpriced at $177.12. In the second table, where a "value" based allocation technique is applied, the diode becomes fairly priced at $.09 each and the power supply becomes fairly priced at $213.87. It is important to note that regardless of allocation technique applied, the bottom-line total order price did not change and was reasonable (see table II-25). However, the allocation technique used did significantly distort the individual unit price.

The non-value based allocation problem also arises on separate stand-alone contracts where contract peculiar costs are allocated. Government and contractor negotiators have frequently agreed to allocate these costs equally to each individual item because it is expedient to do so and they are not primarily concerned with individual unit price reasonableness. Cost allocation is a major area for clean-up in separate contracts as well as formula price agreements if there is to be any hope for establishing unit price integrity.

MATERIAL HANDLING LABOR HOURS ALLOCATED EVENLY TO EACH SPARES LINE ITEM

	Diode		Power Supply
Purchased Parts 2 @ 4¢	$ .08	6@ $100	$600.00
Direct Labor Negotiated 4.5 hours @ $18.00	81.00		81.00
Overhead @ 94%	76.14		76.14
Total Mfg Cost	$ 157.22		$757.14
G&A @ 21%	33.02		159.00
Subtotal	$ 190.24		$916.14
Profit @ 16%	30.44		146.58
Total Price	$ 220.68		$ 1,062.72
Unit Price	$ 110.34		$ 177.12

TABLE II - 23

MATERIAL HANDLING LABOR HOURS PRORATED ON BASIS OF TOTAL PURCHASED PARTS COST

	Diode		Power Supply
Purchased Parts 2 @ 4¢	$ .08	6@ $100	$ 600.00
Direct Labor	.02		161.98
Overhead @ 94%	.02		152.26
Total Mfg Cost	$ .12		$ 914.24
G&A @ 21%	.03		191.99
Subtotal	$ .15		$ 1,106.23
Profit @ 16%	.03		176.99
Total Price	$ .18		$ 1,283.22
Unit Price	$ .09		$ 213.87

TABLE II - 24

TOTAL PRICE COMPARISON

	Diode	Power Supply	Total
Example A	$220.68	$1,062.72	$1,283.40
Example B	$ .18	$1,283.22	$1,283.40

NOTE: Under either method of allocating material handling labor hours, the total price is the same.

TABLE II - 25

Overall, non-value based cost allocation methodologies whether applied in company accounting systems or used to resolve specific contract or formula pricing cost allocation issues, contribute significantly to overpricing of individual spare parts and misrepresentation of realistic individual spare part prices.

"Value-based" cost allocation should reflect a beneficial or causal relationship between spare parts cost pools and their concomitant unit cost objectives such that unit price integrity and reasonableness prevails in accordance with the spirit and intent of CAS 418.

RECOMMENDATIONS

1. Establish a policy requiring "value-based" allocation of spare parts direct and indirect cost elements; stating that discrete per-unit or line item cost allocation methods are no longer acceptable. (OPR: AF/RDC)

2. Require immediate review of all existing pricing formulas to insure "value-based" cost allocation; withdraw from all formula agreements that do not comply by 30 Jun 1984. (OPR: AF/RDC)

3. Initiate a change to the Air Force DAR Supplement requiring "value-based" cost allocation in all contracts and pricing formulas. (OPR: AF/RDC)

4. Initiate a DAR/FAR change requiring "value-based" cost allocation in all contracts and pricing formulas. (OPR: AF/RDC)

PRICING TOOLS

PROBLEM

Sufficient tools are not available to the buyer/contract negotiator for evaluation of noncompetitive proposals of less than $500,000.

DISCUSSION

The Air Force is staffed with price analysts who analyze and assist in negotiation of complex pricing cases that are noncompetitive and in excess of $500,000. These cases represent over 90% of the spares dollars but less than 2% of the contracts. To date none of the overpricing cases reported have been in this category of actions.

This large volume of noncompetitive contracting actions between $25,000 and $500,000 ($25,000 is the small purchase threshold) is susceptable to overpricing. A sample of the negotiated prices of these items revealed that while some tools are available, more are needed to assure that fair and reasonable prices are obtained. Law and regulations require cost and pricing data to be furnished when requested, but large contractors frequently refuse to provide the data as a matter of corporate policy. Formula pricing (wherein negotiated overheads and direct factors are used) is employed extensively in this area. In the main, price analysis is used for this category of items. Some Air Logistic Centers provide a set of indices to make rough approximations of "fair" escalation of material over time; however, this generally makes no allowance for larger or smaller quantities and labor content.

Our survey revealed that the largest potential for overpricing exists in the 0 to $25,000 range. Currently Air Force regulations require no documentation for acquisitions up to $1,000. It is difficult to evaluate the reasonableness of these prices. From $1,000 to $25,000 AFLC had developed a "cost benefit" analysis method of pricing small purchases entitled "Statistical Pricing." AFLC cancelled this program during the AFMAG review of the program. The cost benefit analysis has never supported use of this program for over $10,000. All centers except one use the $5,000 limit for this program. Statistical Pricing, as authorized by AFLCR 70-18, requires that 10% of the actions between $1,000 - $5,000 be individually priced. As long as the negotiated reductions achieved by pricing this sample of actions are less than the administrative costs of pricing them, the remaining 90% of the actions in the population may be accepted as proposed. As stated in AFLCR 70-18, Statistical Pricing "...is designed to permit efficient processing of small purchases..." It can be reasonably inferred that the potential for paying overstated prices for relatively common items (nuts, bolts, etc.) is always present in this category of actions.

While AFLCR 70-18 states that even the non-sampled items (i.e., those eligible for acceptance without detailed pricing) will receive a limited review for readily apparent discrepancies, precious few yardsticks exist with which discrepancies could be measured. Even a record of previous prices paid may not be a usable measure if previous prices were accepted under Statistical Pricing as non-sampled items. In an environment where about 77% of all contract actions are valued at $25,000 or less, and where the workforce is staffed at about 70% of requirements, expedient methods of processing high volume workload are absolutely essential.

With added discipline the statistical method could provide a cost effective method for pricing those acquisitions between $0 and $25,000. Compliance with policy as currently written must be enforced plus the addition of indices and nomographs to allow approximations of material and labor escalation with adjustments for larger or smaller quantities. Also, some threshold such as ± 25% should be established over which normal pricing action should be required. The value analysis review conducted under the expanded Competition Advocate program will provide the tools to adequately price actions in the $25,000 to $500,000 range. Over time, value analysis will also obviate to some degree the need for statistical pricing. Until the expanded Competition Advocate is fully operational and the manpower shortfall is rectified, Statistical Pricing if restructured can continue to meet its objective of processing large volumes of actions expediently plus providing some safeguards against overpricing.

RECOMMENDATION

Develop a new regulation on "Statistical Pricing" with discipline added to

- identify problem contractors
- measure effectiveness of the negotiation sample selected
- provide an alert point (i.e. ± 25%) where the proposal is 100% negotiated
- new tools to measure inflation and quantity change
- coverage down to zero dollars
- include this program as one of the self inspection items

(OPR: HQ AFLC/PMP)

PRICING ACTIONS UNDER $1,000

PROBLEM

All noncompetitive proposals valued at $1,000 or less are accepted without any price justification or documentation. This practice ignores the risks of overpricing.

DISCUSSION

DAR 3-604.1, "Purchases Not In Excess of $1,000", states that action need not be taken to verify price reasonableness for acquisitions of $1,000 or less. The stated premise is an economic fact. At this dollar value, the administrative cost of verifying price reasonableness more than offsets the potential savings. Unless there is something obviously wrong with the proposed price, the buyer is expected to accept the price as proposed.

During 1982, approximately 20,000 noncompetitive actions in this range were processed by AFLC. The total value was less than $10,000,000. As many as 90 additional PEs would be required to price these actions individually. The added manpower cost would exceed, by far, the most optimistic forecast of negotiated savings.

Given the Congressional interest in all aspects of overpricing and the loss of credibility resulting from media attention, change is recommended. However, the economic logic of DAR 3-604.1 is so compelling that any change should recognize and preserve the author's intent, if possible. The Statistical Method of pricing small purchases in AFLC is operative between $1,000 and $5,000 (generally). As discussed elsewhere in this report, the AFMAG is recommending that Statistical Pricing be retained with changes to strengthen the program and instill added discipline. This program, through a sampling technique, will identify contractors who are charging prices that are too high while still allowing volumes of actions to be processed.

RECOMMENDATIONS

Revise AFLCR 70-18 or local operating instructions at the ALC's to include these actions in the revised Statistical Method of Pricing Small Purchases. (OPR: HQ AFLC/PMP, OCR: OC-ALC/PM, OC-ALC/PM, SA-ALC/PM, SM-ALC/PM, WR-ALC/PM)

DEPARTMENT OF DEFENSE PROFIT POLICY

PROBLEM

DOD profit policy does not motivate defense contractors to produce items at the lowest reasonable cost.

DISCUSSION

It has long been recognized that the DOD aproach to profit does not motivate defense contractors to control or reduce direct and indirect costs. Profit is developed by the weighted guidelines method prescribed by DAR 3-808.2. This method develops profit dollars through the assignment of weights which are multiplied by the cost dollars for the various cost elements. Contractors are effectively rewarded for proposals which reflect complex manufacturing techniques and high absolute costs, for both of these result in higher profit dollars under the weighted guidelines method. Profit Study '82 concluded that profit dollars are driven 46% by cost, 37% by risk, and 17% by capital employed. With such a large portion of profit dollars being driven by the complexity and absolute amount of cost, it is difficult to convince defense contractors of the merits of cost controls and reductions. While the weighted guidelines method does include a productivity factor that was intended to award additional profit dollars to contractors that demonstrate cost reductions for follow-on production, the procedures for using this factor are poorly understood and too complex to be effective.

RECOMMENDATION

Revise DAR 3-808 to accomplish the following:

- De-emphasize cost and complexity drivers.
- Simplify the productivity factor so that it will be understood.
- Expand the productivity factor to incorporate cost reduction rewards similar to value engineering savings sharing.
- Reinstate a contractor performance element to reward contractors for cost reduction and productivity enhancement.
- Provide for lower profits for contractors who make no effort in this area. (OPR: HQ USAF/RDC)

SPARE PARTS PRICING

PROBLEM

Current provisioned item order proposal evaluation methods can lead to unit prices that do not reflect the true value of individual spare parts.

DISCUSSION

Unrealistic provisioned item order (PlO) unit prices are frequently traceable to the proposal review process and the methods used to evaluate contractor proposal prices. On proposals with fewer than 10-15 line items, this is not a problem because each unit price is normally separately reviewed; thus leading to price integrity...a price that fairly and reasonably represents the true value of an item. On proposals with more than 10-15 line items, the method of proposal review can lead to establishment of unrealistic PlO unit prices. This can happen when the evaluation techniques employed do not require analysis of each and every part in the proposal. Conceptually, these techniques are designed to conserve time and effort, and to derive fair and reasonable bottom-line proposal prices, not individual unit prices. Therefore, it is possible for some individual parts to be "overpriced" while at the same time the bottom-line proposal price is fair and reasonable. Herein lies a contributing factor to many "overpriced" parts in the Air Force inventory.

A technique is needed that "fills the gap" and enhances our ability to obtain fair and reasonable PIO unit prices, while at the same time does not burden the system with discrete line-item by line-item, time-consuming analysis.

Line item analysis will impact Contract Administration Offices (CAOs), since DAR requires CAOs to evaluate, negotiate and definitize PlOs. Therefore, a line item pricing technique is needed that will apply to and serve CAO pricing activities: it should significantly improve confidence in PlO unit price integrity across all high line-item count proposals; and minimize the impact of time, effort and manpower necessary to do so.

A technique which will satisfy this need is the Price Analysis and Review Technique for Spares (PARTS). PARTS offers a methodology for price review/analysis of each line item and provides reasonable assurance that the Government is not only getting a fair and reasonable bottom-line price, but that each unit price is also fair and reasonable. A more complete outline and description of PARTS is contained in attachment 1.

In conjunction with methods needed to review every line item of a PIO proposal, additional manpower requirements can be minimized if historical records are retained and are readily assessable for comparision to future procurements of the same items. Conceptually, if you once review an item and establish its fair and reasonable price, then the time needed to review that item in the future is significantly reduced; reduced because you have a valid historical reference point and do not need to review the item again from the bottom up. Therefore, a price-history data base is needed.

AFSC's Acquisition Management Information System (AMIS) is an existing and capable automated data base. It contains much of the data and capability

necessary to support an automated price-history data base suited for application with the PARTS concept. Some modifications to AMIS are needed to accomodate the price-history data base concept, but the architecture and foundation is largely available. A more comprehensive outline of suggested data base requirements contained in attachment 2. Once established, this data base should be accessible by all Government agencies. It could then serve to support ALC Competition Advocate efforts.

An additional source of information that would aid in the line item review process of PARTS is the ALC's JO41 Procurement History Record (PHR). The AFLC Acquisition and Due-In System, JO41, has a history data base which contains a three year history of AFLC centrally procured items. This data is currently made available to ALC buyers at the time of receipt of the purchase request Material Management Directorate. As spare parts go through the Competition Advocate screening process, application and review of the PHR would serve as an excellent additional reference point for use in the CAO.

Lastly, defense contractors should be required to certify, at the time of proposal submission, that all part-level prices have been reviewed and that it has been determined that the proposal prices represent a fair market price for like-or similar parts in the open market; that proposal prices are built upon unit price integrity. This action will serve to cause contractors to become more responsible partners in their spare parts business with the Government; and may cause contractor senior management to become more involved in their internal proposal review process.

RECOMMENDATIONS

1. Initiate the PARTS line item pricing technique, or a similar technique, to assure that the Government is getting fair and reasonable spare part unit prices. (OPR: AF/RDC)

2. Develop an automated price-history data base capability within AMIS that would serve as a reference source for future value-review, price analysis efforts. (OPR: AFSC/PM)

3. Insure that a copy of the JO41 Procurement History Record, A-JO41-6CK-D6-M60, is made available or provided to the CAO for each NSN placed on order. (OPR: AFLC/PM)

4. Require contractors to certify all spare parts prices to be fair and reasonable. (OPR AF/RDC)

5. Issue a policy letter to this effect and follow up with a DAR/FAR change. (OPR: AF/RDC)

2 Attachments

Price Analysis Review Technique for Spares

(PARTS)

The "PARTS" approach (as depicted in the attached diagram) is a pricing technique that accomplishes 100% review of line items on a provisioned item order (PIO), basic ordering agreement (BOA) order, or separate contract. PARTS has two basic segments:

1. 100% cost/price analysis of the high-dollar value line items; based on a rule-of-thumb threshold where 10% of the line items account for approximately 80% of the PIO dollars. Conceptually, this segment of PARTS requires complete grass-roots analysis of the high cost items including analysis of labor, material, processes, etc. Selection of a high-dollar threshold is judgmental; a judgment that should reflect the nature of the proposal under review.

2. The second segment of PARTS has three elements:

a. First, "value review" of the remaining 90% of the line items not already analyzed. These items are referred to as the low-dollar-value line items. Value review involves a subjective assessment of item prices as compared to an illustrated parts breakdown, picture, drawing or sketch of the item, including a short written description of labor, material and engineering characteristics of the item. Value review will determine if the price offered appears to be a fair value. For example, a value review should determine that $1.50 is a fair price for a Switch, Toggle, Multi-terminal while $11.50 may not be a fair price; or that $10.00 is not a fair price for a bolt, 7/16 x 2 - but $0.25 may be a fair price.

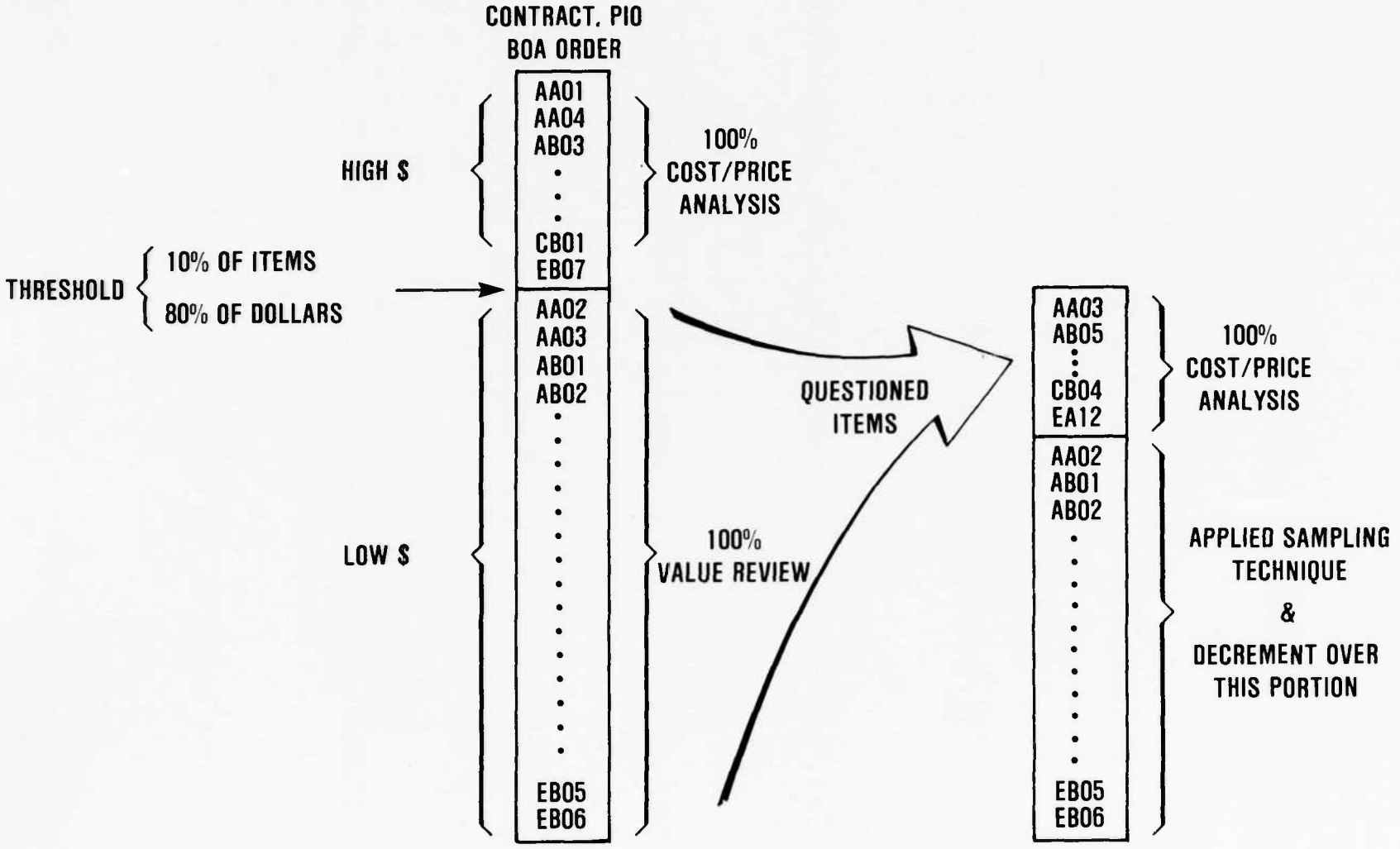
b. Second, when the value review determines that a price may not be fair and reasonable on the surface, that line item would then be set aside for detailed analysis as in (1) above.

c. Third, the remaining low-dollar-value items have "passed" value review. These line items are then sampled, analyzed and decrement-factored to develop a negotiation position. This sampling technique applies only to the items that "passed" value review.

In this manner each and every part is reviewed, or "looked-at" by; i) a detailed analysis of high-dollar items, ii) detailed analysis of the "questioned" low-dollar, value-reviewed items, and iii) sampled and decrement-factored over the remaining low-dollar items. The combination of the three analysis efforts then establishes the Government's negotiation objective for the entire order.

Attachment 1

PRICE ANALYSIS & REVIEW TECHNIQUE FOR SPARES (PARTS)



PRICE-HISTORY DATA BASE
REQUIREMENTS OUTLINE

An automated price history data base to compliment the PARTS concept is outlined herein. The requirement for this data base are intended to serve as a reference source for future PARTS value-review and analysis efforts. The price-history capability of this data base should provide two basic aids for a user:

1. Periodic NSN and part number sequenced listings for desk-top, ready reference during proposal review, and

2. On-line query capability.

The data base should provide the following type of data:

- o National Stock Number
- o Part Number
- o Nomenclature
- o Manufacturer's Code/Name

- o Multiple Procurement History Records:
  - -Contract/Order/ELIN
  - -Date
  - -FMS Flag
  - -Unit Price
  - -Quantity
  - -Extended Price
  - -Contract Administration Activity DODAAD

- o Local Use Data Fields (For example to identify:)
  - -Price Analysis Report Numbers
  - -Contractor Proposal Reference Numbers
  - -Interchangeable Part Numbers/NSNs
  - -Weapon System Application
  - -Vendor/Subcontractor Data
  - -PARTS Unit Value

Attachment 2

LOWEST EVALUATED PRICE

PROBLEM

AFLC policy limits the use of the Lowest Evaluated Price methodology. This may result in lost opportunity to make contract awards in the best interest of the Air Force.

DISCUSSION

In AFLC nearly all competitive procurements are awarded to the contractor submitting the low price. This low price iscomputed based upon: (a) offered price; (b) discounts; and (c) transportation. There is a procedure within AFLC called lowest evaluated price which permits the contracting officer to evaluate factors other than price (i.e. technical areas that affect an offeror's ability to successfuly perform if awarded a contract). Under this procedure the Government identifies standards for each selected area and "scores" each proposal based upon an evaluation of the proposal against the technical standard. The price proposals are then scored based upon each offeror's relationship to the low offeror. The total technical score is then added to the score for price and the successful offeror is that company with the highest total score. Prior to solicitation the Air Force determines the relative weight to be applied to each area. The General Accounting Office (GAO) has sustained DOD's use of this technique and has held that it qualifies as price competition as long as price is given a significant percentage of the weight (normally 30-40% of the total). This procedure has significant potential for use on spare parts contracts and is the best known tool available to the contracting office for selecting that contractor whose proposal is most advantageous to the Air Force, price and other factors considered.

An example of an item that could be a candidate for this methodology would be an aircraft instrument that had two approved manufacturing sources where user experience has demonstrated a difference in Mean Time Between Failure (MTBF) and the Air Force would want to evaluate factors other than just price.

Because of the nature of this procedure, it should be used only on major, critical items where the Government can reasonably expect logistic support problems if the successful contractor were selected only upon the basis of low price. Use of the procedure should be well documented and approved at a level no lower than ALC Director of Contracting and Manufacturing.

RECOMMENDATIONS

1. Expand the policy regarding the lowest evaluated price technique to include major, critical spare parts procurements. (OPR: HQ USAF/RDC)

2. Develop uniform standards for evaluation of proposals. (OPR: HQ AFLC/PM)

FIELD PRICING SUPPORT

PROBLEM

Audit Reports covering spare parts proposals are specific as to conclusions but lack specificity as to rationale to support the recommendations/conclusions. This condition complicates the negotiation process and leads to overpricing and the appearance of overpricing.

DISCUSSION

Field reviews of contractor proposals by DCAA are intended to provide the contract negotiator with informed judgments as to the appropriateness of cost support data, contractor operations and other factors which bear on the proposed price. Interviews with contract negotiators within AFLC identified the following issues:

1. While the quality of the audits was in general considered good, the contract negotiators need more narrative information to take to the negotiation table.

2. While tabulating questioned costs, many of these reports fail to provide sound rationale for the unsupported/questioned cost.

3. Too many audit reports reference previous reports for details of recurring issues. This requires time consuming additional research by the negotiator to assimilate and understand the basis and details of the questioned costs.

4. Often, when the contractor fails to satisfy the auditor's questions with respect to a proposed percentage of some expense pool, the auditor disallows the entire pool. This leaves the negotiator with no recommendation for that cost element even when it is patently obvious that some portion of that expense pool applies. This lays the burden of uninformed judgment on the contract negotiator.

5. The auditor's recommendation for each element of cost is normally a finite and conservative number. The negotiator needs a recommendation couched in terms of a range of most probable cost outcomes with which to work. The net result of cost recommendations which are unsupported by narrative rationale is a waste of the auditor's good work. The negotiator will be unable to establish a reasonable and logical negotiation objective with which to effectively counter the contractor's position.

6. Proposals and audit reports are perishable. The negotiator needs the auditor's input faster and would prefer that the auditor automatically forward the audit report to the buying activity at the same time the report is submitted to the Administrative Contracting Officer.

RECOMMENDATIONS

Work with the Defense Contract Audit Agency to secure increased emphasis on the informational quality of field reports with the goal of assisting the CO in negotiating fair and reasonable prices. Policy issued directing that a field pricing report should, by element of cost, provide:

1. The value proposed (hours or material dollars or factor)

2. The value of the recommendation (hours or material dollars or factor)

3. The basis of the contractor's proposal

4. The CAOs perceived weaknesses of the contractor's proposal

5. The basis of the recommendation with rationale which counters the contractor's proposal (OPR: USAF/RD)

POST PRODUCTION SUPPORT

PROBLEM

A shrinking industrial base and changes in technology, have a negative impact on post production spares support for major end items. This leads to high unit costs and reduced readiness.

DISCUSSION

The service life of several weapon systems currently in the Air Force inventory have been extended beyond original design. As a "rule of thumb" the service life of a major weapon system is usually planned for ten to fifteen years. Both the Minuteman Missile and the F-4 aircraft were fielded in 1962 and are programmed through 2000. The last production Minuteman was produced in 1978 - the last F-4 in 1979.

Logistic support of these and other out-of-production weapons is affected because companies go out of business and technology advances. For example, 21% of all purchase requests returned from the Directorate of Contracting and Manufacturing to the Directorate of Material Management at Warner Robins Air Logistic Center (838 of 3975) were returned because of "no available sources, no solicitation response."

TECHNOLOGY IMPACTS

Item	Last Successful Buy	No Source No bid	Quantity & Anticipated Total Cost	Cost of Mod or New Design
Brine Chiller (Minuteman)	1962	May 1977	850 ea $22,950,000	850 ea $57,810,000 (FY 82)
Data Processor (Minuteman)	1969	Apr 1979	95 ea $ 5,852,000	95 ea $ 7,000,000 (FY 81)
Guidance and Control Cooler (Minuteman)	1971	Feb 1980	8 ea $ 709,800	8 ea $ 4,400,000 (FY 82)
Anti-Skid Control (C-141)	1975	Oct 1978	398 ea $ 1,382,000	398 ea $12,000,000 (FY 81)

TABLE II-26

Until recently there has been no formal long range plan established to support weapons throughout their extended service life.

To counter this trend, a Post Production Support Program was initiated at the Ogden Air Logistics Center and is currently in existence on the Minuteman Missile and the F-4 APQ120 Fire Control System. This program requires the prime contractor to accomplish a complete logistics supportability analysis of the weapon and to maintain this analysis throughout the life of the system. This includes a technology review of all systems and sub-systems to determine industry capability and to recommend to the Air Force ways to sustain logistics support. This includes but is not limited to "life of system" buy-outs; modification to today's technology, reverse engineering, etc. Included in these recommendations are cost trade-offs associated with each option. The Air Force retains the responsibility to select the most cost effective or technically sound recommendation.

The Lockheed Aircraft Company currently has a similar program to assure logistic supportability to its users for the L-1011 Tri-Star aircraft. A stated objective of the Lockheed program is that "spares must be available and prices and leadtimes must be reasonable throughout the lifetime of the L-1011 fleet." Lifetime is defined to be as long as five aircraft remain in service. To achieve this Lockheed requires its suppliers to make specific commitments to develop an inventory plan to provide needed spare parts inventories.

RECOMMENDATIONS

1. Require a "Post Production Support Program" clause be included in requests for proposals for new weapon systems acquisitions. (OPR: HQ USAF/LE)

2. Evaluate the feasibility and implement necessary Post Production Support Plans on all major systems or major end items which do not have current Post Production Support Plans. (OPR: HQ AFLC/MM, OCR: HQ USAF/LE/RD)

MATERIEL MANAGEMENT AGGREGATION CODES (MMAC)

PROBLEM

The Air Force is currently managing too many nonreparable items which have been inappropriately MMAC coded. This ties up scarce Air Force manpower resources.

DISCUSSION

Of the total 568,869 nonreparable items managed by the Air Force, 363,804 are assigned a MMAC. During the AFMAG review of a sample of overpriced items, many appeared inappropriately MMAC coded. For example, a roll of tape with "vent" printed on it, a screwdriver, plus nuts and bolts appeared non-critical. Improper MMAC coding ties up scarce Air Force manpower resources which could be applied to increasing competition and obtaining fair and reasonable prices.

RECOMMENDATION

The Air Force Logistics Command should review all MMAC coded nonreparable items to ensure that the Air Force manages only weapon system critical items. (OPR: HQ AFLC/XR, OCR: HQ USAF/LEY, HQ AFLC/MM)

APPROVING ALTERNATE MANUFACTURING SOURCES

PROBLEM

AFLC published guidance is lacking on the specific procedures governing approval of alternate manufacturing sources for items with Restricted Procurement Method Codes. This is an impediment to competition.

DISCUSSION

There are a significant number of items in the Air Force inventory which are not suitable for procurement by open competition because of: absence of an adquate data package, or technical considerations (critical engine parts, flight safety items and life support equipment). For such items the Air Force has basically three alternatives: (1) continue to procure sole source from the prime; (2) identify those items which are in fact manufactured by a vendor to the prime where there is no value added by the prime during the manufacturing process; and (3) identification and approval of an alternate manufacturing source other than the prime's vendor. Each of these alternatives will be separately discussed below.

There are items managed by the Air Force for various reasons which will always be acquired from the prime. This is because of: (1) proprietary rights to the manufacturing data; (2) unique manufacturing capabilities which other sources cannot duplicate; (3) small quantity requirements which preclude qualification of alternate sources because of economic consideration; and (4) other legitimate reasons that preclude breakout.

Breakout of items direct to the actual manufacturer (vendor) where there is no contribution made by the prime during the manufacturing process (no value added) is the most straight forward form of breakout and carries the lowest level of technical risk. The major problem facing the Air Force is the identification of the vendor and the verification that there is in fact no values added by the prime. The actual manufacturer can be identified in one of the following ways: by voluntary identification on the part of the prime; identification by the Contract Administration Office (CAO); identification by contracting personnel from review of cost and pricing data; or contact by the vendors themselves requesting approval for direct procurement. Upon identification, the vendors should be referred to the Competition Advocate (CR) for evaluation and consideration for approval for future contract action. The Contract Data Management System (CDMS) under development by AFLC/PM has significant potential for "capturing" vendors that have been identified pending evaluation and approval.

The most difficult form of breakout is the approval of an alternate manufacturing source who has not previously made a specific item. The cognizant AFLC engineer must exercise professional judgement prior to approval of an alternate manufacturing source. This involves acquisition of information (including evaluation of preproduction samples) to give the engineer a high degree of confidence that the proposed source can, in fact, make an item with the required degree of quality. Reaching this degree of confidence is frequently difficult because many AFLC engineers do not have experience in manufacturing technology. (However the creation of an expanded Competition Advocate organization opens up the possibility of obtaining of engineers with manufacturing expertise via service contract support.)

During evaluation of a prospective contractor's manufacturing capability for a specific part, consideration should be given to the other parts being produced by that contractor using essentially the same material, same processes and same equipment. Furthermore, wherever possible, the responsible engineer should visit the prospective contractor's facility for first-hand observation of manufacturing procedures and techniques.

Several small business companies who have attempted to become approved manufacturing sources for specific parts have reported to the AFMAG that they have received quite different qualification requirements from different Air Logistic Centers, even though the parts being evaluated by the Centers were similiar. This results in confusion and does not result in a favorable image of AFLC in the eyes of industry. For example, there are only two ALCs that manage engine parts. Procedures for approval of alternate sources at these two ALCs are dissimilar relative to the number of samples required for testing and the weight placed on written evidence of past production. The AFMAG considers it essential that all Centers use the same procedures.

Breakout has great potential for cost savings. The AFMAG recognizes that safe and reliable operation of Air Force weapon systems is paramount to economics of production cost. Key to this is sound selection of alternate sources.

RECOMMENDATION

1. Prepare appropriate guidance on the entire issue of approval of alternate manufacturing sources for use by the five ALCs. This procedural guidance must specifically cover approval of sources for generic groups of items manufactured using the same process specifications. (OPR: HQ AFLC/CR; OCR: HQ AFLC/PM/MM)

2. Include the guidance in recommendation 1, above in a supplement to DAR Supplement 6. (OPR: HQ AFLC/PM; OCR: HQ AFLC/MM/CR)

STORAGE, DISTRIBUTION AND CONTROL OF DATA

PROBLEM

The Air Force's totally manual method of receiving, storing, distributing, and controlling engineering data is inefficient, uneconomical, and compounds the problem of competitive acquisition of spare parts.

DISCUSSION

The System and Usage

The Air Force repository system consists of engineering data repositories located at each of the Air Logistics Centers (ALC) and at a central facility, the Engineering Data Services Center (EDSC) at Wright Patterson AFB. Each repository has files of engineering data maintained on aperture cards to support their assigned systems. The Air Force operates the repositories under the premise that the ALCs must have ready access to the data.

The ALC system managers use engineering data for many purposes such as failure analysis, modifications, parts substitution, hardness/tempest assurance, troubleshooting, and AFR 57-6 (now Supplement 6 of the Defense Acquisition Regulation) breakout screening for procurement of replenishment spare parts. Each ALC repository contains data for these purposes with the EDSC serving as the duplicate and disaster file. If data is not available at the ALCs, they request it from the EDSC. The EDSC also serves as the focal point for filling data requests from other Air Force and DOD agencies, foreign military sales, and the private sector. It also is the focal point for accepting newly procured engineering data and is responsible for reproducing this data and shipping it to the appropriate ALCs and other users.

The need for engineering data is continuing to increase because existing weapon systems are becoming older and are required to last longer than originally planned. This furthers the need to modify, refurbish and accomplish other maintenance tasks that generate higher usage rates of the engineering data. As new equipment enters the inventory, more and more data is being added to the system that may be needed immediately or not for as long as ten or fifteen years after delivery. The amount of data that is accessed annually can also be expected to increase as a direct result of increased breakout screening activity. Table II-27 is a summary of the volume of data stored and used at the repositories.

ENGINEERING DATA VOLUME AND USAGE

REPOSITORY	APERTURE CARDS	BREAKOUT SCREENINGS	OTHER REQUESTS
OC-ALC	4M	13,900	271,540
OO-ALC	5M	7,300	27,370
SA-ALC	5.6M	12,000	42,000
SM-ALC	6M	5,930	73,640
WR-ALC	2.9M	9,290	55,240

(1982 STATISTICS AS REPORTED BY EACH ALC)
Table II-27

Usage of the number of aperature cards can only be estimated since the number of individual aperture cards required to support each breakout screening or other requests is not tracked. A screening may require one or two cards or more than 1000 cards. It is estimated that the other requests are typically filled by use of one or two cards. A conservative estimate is that each breakout screening requires on the average a review of 20 aperture cards. Adding this to the number of other requests indicates that 13.7% of the aperture cards at OC-ALC and 3.5% at OO-ALC are used annually. The differences in useage of data at OC-ALC and OO-ALC exists because of the differences in major weapon systems they manage and the concepts for supporting these systems. OC-ALC manages the B-52 and KC-135 strategic systems that are old, complex and supported organically. Whereas, OO-ALC manages the F-16 and Minuteman missile systems that rely heavily on contractors for logistics and engineering support.

The usage of data at the central EDSC is measured by the number and percent of data requests that are filled and the quantity of data that is distributed. Statistics for the first half of CY 1983 show that the EDSC filled 202,550 requests, received 372,340 new items of data and distributed 3.7M items of data. The EDSC fulfilled 44% of the ALCs' requests which accounted for approximately 15% of all engineering data requested of the EDSC.

Inefficiencies and Causes

The Air Force's aperture card system is inefficient for receiving, storing, distributing and controlling the engineering data. Interviews and audit reports indicate a 10% error rate in the processing of data. Additionally, the EDSC can fill only 40% of requests from users and does not ensure that the data they ship is received by the requestor. Many times the data takes weeks to arrive at the user's desk, because it is sent by third class mail.

A major cause of the repositories' inefficiences is the equipment and procedures used to handle the large volume of data that must be stored and processed. The ALCs and the central repository are using punch card accounting reproduction machines (PCAM) that are old, wearing out, and long obsolete (some equipment is over 35 years old). IBM, the manufacturer of the bulk of this equipment, has notified the Government that they will cease supporting it by January 1985. The filing and retrieval of data is manually accomplished by clerks at the repositories. There are no file control records to enhance the operation of locating data, identifying missing data, or eliminate searching for data that never was on file.

Attempts to replace the equipment have been unsuccessful as demonstrated by the deletion of funds from the FY 83 budgets for the Engineering Data Computer-Assisted Retrieval System (EDCARS) that has been proposed to automate the repositories.

Further inefficiencies are created in the repositories because of the staffing level and skills required for the jobs. Both the EDSC and the ALC repositories have been handicapped by a lumping together of their technical management and stock/store/issue functions. The most convenient way to illustrate this is to compare it with the Air Force method of handling technical orders. With the latter, the division is clear. The technical management functions of stating and monitoring delivery requirements are handled by data management specialists in

grade levels commensurate with their technical management responsibilities. The stock/store/issue functions are handled in another organization by supply specialists who are responsible only for warehousing and retrieval. With engineering data, however, that division has never been clear: All functions are handled in the same branch by the same people. Engineering data supply specialists are expected to become technical data managers without leaving a "supply" job series or achieving the grade structure enjoyed by technical order managers. Yet as technical data managers they are asked to apply engineering and acquisition data requirements to contracts, participate in data reviews, monitor contract deliverables, inspect data, and take a key part in the AFR 57-6 breakout process.

Inefficiently handling the data adversely affects many areas of the users' needs. The impact on spares centers on the ability of inventory management specialists (IMSs) to receive the information required for their competitive purchase. The IMS must have the engineering data available at the time it is needed.

Missing and incomplete data have an adverse impact on competitive spare parts buys as can be demonstrated by the OC-ALC FY 83 program. Approximately 23.6% of the total spares dollar, i.e $430 million, were spent sole source because of missing or incomplete data. If we apply the 25% savings predicted as achievable from competitive procurement, approximately $107M could have been saved assuming all the data had been available and useable for competition. Although the existing method of handling engineering data only accounts for a small part of this problem, even a small percentage of such a savings is a significant amount of money.

The System Needs Major Overhaul

The solutions must focus on resolving the inefficiencies that exist today as well as in the long term. The solutions must allow data to be handled faster, more economical, and most of all, it must be responsive to the users' needs. The long term solution is to automate the data handling system to keep in step with the industry wide movement to use computer aided engineering and design.

Contracting for services to manage and operate the repositories is not recommended, primarily because of the sensitivity of limited rights data. The administrative effort to obtain authority from the rightful owners of the limited rights data to release this data to another contractor could be difficult. Obtaining authority from every contractor would be unlikely and therefore the Government would have to perform duplicate tasks. Otherwise the Air Force would have breached its contract and is subject to suit.

Engineering Data Computed-Assisted Retrieval System (EDCARS)

The EDCARS is the Air Force's program to modernize its repositories. It will automate the requisitioning, indexing, filing, retrieval, and distribution functions of the repositories. It will allow remote access and transmission, provide an index and management sytem, and accommodate interface with contractor CAD/CAM data.

Modernizing the equipment should reduce the costs of operating the repositories. Cost analysis performed by HQ AFLC show that EDCARS will save approximately

$1.2M per year per installation by reducing personnel, material, and engineering and technical waiting time. Other savings will occur with the decentralization of the EDSC at WPAFB which costs approximately $2.2M per year to operate and maintain. The direct annual savings add up to $8.2M. In addition reducing contracting administrative lead time reduces stockpiling and pipeline costs. The AFLC analysis concludes that each day of lead time reduces wholesale stockage costs by approximately $5.1M. EDCARS will unquestionally contribute to reduced lead times; however, a specific quantification is unable to be computed.

The existing aperture card data will be digitized into optical images and stored on laser discs. The current and highest use data will be processed first. The last data to be digitized will be the inactive data. To reformat and store the data in EDCARS medium requires at least two years. If cost effective, data that is obsolete should be purged from the files during this process. However, it may be more costly to sort out the obsolete data than just to store it on laser discs. The automated retrieval system will have sufficient capacity that it should not be hampered with this inactive data on file.

As the existing data becomes digitized, the central EDSC will cease being the central repository. Backup/disaster files will be stored on laser discs and each ALC would keep their own. EDCARS will consist of a network that will allow exchange of data among the ALCs as well as other users. The functions of an executive data center to perform non-peculiar ALC functions will be required. It is planned that this function be retained at Wright-Patterson AFB, Ohio.

US Army Digital Storage and Retrieval Engineering Data System

The EDCARS program was originally transferred to ESD under PACER ACQUIRE; however, after evaluation of the Army's proposed automated system, HQ AFLC decided that it would be more efficient, economical, and significantly reduce the lead time if the Air Force adopted a modified Army system. The Army DSREDS (Digital Storage and Retrieval Engineering Data System) is defined and the draft Request for Proposal virtually complete. AFLC's analysis indicated that the DSREDS required only minor modification to meet Air Force needs such as management information functions. Congress' Joint Committee on Printing (JCP) approved this concept. In FY 84 the Air Force proposes to fund for two pilot systems; one at Sacramento ALC and one at Oklahoma City ALC, and a prototype at the contractor's facility jointly funded by the Army and Air Force. These will be followed by systems at the remaining three ALCs in FY 86. To meet this schedule requires an additional $10M in FY 84 to fund the two pilot systems at $5M each and $3.5M each for the three follow-on production systems in FY 85 and FY 86. Other funds are programmed for partial EDCARS setups at WPAFB and Newark AFS. The total program is estimated to cost $25M.

Funding Shortfalls

Both the Army and Air Force have had difficulty obtaining funding for automated systems. The Air Force's current funding profile is inadequate to meet the development and deployment schedule currently proposed. Approved funding versus requirements is shown below.

3080 Funds (Millions)	FY 84	FY 85	FY 86	FY 87	FY 88
Approved	2.457	4.8	8.2	0	0
Required	12.5	4.8	8.2	0	0

If the Air Force can fund the requirement, the Air Force should solicit JCP approval to take the lead from the Army if the Army fails to fund its program.

There is also an effort underway to deal with the problem of illegibility of engineering data. SM-ALC has a productivity, reliability, availability and maintainability (PRAM) project in progress to fund the acquisition of a scanner, computer and plotter for the enhancement of illegible data. It operates by intensifying faint line segments, replacing some missing segments, and eliminating certain types of extraneous information such as smudges. While this will not salvage all illegible data, SM-ALC estimates it should recover enough that their competitive posture will improve by about 9%. The estimated cost is $123,500 which includes the equipment, installation and one year's maintenance.

While this equipment's different operating speed and format will not allow it to interface directly with EDCARS, its usefulness will not cease when EDCARS is implemented. Its enhancement capability will augment that of EDCARS, by processing old data before it is placed in EDCARS storage. It will also be of use in the ALC's drafting section for enhancing original copies of government drawings.

It is expected that the enhancement equipment's capacity will exceed SM-ALC's requirements, so that it could be made available for enhancing data for the other ALC repositories.

The PRAM allocation was approved at SM-ALC on 2 August 83, and is expected to be approved by HQ AFLC in October 83. Assuming approval, SM-ALC expects the capability to be in place by March 84.

RECOMMENDATIONS

1. Fully support the EDCARS system, which is based on the Army DSREDS system, by providing required funding including an additional $10M for FY 84 and supporting development and installation of the two pilot systems as soon as possible. Existing priorities within AFLC must be reviewed and reassessed in view of the importance of EDCARS to enhance buying spare parts. (OPR: HQ USAF/LE, OCR: HQ AFLC/AQ)

2. The existing PCAM equipment is approaching obsolesence and will become unsupportable without special management attention. Designate an item or system manager within HQ AFLC to address the problem of extended support of the present outmoded repository equipment. (OPR: HQ AFLC/MM)

3. Reclassify the technical management portion of the repositories tasks. Conduct industrial engineering studies to improve efficiencies of the existing operations. (OPR: HQ AFLC/PM)

4. Place the SM-ALC data enhancement capability in operation as soon as possible, and provide this capability to the other AFLC data repositories. (OPR: HQ AFLC/MM)

ACQUISITION DATA FOR MODIFICATIONS

PROBLEM

The Air Force has difficulty in competitively acquiring replenishment spare parts modification projects because adequate provisions for acquisition data packages are not included in modification planning or contracts.

DISCUSSION

Class IV and V modifications were surveyed at an Air Logistics Center (ALC) to determine whether acquisition data coverage was successfully included. A total of 31 modifications ranging from $.5M to $7M initiated during the 1976-78 time frame were selected, because they should have been fielded long enough to be generating replenishment demands for the parts and assemblies added through modification actions. Among the 20 on which information was available, seven had contractual documentation to provide for competitive acquisition of new entry items, but there was no evidence that such acquisition has been attempted. For two others with unknown data requirements, the ALC has been successful in competitively acquiring some replenishment spare parts. The remaining eleven had no provisions for obtaining acquisition data.

Current AFLC modification procedures perpetuate this situation. On an AFMAG visit to a contractor facility, contractor personnel cited an instance where an ALC failed to specify acquisition (or even engineering) data on a major aircraft modification. This will deny the Air Force the means to acquire replacement spare parts by competitive means, as well as accomplishing other logistics support functions without help from the prime.

The above problems appear to stem largely from deficiencies in directives and a lack of awareness and emphasis on the importance of this aspect of modifications. Directives and forms controlling the preparation of Configuration Control Board (CCB) items do not place detailed stress on engineering data, nor do they mention acquisition data for new entry spares. This imposes little discipline making it unlikely that adequate funding will be requested to cover them.

When funding is approved, a modification becomes like any other acquisition in that engineering and acquisition data requirements must be adequately covered in the contract. The ALCs are currently applying DID DI-E-7031, Drawings, Engineering and Associated Lists, to modification contracts, specifying Level 3 engineering data per DOD-D-1000B, Drawings, Engineering and Associated Lists. However, as concluded in other AFMAG findings, Level 3 alone does not ensure the ability to competitively acquire replenishment spares; for some spares additional documentation will be needed. To accomplish this, the ALCs should be including the requirement for acquisition data packages as specified in MIL-STD-885B, Procurement Data Packages. AFR 800-34, Engineering Data Acquisition, should be supplemented to add such direction.

This process is of vital interest to the recently established Competition Advocate (CR) offices at the ALCs. They should be involved in initial modification planning to ensure that competition opportunities are fully considered for the modification itself, as well as for new items introduced. They should also review Government

and contractor prepared Engineering Change Proposals (ECPs) for competition potential, and for their effect on currently competitive items. Finally, they should review CCB documentation to ensure that acquisition data is adequately covered.

RECOMMENDATIONS

1. Revise directives and forms controlling the preparation of CCB items to emphasize data coverage for competitive reprocurement of new items introduced. (OPR: HQ USAF/LEX)

2. Apply AFR 800-34, Engineering Data Acquisition, to ALC modification acquisitions as it is to acquisitions of new systems. (OPR: HQ USAF/LEYE)

3. ALC personnel managing modification packages must plan for acquiring data for reprocurement and project adequate funding to support it. (OPR: HQ AFLC/MME, OCR: ALCs/MMM)

4. Make the ALC Competition Advocate (CR) a part of the review and coordination cycle for modification actions to include:

a. Engineering coordination at the start of the modification process.

b. ECP review for competition potential and effect on currently competitive items.

c. Review of CCB documentation for competition coverage. (OPR: HQ AFLC/CR)

SUPPORT AND INTERFACE RELATIONSHIP

PROBLEM

Weak interface relationships between ALCs and CAOs can impact fair and reasonable prices, competition and overall spares support.

DISCUSSION

Generally, ALCs and CAOs have not developed strong interface and support relationships. Overall, there appears to be a lack of understanding of the other's organization, functions, capabilities, concerns and priorities. Few memorandums of agreement (MOAs) between ALCs and CAOs exist. Formal agreements not only help clarify responsibilities, support requirements and priorities, but can be used to define organizational function capabilities and concerns.

An enhanced relationship could positively enhance breakout initiatives, field pricing support, proprietary and restricted data review, spares delivery statusing, forward pricing rate recommendations, and support to the provisioning process. For example, CAOs can identify and report cost pyramiding situations that may lead to better prices and/or breakout; field pricing support can be tailored to the needs of the ALC and the resources and capability of the CAO; and proprietary and restricted data reviews can aid in ALC breakout-to-competition decisions and efforts.

Formal interface-suport relationships should be established between each ALC and its CAO organizations at major defense contractor facilities. ALC and CAOs should designate focal points for this purpose. The Competition Advocate should be the focal point in an ALC. CAOs should designate Logistics Support counterparts. However, this support-interface concept should not replace or supersede the PCO-ACO relationship, but rather it should serve to open communications lines and enhance overall spares support activities.

RECOMMENDATIONS

1. Develop formal Memorandums of Agreement (MOAs) between ALCs and each of their major CAOs. (OPR: AFLC/CR)

2. Establish the Competition Advocate as the focal point in the ALC for support relationships with CAOs. (OPR: AFLC/CR)

3. Establish a Logistics Support Program Management position in each CAOs to serve as the primary focal point to ALCs. (OPR: AFCMD/EP)

COST PYRAMIDING

PROBLEM

Multiple sub-tier vendor mark-ups can contribute to significant and unreasonable spare parts price increases.

DISCUSSION

The Air Force does not take full advantage of breakout opportunities which exist. Many of these items are known or can be identified in the Contact Administration arena, yet are normally not reported to the ALCs.

Numerous instances have been identified where prime contractor proposals contain items which have no "value-added" on the part of the prime contractor and in some cases, no "value added" on the part of first and second tier subcontractors. However, each of these proposals contained added cost factors such as G&A, Material Burden, and Profit which represented a no value-added wrap-around fee.

Investigations at an AFPRO, during 1980 - 1981, found replenishment spare parts price increases 600-800% above "original vendor" prices, and these price increases directly resulted from sub-tier vendor cost pyramiding. (AFPRO, Det 42 study: Provisioning System Abuses, Computed Breakout Savings Quantified, 1981)

As new weapon systems are developed it is common that pieces of subassemblies, provided by third or fourth-tier vendors, eventually become identified as spare parts. It may be that the original vendor, a third or fourth-tier supplier, is not identified as a direct source; or it may be the case that for warranty, engineering change considerations or "system integrity" reasons, the identified source may still be the prime contractor. When this happens excessive prices occur through compounded mark-ups. Whenever feasible, the Government and/or prime contractor should take action to "breakout" to the original manufacturer.

An actual case involving 146 spare parts showed an average mark-up of 663%. This amounted to $4.5M of unnecessary cost pyramiding; from the original vendor through the first-tier vendor to the prime contractor to the Government buying office.

The compounding effect of substantial sole source dollars spent in the subcontract arena, multiple sub-tier vendor mark-ups, and unquestioned vendor price escalation, combine to create unacceptable spare parts costs.

RECOMMENDATIONS

1. Publish proposal review procedures and guidance for CAOs to use in identification of purchased parts that receive no added value by prime contractors or lower tier vendors. (OPR: AF/RDC)

2. Establish requirements for CAOs to refer no "value-added" purchased parts (stock number, part number, nomenclature, original manufacturer) to the ALC Competition Advocate for breakout consideration. (OPR: AF/RDC)

3. Initiate a mandatory DAR clause requiring contractors to "breakout" to the original manufacturer on purchased spare parts that receive no "added-value" by sub-tier vendors. (OPR: AF/RDC)

4. Initiate a change to DAR Supplement 1, Contractor Purchasing System Review (CPSR) Program, requiring evaluation of contractor efforts to identify and take action to breakout no "value-added" purchased parts. (OPR: AF/RDC)

COMPETITION ADVOCATE

PROBLEM

Lack of a comprehensive, accountable organization at the Air Logistics Centers responsible for spare parts breakout and for ensuring a fair and reasonable price for each spare part has resulted in some spare parts overpricing and inadequate competition.

DISCUSSION

The preceding findings and recommendations of this volume have been of a preventive nature to ensure that the Air Force avoids mistakes in the future which have resulted in the unnecessary noncompetitive acquisition of many spare parts or for not ensuring fair and reasonable prices. The primary focus of an expanded Competition Advocate organization is to correct existing problems by allocating resources, assigning responsibility and establishing accountability necessary to accomplish pricing and competition objectives.

Expanded Role of Competition Advocate The recommended Directorate of Competition Advocacy should report directly to the ALC Commander. By functioning independently of other directorates, this new organization would avoid parochial biases which have in the past impeded progress toward higher competition objectives. Also, by operating off-line from the ongoing requirements/contracting process, the Competition Advocate would not unduly impede the ability of the ALC to meet the demands needed to be responsive to the operational forces on a day to day basis.

The expanded Competition Advocacy Directorate will screen all anticipated buy requirements for the current fiscal year on a proactive basis. This screening process will be conducted at two separate levels - breakout and value analysis. Breakout to the actual manufacturer or breakout for open competition have long been recognized as methods capable of achieving dollar savings. Breakout tasks which include challenge of limited rights legends, research to obtain missing or illegible data, decisions to reverse engineer, and decisions to buy needed data have not in the past been given the priority or the resources needed. In this manner, the AF would also continue to clean-up the 57,000 parts with illegible, inadequate or missing data. Limited manning in the past has resulted in little attention being given to breakout of low dollar items which are the majority of the AFLCs purchase actions.

The value analysis function of the expanded Competition Advocate organization will provide an independent estimate (should cost) for every item. This estimate will permit contracting personnel to break away from historical prices which may not have reflected appropriate unit value.

By dedicated screening on a continuous basis, it is expected that after a period of time, probably 12 - 18 months, the Competition Advocate would be screening items projected for purchase in future years. This would allow more time to systematically seek and qualify new supplier sources.

Attachment 1 is an organization chart for the proposed directorate. Attachment 2 is an AFMAG summary flowchart showing the progress of an item identified for review by the Directorate of Competition Advocacy. A summary of assigned

responsibilities follows below. In addition, a draft copy of AFLCR 23-49, "Director of Competition Advocacy", which matches the function in attachment 2 is included as attachment 3.

1. The Policy Management and Information Systems Office (CRX) is the plans and management office responsible for program execution, workflows, data processing, initial item screening, data analysis and reports.

2. The Source Development Office (CRS) reviews noncompetitive acquisitions, seeks and qualifies new contract sources, performs market/facility research, interfaces with the Small and Disadvantaged Business Utilization Office, investigates and resolves barriers to competition.

3. The Engineering Data Management Division (CRE) is responsible for identification of potential breakout candidates, designates breakout priorities, researches questionable restrictive legends, evaluating, determining, and recommending changes to AMC codes.

4. The Value Analysis and Review Division (CRV) is responsible for fair and reasonable pricing. They select items for review, obtain data necessary to determine what the item should cost, set target prices for each item, and record the target price for immediate access by other Competition Advocate personnel and the PCO to aid in price negotiations and breakout activities.

RECOMMENDATIONS

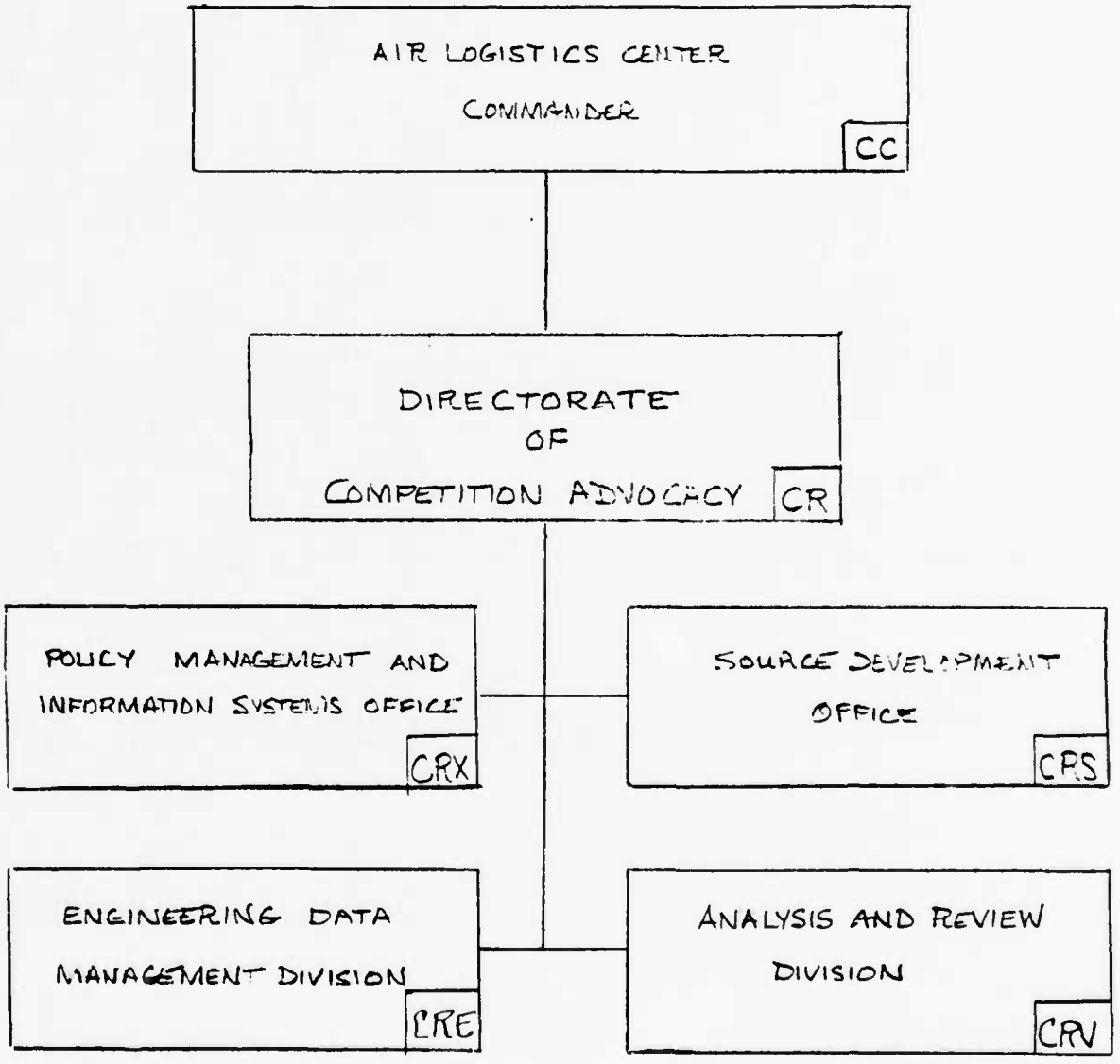
1. Assign personnel resources to the Directorate of Competition Advocacy necessary to accomplish its objectives. (OPR: HQ AFLC/MP)

2. Obtain ADP resources (see Attachment 4) necessary to support the Competition Advocacy function at all five ALCs. (OPR: HQ AFLC/CR)

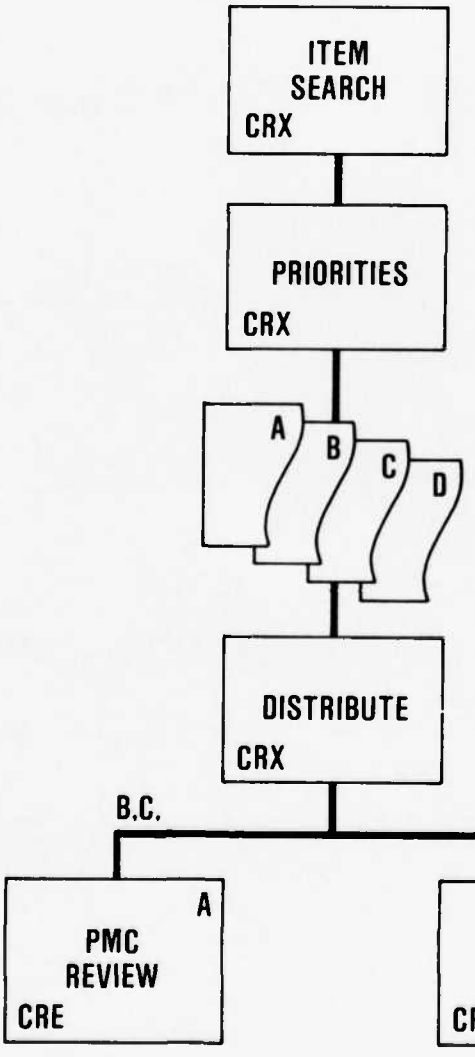
3. Identify and allocate to each ALC funds necessary to fully support breakout decisions (contract engineering, TDY, purchase of data, source development, etc). (OPR: HQ AFLC/CR)

4. Develop a performance measurement and reporting system to provide management visibility of the costs and benefits of the breakout process. (OPR: HQ AFLC/CR)

4 Attachments



Attachment 1



IN-PUT SOURCES
DO 39, 41, 62, J041
PACER ZERO

- NON-COMPETITIVE
- FY 84 PROJECTED BUYS ALL OTHER ITEMS NOT PROJECTED FOR BUY

A. FY 84 BUY PROJECTIONS INCREASING $ VALUES

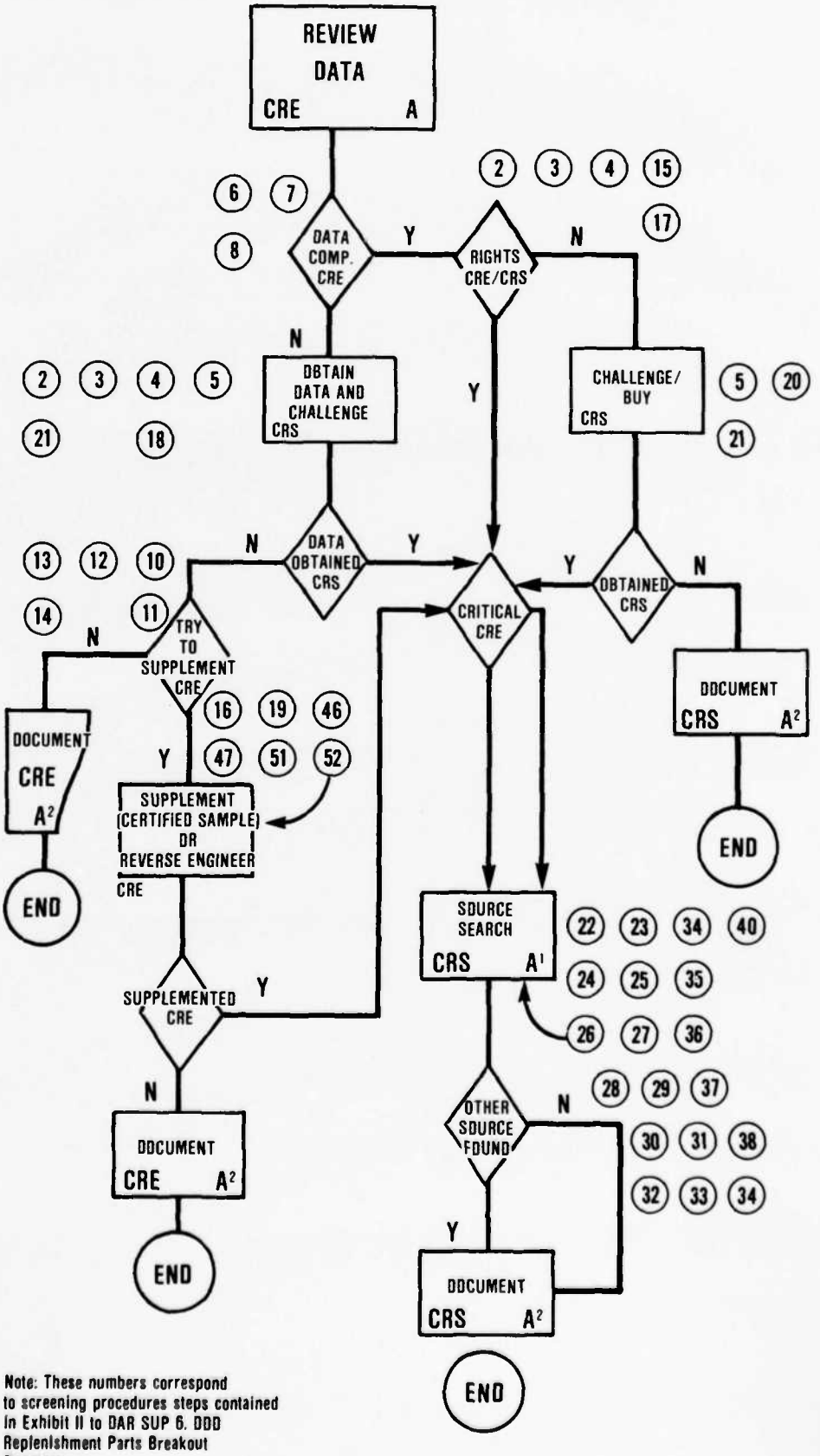
B. FY 84 BUY PROJECTIONS DESCENDING $ VALUES.

C. ALL OTHER ITEMS NOT PROJECTED FOR BUY

D. MASTER CONTROL LIST RETAIN IN CRX

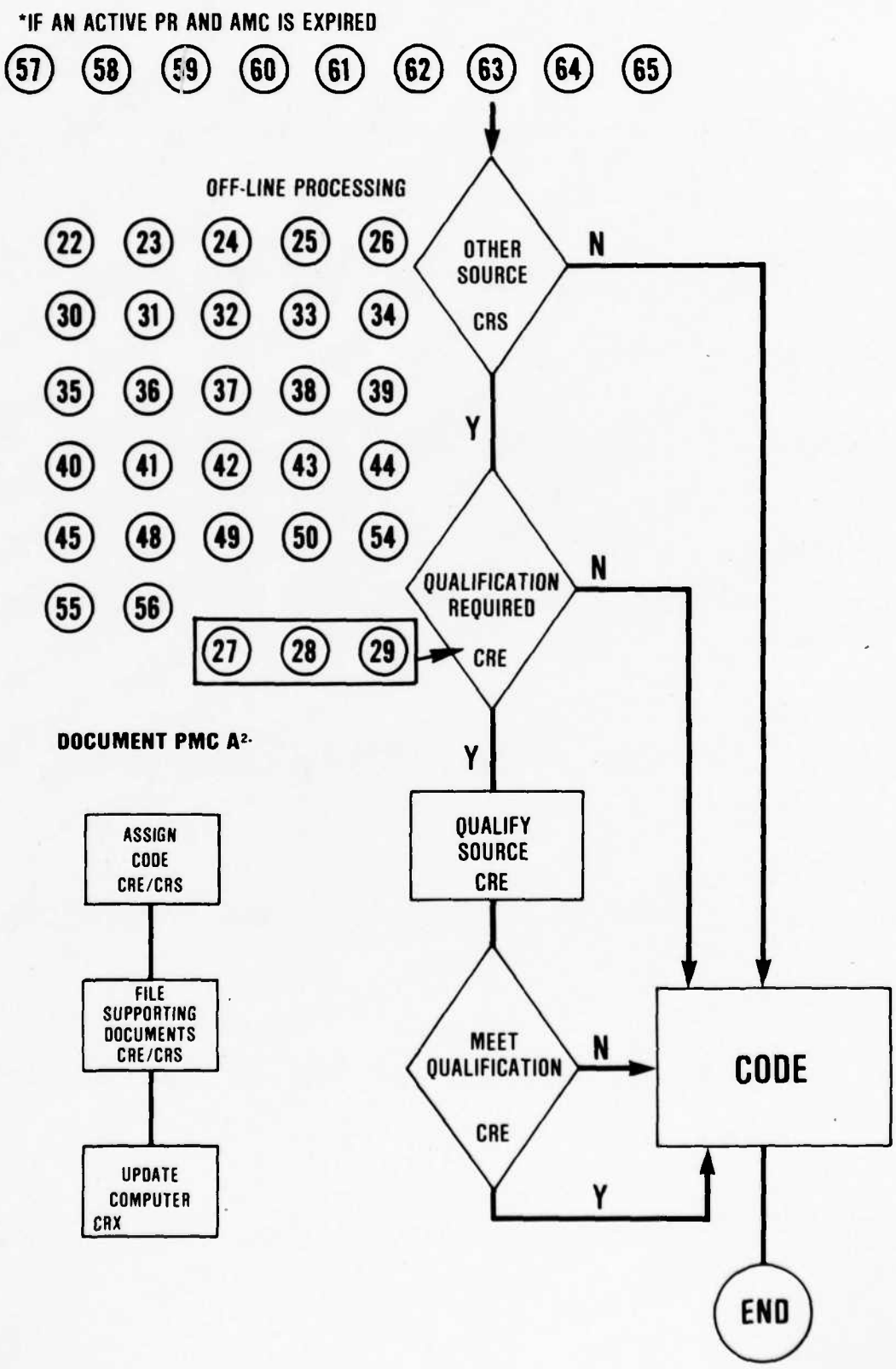
Attachment 2

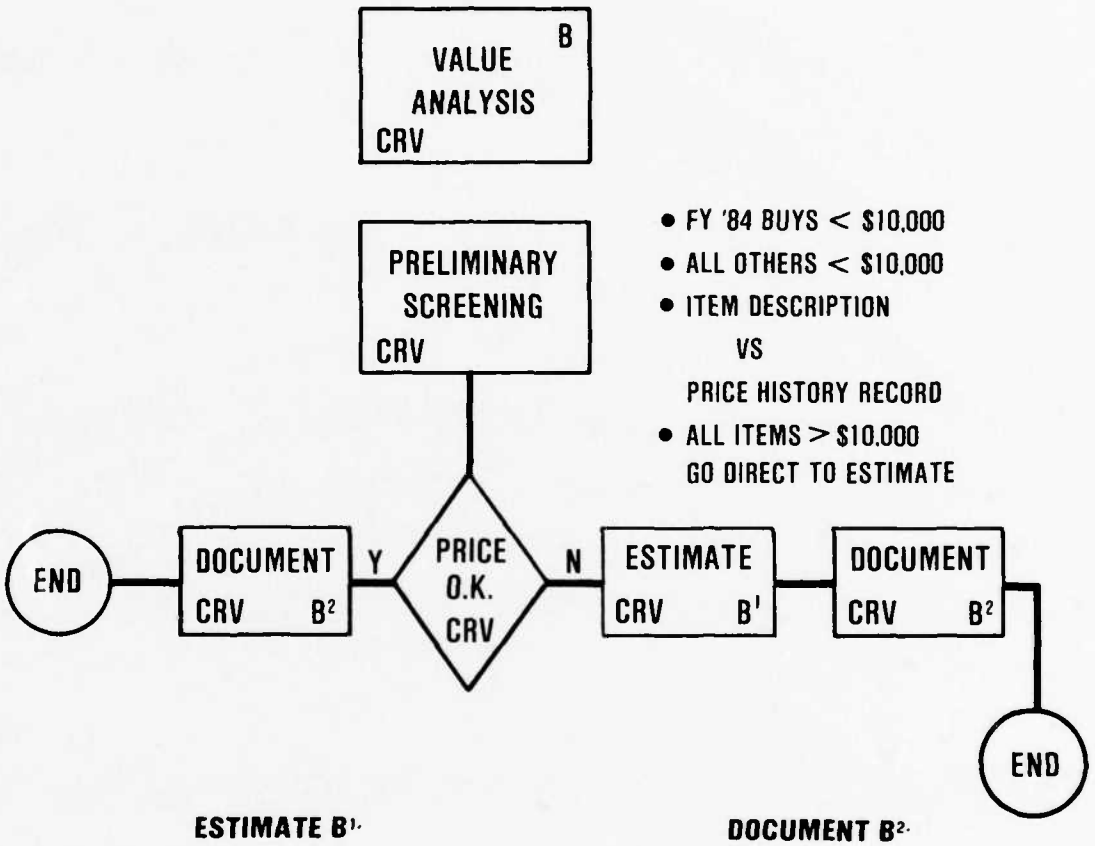
PMC REVIEW



Note: These numbers correspond to screening procedures steps contained in Exhibit II to DAR SUP 6, DOD Replenishment Parts Breakout Program

SOURCE SEARCH A[1]





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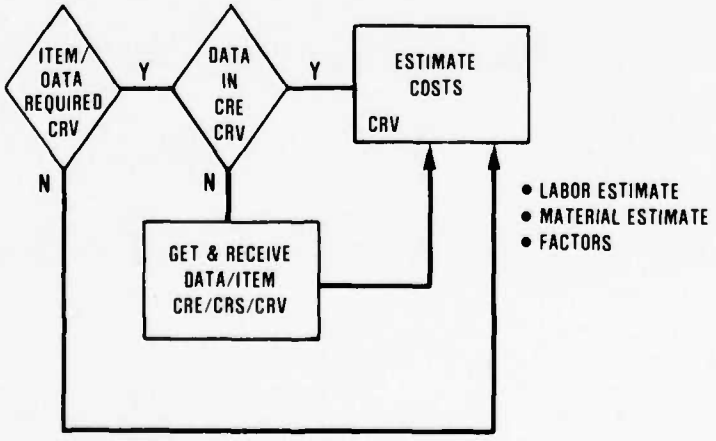
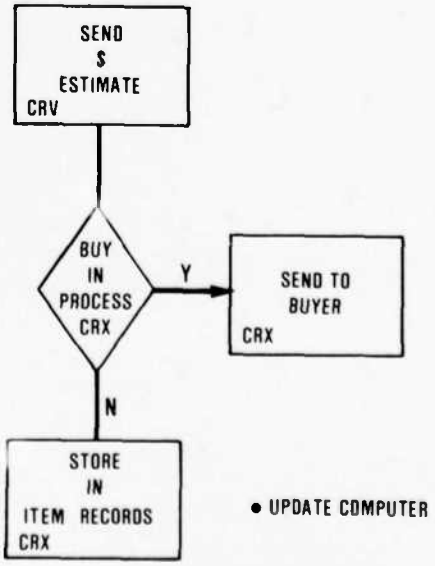


DOCUMENT B^{2}.



DEPARTMENT OF THE AIR FORCE
Headquarters Air Force Logistics Command
Wright-Patterson Air Force Base, OH 45433

AFLCR 23-49

Organizations and Mission - Field

DIRECTORATE OF COMPETITION ADVOCACY

This regulation sets up the organization and functional responsibilities of the Directorate of Competition Advocacy (CR) at the Air Logistics Centers.

1. AUTHORITY: Secretary of Defense Memorandums, 9 September 1982 and 14 October 1982, which direct increased competition in the acquisition process and support the concept of a Competition Advocacy to each buying center, as required by the USDR&E Memorandum, 10 November 1981. HQ USAF/IG-AFMAG message, 29 July 1983, which expands the original charter of the Competition Advocacy to include price screening; item screening for breakout/competition; management of engineering data; and source development and supplier interface.

2. ALIGNMENT AND RESPONSIBILITIES: The required organizational alignment and functional responsibilities are indicated below and in attachment 1. Deviations or changes to the prescribed functional entities and responsibilities will not be made without first being approved by HQ AFLC.

Supersedes AFLCR 23-49, 12 May 83,
(see signature page for summary of changes)
OPR: MPM (P.R. Boyle)
Approved by: Thomas A. F. Conti, Col, USAF
Writer-Editor: I. Bitner
Distribution: F, X
HQ USAF/MPMO; HQ AFISC/DAP; AUL/SE.....1 ea

a. Competition Advocacy (CR):

(1) Manages the competition advocacy program for the ALC commander. Consolidates the activities of the directorates and assesses the ALC progress toward achieving higher headquarters goals, and reports to the Commander and HQ AFLC/CR as required.

(2) Establishes an aggressive program and implements AFLC/CR directed initiatives to increase competition, manages and accomplishes the PACER PRICE Program, improves management of engineering data and resolves source/supplier difficulties.

(3) Maintains liaison with industry, HQ AFLC, other MAJCOMs, other service/agencies regarding the AFLC Competition Advocacy Program.

(4) Chairs Zero Overpricing Committee.

b. Policy Management and Information Systems Office (CRX):

(1) Controls item screening, priorities, and schedules item reviews by applying AFLC established criteria.

(2) Tracks status of programs, items scheduled and under review, ensures steady workflow; coordinates with functional directorates involved in workflow.

(3) Determines/manages resources to ensure adequate manpower, skills, training, funds, facilities, Automated Data Processing Equipment (ADPE) and other equipment are provided to support the mission of the Competition Advocacy Directorate.

(4) Conducts reviews and provides expertise to the Competition Advocacy regarding all matters of program organization, implementation and operating procedures.

(5) Determines impacts/provides guidance on policy/procedural changes as they relate to competition.

(6) Recommends to AFLC/CR proposals for and locally operates/manages standardized automated data processing tools to support the management information, workload management, and item analysis requirements of the Competition Advocacy.

(7) Participates in planning, quantitative goals and objectives for the activity; develops output products; develops and implements measurement and audit techniques; collects, maintains, and analyzes data and prepares reports for distribution.

(8) Collects and maintains reference materials and library necessary to support the CR function.

(9) Maintains documentation supporting AMC coding decisions and value analysis. Updates appropriate automated systems.

c. Source Development Office (CRS):

(1) Provides a review process for those noncompetitive acquisition actions or other actions which may be requested in which a buyer/PCO, after coordination with CRV, cannot obtain a unit price within established command parameters; prepares recommendations for Business Management Steering Committee review/resolution regarding breakout potential, e.g. reverse enginering, substitution, in-house manufacture, etc. to resolve the price discrepancy.

(2) Actively pursues/investigates new/potential sources, assists and coordinates on source qualification on items with restrictive AMC codes.

(3) Visits contractor plants and facilities; provides and receives suggestions/information for developing new capabilities and new sources.

(4) Conducts market/facility research and analysis; and maintains register of existing facilities and potential sources developed by CRS.

(5) Interfaces with Small and Disadvantaged Business Utilization Office.

(6) Principal liaison activity with industry and other federal activities as it relates to the investigation and elimination of barriers to competition.

(7) Assists CRE obtaining missing/challenging data.

d. Engineering Data Management Division (CRE):

(1) Orders and receives current data packages and provides internal control of documentation and the data packages needed for competition advocacy functions.

(2) Reviews and evaluates current data packages to assess adequacy to support Acquisition Method Coding (AMC). Determines additional data requirements and sponsors, where necessary, their acquisition by CRS.

(3) Develops Acquisition Data Packages, including all background and supporting data necessary to facilitate breakout and competition reprocurement.

(4) Identifies limited rights data and sponsors acquisition of the rights thereto, when appropriate, through CRS.

(5) Recommend item substitution and solicits appropriate engineering approval relative to such factors as flight safety and item criticality which may affect competition decisions.

(6) Investigates and determines reverse engineering requirements

as contemplated by DAR 1-304.2.

(7) Performs all functions associated with DAR Sup 6/AFR 57-6.

(a) Accomplishes screening actions in support of the annual buy program.

(b) Ascertains if item is safety of flight critical, or subject to other special conditions that could prohibit competition.

(c) Screens breakout candidates for adequacy, completeness and rights status relative to competition.

(d) Researches any questionable legends and prepares all pertinent background information.

(e) Evaluates, determines and assigns AMC, obtains engineering authority coordination as appropriate, and ensures changes are implemented.

(8) During acquisition stage of new item procurement accomplishes appropriate actions specified in accordance with AFR 800-34.

(a) Responsible for ensuring that engineering data planning and management are made an integral part of the programs's strategy and execution.

(b) Participates in conjunction with acquisition activity to ensure that ALC engineering data requirements are incorporated at an early stage in the acquisition process.

(c) Participates in all post-award actions/reviews where engineering data requirements are involved.

(d) Reviews for relevancy and advises on deferred acquisition and delivery of engineering data in conjunction with the acquiring activity.

(e) Provides CR representation at Transfer Working Group for PMRT.

(f) Works with AFLC SMs/IMs to ensure data calls for modification programs include data requirements to support competitive reprocurement actions.

(g) Directs the acquisition of engineering data in support of new spare parts acquisitions (BP15 actions).

(9) Responsible for new source approval in coordination with CRS and the appropriate engineering authority.

e. Analysis and Review Division (CRV):

(1) Accomplishes the following functions as established in the PACER PRICE Program Plan, 29 July 1983, as revised:

(a) Obtains item review schedule from CRX and batches them for logical processing.

(b) Obtains physical item from supply, as required.

(c) Assesses and determines packaging requirements/revisions in conjunction with DS.

(d) Compiles data from other CR branches and determines target prices for individual items by preparing a projected price/quantity curve.

(e) Provides to CRX the proposed target prices and supporting documentation which may include; substitute items, packaging requirements, etc.

(2) Accomplishes stratified fiscal year buy reviews and AF Zero Overpricing and PACER ZERO investigations.

(3) Provides analysis and support for FWA/GAO/IG investigations.

(4) Investigates errors and discrepancies identified during analysis and accomplishes corrective action with appropriate OPR.

(5) Reviews with Buyer/PCO and provides information to assist in the resolution of acquisition problems which arise when the Buyer/PCO cannot obtain the unit price within established command parameters.

ALC Competition Advocate ADP Requirements (MINIMUM)

DLSC Terminals	Quantity

The DLSC terminals will be used to obtain item information through the Defense Integrated Data System (DIDS), for below listed CR activities. DIDS provide; noun, nomenclature, application data, manufacturer's code, design control references, etc.

CRX	1 Each
CRV	1 Each

Microprocessors	Quantity

The microprocessors will provide capability to store, update and access spare parts information related to pricing, sources, and breakout. They will perform trend analysis and produce management products required to monitor goals and provide reports to higher headquarters. The following will provide essential capabilities; word processing, printers, graphics, statistical analysis, spread sheet, data base management system and basic interpreter. Microprocessor for CRE must have aperature card reader and printer with at least two input terminals.

CRX	1 Each
CRV	1 Each
CRE	1 Each

Attachment 4

PRODUCT KNOWLEDGE

PROBLEM

Buyers and analysts are not provided with enough descriptive data and pictures of items to be purchased to enable them to know what they are buying. This lack of product knowledge contributes to excessive prices paid and "horror" stories.

DISCUSSION

One of the major causes of "horror" stories in AF contracts is lack of buyer product knowledge. During the mid 1960's, Congressman Pike held a series of hearings on excessive prices paid by DOD for spare parts. At that time, the Air Force came to the conclusion that product knowledge was one of the most critical elements required for a buyer to do a good job of pricing. However, action by the Air Force to enable the buyers to obtain adequate product knowledge diminished and all but disappeared over the years.

Buyers are expected to evaluate proposals/quotations received to determine if they are fair and reasonable. If their review results in the determination that the price is excessive they are required to enter into negotiations with the contractor and reach an agreement on a price that both sides agree is reasonable. If the buyer does not know what the item looks like and has little or no information on how the item is made, it is impossible for that buyer to evaluate the contractor's proposal and negotiate a reasonable price for the Government.

Purchase Requests received by buyers in AFLC today have no picture of the item and extremely limited technical information. The buyer can obtain product knowledge about the item being procured, but this requires a substantial amount of effort, and from a practical administrative perspective, it is virtually impossible because of the large numbers of purchase requests assigned to any one buyer.

The AFMAG believes that product knowledge is a very basic and fundamental requirement for evaluation/negotiation of fair and reasonable prices. The Contract Data Management System (CDMS) described elsewhere in the report could be expanded to provide to the AFLC buyer workforce detailed product knowledge information on every item managed by the Air Force. This system could display a digitalized computer picture of any stock numbered item along with a simple laymans language technical description of the item. This description should include the type of material used (including whether a casting/forging was required) and major manufacturing processes required. The data required for system input could be prepared by organic AFLC resources, or procured from contractors through a contractual action. Because of the time table for CDMS, this must be considered to be a long term objective.

Pending implementation of CDMS, the AFMAG believes that some form of interim product knowledge program is required. The Defense Integrated Data System (DIDS) could be used to provide to the buyers a valuable technical description of items being procured. This could be accomplished by placing a DIDS terminal in each AFLC buying branch. The technical descriptions in DIDS could be supplemented by a picture of the item from the applicable Illustrated Parts Breakdown Technical Order (IPBTO).

RECOMMENDATIONS

1. CDMS be expanded to provide a picture and technical description of every item in the Air Force inventory. (OPR: HQ AFLC/PM)

2. Place DIDS terminals in each ALC buying branch. (OPR: HQ AFLC/PM)

3. Include a picture of each item from the TO in the purchase request package until CDMS comes on-line. (OPR: HQ AFLC/MM)

REVIEW OF LOW COST PARTS

PROBLEM

Current DOD policy creates the potential for overpricing and results in lost opportunity for competition by not requiring screening for procurement data for items with an estimated annual buy value of less than $10,000

DISCUSSION

DAR Supplement No. 6, dated 1 June 1982, does not require screening of items with an annual estimated value of less than $10,000. Consequently, items are frequently purchased on a sole source basis. The rationale for this policy is that it is not economically feasible to screen items below this dollar value. This has been based upon the assumption that the cost of screening all such items exceeds the overall reduction resulting from competition on those items found suitable for competition. Items which are not screened are assigned an Acquisition Management Code (AMC) of "L".

It is the consensus of the AFMAG that failure to screen these "L" coded items has resulted in lost opportunity for competition and creates a high potential for "horror" cases.

Data available to the AFMAG indicates that approximately 140,000 individual spare parts are currently assigned AMC code "L". This represents about 39% of all items managed by the Air Force which have been assigned any AMC.

The establishment of "Pacer Price" review under the Competition Advocate (CR) at each of the five ALCs will screen all active items in the inventory.

RECOMMENDATION

AFLC implement DAR Supplement No. 6 to reduce the threshold for screening to $0 and thereby eliminate procurement method code "L" from the list of authorized codes. (OPR: HQ AFLC/PM)

MANUFACTURING ENGINEER SUPPORT

PROBLEM

The requirements of Defense Acquisition Regulation Supplement 6, DOD Replenishment Parts Breakout Program, alternate source approval and the establishment of an expanded competition advocate organization will impose significant additional burdens upon existing ALC engineering resources

DISCUSSION

Breakout and the development of alternate manufacturing sources require dedication of a significant amount of engineering talent. The Air Force's ability to accomplish this effort is dimished by the fact that very few AFLC engineers have experience or academic backgrounds in manufacturing technology. This type of expertise is necessary in determining a potential contractor's ability to manufacture a specific item. This is particularly true when there is a requirement for comparison of material, processes and equipment used by the prospective source.

Furthermore, the recently initiated review of items in the Air Force inventory by the Competition Advocate will be completed much sooner by the dedication of additional engineering resources. The acquisition of private sector engineering talent through the use of support contracts would assist this effort. HQ AFLC could competively establish several indefinite delivery type contracts against which all five ALCs could issue orders. These contracts should be negotiated and administered in a manner similar to the existing AFLC field team support program.

The ALC Competition Advocates should budget for contract engineering support for future years. However, pending such budget approval, funding for this support could be made available by reprogramming existing AFLC resources.

RECOMMENDATIONS

1. Competitively establish indefinite delivery engineering support contracts to support the Competition Advocate organizations. (OPR: AFLC/PM)

2. Reprogram existing resources to allow the Competition Advocate at all five ALCs to issue orders against these contracts. (OPR: AFLC/AC; OCR: AFLC/CR/MM)

MANPOWER

PROBLEM

AFMAG recommendations require increased personnel resources in all phases of the acquisition system.

DISCUSSION

The Secretary of Defense issued a memorandum on 29 August 1983 that outlined a series of actions required to improve spare parts acquisition. Secretary Orr responded to this memorandum on 16 September 1983 and stated in part: "The Air Force concurs with the objectives and specific actions outlined in the referenced memorandum. Many of these actions are already underway, or will be initiated within the next 60 days. However, "initiated" will be a hollow gesture without additional manpower resources."

The AFMAG findings fully substantiate this view. Central to the AFMAG recommendations is their effect on personnel requirements. Our analysis showed unequivocally that the short and long term solutions to problems facing the Air Force in assuring price reasonableness, increasing breakout and expanding competition lie in adding more personnel resources.

To improve the spare parts acquisition process more personnel are required for all phases of the systems acquisition process. During the early stages of system development planning and programming for breakout, spare parts competition, and data acquisition are needed. As noted in the Affordable Acquisition Approach Study report issued by Air Force Systems Command in 1982, over 85% of the life cycle costs are locked in by the full scale development decision. Thus, it is critical that spare parts considerations are made a part of source selection and resulting contracts while competition for system development and acquisition still exist. Expenditure of a few resources at this point will have a lasting effect on the prices the Air Force pays for spare parts.

While the basic spare parts strategy is established in concept validation, demonstration and full scale development, the first price we pay for those parts is established during initial provisioning. More intensive management of the provisioning process and better pricing of initial spares as production units come off the line will require additive resources. Both the acquisition offices and contract administration functions require more manning to support intensified provisioning management.

As replenishment spares are bought for existing systems and new ones come into the inventory, a concentrated effort is required to review acquisition method codes and assign a fair dollar value for items not bought in the competitive market place. AFLC currently has nearly 250,000 items that are coded as sole source. An intensive effort to review these items, find competitive sources, and establish a fair value for those that must remain sole source is a large task requiring significantly more people.

Contract administration offices play a central role in assuring fair prices and competition for spare parts. Their close association with both prime and subcontractors make them invaluable at all phases of systems acquisition. They play a pivotal role in identifying actual manufacturing sources, identifying

realistic costs, and pricing spare parts. Every contract, be it for initial or replenishment spare parts, requires more intensive contract administration if the AFMAG recommendations are to have their full effect.

Secretary Orr noted in his memorandum that the Air Force Logistics and System Commands have identified more than 3,000 additional manpower requirements to carry out the spare parts program identified by the Secretary of Defense. The AFMAG's preliminary analysis of personnel needs indicates that this figure has merit when considering the magnitude of the task.

The addition of substantial numbers of new personnel demands an aggressive recruitment program to hire trainees with prerequisite education, training and experience. Preliminary discussion with those responsible for personnel matters at HQ USAF indicates that authority can be obtained to hire "Schedule B" employees (temporary full time). This, however, will require a follow-on effort to integrate those hired under that procedure into the permanent workforce. The ALCs are key to making this process work and they should be allowed to establish registers and recruit in their geographical area. AFMAG believes that this approach would result in greater stability in the workforce.

The requirement for additional manpower resources is immediate. Secretary Orr, however, notes that as a practical matter, all of these people could not be hired and trained in FY 84. As a consequence, he asked the Director of Air Force Manpower to request 1000 personnel spaces for FY 84 and to complete a ramp-up to the full requirement in FY 85 and FY 86. In the interim, AFLC could critically examine the priorities of tasks performed by ALC contracting organizations, reprioritize those efforts and implement internal resource realignment to eliminate unnecessary clericalization. This would free people for higher priority tasks. For example, the current efforts of the PMD organization should be reviewed. A significant part of their effort relates to follow-up of numerous delivery delinquencies that turn out not to be factual. They also spend considerable time in secondary contract administration, e.g., processing accelerated delivery requests. These could be more effectively handled by direct interface between the item manager and the administrative contracting officer. The remaining portion of their function could be assigned elsewhere in the contracting organizations. The resulting manpower positions could then be assigned to hands on buying and price analyst requirements. AFMAG believes that there are similar opportunities for realignment within other functional areas within the ALCs.

RECOMMENDATIONS

1. Provide refined time phased manpower estimates to implement AFMAG recommendations to HQ USAF/MP. These requirements must be fully supported in fiscal year 1984 and in the outyears. (OPR: HQ USAF/MP, OCR: HQ AFLC/MP, HQ AFSC/MP)

2. An aggressive approach to recruiting added qualified personnel resources must be implemented. (OPR: HQ USAF/MP, OCR: HQ AFLC/MP, HQ AFSC/MP)

3. Examine, realign, and reassign personnel to higher priority tasks within contracting and other functions. (OPR: HQ AFLC/PM)

AUTOMATED DATA PROCESSING (ADP)

PROBLEM

Contracting data systems in use today are inadequate and impair the Air Force's ability to effectively manage and price spare parts acquisition.

DISCUSSION

The spare parts contracting job can not be accomplished without extensive ADP support. Computers are used to generate purchase requests, monitor the contracting process, track spare parts deliveries after contract award, accumulate historical data on spare parts purchases and perform other functions supporting the acquisition process. The following paragraphs briefly describe current ADP systems which support the spare parts contracting process, cite system deficiencies, outline actions underway to improve current capabilities and finally, offer recommendations regarding ADP support for spare parts.

Current Systems

AFLC central procurement activities use six automated systems to manage the spare parts contracting process: JO14, JO23, JO41, DO16, E841 and UPAMS. The JO14, Mechanized Bidders List System, provides buyers a list of sources for supplies and services. The JO23, Automated Purchase System, generates automated purchase requests (PRs) and automated delivery/orders that provide some relief from manual document preparation. The JO41, Acquisition and Due-In System, has three distinct segments: pre-award, post-award, and purchase history. The pre-award segment tracks the process of PRs until a contract is awarded or other appropriate action is completed. The post-award segment records and reports status of locally awarded contracts/orders and the status of material/property due-in under contract. The history segment provides a record of each AFLC contract action taken against a stock numbered item. The DO16, Status of Present/Projected Backordered Items System, provides management information used to correlate delinquency data to backorders and projected backordered items. The E841, Contracting Manpower Management System, uses work measurement standards and workload forecasts to compute contracting manpower requirements. The UPAMS, Unpriced Action Management System, tracks and prepares reports concerning unpriced contractual actions.

The six systems support AFLC spare parts contracting operations at the five Air Logistics Centers (ALC). They operate in complex interrelationships with numerous other automated systems. Attachment 1 highlights the fact that contracting data systems cannot be viewed in isolation. Any changes, enhancements or system replacements must consider multiple interface requirements supporting virtually every functional area in the ALC. Other notable aspects of the current systems include: large volumes of data; the requirement for systems to surge to support a wartime mission while generally operating in a relatively steady-state peacetime environment; and yearly manpower and budget contraints which limit the level of ADP support which can be provided.

System Deficiencies

AFLC contracting data systems in use today have four major deficiencies: (1) data within the existing systems is difficult to access, (2) the systems do not provide the information required to effectively manage and price spare parts acquisitions, (3) there is virtually no ADP capability available for direct use by buyers, analysts or managers, and (4) the systems are not easily adapted or expanded to meet changing information requirements. These deficiencies are explored in more detail below.

1. Data within the existing systems is difficult to access. This occurs for several reasons. Contracting systems are basically off-line data tracking systems which generate fixed format, hard-copy listings at specified intervals, i.e. daily, weekly, monthly. The systems operate on several different computers through a series of batch-sequential computer programs. Extracting data not found on standard listings requires special programming for each system involved as well as programming to analyze the data. In some cases this programming can be quite extensive. In the worst cases data is not captured by the systems and must be manually extracted. Efforts to collect the spare parts pricing data found in this report provide a good case in point. Data required for trend analysis resided in three separate data systems, operating on two makes of computers, at each of five Air Logistics Centers. Data tapes had to be collected from each Air Logistics Center and special programs written to extract, combine, and analyze the data. The effort was hampered by bad data, bad tapes, programming problems, limited computer resources, and the volume of data...over 4 million records. In spite of excellent programming support, the effort was cumbersome and time consuming at best.

2. The systems do not provide the information required to effectively manage and price spare parts acquisitions. This is caused, in part, by the access problem cited above, and the existence of system "voids" where data is either not collected and/or not processed to produce needed information. For example, there are no automated systems for tracking increases or decreases in spare parts prices from year to year. As a result managers, analysts and buyers lack visibility of spare parts price trends. When trend data is required, special programs must be written and/or a manual analysis accomplished. This situation contributes to the present public concern over spare parts prices. Media horror stories involving a small number of individual parts have led to a widespread conclusion that the price of all spare parts has increased dramatically. The absence of an accurate, accessible trending system makes such conclusions more difficult to deal with. The DOD IG, for example, reviewed over 9,500 procurement history records contained in the JO41 system at one ALC and concluded, albeit erroneously, that the prices paid for over 25% of jet engine parts had increased more than 500% from 1980 to 1982. The Air Force maintained that the parts examined had increased less than 7% but to document that position, the Air Force had to undertake an extensive, largely manual, record screening effort. The availability of an accurate, accessible data base management system would have simplified the analysis, averted the erroneous conclusions regarding price trends, and avoided an unnecessary manual exercise.

Recent examples involving Congressional requests for spare parts data further highlight problems caused by the lack of access to information. In May 1983 the Air Force was not able to provide specific data requested by Congressman Brooks relative to sole source procurements with Pratt & Whitney Aircraft because, "Our

data system does not stratify the data to this degree of detail". In another instance the Air Force was asked to provide Senator Tower information regarding F100 engine parts procured over the past five years. The following extract from the Air Force response summarizes the problems that spare parts buyers, price analysts and managers regularly encounter when they attempt to collect data from the current systems:

> Responding to this inquiry has proved to be a very difficult process. For nearly two months now, we have attempted to extract from our logistic acquisition and Due-In System contract award data for Fiscal Years 78-82 for both competitive and noncompetitive F100 engine item buys with an annual procurement value of at least $100,000. Due to system limitations, the data requested for each fiscal year could not be obtained without extensive manual effort or implementing a new computer program.

3. There is virtually no ADP capability available for direct use by buyers, managers and analysts. ADP support for contracting is handled by computers located at a central site outside the contracting area. Hard-copy computer listings are delivered to contracting personnel as they are generated, weekly in most cases. Pricing personnel do have access to Copper Impact System, a time-sharing system which provides modeling capabilities and pricing utilities. However, the system is difficult to use and has not received wide usage by field personnel. A small number of JO41 remote terminals are also located in the contracting area for use by clerks performing data input and error correction functions. For the most part, buyers must price the vast majority of spare parts without the aid of ADP tools. There are no terminals in the buying divisions and the software which would enable buyers to easily access and analyze data does not exist. Spares pricing is therefore very labor intensive, requiring manual research and analysis with desk top adding machines and hand-held calculators. The high volume of spare parts work load, coupled with the current staffing level of approximately 70% precludes in-depth analysis for all but the largest buys. Certainly, not all spare parts buys require ADP tools, however, reasonable access to such aids can only enhance spare parts pricing and management effectiveness.

4. Systems are not easily adapted or expanded to meet changing information requirements. ADP support for contracting is accomplished through a series of batch-sequential computer programs with a number of time consuming off-line interfaces. The hardware supporting these systems is near saturation. Consequently, the systems cannot be readily expanded. Further, they are basically off-line data tracking and management information systems which generate fixed format listings at specified intervals, i.e. daily, weekly, monthly. Any variation to standard products requires a lengthly process of approvals, programming, testing and implementation. A seemingly simple data request may take weeks or even months to effect. The same is true for modifications to update or enhance these systems. In fact, there is currently an eight month backload of priority programming workload to correct deficiencies and make enhancements to the post-award segment of the J041 system alone. The J023 system currently has over a 6 manyear backlog of required programming improvements. Complex interfaces, inefficient systems, lack of capacity and lack of qualified programmers all contribute to this situation.

Other general conditions exists which impact the effective management of spare parts.

a. Systems lack capacity to handle wartime surge in contracting workload. AFLC computer systems can barely handle the peacetime workload. System expansion or redesign during mobilization would delay acquisition of urgently needed war materials.

b. Systems cannot rapidly identify changes to obligated funds on contracts. Current fund status is needed to prevent funds from becoming dormant and to allow for useful employment of all funds to fill other valid requirements.

c. Systems lack compatibility with the Military Standard Contract Administration Procedures (MILSCAP). This situation causes the continuation of inefficient, manual processing of contract administration data and contributes to the problem cited in (a) above.

In summary, the current systems are archaic with virtually no on-line capability available for buyer or manager use. There is no simulation capability and trend analysis must be done manually. The data bases are inflexible making data difficult to access and analyze. Continued "band-aid" fixes to existing contracting data systems will not solve the problem.

What is Being Done

The deficiencies cited above have been recognized by Air Force managers and efforts are already planned or underway to address them. Some programs are directed specifically toward improving ADP support for pricing, while others address the overall spare parts acquisition process. Near term actions include: (1) Development of special computer listings, using current systems, to identify sole source items for potential breakout to competitive status. This effort was completed in September 1983 and focused on items slated for purchase in FY 84, (2) Development of special computer listings which identify items with a history of increasing prices. This effort was completed in August 1983, (3) Installation of the Automated Contract Preparation System (ACPS), a standardized word-processing/document preparation system, at all Air Logistics Centers. This project will be completed by mid-September 1983.

Intermediate term actions include: (1) development of on-line interrogation capability for various requirements, contracting, cataloging and requisition/distribution systems. These enhancements will make data more accessible to the users. They are scheduled for Spring 84, (2) acquisition and installation of Near term Initiative (NTI) 019, an AFLC program sponsored by the Secretary of the Air Force which will give spare parts buying personnel on-line access to contracting data. The initiative will place terminals in the buying divisions and will provide system software to allow buyers and managers to access and analyze contracting data. The program is an interim measure pending full development of a comprehensive data system for AFLC contracting activities. Contract award for the near term system is projected for February 1984, with initial operating capability (IOC) in June 1984.

Long term programs to improve ADP support for spare parts acquisition are underway within AFLC's Logistics Force Structure Management System (LFSMS) program. The program calls for development of a number of discrete ADP

systems which will be linked together via a communications network. This network will enable logistics managers to access and combine information in the various systems and make meaningful resource decisions. Specific programs and their functions are shown in attachment 2. The Contracting Data Management System (CDMS) is the long-term system which will address the deficiencies discussed in this section. CDMS will replace the outmoded contracting data systems described earlier. It will provide on-line access to data, analytical tools, capacity to handle surges in spare parts work load, interface with other LFSMS systems, MILSCAP compatibility, real-time management information and will address an extensive list of user-identified requirements which the current systems cannot meet due to hardware or software constraints. CMDS will automate many inefficient, manual practices such as DD 350 preparation, funds certification procedures, trend analysis, management status reporting, etc. CDMS is presently in the conceptual phase and is projected to be operational in May 1987. This schedule projection is based on program funding for system development and hardware acquisition of $22 million spread over three years. Yearly requirements are approximately $5 million, $7 million and $10 million in FY85, 86, and 87 respectively. However, during the FY85 budget cycle, the CDMS program was not funded for FY85. The program was slipped one year, to begin in FY86. If no funds are forthcoming for FY85, CDMS will be delayed one year, to Spring 1988. Further, both the CDMS and NTI-019 programs are managed by one program office in HQ AFLC/PM. The office is staffed with seven people and has relied heavily on support from other offices to initiate and maintain both projects. As CDMS and NTI-019 move further into the acquisition cycle current manpower will be unable to handle the growing program management workload. Failure to provide the skilled manpower required for basic program management functions will jeopardize both programs. CDMS and NTI-019 are critical to the improvement of computer support for the spare parts acquisition process. These systems must be fully supported to assure timely implementation. Spare parts pricing and management will never be more than marginally effective unless personnel have the information and tools to do the job.

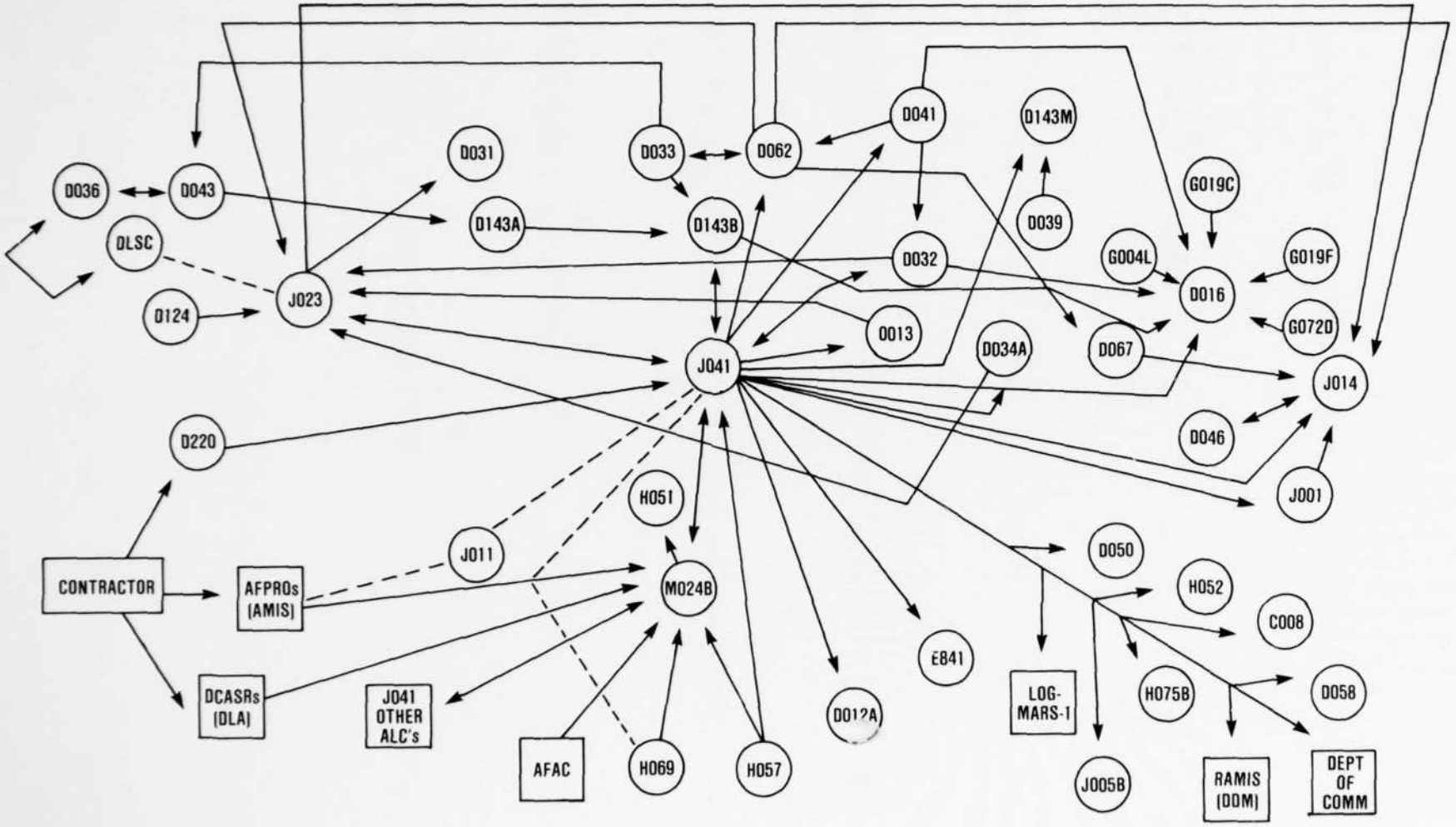
RECOMMENDATIONS

1. Fund the CDMS program beginning in FY85. (OPR: HQ USAF/LEX, OCR: HQ AFLC/PM, HQ AFLC/XR, HQ USAF/RDC)

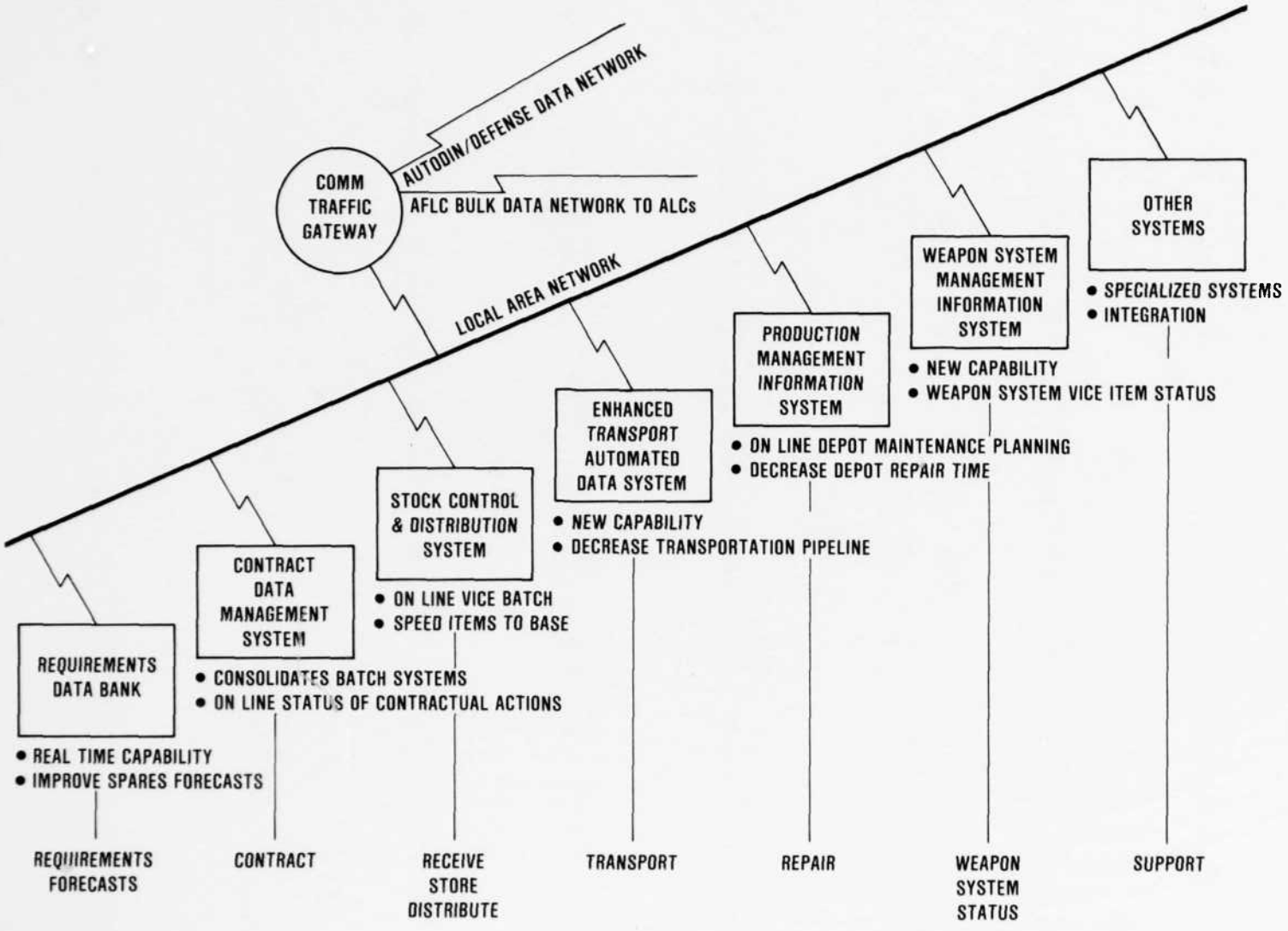
2. Provide adequate support for CDMS/NTI-019 program office manpower needs. Proposed manning for the CDMS office is at Attachment 3. (OPR: HQ AFLC/MP, OCR: HQ AFLC/PM)

3 Attachments

SYSTEM INTERFACES



LOGISTICS FORCE STRUCTURE MANAGEMENT SYSTEMS ARCHITECTURE



RECOMMENDED MANNING
CDMS/NTI-019 PROGRAM OFFICE

Program Mgr	Lt Col	1
Dep Program Mgr	GS-4	1
Sec/Mgt Assistant	GS-5	1
Sec	GS-3	1

System Engineering		Configuration Control		Requirement & Prog. Control	
GS-14	1	GS-13	1	GS-14	1
GS-13	2	GS-12	1	GS-13	3
GS-12	4			GS-12	2
GS-11	1			GS-3	1
GS-4	1				

Attachment 3

AD-A134 841 SPARE PARTS ACQUISITION VOLUME 2 PROBLEMS AND RECOMMENDATIONS(U) AIR FORCE MANAGEMENT ANALYSIS GROUP MMCLELLAN AFB CA OCT 83 3/3

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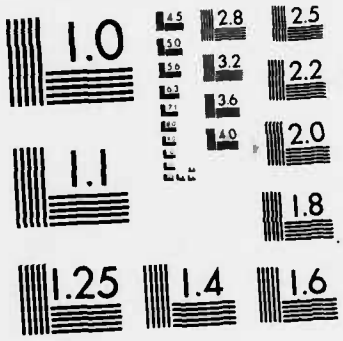

CONTRACTING WORKFORCE TRAINING

PROBLEM

Many personnel in the contracting workforce require additional skills to achieve the objective of improved acquisition of spare parts.

DISCUSSION

The increasing and complex nature of the AFLC contracting workload has severely challenged the ability of contracting personnel to perform their assigned responsibilities. Exacerbating this problem is the subtle, but continuing deterioration in the average skill level of the contracting workforce. In addition to increasing turnover rates at the ALCs, their inability to recruit from college campuses has diminished because of contraints on outside hiring. Consequently, contracting has turned more and more to the maintenance shops, warehouses, and typing pools to fill critical vacancies. While these may be good, well-motivated employees, they require training for contracting which they are not receiving. AFLC has established a training program which identifies mandatory courses for buyers. Each of the ALCs has furnished data which indicates that the need for training is not being met. An indication of the training shortfall is as follows:

	FY 81 - 82	
Course Title	Requirements	Allocations
Mgt of Defense Contracts (Basic)	202	95
Mgt of Defense Contracts (Adv)	404	144
Central Systems Level Contracting	119	88
Defense Cost & Price Analysis	213	90
Principles of Contract Pricing	202	129
Government Contract Law	377	42

Contracting organization management personnel at all levels must assure that allocations for mandatory training courses made available are used. One way this can be effectively implemented is to make this an element in the General Manager Appraisal System (GMAS) work plan.

Implementation of the many separate recommendations made by this AFMAG report will change many traditional contracting procedures. The AFMAG considers it to be mandatory that course content of AFIT training be consistent with the objectives of improving the competition and pricing of spare parts.

The training backlog outlined above is applicable to the existing workforce. Additional authorizations approved by Congress/Air Staff to apply to workforce shortfall will increase the overall training requirements. In addition to current

use of teleteach, road shows, and seminars, AFIT should consider selecting candidates from current courses who, with perhaps some minimal additional training, could become teaching assistants or seminar leaders when they return to their installations. These trained personnel could then, with help from AFIT as needed, tutor groups of fellow workers in the course material on a flexible basis commensurate with normal workload.

RECOMMENDATIONS

1. Insure that allocations for mandatory contracting training (GS1102 series) equal at least 90% of requirements. (OPR: RDC)

2. Insure that the GMAS work plans for contracting and manufacturing management personnel include proper use of training allocations as an evaluation element. (OPR: HQ AFLC/PM)

FORMAL TRAINING FOR ENGINEERING DATA MANAGEMENT

PROBLEM

Due to the complexities of managing engineering data it is essential that Program Managers, Data Management Officers (DMO) and Engineering Data Management Officers (EDMO) receive specialized training in data acquisition procedures to properly and effectively accomplish engineering data management responsibilities.

DISCUSSION

Program Managers, DMOs and EDMOs should attend formal training; however, training currently available is minimal and there is no requirement to attend as a prerequisite for assuming these positions.

1. There are 260 people involved in data management in AFSC and AFLC. Of these, AFSC has 196 and AFLC 64. This excludes EDMOs required by AFR 800-34, Engineering Data Acquisition, 11 April 1983 which requires Program Managers to designate an EDMO responsible for managing the acquisition of engineering data. The DMOs in System Program Offices (SPO) administer the total data management function, while the EDMO will focus entirely on engineering data. In AFLC, DMOs at the Air Logistics Centers (ALC) also administer the total data management function. DMOs in the SPOs and ALC directorates generally range in grade from GS-4 to GS-7. There is no career field and most DMOs are in an administrative field, primarily the 301 series. Data management is a complex field and trained DMOs and EDMOs are essential for providing knowledgeable advice to AFSC Program Managers and AFLC Weapon Systems Program managers. AFIT provides training in course PPM 370, DOD Data Management, however, only 64% (125) of the DMOs in AFSC have attended this course and 56% (36) of the DMOs in AFLC have attended the AFIT course.

2. Specific duties of the EDMO are covered by AFR 800-34; however, there is no career field and the qualifications needed to accomplish the tasks are not defined. At a minimum, EDMOs should have experience in the preparation and use of engineering data and attend AFIT course PPM 370.

3. The AFIT course PPM 370 curriculum includes very limited instruction on engineering data. The course needs to cover in more detail the following areas:

a. Implementing AFR 800-34, Engineering Data Acquisition, 11 April 1983. An AFLC/AFSC supplement will specify relationships, procedures, amplify on requirements and, in general, detail what is needed to effectively implement the basic regulation. The supplement is currently being prepared.

b. Follow on support uses for engineeing data and the impact of inadequate engineering data on the competitive procurement of spare parts.

c. Responsibilities of the Program Manager, EDMO and DMO with respect to obtaining adequate acquisition data packages.

d. Tailoring of DOD-D-1000B, Drawings, Engineering and Associated Lists, 30 November 1978, and its associated data item descrition DI-E-7031, Drawings, Engineering and Associated Lists, 31 May 1977.

4. The program management course at the Defense Systems Management College provides program managers and other mid-level managers with the management skills necessary for planning, organizing, directing, and controlling defense weapon system acquisition programs. Program managers also should be provided instruction on data management during this course with particular emphasis on engineering data and acquisition data packages for competitive acquisition of spare parts.

RECOMMENDATIONS

1. That prior to assuming DMO and EDMO duties, attendance at AFIT course PPM 370 be mandatory. (OPR: HQ USAF/RDX; OCR: HQ AFSC/SD, HQ AFLC/AQ)

2. That the AFIT course PPM 370 be expanded to include detailed study on engineering data, specifically addressing the requirement for implementing AFR 800-34. (OPR: HQ USAF/RDXM)

3. That the DSMC course on Program Management be expanded to include a session on data management and data rights with emphasis on acquiring, pricing, delivering and using engineering data and acquisition data packages for competitive procurement of spare parts. (OPR: HQ USAF/RDXM)

FIRST ARTICLE APPROVAL

PROBLEM

Improper use of first article provisions for qualifications of new competitive contractors can result in increased cost and excessive lead time.

DISCUSSION

First article provisions are designed to be used in contracts when the Government requires an additional degree of assurance that the contractor can furnish a product that is satisfactory for its intended purpose. These contracts require the contractor to complete a small quantity of units (usually one or two) to be tested before he can begin to make the remaining production quantity. Contract provisions normally prohibit the contractor from acquiring material for the production quantity until after approval of the first article.

Because of the small quantity of first article units under a contract, many contractors will hand build these units in a model shop which may or may not be representative of a production lot.

First articles by their very nature (small quantity lots) are expensive to produce and increase the total contract production lead time (since the contractor cannot start production until after first article approval).

There are two other procedures available to the Air Force which may be a suitable substitute for first article provisions. The first of these is called Initial Production Evaluation - under this procedure the Government evaluates the first unit(s) which come off of the production line. Since they are production units, they are more representative than hand-built model shop first articles. Use of initial production evaluation procedures is significantly enhanced if the cognizant ALC engineer is given the opportunity to go to the contractor's plant for hands-on evaluation of initial production quantities.

The other alternative is to require the contractor to produce a limited quantity of units for pre-contract evaluation. The cost of production of these samples can be paid by either the contractor or the Air Force, or shared by both.

The regulatory guidance contained in DAR 1-1900 concerning use of first articles in considered to be adequate. However, there have been instances of improper use caused by misunderstanding of alternatives and inadequate training of personnel.

RECOMMENDATION

Establish a comprehensive training program covering the procedures set forth above for presentation to all concerned ALC MM, PM and CR personel. Consideration should be given to using video tape as a training medium with copies provided to all five ALCs. (OPR: HQ AFLC/PM, OCR: HQ AFLC/MM)

EMPLOYEE MOTIVATION

PROBLEM

Standards used for measuring individual and organizational performance fail to provide adequate motivation to achieve required improvements in competition and pricing of spare parts.

DISCUSSION

Accountability and employee performance standards within AFLC have historically focused on timeliness as a result of senior management pressure to maintain the Air Force in a position of operational readiness.

Management Indicators

The HQ AFLC management rating system as applied to contracting is an example of the manner in which this concern is being emphasized. This emphasis has created a perception in the workforce that may result in less than the best contract price due to timeliness concerns being the predominant factor. This perception may also impede breakout efforts because of the time required to approve new sources.

On 14 July 1983, HQ AFLC published revised objectives for its five ALC central procurement organizations. There are three separate weighted areas evaluated. These areas and their respective weights in relation to the area percent are as follows:

1. Contract placement (60%)
    a. On time rate (.6)
    b. On hand overage actions (.4)
2. Contract Administration (30%)
    a. On time rate - hardware (.2)
    b. On time rate - provisioning (.3)
    c. On time rate - back orders (.2)
    d. Delinquencies over 90 days (.3)
3. Compliance to goals (10%)
    a. Competition (.5)
    b. Small and disadvantaged business (.5)

Based upon the weight assigned, 36% (60% x .6) of the total contract placement points are given to the on time rate. An additional 24% of the total points are assigned to on hand overage actions and only 5% of the points are assigned to

competition. There is no objective which evaluates effectiveness of pricing or negotiation of fair and reasonable "value oriented" spare parts prices. This disproportionate amount of weight given to "timeliness" appears to send the message to the workforce that management's primary concern is how quick the buyer can place the contract, with little concern given to the quality of the action.

Performance Appraisals

This message is further reinforced by the manner in which the personnel appraisal system has been implemented with both General Manager Appraisal System (GMAS) and Job Performance Appraisal System (JPAS) work plans which are heavily weighted on how much and how fast rather than how well. Leadership must ensure accountability is clearly established by revising appraisal standards to more accurately represent what we require, i.e., a balanced approach of maximizing the quality of pricing, breakout, and competition of spare parts while still recognizing the need to be responsive to the operating force's requirements. Employees then must be rated and rewarded on their actual performance under these revised standards.

The current performance recognition program, AFR 40-451, Civilian Performance Recognition Program, provides sufficient latitude to recognize high performers, including monetary and honorary awards. Three cash awards are available with varying amounts of compensation:

1. Sustained Superior Performance Award

   - 1 to 15% of payable salary, based on total annual performance.

2. Quality Step Increase

   - Additional within-grade increase which indefinitely raises the employee's rate of basic pay, based on total annual performance.

3. Special Act or Service Award

   - Certificate with cash award from $250 to $35,000. Amount is in proportion to the benefits realized by the Government, based on performance which has significantly exceeded job requirements as a one-time occurence.

Incentive Awards

A perception exists with some management officials that the current recognition system is not and cannot provide adequate motivation and incentive to the workforce. In actuality, the system is designed to meet these needs, but management must give increased attention to proper administration of the program. There appears to be significant differences in administration of the recognition program across installation lines which may be attributed to funds availability. For example, within AFLC through the first two rating cycles, the total merit awards made to GM-13-15 employees in GM series 1101, 1102, 1670, 2001, 2003 and 2010 ranged from a high of 20% (39/194) at base A to 38% (75/198 at base B. The disproportionate recognition of personnel could foster a lack of confidence in the system.

New emphasis must be focused on three objectives: providing adequate funding for cash awards, providing appropriate honorary recognition, and assuring equity in administration of the program. Current recognition programs allow great latitude at the operating level to determine the total amount of funds available for awards and the specific percentage of salary to be awarded. The fact that awards money comes out of civilian pay funds complicates the local decision-making process with competing priorities bumping against the awards funds.

Resolving this problem may require MAJCOM senior management intervention with one alternative being assuring adequate awards money and precluding local tapping of the fund for other purposes. While that kind of control is undesirable from an overall delegation of authority viewpoint, it may be the only way to instill credibility in the program. The initial move, however, should be to ensure local commanders are aware of the attention that needs to be given the spare parts acquisition initiatives and allow them the opportunity to properly manage and fund the awards program in accordance with some definitive MAJCOM guidelines.

Although honorary awards are currently available for total job performance, there is no specific honorary recognition for employees who excel in breakout, competition, and quality pricing. Other functional areas, i.e., AFR 900-19, Contracting, Manufacturing and Quality Assurance Awards Program, have developed competitive honorary awards for their respective needs. An annual competitive Air Force functional honorary award program to recognize employees for excellence is increasing breakout and spare parts competition needs to be established. Competition should be at base, MAJCOM and Air Force level with appropriate ceremony and recognition item (i.e. emblem, certificate, plaque or trophy). Competition should be between peer groups. Groups should be categorized, for example, by senior managers, middle-managers, supervisors, specialists, technicians and clerical, if applicable. This requires an effort to see that employees in like jobs are being rated on equivalent standards between organizations, bases and within each MAJCOM if Air Force-wide awards are adopted. The existence of the program and the awards presented need to be publicized within the Air Force and the American public.

RECOMMENDATIONS

1. Identify functions, organizations, and specific positions that have a role in the breakout and competitive spare parts acquisition process. Revise official position descriptions of these positions and establish a new critical element and performance standard in General Manager Appraisal System (GMAS) and Job Performance Appraisal System (JPAS) work plans reflecting the new responsibility. (OPR: HQ USAF/MPK, OCR: HQ USAF/RDC/LEY)

2. Provide adequate funding and administration of the Air Force Civilian Performance Recognition Program at MAJCOM and local level, using the cost management committee function (AFR 40-112) to assure the greatest motivational impact. (OPR: HQ USAF/MPK, OCR: HQ USAF/ACB/RDC/LEY)

3. Establish an annual competitive Air Force functional honorary award to recognize employees for excellence in increasing breakout and spare parts competition. Incorporate the award in the appropriate AFR 900 series regulation. (OPR: HQ USAF/MPK, OCR: HQ USAF/RDC/LEY,SAF/AA/PA)

4. The management rating system for the ALC organizations must be restructured to place a more balanced evaluation of an organization's effectiveness in relation to quality pricing, negotiation effectiveness, and expansion of effective competition. (OPR: AFLC/PM)

BUSINESS STRATEGY WITH INDUSTRY

PROBLEM

The Air Force Logistics Command does not plan future spares buys with industry.

DISCUSSION

The Corona Require report recommended that the Air Force Logistics Command (AFLC) establish a Businesss Management Steering Committee (BMSC) that would be responsible for industry interfaces. The recommendation was approved and AFLC directed that the Air Logistics Centers establish ths group in a 28 June 1983 letter. To date, no formal taskings have been assigned to the Steering Committee.

Exchanging information about planned purchases of spare parts can benefit the Air Force and industry. The Air Force can obtain information on leadtimes, potential problems because of obsolete or out-of-production parts, economic production quantities, and additional suppliers. Industry can use Air Force future buy plans to assess and plan their own operations to support anticipated orders, establish leadtime forecasts and develop cost estimates.

Additionally, future buy information can provide a broader base of suppliers an opportunity to compete for items they are qualified to produce. We reviewed the current AFLC initiatives to obtain and exchange information with industry. We found two existing programs which can be expanded to facilitate the Business Management Steering Committee and industry interface.

Today AFLC does an annual survey with industry to obtain estimates of production leadtimes (AFLCR 84-4, Production Leadtime Acquisition). The survey usually begins in January using the September computation results. Items selected for the survey are those with a projected buy requirement in the next fiscal year. For example, the January 1984 survey will include items with a projected FY85 buy. Listings are prepared, showing the name of the current contractor, and identify the item, part number, expected buy quantity and current production leadtime. Contractors are only asked to provide projected leadtimes. When a response is received, the item manager will review the leadtime estimates and put the forecast into the computation. Even though the listings provide item quantities, AFLC does not ask for the identification of items that face production problems or economic production quantities. Additionally, these listings are not provided to potential competitors who could develop the capability to compete. Contractors can request information from the requirements systems under AFLCR 81-2, Release of Requirements Data. The requests can range from computed buy quantities to the failure and condemnation data used to compute requirements. While certain contractors (Pratt-Whitney, General Electric, Sundstrand) request this information on a routine basis, there is no formal exhange program. Today this effort results in contractor's obtaining Air Force data but the Air Force does not receive information in return. The AFMAG believes that these programs Production Leadtime Acquisition and Release of Requirements Data provide the framework for the Business Management Steering Committee to interface with industry. The data from these two programs can be used to develop AFLC and Industry strategies for future year spares buys. If AFLC begins now an acquisition strategy can be implemented for the FY85 buy program.

Table II-28 shows an expected time flow for this process.

BUY PLANNING PROCESS

AUG 83	OCT 83	JAN 84	MAR 84	APR 84
	BMSC Procedures For Buy Planning	FY85/86 Buy Qty/Lists Produced/Sent to MFGs	Meetings w/Major Suppliers and potential competitors	Data Incorporated Into Advance FY85 PRs

TABLE II-28

RECOMMENDATIONS

Develop and establish an interface program with industry concerning planned purchases. This interface should result in AFLC obtaining information on production leadtimes, economic production quantities, and potential acquisition problems on obsolete or out-of-production parts and the potential for expanding the supplier base. To expand competition, this interface with industry should include major suppliers, small business firms and Industry Associations. (OPR: AFLC/PM; OCR: AFLC/MM, Air Logistics Center Business Management Steering Communittees)

PROGRAM FOR CONTROLLING DATA RIGHTS

PROBLEM

Engineering data containing unauthorized limited rights legends is accepted by the Air Force, which inhibits competition when acquiring spare parts.

DISCUSSION

Data from AFLC and Air Logistics Centers (ALC) indicate that approximately eight percent of potential spare parts buys can not be competed because of limited rights legends on data. These legends were not challenged during the acquisition or post production support phases and consequently there is a high potential for unauthorized markings to be in the system.

Visits by members of the AFMAG to System Program Offices (SPO), Air Force Plant Representative Offices (AFPRO), and ALCs revealed a lack of emphasis on data rights. Rights in data have not received emphasis on the front end of acquisition programs even when the appropriate DAR clauses are in the contracts. Contractor data rights claims are not challenged, either during the negotiation process or when the data is developed at the contractor facility. Similarly, when ALCs prepare bid sets based on procurement data packages, questionable restrictive legends on data are not being challenged and the 60 day challenge letter authorized by DAR 7-104.9(a)(d), "Rights in Technical Data and Computer Software - Removal of Unauthorized Markings" is not being sent.

The lack of activity in data rights can be attributed to a lack of policy, procedures, and guidance concerning data rights. Contracts personnel, engineers, and lawyers need to be made aware of the appropriate aspects of data rights to properly administer a data rights program. To do this, a centrally administered program to provide guidance on data rights is needed. This program can provide the following services:

1. Give assistance in administering contractual provisions related to data rights.

2. Establish a program to instruct personnel in the procurement activities on the way to handle data rights problems.

3. Give guidance on when to challenge the propriety of limited rights legends on data, how it should be done, and who should do it.

4. Assist Competition Advocates and contracting officers in conducting challenges of limited rights legends, particularly during the FY 84 buy program.

5. Coordinate challenge activities with the Air Force Trial Attorney, Wright Patterson AFB, in anticipation of legal action that might be taken by contractors when limited rights legends are removed from their drawings.

6. Give guidance on purchasing needed data rights.

7. Recommend changes to the DAR and the AF DAR supplement regarding to data rights.

The proper office to administer this program is the Patent Law Division of the HQ USAF Legal Office. To assist this division, a Data Rights Board should be established under the auspices of HQ USAF/JA. This board should consist of patent attorneys and other knowledgeable personnel, with representatives from HQ AFSC, HQ AFLC, a selected ALC and a selected AFSC product division.

One of the underlying premises of this effort is that the Air Force must become aggressive in legally supportable challenging of limited rights legends and negotiating and evaluating contractor claims.

RECOMMENDATIONS

1. The Patent Law Division of the Legal Office establish a program for providing policy, guidance, and assistance in data rights. (OPR: HQ USAF/JA)

2. Establish a Data Rights Board, chaired by HQ USAF/JA, with representatives from all interested organizations to administer the program. (OPR: HQ USAF/JA, OCR: HQ AFSC/JA, HQ AFLC/JA)

DATA RIGHTS CERTIFICATION

PROBLEM

Competition is inhibited by an Air Force DAR Supplement 1-313 which requires a contractor to certify that he has full legal rights to use data which he has in his possession.

DISCUSSION

The major practical recource available to the Government under the DOD data rights policy for mismarked data is the removal of improperly applied legends. Owners of proprietary rights in data have several remedies available to them when the Government misuses or threatens to misuse data. Such alleged misuse generally takes one of two forms - use of the data in the procurement process by incorporating it in a solicitation for competitive offers, or publication of the data by its inclusion in a Government data bank which is available to many outside sources. Either of these acts may destroy or severely impact the value of the proprietary rights of the owner. In addition, the use of the data in the procurement process will generally deprive the owner of the data of a preferred or sole source position with regard to the supplies or services being procured.

The Government is not obligated to investigate and resolve allegations that non-government personnel have violated proprietary rights. This is a private matter between parties to be resolved by private litigation, or agreement between the disputing parties. The mere fact that a potential contractor submits data bearing the name of a different contractor does not prove a violation of proprietary rights. The contractor who prepared the data may have lost proprietary rights by not protecting the rights or it may never have been subject to proprietary rights. The potential contractor may have obtained the data from the Government or other lawful source.

Air Force DAR Supplement 1-313 contains guidelines and procedures for assignment of an Acquisition Method Code (AMC). It also provides a model certification which proposers must execute if their technical data may be a copy of another source's data. Contractors have advised that the procedure is costly, burdensome and not required by law. A review of the applicable decisions has verified the contractor's views and objections.

RECOMMENDATION

Rescind Air Force DAR Supplement 1-313 Paragraph (c)(ii). (OPR: HQ USAF/RDC)

REMOVAL OF RESTRICTIVE DATA RIGHTS LEGENDS

PROBLEM

There are over 29,000 items managed by the Air Force which cannot be competed because of limited rights in data.

DISCUSSION

The basic policy of the DOD, contained in DAR 9-203(a), provides protection for proprietary rights by allowing delivery to the government of data with limited rights legends rather than by withholding such data from delivery to the government. The Air Force has recognized these restrictions for the life of the data.

The AFMAG, in other elements of this report, has recommended changes in future acquisitions which limit the time during which limited data rights would be recognized, strengthen the Air Force system of challenging data rights claims, and establish a contractual framework with which to maximize the amount of data delivered with unlimited rights.

The PACER PRICE program within AFLC and the restructured competition advocates office in the ALCs are addressing data rights for data presently in the repository. Paragraph (d) of DAR 7-104.9(a), establishes the right of the government to challenge claims of limited rights to data. One goal of the competition advocate program is to accomplish a 100% challenge of limited rights for data presently contained in the repositories.

Consideration was given by the AFMAG to a blanket type action which would significantly reduce the amount of limited rights data, particularly for older systems. However, to be effective and supportable in a court challenge, such action should follow the requirements of the DAR for challenging rights. To do this, the AFMAG supports a procedure whereby the Secretary of the Air Force, as the head of an acquisition agency, initiates action with major spare parts suppliers to voluntarily remove restrictions for older data and at the same time notifies them that their rights to such data are challenged.

The problem of lower tier subcontractor and vendors claiming limited rights to delivered data should also be addressed in the Secretary's letter. Initial attempts to reduce limited rights in delivered data should be directly with prime contractors, suggesting they take action with those suppliers who established limited rights claim through the prime contract.

At some point in time the AFMAG envisions potential direct Air Force involvement with vendors claiming limited rights to data in Air Force files. This should be determined on the basis of responses to the Secretary's letter.

RECOMMENDATION

Establish a program to seek voluntary removal of restructive data legends from AF contractors. (OPR: HQ USAF/RDC, OCR: SAF/GC)

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AIR FORCE AND OTHER GOVERNMENT AGENCIES VISITED

1. Air Force Acquisition Logistics Division, Wright-Patterson AFB, OH.

2. Air Force Business Management Research Center, Wright-Patterson AFB, OH.

3. Air Force Plant Representative Office, Boeing Witchita Kansas.

4. Air Force Plant Representative Office, Hughes Aircraft Company, Los Angeles, CA.

5. Air Force Plant Representative Office, Lockheed-Georgia Company, GA.

6. Air Force Plant Representative Office, Westinghouse Electronic Corporation, Baltimore, MD.

7. Ballistic Missile Office, Norton AFB, CA.

8. Defense Contract Administration Services Plant Representative Office, Hughes Aircraft Company, Fullerton, CA.

9. Defense Contract Administration Services Region, Los Angeles, CA.

10. Defense Logistics Agency Cameron Station, Alexandria, VA.

11. Defense Contract Audit Agency, Washington, D.C.

12. Headquarters Aeronautical Systems Division, Wright-Patterson AFB, OH.

13. Headquarters Air Force Contract Management Division, Kirtland AFB, NM.

14. Headquarters Air Force Logistics Command, Wright-Patterson AFB, OH.

15. Headquarters Air Force Systems Command, Andrews AFB, MD.

16. Headquarters Electronics System Division, Hanscom AFB, MA.

17. Headquarters United States Air Force, Pentagon, Washington, D.C.

18. Navy Plant Representative Office, McDonnell Douglas Corporation, St. Louis, MO.

19. Office of Secretary of Defense, Undersecretary for Research and Engineering, Washington, D.C.

20. Ogden Air Logistics Center, Hill AFB, UT.

21. Oklahoma City Air Logistics Center, Tinker AFB, OK.

22. Sacramento Air Logistics Center, McClellan AFB, CA.

23. San Antonio Air Logistics Center, Kelly AFB, TX.

24. Space Division, Los Angeles Air Force Station, Los Angeles, CA.

25. United States Navy Aviation Supply Office, Philadelphia, PA.

26. Warner Robins Air Logistics Center, Robins AFB, GA.

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1-313

a. Breakout and Competitive Acquisition

The Air Force intends to provide for maximum practical breakout and competitive acquisition of any part; subassembly or component (hereinafter called Parts) as provided in DAR 1-313 and 1-326). Also the Air Force intends to be able to fully cooperate and support Foreign Military Sales (FMS) of hardware, technical data and computer software and joint U.S. - Foreign Government programs including production in a foreign country by or for a Foreign Government. To accomplish this intent, the Air Force seeks to either:

1. acquire acquisition data packages with sufficient rights for competitive acquisition or manufacture of such parts world wide; or

2. provide for multiple qualifications of sources of such parts

b. Acquisition of Additional Technical Data and Computer Software

1. The Air Force has the right during the term of this contract or any future contract related to (THE SYSTEM) that is subsequently awarded to the contractor, to purchase from time to time "Acquisition Data Packages" (ADPs) for breakout and competitive acquisition of parts defined above,together with the required technical data and computer software rights as described in the Predetermination of Rights in Technical Data, Computer Software and Technical Assistance clause below. Upon written notice of the Government's intent to purchase ADPs, the Contractor shall within.....days after receipt of such notice, submit a proposal for the furnishing thereof, which proposal shall include the preparation and reproduction costs of such data, and, as applicable, the amount to be paid as compensation for data rights as priced in the Predetermination clause below. Upon receipt by the Contractor of an order for such ADP and for payment of the fixed price and/or the establishment of a royalty arrangement, the Contractor shall make delivery of the ADP with unlimited rights in accordance with a schedule agreed upon.

2. The Contractor's right to compensation for data rights shall apply only to data which the Contractor would be entitled to mark with the limited rights legend of the General Provision of the contract called "Rights in Technical Data and Computer Software". The Contractor's entitlement to mark the data shall be established during the initial predetermination and shall be reviewed at the time the contractor receives notice of the Air Force intent to purchase ADPs.

c. Qualification of Additional Vendors

1. The Contractor shall submit a list of parts suitable under paragraph a. above and having the stability of design for qualification of at least one additional source. This list shall indicate, for those selected parts having only one source, an estimate of the cost for which one or more additional vendors will be fully qualified. The list shall clearly identify each part by name or title, drawing number(s), function and location in the system, the suitability for qualification, and names of proposed additional sources or vendors to be qualified and estimated overall dollar savings potential.

2. It is further agreed that the Government has the right to require the Contractor to qualify at least one additional competitive source for all listed parts, to permit the competitive purchase of the parts by the Government. This right may be exercised from time to time for the term of this contract. Upon written notice from the Contracting Officer, the Contractor shall, to the extent possible,promptly proceed with, and complete, the qualification of parts as required at prices to be negotiated. In qualifying vendors, the Contractor shall use the same basis or standard to the extent possible, in order that no competitive advantage or disadvantage is given to any vendor. The additional vendor or source shall be other than the prime Contractor, unless the Contracting Officer specifically approves the prime Contractor as the additional source. Any disagreement as to price, terms or enforcement of this provision shall be resolved using the procedures of the General Provision entitled, "Disputes."

3. The prices to be paid by the Government for the purchase of Acquisition Data Packages and the Qualification of Additional Vendors are not included in the incentive price provisions of this contract, but shall be subject to fixed price orders as provided under the provisions of this clause.

d. Review of Limited Rights Data

The contractor hereby grants its permission to disclose and release any data submitted hereunder marked with a Limited Rights Legend to a contractor retained by the Government to review the propriety of such a marking; provided that such contractor shall be prohibited from further releasing, disclosing or otherwise using such data. The contractor shall include this clause in all subcontracts hereunder calling for data.

e. Subcontractors and Vendors

1. The contractor is responsible for securing compliance by his subcontractors and vendors with the requirements of this clause. The contractor shall use diligent efforts to contract only with suppliers who will accept this clause. In cases in which the contractor, after diligent efforts, is unable to persuade a subcontractor or vendor to accept this clause, the contractor shall report the entire circumstances, including alternate approaches to resolving the problem, to the Contracting Officer, who after consideration of the circumstances and alternatives, will within thirty (30) days direct the contractor as to action to be taken. The contractor shall follow the course of action directed by the Contracting Officer.

2. In addition, the contractor shall consider the programs including, but not be limited to, disabled veterans and/or handicapped workers, veterans of the Vietnam Era, small business concerns, and woman owned businesses when selecting items for breakout and qualification of additional vendors.

f. Warranty of Data

1. The contractor warrants that the data provided under this contract will be complete, accurate, and adequate as of the time of delivery for the purpose for which it was procured, and that he will promptly correct or furnish, as applicable, any data required hereunder which the contracting officer determines is incomplete, inadequate or deficient for those purposes, provided that the

contracting officer notifies the contractor of the contracting officer's determination within ____ years after the last data has been delivered under this contract or subsequent follow-on contracts. This will be done at no increase in contract price.

2. Further, the contractor agrees, that if the Government uses any of the data supplied under this contract for competitive acquisition purposes and such data turns out not to be suitable for that purpose, to reimburse the Government any additional costs incurred as a result of using said defective data, including costs incurred in getting it corrected by another contractor. Any data not complete, accurate and adequate as of the time of delivery for the purpose for which it was procured shall be subject to the Technical Data - Withholding of Payment Clause set forth in Section I.

(End of Clause)

AF DAR SUPPLEMENT 7-2003.61, PREDETERMINATION OF RIGHTS IN TECHNICAL DATA, COMPUTER SOFTWARE AND TECHNICAL ASSISTANCE

7-2003 Clauses to be Used When Applicable

7-2003.61 Predetermination of rights in Technical Data, Computer Software, and Technical Assistance

The clauses below, or a clause specially drafted to meet particular needs, shall be used when the Government desires the ability to competitively acquire, operate and maintain the product developed under the contract, and when it is desired to acquire computer software that may be subject to restricted rights.

1. Request for Proposal, Section L. Instructions to Offerors Clause.

PREDETERMINATION OF RIGHTS IN TECHNICAL DATA AND COMPUTER SOFTWARE

(a) The offeror is requested to identify in the proposal the technical data or computer software (including data or computer software to be furnished in whole or in part by a subcontractor), which will be identified as being limited rights data or restricted rights computer software according to paragraph (b) of the "Rights in Technical Data and Computer Software" clause of this solicitation. This identification need not be made for data or computer software that relates to standard commercial items that are manufactured by more than one source of supply. Identification of restricted rights computer software should include identification of the proposed restrictions to be placed upon such computer software items. The restrictions will be subject to limitations of paragraph (b)(3) of the "Rights in Technical Data and Computer Software" clause.

(List here that technical data and/or computer software which the contractor proposes to deliver subject to limited or restricted rights. Data and software that clearly comes within paragraph (b)(1) of the "Rights in Technical Data and Computer Software" clause and would therefore be acquired with unlimited rights should not be listed.)

(b) Limited rights data and restricted rights computer software may be identified as such, pursuant to (a) above only if it pertains to items, components, or processes developed at private expense. Nevertheless, it cannot be so identified if it comes within paragraph (b)(1) of the"Rights in Technical Data and Computer Software" clause. At the request of the contracting officer or his representative, the offeror agrees to furnish clear and convincing evidence that the data, which will be so identified, comes within the definition of limited rights data, or restricted rights computer software, as appropriate.

(c) The listing of a data or computer software item in (a) above does not mean that the Government considered such item to come within the definition of limited rights data or restricted rights computer software.

(End of Clause)

2. Contract Clause

PREDETERMINATION, AND OPTION TO ACQUIRE TECHNICAL DATA, COMPUTER SOFTWARE, TECHNICAL ASSISTANCE AND RIGHTS

(a) It is agreed that the terms and conditions of this provision do not limit in any manner the contractor's rights and obligations under the Deferred Ordering of Technical Data or Computer Software clause DAR 7-104.9(m) contained herein. The definitions set out in paragraph (o) shall be used in interpreting this clause and the DAR 7-104.9(a) Rights in Technical Data and Computer Software clause included in this contract and any other provisions herein pertaining to rights in technical data and computer software. In addition, the terms, conditions, and definitions of the DAR 7-104.9(a) clause included in this contract are applicable to this predetermination and option agreement and shall govern in case of conflict with this agreement.

(b) It has been predetermined that all computer software and technical data required to be developed, generated, or delivered under this contract will be delivered with unlimited rights except that excluded in paragraphs (e) and (f) below. Technical data and computer software that will be used or modified in the performance of work hereunder and to which the Government has less than unlimited rights are also listed in paragraphs (e) and (f).

(c) The Government has unlimited rights in the following technical data and computer software that will be developed, generated, used, modified, or delivered under this contract. The Government shall have the right to modify this contract for the purpose of ordering any of the items identified. The contractor shall furnish any technical data or computer software so ordered and shall be compensated for conversion into a prescribed form for reproduction and for delivery.

Description of Technical Data or Computer Software

(1) _____
(2) _____, etc.

(d) The Government shall have the right to acquire by option any of the technical data or computer software listed in (e) below by modification of this contract during the performance of this contract or for a period of ___ years after the end of the period of performance as identified in Part ( ) - SECTION ( ) herein (and as may be modified hereafter) or after termination of this contract.

(e) The Government shall have the right to acquire the technical data and assistance listed below and fully paid up license as indicated, covering all rights, including any applicable patent rights for the maximum prices stated in:

1. Any technical data or computer software used in the performance of this contract, except that excluded in paragraph (f). The following maximum prices and delivery schedules apply as indicated in paragraphs (g), (h) and (m):

Description of Technical Data and Computer Software	Maximum Price	Maximum Delivery After Exercise (Days)
(i)_____	___	_____
(ii)_____		_____

Any other technical data

2. Technical Assistance necessary to produce, maintain, operate, or modify any item or component produced, or any process or software used under this contract, except those excluded in paragraph (f). The following maximum prices and delivery schedules apply as indicated

Identification of Items, Components, Process or Computer Software	Maximum Price	Time for Maximum Delivery After Exercise of Option
(i)_____	___	_____
(ii)_____		_____

Any other items, components, processes, or computer software

Identified technical data, as on a Contract Data Requirements List, can be listed here.

Other assistance and unidentified data needed for back-up purposes can be covered here.

3. Form, fit and function data, as defined in paragraph o(3) for any items excluded from this option clause or for which the Government does not acquire detailed technical data or assistance, or rights.

(f) Exclusions: The following is excluded from the operation of this clause:

> Manufacturing data and technical assistance pertaining to standard commercial components manufactured and sold by two or more competing suppliers.

(g) The maximum prices stated in paragraph (e) will be reduced in accordance with paragraph (h) and (j) if:

1. The Government does not acquire a fully paid-up license of the scope indicated.

2. The Government acquires technical data and assistance or computer software and rights for less than the full item, component, process, or software, for which the price is established.

3. The contractor is unable to substantiate that the pertinent items, components, processes, or software were developed at private expense.

(h) Exercise of Options.

1. When the Government desires to exercise any of the above options, it will notify the contractor in writing of the technical data or assistance desired, including the extent of and the desired terms and conditions of any license. The contractor will furnish the technical data or assistance within the maximum delivery period specified, without waiting for completion of negotiations or any appeal.

2. If the technical assistance is to be furnished to a non-Government licensee, the Government will normally direct the contractor and the prospective licensee to negotiate with each other. Leader/follower procedures of DAR Section 4, Part 7, will normally be followed. Any agreements reached will be subject to Government approval and should have the provisions set out in (h) (3) below.

3. Within _____ days, the contractor will furnish a pricing proposal. Technical assistance concerning particular items components, processes, or computer software should normally be separately priced. Normally, any price for rights should include a flat sum, a royalty rate, and paid-up license sum. The flat sum will be paid when the licensee produces the item, component, or computer software; or demonstrates the process in a fashion acceptable to the Government; or meets stated contract specifications agreed to at the time of ordering. The flat sum will include the actual cost for furnishing such data or technical assistance plus a sum based on the factors set out in subparagraph (i). The royalty rate shall be computed on some base indicative of the future use by or for the Government. After the flat sum and royalties total the paid-up license sum, the Government shall have the right to acquire the designated items, components, processes or computer software, or have them used by or for it without payment of further royalties or fee. Upon request, the contractor will substantiate that the pertinent items, components, or processes were developed at private expense.

4. The contractor certifies that the items set out in paragraph (e) above were developed at private expense, and not as an element of performance of this or any other Government contract.

(i) At the request of the PCO or his designated representative, the contractor agrees to furnish clear and convincing evidence that the technical data or computer software listed above comes within the definition of limited rights data or restricted rights computer software, as appropriate. The listing of a data or computer software item above does not mean that the government agrees such items come within the definition of limited rights data or restricted rights computer software. The government may make a subsequent determination as to whether the listed technical data or computer software is entitled to limited or restricted rights treatment based on the procedures and criteria set out in the "Rights in Technical Data and Computer Software" clause.

(j) Without waiting for the beginning or completion of negotiations, the Government shall have the right at any time to enter a final order requiring the contractor to furnish any technical data or assistance required to be furnished under this contract to a named licensee. The order shall state which rights are being acquired by the Government, and the prices, terms, and conditions under which the data

(k) It is agreed that the essence of the contract, insofar as this option clause is concerned, is to give the Government the ability to transfer technology within the time period necessary to meet schedules and before it becomes obsolete. The time spent during the pendency of conventional appeals may effectively deprive the Government of the benefits of this option. Accordingly:

1. The contractor will promptly furnish technical data and assistance according to the terms of any order entered under paragraph (h), and the Government shall have the right to use and disclose the data outside the Government according to the terms of the order, during the pendency of any appeal, provided the order has been approved by the DCS/Contracting and Manufacturing and the Staff Judge Advocate of the Air Force Systems Command. The contractor shall have the period stated in the order, not less than 10 days, to state his or her objections to any such order to the DCS/Contracting and Manufacturing.

2. The Contractor shall have the right to appeal the amount of monetary compensation granted, but no other issue.

3. Appeals may be filed under the Disputes clause or in any other forum provided for contracts of this type at the time of the entry of the order.

4. The Government shall pay the contractor the compensation provided for by the order, promptly upon its entry, without waiting for the completion of the appeal.

(l) The following factors shall be considered in determining the compensation due the contractor:

1. The benefit actually received by the Government from its use of the technical assistance or patent rights.

2. The private independent research and development expense, and efforts not required by any Government contract, in developing the data or the pertinent item, component, process, or computer software. This includes the expense of unsuccessful research and development, which was reasonably necessary as part of the development program. Reasonableness of expenses will be determined on the basis of knowledge available at the time of the expenditure.

3. The incentive needed to induce others to invest equivalent private expense and effort in independent research and development.

4. Any detriment to a competitive advantage (in terms of potential for future business, whether commercial or Government) suffered by the contractor as a result of acquisition of the technical assistance by the Government.

5. The extent to which the competitive advantage in (4) above was enhanced by virtue of the contract work.

6. The extent to which the field of technology to which the technical assistance pertains was developed by Government funds.

7. Any obligations of the contractor to pay others for the use of the assistance.

8. The terms of any previous sales or offers of sale of the assistance or products to which the assistance pertains.

10. The extent to which the contractor's competence in the field was brought about by prior Government contracts.

11. The degree of originality represented by the assistance (routine engineering versus high creativity).

12. The coverage of the pertinent item, component, process, or computer software by valid patents, patentable claims of pending patent applications, or copyrights.

(m) Subcontract provisions:

1. This clause, in its entirety, shall be included in all subcontracts of any tier unless the subcontracted item is a standard commercial item which is manufactured and sold by two or more competing suppliers.

2. The word "contractor" appearing in this clause includes "subcontractors" unless otherwise indicated.

3. If a subcontractor is required to furnish technical assistance directly to the Government as a result of the exercise of provisions contained herein, the contractor shall not burden this contract with indirect charges or fees for any price paid to the subcontractor for the technical assistance.

4. The Government may negotiate any request for greater rights directly with a subcontractor. The prime contractor consents to the processing of an appeal by any subcontractor of any tier in the name of the prime contractor under the Disputes clause from any decision of the contracting officer concerning rights in technical data or computer software under the clause.

5. The contractor shall have the sole responsibility to negotiate the provisions of this clause into subcontracts and will resolve any and all problems relating to identification, pricing, and submission of reprocurement data. The contractor will ensure that this responsibility is carried out in a manner that prevents problems from being passed on to the Government for resolution.

(n) The contractor agrees that in any follow-on contract for this system:

1. To accept technical data and computer software provisions that grant the Government the same rights in technical data and computer software and options as are granted in this contract.

2. Not to assert any right adverse to the Government that would not have been asserted under this contract.

(o) Definitions:

1. Technical Assistance means such technical and other data; know-how, including technical analysis, advice, and training; computer software; special tooling; and any other assistance necessary for the licensee to understand and use any data or computer software required to be delivered under this contract; or to manufacture, maintain, operate, or modify any item or component produced or any process or software used under this contract. Manufacturing data may be excluded for any component that can be fully identified and can be obtained from two or more competitive sources.

2. Manufacturing data means data needed only for manufacturing purposes. It does not include form, fit, and function data or data needed for operation, maintenance, or modification purposes.

3. Form fit, and function data means data necessary to integrate a process with a larger process or acquire items, components, and computer software and fit it within the system or sybsystem with which it will be used. This includes sources, configuration, mating and attachment characteristics, functional characteristics, performance requirements, information necessary to modify a standard item for the particular purpose, and any additional information necessary to assure the requisite safe,dependable, and effective use of the item, component, process, or computer software.

4. Licensees include both Government and non-Government persons and organizations.

5. Developed, as used in the phrase "developed at private expense", means actually reduced to practice. To be considered developed, an item or component must have been constructed, a process practiced, and computer software used, and in each case must have been tested to the extent necessary to determine that it is capable of accomplishing the practical purpose for which it was developed. When an item, component, process or software does not meet these criteria, separable portions thereof that do neet these criteria will be considered to have been developed.

6. At private expense, as used in the phrase "developed at private expense", means that completed development (100%) accomplished without Government funds and at a time when no Government contract required the performance of the development effort. Independent research and development funds compensated by the Government under IR&D agreements will be considered as private funds.

(p) Warranty of Data

1. The contractor warrants that the data provided under this contract will be complete, accurate, and adequate as of the time of delivery for

the purpose for which it was procured, and that he will promptly correct or furnish, as applicable, any data required hereunder which the contracting officer determines is incomplete, inadequate or deficient for those purposes, provided that the contracting officer notifies the contractor of the contracting officer's determination within three (3) years afer the last data has been delivered under this contract or subsequent follow-on contracts. This will be done at no increase in contract price.

2. Further, the contractor agrees, that if the Government uses any of the data supplied under this contract for competitive reprocurement purposes and such data turns out not to be suitable for that purpose, to reimburse the Government any additional costs incurred as a result of using said defective data, including costs incurred in getting it corrected by another contractor. Any data not complete, accurate and adequate as of the time of delivery for the purpose for which it was procured shall be subject to the Technical Data - Withholding of Payment Clause set forth in Section I.

(q) Acquisition Data Packages

Notwithstanding any provisions to the contrary set forth in any of the acquisition method coding or acquisition data documents set forth in this contract, the contractor agrees to supply data to the Government required by the acquisition method code assigned by the Government, even though the contractor does not agree to assignment of this code. The acquisition of unlimited rights in technical data and/or technical assistance associated with such a data package is set forth above.

(r) Review of Proprietary Data

The contractor hereby grants its permission to disclose and release any data submitted hereunder marked with a Limited Rights Legend to a contractor retained by the Government to review the propriety of such a marking; provided that such contractor shall be prohibited from further releasing, disclosing or otherwise using such data. The contractor shall include this clause in all subcontracts hereunder calling for data.

(s) Budgetary & Planning Cost Estimates for Second Sourcing

1. The contractor hereby agrees to pursue a valid and objective second source plan for the items designated in appendix B of Section V of the instructions to offerors and to assist the Government to the maximum extent to achieve the optimum second source plan.

2. In pursuit of the Government's objective to maximize Government competitive procurement of follow-on replenishment spare parts the contractor is also required under RFP_____(see Appendix _ of Section __ of the instructions to offerors) to submit budgetary and planning cost estimates for second sources for the thirty (30) highest procurement value replenishment spare parts items. The Government may elect ot pursue a second source for any or all of the said items immediately or sometime in the future prior to the completion of deliveries under the contract. The budgetary and cost estimates submitted by the contractor shall serve as a baseline to determine the fairness and

reasonableness of the firm fixed price to be paid by the Government in the event the Government elects to have a second source designated for any or all of the thirty (30) highest cost replenishment spare parts items.

AF DAR SUPPLEMENT DAR 7-104.9 (a), TIME LIMITS FOR LIMITED AND RESTRICTED RIGHTS

Notwithstanding any other provision of this contract, it is the intent of both the Government and the Contract that ___*___ months after the first delivery of production items under this contract, the Government shall have unlimited rights, as defined in subsection (a)(7) of this clause, in all technical data and computer software used by the Contractor, including subcontractors and suppliers at any tier, in all phases of the development and manufacture of production items including, but not limited to, all components, modules, assemblies or parts thereof. For purposes of this subsection (h), the Government shall have the right at any time following the ___*___ after the delivery of the first production item(s) and within two (2) years after either acceptance of all items (other than data or computer software) to be delivered under this contract or termination of this contract, whichever is later, to direct the Contractor to deliver all technical data and computer software, in a format prescribed by the Contracting Officer, necessary to reprocure from another contractor(s) either an entire production item in the production configuration then-current or any component, module, assembly or part thereof. When the Contracting Officer directs delivery of technical data and computer software under this subsection (h), to the extent not otherwise previously compensated for delivery of such technical data or computer software, the Contractor shall be compensated for converting the data or computer software into the prescribed form, for reproduction and delivery.

* Insert a period which shall not exceed 60 months.

AF DAR SUPPLEMENT 7-104.9(l), IDENTIFICATION OF TECHNICAL DATA AND QUALIFIED SOURCES AND/OR ACTUAL MANUFACTURERS

Technical data (as defined in the "Rights in Technical Data and Computer Software" clause of this contract) delivered under this contract shall be marked with the number of this contract, name of Contractor, name of any subcontractor who generated the data, and names of qualified sources and/or actual manufacturers of the item or component described in the data.

AF DAR Sup 9-202, ACQUISITION OF RIGHTS IN TECHNICAL DATA

9-202.1 Background

The Air Force is required to competitively acquire, operate and maintain each product produced under its research and development contracts. Contractors and their subcontractors prepare technical data including engineering data as an integral part of their design, development and production effort. The Air Force relies on this technical data throughout the life cycle of the documented hardware to perform management, engineering, maintenance, modification, competitive reacquisition of spares, test, and other logistics functions. Therefore, procuring contract officers must plan from the outset of the acquisition process to guide contractors and subcontractors to make sure that accurate and acceptable technical data with appropriate data rights are delivered when needed at the minimum life cycle cost. Data requirements and tasks, including rights in data, will be tailored to each acquisition or modification program through a Statement Of Work (SOW). A contractor's priced proposal should include the cost of technical data including appropriate rights and should be submitted while competition exists in order to keep the total purchase price to a minimum. The evaluation of proposals for purposes of award will include and take into account the total price of an option to acquire rights in technical data and computer software and the availability of technical assistance to meet life cycle needs for operation, maintenance, and competitive acquisition of the entire system.

The PCO should include the "Breakout and Competitive Acquisition" clause (AF DAR Supplement 1-313) and "Predetermination of Rights in Technical Data and Computer Software" clause (AF DAR Supplement 7-2003.61), in solicitations. The "Notices of Certain Limited Rights" clause (DAR 7-140.9(b)) should be used in solicitations and contracts. These clauses require the contractor to notify the PCO when the contractor or any subcontractor, vendor, or supplier to the contractor intends to use any item having data subject to limited rights. Limited data rights claims should be challenged and resolved as soon as practicable. As a minimum, the PCO should require the contractor to furnish clear and convincing evidence to substantiate limited rights claims during the negotiations and no later than the last phase of a program where competition exists.

Notice of Certain Limited Rights

Offerors and contractors shall be required to identify any items, components, and processes for which technical data would be delivered with limited rights and any software which would be subject to restricted rights. The following information should be submitted for each claim of limited rights:

1. Part number (if available)

2. Application or next higher assembly identification.

3. Description of item, process, material or feature that causes the item to be proprietary, e.g. source of project or accounting codes, and adequate verification that the embodiment meets the contract specifications without additional Government direct funded development.

4. For commercial items only, a record of sales to other customers (including dates of sales and customer name).

5. For noncommercial items, a copy of basic (first issue) drawing showing date of preparation.

The notice of limited rights requirement applies to all items, components and processes forming part of the system, whether manufactured in house, by the offeror, or obtained from subcontractors or vendors. The notice does not apply to any items or components which are readily available in the commercial open market from two or more competitive sources, e.g., electronic components such as resistors, capacitors, transistors, transformers and the like. Only specification control type data, (DOD-STD-100) with unlimited rights will be used for such commercially available items.

9-505 Data Requirements

Data requirements and tasks will be tailored to each acquisition or modification program through a Statement of Work (SOW). There are at least five distinct techniques for obtaining competition currently in use in weapons systems acquisition. The "standard" method of competitively acquiring spare parts described in DAR 1-313 comprises furnishing an Acquisition Data Package (ADP). The DAR describes a "part" as any part, subassembly or component for military equipment, to be used for replenishing of stock, repair, or replacement which must be procured so as to assure the requisite safe, dependable, and effective operation of the equipment. Items procured as spare parts are governed by DAR Supplement 6, DOD Replenishment Parts Breakout Program.

The other four methods of obtaining competition are: (a) Form-Fit-Function, (b) Directed Licensing, (c) Leader-Follower, (d) Contractor Teams. General guidance on the policies to be followed in this area is found in DAR 1-304. Acquisition procedures in order of preference may be found in DAR 1-304.2(b) as follows:

1. Obtain competition by use of form, fit or function specifications "brand name or equal" purchase descriptions, performance specifications or other techniques for obtaining nonidentical items;

2. Use sole source procurement from the existing manufacturer if the price is fair and reasonable;

3. Obtaining competition by other techniques such as licensing, specific acquisition of unlimited rights in data or leader-follower procurement.

4. Obtain competition by developing a design specification through reverse engineering.

The "Breakout and Competitive Acquisition" clause, AF DAR Sup 1-313, is specifically designed to acquire an option to purchase an Acquisition Data Package (ADP) for acquisition of spare parts. Use of the Breakout clause in conjunction with the "Predetermination of Rights in Technical Data and Computer Software" clause, AF DAR Sup 7-2003.61, will provide an option to acquire sufficient data including preparation and reproduction costs with a prepriced option to acquire appropriate rights in data for each of the acquisition procedures outlined in DAR 1-304.2(b). If the contract provides for pricing and delivery of a complete Level 3 engineering data package, the costs for the data included in the

ADP will be limited to reproduction and administrative costs. The Breakout and Predetermination options must be acquired while competition still exists among alternative contractors.

The rights in Technical Data and Computer Software clause set forth in DAR 7-104.9(a), is required to be inserted in all contracts calling for the delivery of technical data except for contracts for special works such as books and movies, contracts for the specific acquisition of unlimited rights in data and contracts to be performed outside of the United States (DAR 9-203(a)). The Basic Data Clause is applicable to both research and development contracts and manufacturing contracts. The policy of requiring the listing of all data requirements either on the Contract Data Requirements List (CDRL), DD Form 1423 or the Statement of Work (SOW), is enforced by the inclusion of a mandatory Data Requirements Clause in most domestic contracts precluding any legal obligation on the part of the contractor to deliver any such non-listed data. This data requirements clause is set forth in DAR 7-104.9(n).

The PCO should ensure that the contract provides for the Deferred Ordering, DAR 7-104.9(m) and Deferred Delivery, DAR 7-104.9(d), (and for the use of options to acquire data, technical assistance and rights in technical data); when these procedures will reduce dollar investment, will restrict the purchases to more valid requirements, or will ensure that the data being delivered incorporates the latest revisions.

Predetermination of Rights in Technical Data

The Predetermination procedure will be initiated by the EDMO and the PCO by including the Predetermination of Rights in Technical Data and Computer Software clause, AF DAR Sup. 7-2003.61(a) and (b) in solicitations. Note that this procedure is directed toward a limited rights predetermination. It is most appropriate for use in a development contract where the Government desires an unlimited rights data package for reprocurement purposes and is concerned that the contractor may incorporate so many proprietary items, components and processes in the design that this purpose will be frustrated. In such cases, notice of such action gives the Air Force the opportunity to challenge the propriety of claims, purchase the rights, or order the contractor to design around the proprietary item. The PCO shall consult his counsel as fully as possible in connection with the various steps of the procedure.

The predetermination (option) includes the right to acquire technical data and any technical assistance necessary to produce the desired item, or practice the process, etc. The options must be specially drafted, with substantial input from the project engineer, to be sure that they will meet the future needs for the particular program. The options are particularly useful when the Air Force is uncertain whether it will ever have to turn to any other manufacturer for future production, operation, or maintenance, or to integrate the item being developed into larger systems. When an option committing a contractor to enter a license is included in a U.S. Government contract, the Government can assure the availability of the technical data for NATO cooperative programs. Implementation takes the form of a contract option which can be exercised by the Government. When the option is exercised, the contractor enters into negotiation for a license with the licensee for all or part of a system or item.

The options are also useful when the Government lacks the resources to investigate and challenge the contractors r. or when it is uncertain whether it will use any, some, or all of the components for spare parts breakout or replenishment. The option contained in AF DAR Sup 7-2003.61(b) is designed for such a complex situation and contains many different sections which can be used separately in less complex situations. In any predetermination agreement, or option, the items, components, processes or software should be identified in sufficient detail so that it is absolutely clear as to what is covered by the agreement. For example, this could be done by reference to identified drawings. Contractors have often maintained that they are entitled to limited rights because the data was developed at private expense. They then submit proof that design work was done, drawings were prepared, or patent applications were filed before contract was awarded. This proof is not adequate to qualify for limited rights.

Limited Rights Markings

The DAR 7-104.9(a) Basic Data Clause limits contractors rights to "technical data pertaining to items, components, processes, or computer software developed at private expense". The clause also contains categories of technical information which are not subject to the protection afforded by the clause. With one exception, these categories preempt the private expense test. If data falls within on of these categories, the Government will receive unlimited rights even if the data pertains to an item, component or process developed at private expense. Paragraph (b)(1)(i) of the clause gives the Government unlimited rights in: "(i) Technical data and computer software resulting directly from performances of experimental, developmental or research work which was specified as an element of performance in this or any other Goverment contract or subcontract". The basic purpose of this provision is to assure the Government that it obtains full rights to use and disclose all data which flows directly from the research and development work paid for by the Government under the contract.

The contractor is protected from giving up proprietary rights to data pertaining to items, components or processes developed at private expense by the requirement in this clause that the "data" must "result directly" from the performance of research or development work. If the contractor incorporates private expense data into data which meets this test, the clause precludes placing a limited rights legend on such data with the result that the contractor will have given up the proprietary rights. The application of this paragraph is also limited to situations where "experimental, developmental, or research work was specified as an element of performance" in a contract. In most research and development contracts this occurs as a matter of work of this nature. In other types of contracts it might be less clear that such work was being called for. DAR 7-104.9(j) provides an optional clause that can be used to clarify this matter when necessary.

Paragraph (b)(1)(iv) of the DAR Data Rights Clause gives the Government unlimited rights in: "technical data necessary to enable manufacture of end-items, components and modifications, or to enable the performance of processes, when the end-items, components, modifications or processes have been, or are being, developed under this or any other Government contract or subcontract in which experimental, developmental or research work is, or was specified as an element of contract performance, except technical data pertaining to items, components, or computer software developed at private expense (but see (2)(ii) below)". This is the only category of unlimited rights in technical data that is

subject to the limited rights exception. This category sweeps in data from any other contract in the same manner as (b)(1)(i). It also parallels the first category in that it applies only if the end-items, components, modifications or processes were developed under a contract specifying experimental, developmental or research work.

The purpose of Paragraph (b)(1)(iv) is to give the Government rights to data packages which will permit other companies to manufacture the equipment developed with Government funds. Since this category does not give unlimited rights to private expense data, it will not fully accomplish this purpose if such data is ordered by the Government. Thus, if the data requirement calls for a package containing complete manufacturing drawings for a product developed under a contract, drawings for all products which do not meet the private expense test will have to be delivered by the contractor with unlimited rights but any drawings describing items, components or processes developed at private expense will be delivered with proprietary legends. To prevent this, the Government must either have the contractual right to specifically acquire unlimited rights or the Government must specify that an alternate type of data such as form, fit or function data will be delivered in addition to private expense data. The Government also obtains unlimited rights to:

(ii) computer software originated or developed under the contract.

(iii) computer data bases prepared under a Government contract.

(v) corrections or changes to technical data or computer software.

(vi) form, fit or function data.

(vii) manuals or instructional materials.

(viii) public domain.

(ix) technical data described in a predetermination agreement.

One of the unique procedures permitted by the Data Rights Clause is the predetermination of rights before contracting. This procedure is implemented by paragraphs (b)(1)(ix) and (b)(2)(i) which permit predetermination of both limited and unlimited rights. DAR 9-202.2(d)(1)(b) addresses the procedures and conditions for predetermination. Air Force DAR Sup 7-2003.61 should be used as a model for all predeterminations.

Removal of Unauthorized Markings

Paragraph (d) of the DAR 7-104.9(a) clause gives the Government the right to remove any unauthorized marking on technical data delivered under a contract containing that clause, if:

"(i) The contractor fails to respond within sixty (60) days to a written inquiry by the Government concerning the propriety of the markings or, (ii) the contractor's response fails to substantiate, within sixty (60) days after written notice, the propriety of limited rights markings by clear and convincing evidence". This challenge procedure can also be used for restrictive rights claims

on computer software delivered under the contract. After the Government sends the contractor the notice of challenge, the burden of proof lies upon the contractor to justify the limited rights markings.

It is the policy of the Air Force to issue the sixty day challenge letter for each item of technical data which is determined to fall within the unlimited rights categories covered by Paragraph (b)(1)(i), (ii), (iii), (v), (vi), (vii), (viii). Contractors should be required to submit the same type of information previously discussed in the Notice of Limited Rights requirements for justification. If "technical data necessary to enable manufacture of end-items, components, modifications, or to enable the performance of processes" (paragraph (iv)) is delivered with limited rights, the Government agent reviewing the technical data should first check to see if the data is listed in a predetermination agreement (AF DAR Sup 7-2003.61). The contract files should also be checked for the proper Notice of Limited Rights required by DAR 7-104.9(h). If the item, component or process is not listed in either of the above, the cognizant Government agent should issue the sixty day challenge letter. For each claim of limited rights, the contractor should be required to submit the same type of information discussed above. In reviewing the contractors evidence, the following criteria should be used.

For purposes of defining "developed" as used in the phrase "developed at private expense" in DAR 7-104.a(a), an item, or component must have been constructed; a process practiced and computer software used, and in each case must have been tested to the extent necessary that it is capable of accomplishing the practical purpose for which it was developed. The key words in the clause are that the Government is entitled to unlimited rights, "unless" the technical data "pertains to an item, component, or process developed at private expense". Contractors frequently maintain that limited rights apply if the "data" was developed at private expense and that it is not necessary to have actually built the hardware. A guidance film script explaining the "developed at private expense" policy issued in 1964 advised private developer who had an item 90% completed at private expense, and who were contemplating taking a Government contract to complete the development, to finish the development at private expense in order to avoid losing its rights.

"At private expense" means that completed development was accomplished without Government funds (except IR&D) and at a time when no Government contract required the performance of the development effort. If the development work is completed with a mixture of Government and private funds, the Government is entitled to unlimited rights in all data pertaining to that item.

In addition, DAR 9-202.3(c)(2) requires DAR 7-104.9(P), Restrictive Markings on Technical Data Clause to be used in all contracts requiring technical data. The clause requires the contractor to establish procedures for reviewing technical data markings and to maintain records to show how the procedures wer applied in determining that the markings are authorized. It also requires a quality assurance system in this area and the appointment of a specific individual responsible for meeting these contract requirements. Thus, this clause provides the contractual underpinnings for the Air Force to enforce the DOD data rights policy. If the contractor fails to make a good faith effort to institute the procedures required by the clause, any limited rights markings on technical data delivered under the contract may be cancelled or ignored by the Contracting Officer.

Warranty of Technical Data

The Department of Defense has promulgated optional warranty clauses to be used in the acquisition of technical data (DAR 7-104.9(o)(1). When AF DAR Sup 7-2003.61 clause is used, paragraph (m), Warranty of Data, provides adequate protection for the Air Force. This provision provides for greater penalties if the data is not adequate for competitive acquisition. In addition to being subject to withholding under the Withholding of Payment Clause, the contractor is required to reimburse the Government any additional costs incurred as a result of using said defective data. The contractor is also required to promptly correct or furnish any additional data at no increase in contract price.

Time Limits for Limited and Restrictive Rights

Air Force DAR Sup 7-104.9(a) provides for a maximum life of five years Limited Rights and Restrictive Rights markings. For a period not to exceed 60 months after the first delivery of production items, the marked data will not be disclosed outside the Government except for the purposes set forth in the Basic Data Clause or the Data Rights option clause in this supplement

Engineering Data Acquisition

The Procuring Contracting Officer (PCO) must include the following Defense Acquisition Regulation (DAR) clauses in both the solicitation and the contract:

7-104.9(a) Basic Data Clause - Rights in Technical Data and Computer Software.

7-104.9(b) Notice of Certain Limited Rights.

7-104.9(c) Technical Data Clause - Specific Acquisition.

7-104.9(d) Deferred Delivery of Technical Data or Computer Software.

7-104.9(h) Technical Data - Withholding of Payment.

7-104.9(j) Identification of Experimental, Developmental, or Research Work.

7-104.9(k) Rights in Technical Data - Major Systems and Subsystems Contracts.

AF DAR Sup 7-104.9 (1) Identification of Technical Data and Qualified Sources.

7-104.9(m) Requirements for Data/Technical Data Warranty AF DAR Sup 7-104.9(o).

7-104.9(p) Restrictive Markings on Technical Data.

AF DAR Sup 1-113 Breakout and Competitive Acquisition.

AF DAR Sup 7-2003.61 (a), Predetermination of Rights in Technical Data and Computer Software.

AF DAR Sup 7-2003.61 (b), Predetermination , and Option to Acquire Technical Data, Computer Software, Technical Assistance and Rights.

AF DAR Sup 7-104.9(a)(8) Time Limits for Limited and Restricted Rights.

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