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AIR COMMAND AND STAFF COLLEGE

STUDENT REPORT

EVALUATION OF THE 1984 CHANGES
TO THE SPARE PARTS STOCKAGE POLICY

Major Ronald L. Forest 86-0880

"insights into tomorrow"

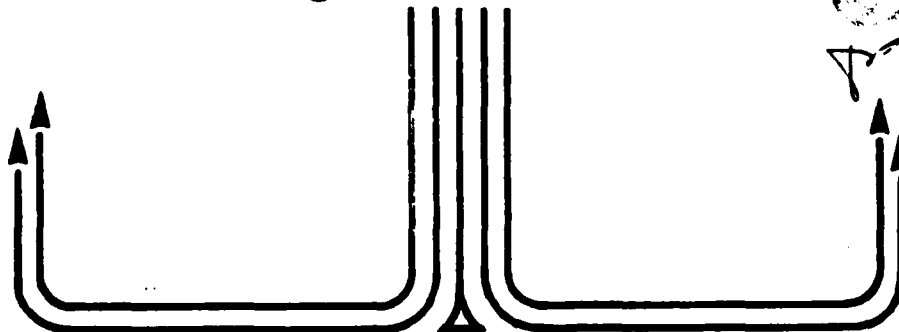
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<p>The Air Force made four changes to the spare parts stockage policy in 1984 that were recommended by the Air Force Logistics Management Center. The author evaluated the four changes and found that they are beneficial to the Air Force and should be retained. A secondary finding is the need for the Air Force to better control future major supply policy changes. Possible program control, clear instructions to the field, and better information flow would enhance future supply policy changes. The author used AFLMC reports to identify the policy changes and monthly supply data from the field (M20 and M30) to compare supply performance before and after the changes.</p>			
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Submitted to the faculty in partial fulfillment of
requirements for graduation.

**AIR COMMAND AND STAFF COLLEGE
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PREFACE

This study will be published as an Air Force Logistics Management Center (AFLMC) report.

The purpose of this study is to document the results of FY84 supply stockage policy changes and to analyze the Air Force's ability to manage stockage policy changes. The Air Force Logistics Management Center recommended the four changes considered in this study and projected resulting cost and benefits. This study will identify the policies and compare projections with actual cost and benefits. The changes are significantly improving supply support and the results were accurately predicted by the Air Force Logistics Management Center. Therefore, future Air Force Logistics Management Center supply recommendations should be favorably considered. The author did find a need to improve the policy change procedure and made specific recommendations in Chapter Three.

The author would like to recognize the assistance of two individuals without whom this project would have been impossible. First, I would like to thank the project sponsor, Lieutenant Colonel Doug Blazer, Chief, Stockage Policy and Analysis Division, Air Force Logistics Management Center. Also the guidance and suggestions of Captain Martha Ham were critical to this project.



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ABOUT THE AUTHOR

Major Forest was commissioned through ROTC in 1972, after which he was assigned to Undergraduate Pilot Training. Upon completion, he attended Combat Crew Training as a KC-135 copilot at Castle AFB, California. His first operational assignment began in 1973 at Grissom AFB, Indiana as a copilot. He upgraded to aircraft commander in the KC-135 in 1975 and left the Air Force in 1977. In 1979, Major Forest returned to the Air Force as a KC-135 aircraft commander at Blytheville AFB, Arkansas. He soon upgraded to instructor pilot and became the executive officer for the 97th Bombardment Wing. In 1982 he was reassigned to NATO Air Base Geilenkirchen, West Germany where he worked in current operations, the command post, and became Chief of Aircrew Support. He assumed his present status as an ACSC student in August, 1985.

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EXECUTIVE SUMMARY

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AUTHOR(S) MAJOR RONALD L. FOREST, USAF

TITLE EVALUATION OF THE 1984 CHANGES TO THE SPARE PARTS STOCKAGE POLICY

I. **Purpose:** To determine if the stockage policy changes made in 1984 are performing as predicted.

II. **Problem:** The Air Force Logistics Management Center was tasked to make recommendations to the Air Staff to improve overall supply performance. The Air Staff implemented four of the recommendations based on projected cost estimates and benefits. Now that the changes have been in effect for about a year and a half, the Air Staff wants a report on the progress.

III. **Data:** The author secured the Air Force Logistics Management Center reports on each of the four recommended stockage policy changes. This report provides clear statements of the old policy, new policy, background information, cost estimates, and projected benefits to be used as bench marks. All projections were combined in one list to get comprehensive numbers to compare with actual cost and benefit numbers. The author then secured actual data from monthly Worldwide Supply Performance Reports and Consolidated Stock Fund Data Reports. Data from fiscal year 1984 is compared with fiscal year 1985 and the first six months of fiscal year 1986.

CONTINUED

IV. Conclusions: Comparison of the actual data and the projected data indicates that the changes recommended by the Air Force Logistics Management Center have produced the desired and projected results. The author did find that stockage policy changes were ineffectively controlled and a need exists for a coordinated implementation plan for future major changes to Air Force stockage policy.

V. Recommendations: Changes made to the stockage policy are working and should be retained. Future changes should be carefully planned and controlled.

CHAPTER ONE

INTRODUCTION

The Air Force for 10 years has been scrapping millions of dollars of needed spare parts and then, in many cases, repurchasing them at higher prices from junk and salvage dealers... Since 1974, Air Force procedures have called for automatic disposal of many spare parts, ranging from screws and nuts to airplane doors, if none had been requested within the past 12 months... Time and time again, we came across instances that on maybe the 13th month, a requirement for that item came up, and we would go and the shelf was empty, and we would have to reprocur it.

Washington Post, 7 July 1984

The above excerpts highlight the problem with the past Air Force spare parts retention policy. Lieutenant General Leo Marquez, Deputy Chief of Staff for Logistics and Engineering, HQ USAF, explains, assets. . . "that we acquired very efficiently at the front end could go out the back door in accordance with established retention policy." (1:18) General Marquez emphasized the importance of stockage policy to efficiently and effectively support the Air Force mission.

To emphasize the importance of supply and stockage policy, he declared fiscal year 1985 as the Year of Supply. The Air Force Logistics Management Center (AFLMC) was tasked to spearhead efforts to improve the supply system. After careful analysis, AFLMC made several recommendations to the Air Staff which the Air Force implemented in the beginning of FY85. (9)

This report explains four of the AFLMC recommended changes to the supply system and compares actual with forecasted results. The old and the new supply stockage policies will be explained as well as the method of measuring improvements in the Air Force supply system. Conditions and problems that influenced the 1984 changes or their evaluation will be explained. Finally, recommendations will be made to improve implementing future changes to the supply system.

PROBLEM STATEMENT

Are the 1984 changes to the Air Force spare parts stockage

policy producing the desired results and is the Air Force accurately tracking and controlling changes in supply performance?

The four stockage policy changes involve these areas:

- (1) Cost variables which are used to compute the order quantity for consumable or economic order quantity (EOQ) items.
- (2) Safety levels for EOQ items.
- (3) Retention of EOQ items.
- (4) Demand leveling for selected field-level repairable items.

BACKGROUND

The Air Force Logistics Management Center received the following taskings:

(1) Cost Variables for EOQ Items. Cost variables, such as cost to place an order and holding cost, are used to compute order quantities, or how much to order, for EOQ items. In May 1978, the United States Air Force Director of Maintenance and Supply (USAF/LEY) tasked AFLMC to update these factors periodically so Air Force bases would order the most economical quantity for EOQ items based on the appropriate variable costs. The AFLMC recommended changes to the cost variables that would result in an increased order quantity, i.e., bases will order more items every time they place an order. (3:1-3)

(2) Safety Levels for EOQ Items. AFLMC initiated a study to analyze and develop alternative forecasting techniques for both demand averages and demand variation for EOQ items. The forecast for demand averages and variances is the biggest factor in determining the depth or how much to stock. AFLMC recommended changes to the way the Air Force forecast the variance of demand. The forecast of the variance of demand is used in determining the safety level. (4:1-2)

(3) Retention of EOQ Items. In 1984 the Air Force Stockage Advisory Board tasked the AFLMC to evaluate the Air Force base level retention policy. Bases were disposing of items that would be needed later at the same base. United States Air Force Deputy Chief of Staff for Logistics and Engineering (USAF/LE) approved AFLMC recommendations to increase the retention period for consumable items. (5:1)

(4) Demand Leveling for Field-level Reparable Items. In November 1983, the Wholesale-Retail Panel of the Standard Base Supply System MAJCOM Advisory Group requested that AFLMC conduct an analysis on stockage policy for field-level reparable assets. The Air Force was not repairing many field level reparable units, and the AFLMC found it was appropriate to use reparable item demand levels for items that were not being repaired. Their recommendation was to add an EOO to the existing demand level for field-level reparable items that display characteristics of EOO items. (6:1-3)

PREVIOUS STUDIES

The Air Force Logistics Management Center has published individual studies on each of the four supply system changes covered in this report. The studies were the basis for changing supply policy. This report uses information from the four separate AFLMC studies to identify the policy changes and forecasted results.

OBJECTIVES

The objectives of this study are to:

- (1) Compare actual implementation costs and benefits of the policy changes with forecasted costs and benefits.
- (2) Investigate the Air Force's ability to track the performance of supply system changes.
- (3) Recommend improvements to the supply system stockage policy change process.

CHAPTER TWO

ANALYSIS

OVERVIEW

This chapter documents the analysis of the 1984 stockage policy changes. The Air Force changed four areas of the spare parts stockage policy based on recommendations from the Air Force Logistics Management Center. This chapter will identify the four supply policy areas, including the background, old policy, new policy, projected costs, and projected benefits for each area. The next section describes the analysis methodology and the third section documents the actual performance resulting from the changes. The final section identifies several issues with the management and control of the change process.

SUPPLY POLICY

Economic Order Quantity Cost Variables

Background. An Economic Order Quantity (EOQ) item is a consumable item which usually cannot be economically repaired. This term includes all types of consumable items, such as minor parts, components, tools, administrative supplies, and hardware. For EOQ items, accountability is terminated upon issue. Demand levels for EOQ items are based on total variable inventory cost, which includes the cost of the item, the cost to order, and the cost to hold the item. The quantity to order that minimizes total variable cost is called the Economic Order Quantity. The cost to hold an item is expressed as a percentage of the item cost, while the cost to order an item is expressed as a flat cost per each order. (2:11-3)

Old Policy. The old policy used average values for cost to order and cost to hold based on 1980 measurements. (2:11:4)

New Policy. Using 1983 data the AFLMC recalculated the values to order and hold an item and found the previous costs had changed. The cost to place an order had increased from \$4.54 to \$5.20 and the cost to hold an item had decreased from 26% to 15% of the cost of the item. The cost to order local purchase items also increased from \$15.84 to \$19.94. AFLMC recommended that the new values be used. (3:25)

Projected Costs and Benefits. By using the new values to find the EOQ, stock levels would increase, resulting in a projected 1% increase in stockage effectiveness. Stockage effectiveness measures the line item fill rate for stocked (demand leveled) items. The projected cost was \$31 million for General Support Division (GSD) and \$11 million for System Support Division (SSD). The AFLMC projected a 3% decrease in the number of incidents resulting in the grounding of major end items such as aircraft, engines, vehicles, etc. (10)

Economic Order Quantity Safety Levels

Background. The Safety Level Quantity is the number of assets required to be on hand to permit continuous operation in the event of uncertain demand or lead times. The Order and Ship Time Quantity is the quantity required to be on hand to meet demands during the period it takes to place an order and have it transported. These quantities are summed to determine the reorder point or when to reorder. (2:11-4)

Old Policy. The old policy underestimated the uncertainty or variance of demand 40% of the time and did not consider variations in order and ship time at all. Demand for many items is more variable than was estimated with the previous policy. Variations in order and ship time were not considered, but certainly could impact supply support. Manufacturing time or shipping time are susceptible to labor strikes, bad weather conditions, etc. (4:15) More inventory is needed as a buffer to ensure uninterrupted mission performance.

New Policy. The AFLMC recommendation was to change the safety level formula to accurately measure the variance of demand and to consider the variance in order and ship time. (4:15-16)

Projected Costs and Benefits. By using the new formula, stockage effectiveness was projected to increase 4.7% at a cost of \$76 million for GSD and \$25 million for SSD. (4:15) This represents new requirements and is an increase in inventory. The AFLMC projected a 4% decrease for mission capability (MUCAP) incidents. (4:16)

Economic Order Quantity Retention

Background. Items for which there is no longer any need should be considered excess. When items are declared excess, they are disposed of. If they are declared excess too soon, the Air Force must repurchase the item. If they are held too long, the Air Force incurs needless holding costs. (10)

Old Policy. The Air Force specified 365 days as the retention time for all EOQ items. The AFLMC found that many

items had an average time between demands greater than 365 days and that many items identified as excess were later critically needed for mission support. For these reasons, AFLMC suggested that retention time for all items be increased based on past demand and the Mission Impact Code, a code that identifies the essentiality of the item to Air Force weapon systems. (10)

New Policy. The AFLMC recommended new retention times from 2.5 years for the least urgent items to 3.25 years for items with the highest mission impact code. This new retention period would compensate for infrequent demands for certain items. For example, the item that is requested every 13 months on average would not be declared "excess" after 12 months only to be required the next month. (5:18)

Projected Costs and Benefits. This increase in retention was projected to reduce MICAP incidents by 2% and increase on-hand inventory by \$116 million total for GSD and SSD. The increase in inventory is from retention of existing assets and does not represent additional cost. (5:16)

Adding an EOQ to Selected Field-level Repairable Items

Background. Field-level repairable items are items that are supposed to be fixed at the base level rather than the depot. If the item is found to be beyond economic repair at the base, it is discarded. (6:1)

Old Policy. Field-level repairable items are stocked differently than EOQ items, but many of these items perform similar to EOQ items. The AFLMC found that about 75% of all field-level repairable items cost less than \$750 and better than 60% of the items were being replaced rather than repaired at base level. Repairable item demand levels assume repair at the base. Since many items are not being repaired, demand levels were insufficient to effectively support the mission. (6:2)

New Policy. The AFLMC recommended adding an EOQ to selected field-level repairable items and using the previous demand level as the reorder point. Thus, less expensive items (less than \$750) that were not being repaired are now stocked similar to EOQ items. (6:3)

Projected Costs and Benefits. In light of this change, the AFLMC projected that fill rates for field-level repairable items would increase 14.5% at a cost of \$3 million for General Support Division (GSD) and \$4 million for System Support Division (SSD) items. The AFLMC projected a 6.9% decrease in MICAP incidents caused by field-level repairable assets. (6:2-3)

Summary

The Air Force changed four areas in supply policy based upon the recommendations from the Air Force Logistics Management Center. Figure 2.1 is a combined list of cost and benefit projections from all four stockage policy areas.

	Cost (\$ Millions)		Benefit		MICAP	
	GSD	SSD	Stockage EOQ	Effectiveness Reparable	EOQ	Reparable
EOQ Cost Variables	31	11	1%		3%	
EOQ Safety Level	76	25	4.7%		4%	
EOQ Retention					2%	
Demand Leveling	3	4		14.5%		6.9%

Total	110	40	5.7%	14.5%	9%	6.9%

Figure 2.1 AFLMC Projection Summary

In Figure 2.1, the term "stockage effectiveness" means the fill rate for items that should be on-hand. Later in this report, the projected data will be compared to the actual costs and benefits of the changes made to the stockage policy.

METHOD OF ANALYSIS

To evaluate the actual performance resulting from implementing these stockage policies, information was needed on the actual cost and benefits of the policy changes. Data from the Worldwide Supply Performance Report (M-32) and the Consolidated Stock Fund Data Report (M-20) were tracked on a monthly basis to get the average annual performance.

The M-32 Monthly Base Supply Management Report provides standard management products for Standard Base Supply System (SBSS) managers. It is used to provide data for analysis of SBSS overall operational effectiveness, potential problem area identification, and statistical data in support of system modifications. For this report, the Worldwide Supply Performance

Reports were used to track actual benefits produced by the policy changes. (2:24)

The M-20 Stock Fund Stratification Program provides uniform stratification for both General Support (GSD) and System Support Divisions (SSD) of the Air Force Stock Fund. It identifies assets and provides aggregate measures of a base's logistics requirements by measuring asset availability against known requirements. It provides the capability to report stock fund assets and transactions as a basis to prepare stock fund operating programs. For this report, both the GSD and SSD Consolidated Stock Fund Data Reports are used to track actual costs of the 1984 stockage policy changes. (2:24)

The AFLMC projected the costs and the benefits of the changes as measured by an increase in stockage effectiveness and a decrease in MICAP incidents. The next section examines the actual data collected. Other problems that have a bearing on this problem are also discussed.

ACTUAL PERFORMANCE

Having identified the changes to the supply system along with the projected costs and benefits, actual performance was compared with the projections. Since the four changes were implemented at about the same time, the projected results were combined and discussed in terms of costs, fill rates, and mission capability (MICAP) incidents. As a reminder, a MICAP incident is a request for an item that cannot be filled and results in the grounding of a major end item, such as aircraft, engines, vehicles, etc. A reduction in the number of MICAP incidents is good for the Air Force and a sign of better supply management. (9) Data from fiscal year 1984 were compared with data from FY85 and FY86. The changes were implemented in June 1984 (EOQ Cost Variables) and October through November 1984 (Safety Level, EOQ Excess and Adding an EOQ to Field Repairable Items).

Cost of Policy Changes The combined General Support Division (GSD) cost of all four changes was projected by the Air Force Logistic Management Center to be \$110 million. Data from the monthly GSD Consolidated Stratification and Transaction Report (M-20) were compiled and shown in Figure 2.2. Four categories, operating level, order and ship time, safety level, and repair cycle, comprise the total demand level and were combined to arrive at the total GSD cost. Figure 2.2 shows an increased requirements level of \$134.3 million which is compared to the projected \$110 million. See Appendices A and B for examples of the Consolidated Stratification and Transaction Report.

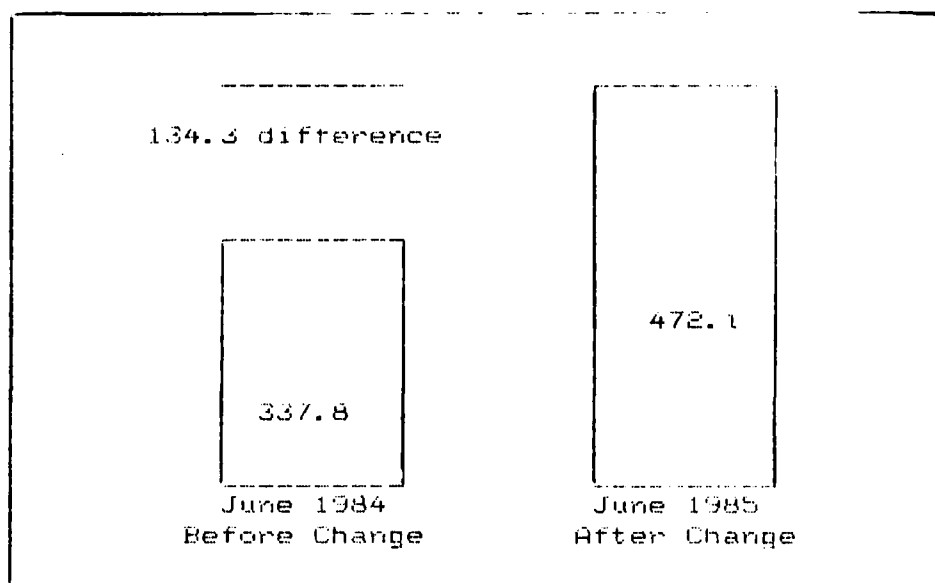


Figure 2.2 Increases in General Support Division Requirements Level

Figure 2.2 shows a \$134.3 million increase in GSD requirements levels as compared to the projected \$110 million. The AFLMC \$110 million projection was for inventory augmentation which is the amount of inventory that has to be procured to satisfy the new level. Although the requirement increased by \$134.3 million, not all of that had to be procured. There was existing inventory to satisfy some of the requirement. When the new stockage policies were implemented, there was no snapshot of the inventory requirements or on hand balances directly after implementation. This was because of programming errors in the M&O. The best estimate of the change was therefore made by comparing June 1985 data with June 1984 data. This does not allow an accurate measure of the inventory augmentation cost. Some of the on-hand inventory would have been applied against the new requirement level and therefore would not have had to be procured. It is safe to say that the GSD cost was less than \$134.3 million.

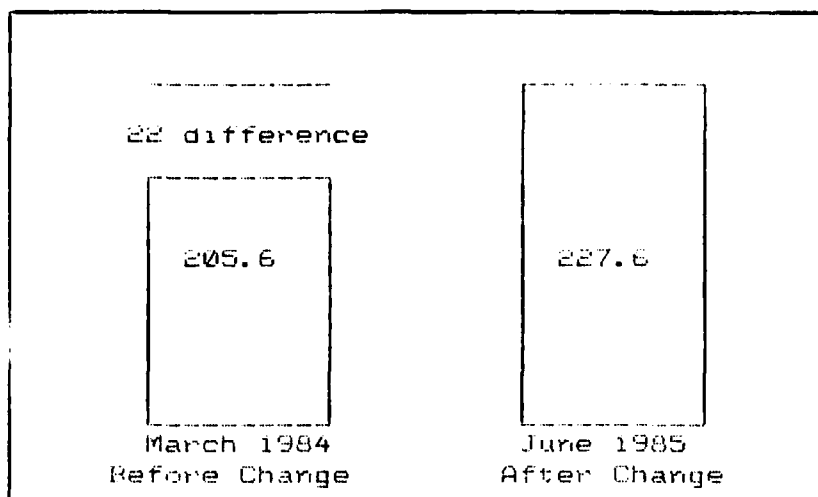


Figure 2.3 Increases in System Support Division

Figure 2.3 shows a \$22.0 million increase in SSD requirements as compared to the projected \$42.4 million due to the 1984 stockage policy changes.

In summary, the AFLMC projected an inventory augmentation requirement of \$150 million (110 + 40). The actual increase in the total requirements level was \$156.3 million (134.3 + 22). The actual inventory augmentation cost cannot be accurately computed, because there was no snapshot immediately after implementation. However, the inventory augmentation cost was less than \$156 million. Regardless, the AFLMC cost projections were remarkably accurate. The actual requirements levels were within 5% of the AFLMC projections.

Stockage Effectiveness The Air Force Logistics Management Center projected stockage effectiveness to increase 4.7% for EOU items and 14.5% for field reparable items as a result of the four supply policy changes. Data on stockage effectiveness was taken from the USAF Supply Management Report (M-SR) each month and combined in Figure 2.4. See Appendices C and D for examples of the USAF Supply Management Report.

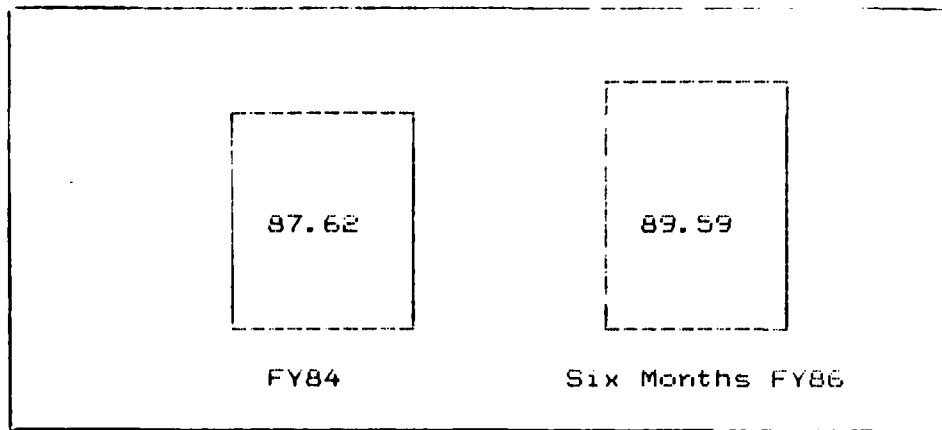


Figure 2.4 EDO Stockage Effectiveness in Percent

Figure 2.4 shows a 2.3% $((89.59 - 87.62) / 87.62)$ increase in average stockage effectiveness compared to the projected 4.7% increase.

The increase in stockage effectiveness for field reparable items could not be measured, because fill rates for field reparable items are not measured separately in the M-32. As shown in Figure 2.4, there has been a significant increase in the EDO stockage effectiveness, but not up to the AFLMC's projection. There are two mitigating factors. First and foremost, the program implementing the new safety level did not work. The AFLMC identified the programming error in August 1985 and it was corrected in late November 1985. The correction should further increase stockage effectiveness. Secondly, stockage effectiveness is not the best way to measure the impact of the stockage policy changes. Net unit fill rate is a better measure, but the M-32 does not accurately measure unit fill rates. Stockage effectiveness is computed for all stocked items by:

$$\frac{\text{Line Items Filled}}{\text{Line Items Filled} + \text{Line Items Back ordered}}$$

An example shows why stockage effectiveness is not the best fill rate performance measure. Assume a customer requests 10 units of an item and only 2 are available. The Air Force stockage effectiveness for this transaction is 50%, two units were issued (one line item filled) and eight units back ordered (one line item back ordered). On the other hand, the unit fill rate for this transaction is 20%. Now assume the new stockage policy increased on-hand stock to eight units. Stockage effectiveness would again be 50%, but unit effectiveness is 80% -- a significant increase. Stockage effectiveness does not accurately measure the increased performance. (10)

MICAP Incidents The Air Force Logistics Management Center projected MICAP incidents to decrease by 9%. Data from the monthly USAF Supply Management Reports were compiled in Figure 2.5 to show Economic Order Quantity (EOQ) MICAP performance. See Appendices E and F for examples of where MICAP data is displayed in the USAF Supply Management Report.

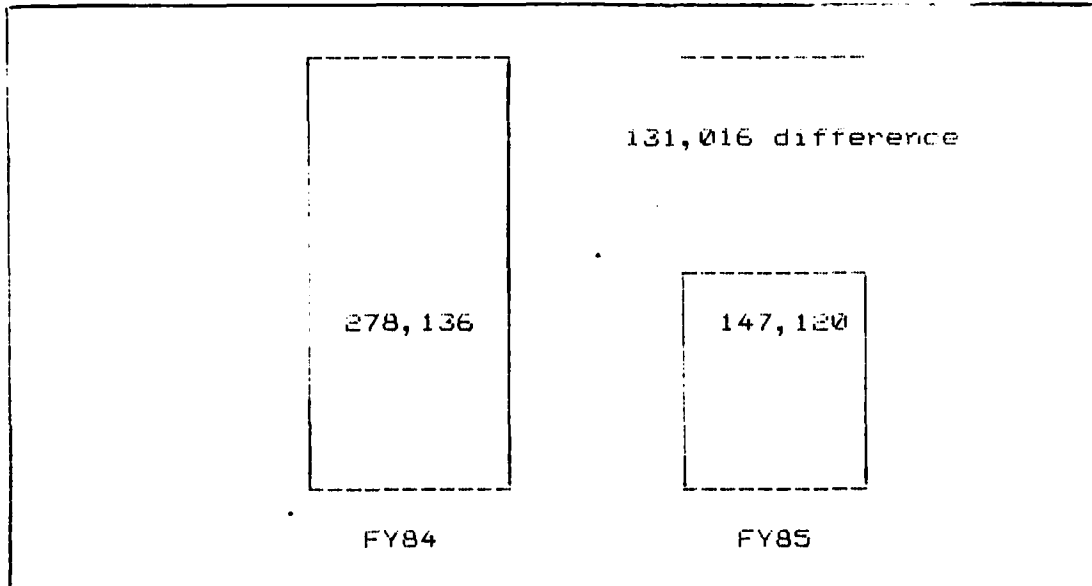


Figure 2.5 Total Economic Order Quantity MICAP Performance

Figure 2.5 shows a decrease of 131,016 EOQ MICAP incidents or a 47% decrease as compared to the projected 9% decrease.

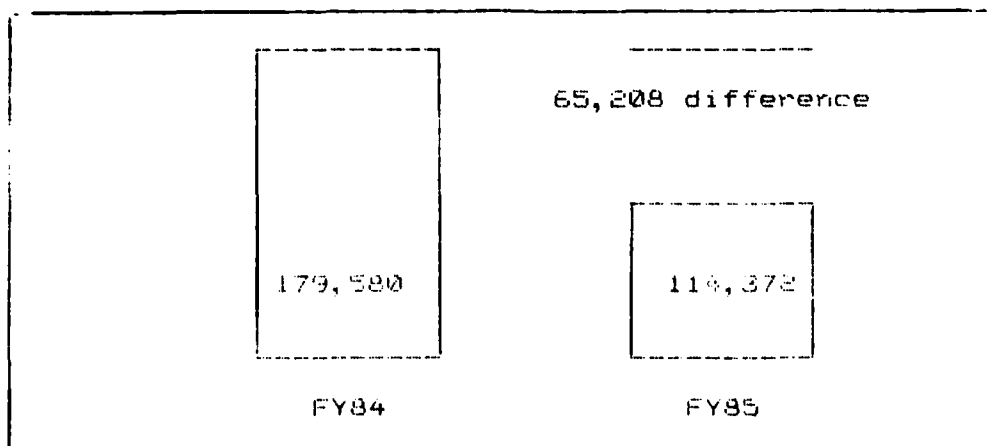


Figure 2.6 Total Field Reparable MICAP Performance

Figure 2.6 shows a decrease of 65,208 field reparable MICAP incidents or a 36% decrease as compared to the projected 18.9% decrease. However, not all reductions in field reparable MICAP occurrences were a result of adding an EOQ to selected field reparable items. Figure 2.7 shows the decrease in MICAP occurrences for stocked items.

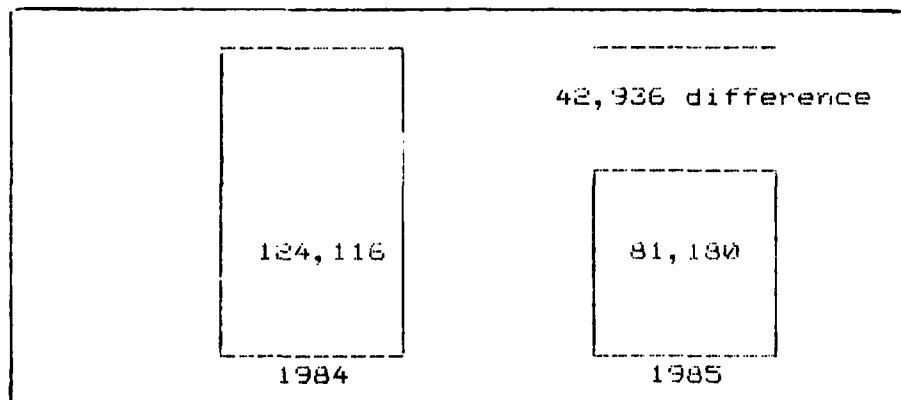


Figure 2.7 MICAP Occurrences For Stocked Items

A reduction of 42,936 MICAP occurrences was affected by the EOQ for field reparable policy. The remaining MICAP reductions (22,272) for non-stocked items were a result of the moratorium on disposal of assets. These benefits will continue after the moratorium is lifted, because of the implementation of the recommendations from the AFLMC's XF 3 Retention Study. In that study, the AFLMC projected a decrease of 2% in MICAP occurrences as compared to the 12.4% that actually occurred. (11)

Economic Order Quantity Retention In 1984, the Air Force put a freeze on discarding unused spare parts until implementation of new retention policy. The Air Force Logistics Management Center recommended a new policy to retain spare parts longer and projected an increase in on-hand inventory of \$116 million. Thus, the moratorium caused the items to be held before the policy was implemented. Regardless, the performance projections should still hold. The stock fund totals, as tracked in the AF-20 Stock Fund Stratification Program, reflect the dollar value of the stock on-hand. The stock fund is measured in two divisions, General Support Division (GSD) and System Support Division (SSD). Figures 2.8 and 2.9 indicate the actual total increases in the stock fund totals for both GSD and SSD. (11)

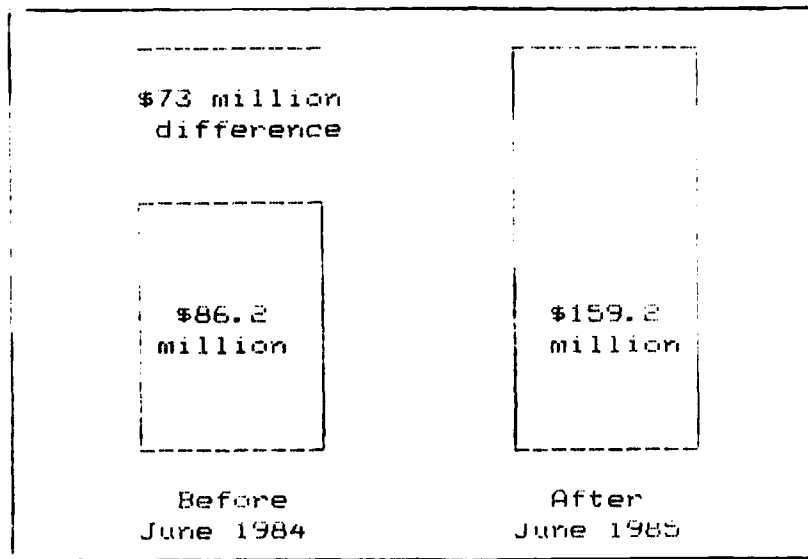


Figure 2.8 GSD Stock Fund Totals

Figure 2.8 shows a \$73 million increase in the GSD Stock Fund.

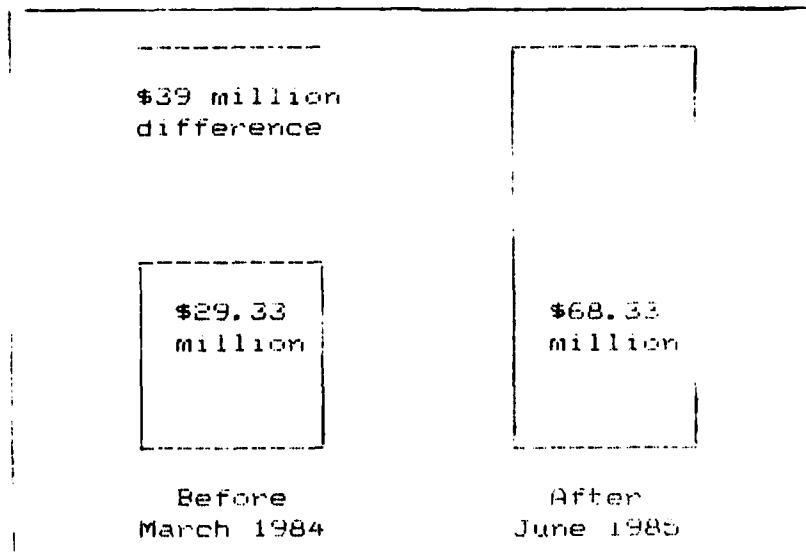


Figure 2.9 SSD Stock Fund Totals

Figure 2.9 shows a \$39 million increase in the SSD stock fund. The stock fund total from Figure 2.8 and Figure 2.9 is \$112 million as compared to the AFLMC projected \$116 million.

ISSUES

During the process of identifying and evaluating the changes made to the spare parts stockage policy, several issues were identified.

1. Conversion to the new Phase IV computer system delayed releveing at some bases. This caused a vague starting point to collect data after the stockage policy changes. The stockage policy program changes were implemented, but required releveing prior to the new levels taking effect. Some bases sent their M-20 report before releveing so the new stockage policy was not accurately measured immediately after implementation. Thus, the inventory augmentation cost could not be accurately measured. (9)
2. The cost of the stockage policy could also not be accurately measured because of problems with the M-20.
3. Instructions to the field on how to run M-20 data were misinterpreted or not followed. Air Force stock fund managers did not know or did not understand the stockage policy changes and their expected impacts. This prevented a clear snapshot of data before or after the policy changes were made. As a result, the Air Force did not take the necessary actions to compute the inventory augmentation costs. (9)
4. Inaccurate and invalid measurements on the M-32 resulted in erroneous unit fill rates. Unit fill rates varied significantly from month to month and in some months exceeded 100%. Therefore, unit fill rates, which is a more accurate measure of fill rates than stockage effectiveness, could not be measured.
5. The program released by the Data Systems Design Office (DSDO) contained the wrong safety level computation. The DSDO corrected the safety level in November 1985. However, for this report, the AFLMC could not accurately measure the complete impact of the safety level change. It is reasonable to expect fill rates to increase further. (9)
6. The moratorium on disposal of assets compounded the measurement of the stock fund impact resulting from the new M-20 retention criteria.
7. The Supply Management Report does not accurately measure unit fill rates and does not measure fill rates by commodity group. Since different commodity groups have a different stockage policy, lack of performance data hinders management. As a result, base level repairable fill rates could not be measured.

CHAPTER THREE

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. The four changes recommended by the Air Force Logistics Management Center significantly improved the supply system's capability to support the Air Force mission.
2. Some of the AFLMC's measurable projections were accomplished at least to some degree. Considering the compounding issues, the projections were remarkably accurate.
3. The AFLMC's models and stockage policy forecasting techniques are valid.
4. The stockage policy changes were ineffectively controlled; there is a need for coordinated implementation plans.
5. Data collected before and after the stockage policy changes indicate a lack of knowledge on the part of Air Force stock fund managers.
6. The Air Force Supply Management Report needs to be improved to provide accurate and valid performance measures for all commodity groups.

RECOMMENDATIONS

1. Retain the new stockage policies. (OPR: HQ USAF/LEY)
2. Appoint a change agent or committee to oversee all future major stockage policy changes. (OPR:HQ USAF/LEYS)
3. The change agent (committee) should develop an implementation plan to include:
 - a. Actions required by HQ AFLC, wholesale agencies, MAJCOMs, bases, and DSDO.
 - b. How and when the performance is to be measured.
 - c. How to ensure adequate quality control on the changes.

d. Who and when to document the performance.
(OPR: HQ USAF/LEYS appointed change agent)

4. Review and improve the Supply Management Report (M-52) stockage policy indicators to ensure accuracy and completeness.
(OPR: DSDD/LGS)

5. Continue to use the AFLMC models and forecasting techniques to forecast future stockage policy impacts. (OPR: AFLMC/LGS)

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10. October, 1985 interview with Captain Martha Ham, Air Force Logistics Management Center, Gunter AFS, Alabama.
11. December, 1985 interview with Major Douglas Blazer, Air Force Logistics Management Center, Gunter AFS, Alabama.

APPENDICES

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3/31/84
REPORT -

TOTAL AIR FORCE CONSOLIDATED SIGNIFICATION TABLE III REPORT

30 JUN 84
DEFICIT
COL 6

REQUISITION	SERVICEABLE STOCK ON HAND	INSERVICEABLE STOCK ON HAND	ON ORDER DUE IN	ON ORDER DUE IN	ON ORDER DUE IN
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6
1 ASSETS, STRATIFICATION DATE	603,443,404	528,288,708	488,452,717	19,358,873	
2 ASSETS, ANTICIPATED NON-RECOVERABLE	108,728,853	522,778,177	4,888,747	17,877,883	30,838,883
3 PREPOSITIONED W/R PROJECTABLE	220,819,308	10,888	384,180,050	2,280	131,837,184
4 REQUISITIONING OBJECTIVE	7,947,950	2,384,143	322,887,453	857,010	48,777,837
5 STOCK DUE OUT	54,489,018	248,724	14,848,010	30,787	4,640,739
6 SAFETY LEVEL	74,002,907	27,142	14,848,010	2,857	4,640,739
7 NUMERICAL STOCKAGE OBJECTIVE	81,328,118	1,882,488	18,028,334	171,888	18,355,573
8 REPAIR CYCLE	18,383,230	411,888	4,448,580	351,378	1,843,888
9 OPERATING LEVEL	187,188,714	13,142	32,881,873	58,119,027	58,119,027
10 BALANCE PREPOSITION WAR RESERVE	2,421,780	44,777	874,085	18,272	1,077,080,888
B OPENING/RETENTION POSITION					
1 ASSETS, STRATIFICATION DATE	563,443,484	528,288,708	488,452,717	19,358,873	
2 ASSETS, ANTICIPATED NON-RECOVERABLE	108,728,853	522,778,177	4,888,747	17,877,883	30,838,883
3 PREPOSITIONED W/R PROJECTABLE	142,842,849	10,588	4,888,747	2,280	
4 REQUISITIONING OBJECTIVE	837,048,417	2,433,408	422,379,887	863,309	144,138,287
A STOCK DUE OUT	380,872,884	248,724	322,887,453	30,787	48,777,837
B SAFETY LEVEL	74,002,907	27,142	14,848,010	2,957	4,640,739
C NUMERICAL STOCKAGE OBJECTIVE	111,403,481	1,882,488	18,028,334	171,888	18,355,573
D REPAIR CYCLE	18,383,230	411,888	4,448,580	351,378	1,843,888
E ORDER AND SHIP TIME	88,229,111	38,285	28,193,917	6,288	12,288,123
F OPERATING LEVEL	157,188,714	13,142	32,881,873	58,119,027	58,119,027
G AFAD - DEMAND REQUIREMENTS					
A CURRENT YEAR	355,888,848	581,703	33,283,742	251,292	4,248,722,808
B APPORTIONMENT YEAR	1,454,435,021	103,885	12,188,827	80,584	320,045,720
C BUDGET YEAR	1,454,435,021	302,087	17,720,328	108,882	1,408,755,185
D BALANCE AFAD	1,080,801,281	130,834	2,372,381	45,784	1,444,881,395
H BALANCE PREPOSITION WAR RESERVE					
1 ECONOMIC RETENTION	1,884,149,154	318,885	2,915,481	185,008	
A LIFE CYCLE RETENTION	10,778,842	201,731	23,135	177,888	
B USAP DIRECTED RETENTION	12,036,882	831	2,707		
I LOCAL EXCESS					
A USAF POLICY RETENTION	84,326,383	524,858,133	33,032,770	18,248,773	
B MAJCOM DIRECTED RETENTION	4,123,504	13,510	18,672	844	
C LOCAL DIR RET/SPEC RQMT IN	2,380,833	6,828	184	2,138	
D PENDING DSP/CANC REQUESTED	11,248,881	30,510	4,888,234	34,811	
E REPORTED AWAITING ICP REPLY	22,373,288	192,785,781	8,057,408		
F PENDING REPORT/CANC TO ICP	18,833,387	1,180,070	7,271		
	27,285,332	913,124,733	20,278,000		

	REQUIREMENT COL 1	SERVICEABLE STOCK ON HAND COL 2	UNSERVICEABLE STOCK ON HAND COL 3	ON ORDER DUE IN COL 4	ON ORDER DIFFM COL 5	DEFICIT COL 6
A READINESS POSITION						
1 ASSETS, STRATIFICATION DATE	616,665	731,357,393	38,744,873	654,221,540	14,802,103	
2 ASSETS, ANTICIPATED NON-RECOVERABLE			32,630,322		13,035,324	
3 PREPOSITIONED W/R PROTECTABLE	204,586,033	130,782,193	13,039	9,901,228	8,662	63,889,573
4 REQUISITIONING OBJECTIVE	995,408,609	286,971,255	2,156,393	534,159,512	670,554	172,121,449
A STOCK DUE OUT	497,651,102	8,226,286	267,723	430,491,333	127,839	58,665,760
B SAFETY LEVEL	97,205,454	66,853,561	151,851	22,642,492	65,232	7,557,550
C NUMERICAL STOCKAGE OBJECTIVE	125,470,388	84,738,899	1,391,134	22,243,538	176,230	17,096,817
D REPAIR CYCLE	1,526,261	1,003,618	104,083	230,244	98,074	188,316
E ORDER AND SHIP TIME	99,771,706	54,375,958	76,759	31,368,122	43,292	13,950,867
F OPERATING LEVEL	273,555,404	126,148,891	241,602	58,551,905	203,179	88,613,006
Total B.D.S.F.	4,149,414,072	58,051,639	681,213	38,242,809	335,420	4,052,438,411
5 AFAO - DEMAND REQUIREMENTS	4,149,414,072	22,703,878	106,908	13,179,727	101,659	300,896,480
A CURRENT YEAR FY 1985	336,886,991	25,157,714	389,469	19,973,960	154,448	1,337,844,220
B APPORTIONMENT YEAR FY 1986	1,383,365,363	7,409,310	131,588	4,034,580	53,828	1,371,789,895
C BUDGET YEAR FY 1987	1,383,365,363	2,780,739	53,248	1,054,542	25,485	1,041,907,826
D BALANCE AFAO	1,045,796,355					
6 BALANCE PREPOSITION WAR RESERVE						
7 ECONOMIC RETENTION	2,152,383,358	42,014,884	314,158	4,655,622	169,992	
A LIFE CYCLE RETENTION	10,285,586	10,038,070	167,141	80,368	127,253	
B USAF DIRECTED RETENTION	12,329,880	12,302,886	14,222	12,850	14,222	
8 LOCAL EXCESS						
A USAF POLICY RETENTION		159,161,364	35,503,311	35,684,247	13,974,163	
B MAJCOM DIRECTED RETENTION		7,582,565	19,723	16,096	789	
C LOCAL DIR RET/SPEC PROMT DUE-IN		4,004,263	8,482	237	2,596	
D PENDING DSP/CANC REQUESTED		17,696,190	29,728	10,018,288	29,728	
E REPORTED AWAITING ICP REPLY		44,676,510	4,112,201	11,708,704		
F PENDING REPORT/CANC TO ICP		19,323,422	608,811	12,605		
		65,859,230	17,242,439	13,928,027		

CUSTOMER SUPPORT EFFECTIVENESS

AGENCY	LINE ITEMS REQUESTED	LINE ITEMS ISSUED	LINE ITEMS BACK ORDERED	ISSUE EFFECTIVENESS	STORAGE EFFECTIVENESS	COR ON TIME	TOTAL UCR	RELEASE EFFECTIVENESS
A	76252	51241	32492	61.272	65.962	12673	31195	42.622
B	56358	26421	35943	42.362	79.452	14657	33435	43.432
C	11772	43674	61816	79.362	51.362	35325	57225	61.692
TOTAL	41352	314057	137736	77.752	89.492	62635	121352	51.392
SYSTEM SUPPORT DIVISION								
A	36722	21651	14967	61.242	77.682	5301	13217	42.712
B	15717	7115	11673	28.712	66.822	4984	8259	54.292
C	34892	37715	7471	23.432	87.462	4216	5651	72.252
TOTAL	27329	61484	34741	64.362	82.422	14281	27327	51.522
CENTRAL LEVEL ANALYSIS								
A	41156	32769	7762	87.692	82.262	5237	7397	43.922
B	3546	7433	1756	57.592	58.322	455	1126	43.472
C	4557	4474	156	55.952	55.952	38	64	55.372
TOTAL	49239	34516	9453	72.632	79.852	3730	8577	43.482
NON-CENTRAL LEVEL ANAL								
A	13354	7921	6442	53.142	71.432	2382	5757	41.372
B	2521	1391	1562	46.922	69.432	422	957	42.122
C	4112	6071	243	97.182	98.482	115	242	47.912
TOTAL	25174	17973	8252	68.412	82.042	2917	6994	41.792
OVERALL TOTAL								
A	15756	11459	6189	65.822	81.672	23673	57556	41.132
B	74250	37352	52701	42.322	74.592	22816	43821	45.672
C	379191	247636	89521	82.142	91.182	39674	63384	62.592
TOTAL	57587	432927	182261	78.372	86.832	83363	164751	50.592
ERRC SUMMARY								
PLCCV	45493	72714	25337	74.112	82.342	9567	21731	43.992
PLUP	170415	307414	156351	59.262	53.272	73803	143631	51.592
TOTAL	57587	432927	182261	72.372	86.832	83363	164751	52.592
TOTAL	12471	1537	11019	14.442	22.572	1657	16399	12.012

URGENCY OF RECD	LINE ITEMS REQUESTED	LINE ITEMS ISSUED	LINE ITEMS BACK ORDERED	ISSUE EFFECTIVENESS	GENERAL SUPPORT DIVISION	LINE ITEMS B/O 4M	STOCKAGE EFFECTIVENESS	DOOR ON TIME	TOTAL DOR	RELEASE EFFECTIVENESS
A	5748	3958	2698	59.69%	2166	2166	97.89%	14823	29633	47.32%
B	3453	2359	25467	44.34%	2138	2138	81.62%	13538	26395	51.29%
C	24514	20412	5833	77.62%	42148	42148	92.38%	36617	68718	63.38%
TOTAL	343647	265129	111603	74.32%	84546	84546	93.65%	64178	116746	54.97%
SYSTEM SUPPORT DIVISION										
A	26374	18363	7967	64.78%	5734	5734	81.21%	4971	9897	54.64%
B	9685	5384	7769	43.91%	5416	5416	69.57%	3531	6128	57.62%
C	24984	21960	5371	80.35%	2566	2566	88.67%	3455	5242	65.90%
TOTAL	61043	45739	23120	60.47%	13716	13716	82.93%	11957	20467	58.42%
CENTRAL LEVEL ANALYSIS										
A	32397	25982	5216	80.69%	172	172	81.12%	3394	5995	56.61%
B	3231	2154	1658	56.61%	58	58	57.49%	544	1243	43.76%
C	3524	3435	127	96.43%	1	1	96.46%	38	98	38.77%
TOTAL	38922	31581	8421	79.78%	229	229	80.25%	3976	7336	54.19%
NON-CENTRAL LEVEL ANAL										
A	11314	6729	4276	58.23%	2978	2978	78.38%	2414	4372	55.21%
B	2063	1139	1569	42.16%	998	998	66.29%	462	1831	44.81%
C	1670	1483	211	89.06%	117	117	94.63%	64	147	43.53%
TOTAL	15247	9351	6596	58.63%	4077	4077	78.77%	2940	5558	52.97%
OVERALL TOTAL										
A	127533	91032	48295	65.47%	29934	29934	83.43%	24882	49897	58.51%
B	52852	29042	36863	44.06%	2782	2782	76.21%	18075	34797	51.94%
C	275324	231696	64729	78.16%	44832	44832	92.09%	48174	66285	62.68%
TOTAL	455659	351774	145597	70.16%	102568	102568	88.23%	83251	150399	55.33%
EMRC SUMMARY										
REGOV	69173	52623	19277	73.26%	6611	6611	83.66%	9355	17153	54.53%
LOC	386486	296942	136320	59.54%	95957	95957	89.69%	73696	132946	55.43%
TOTAL	455659	351774	145597	70.16%	102568	102568	88.20%	83251	150399	55.33%
FJUIP	15033	2816	13973	16.84%	5556	5556	25.21%	1356	15604	8.69%

PICAF ANALYSIS

NON-PA ITEMS		ECO ITEMS	
NDR	FCT	NDR	FCT

ECRT ITEMS		TOTAL	
NDR	PCT	NDR	PCT

CAUSE	NDR	FCT	NDR	FCT	ECRT ITEMS	TOTAL
A-NO STK LVL-NO DEMANDS	2296	13	8478	50	8	14782
E-NO STK LVL-NO DEMANDS	1219	8	2293	13	2	3317
C-IN/SP PROHIBITS LVL	17	0	4	0	1	21
E-BASE DECISION-NO LVL	5	0	62	0	1	68
F-FULL STK-J BALANCE	80	0	88	0	0	174
G-FULL STK-ASSETS ANP	382	3	13	0	0	395
H-K FULL STK-RUN > STD	6801	53	3427	20	2	10228
J-K FULL STK-RUN < STD	850	6	1691	10	0	2541
K-K FULL STK-NO DUE-IN	231	1	595	3	0	826
L-COMPANE VALUE	378	2	0	0	1	328
M-FULL STK-INACCESSIBLE	585	4	5	3	2	591
N-INITIAL SHORTAGE	34	0	6	0	2	42
TOTAL	12635	16647			11	29293

CAUSE	NDR	FCT	NDR	FCT	ECRT ITEMS	TOTAL
1-CANCELLATION	599	2	968	2	2	1559
2-REC ALC/GTH SWGS	7561	28	3525	8	1	11467
3-REC PSA	436	1	635	13	15	6618
4-REC JLS	2224	7	2515	5	2	4539
5-CANN-REGLULL	2933	10	741	1	4	3553
6-REC LP	32	0	2726	61	12	13585
7-REC FASE ASSETS	780	2	891	1	2	1571
8-WAY ASSET USEU	12223	44	2116	4	2	14129
9-CANN-SATISFY	195	0	717	2	1	912
9-RPT ERROR	471	1	845	1	1	1277
TOTAL	26994	47562			1326618	1401172

MICAP ANALYSIS

CAUSE	NON-MA ITEMS		EQO ITEMS		EQMT ITEMS		TOTAL	
	NBR	PCT	NBR	PCT	NBR	PCT	NBR	PCT
A-NO STK LVL-NO DEMANDS	1696	21	5369	51	3	100	7039	38
B-NO STK LVL-W/DEMANDS	763	9	1295	12	0	0	2055	11
C-IM/SM PROHIBITS LVL	5	0	5	0	0	0	10	0
C-BASE DECISION-NO LVL	5	0	38	0	0	0	43	0
F-FULL STK-0 BALANCE	33	0	56	0	0	0	89	0
G-FULL STK-ASSETS AWP	311	3	4	0	0	0	315	1
H-< FULL STK-RQN > STU	3774	48	1839	17	0	0	5613	31
J-< FULL STK-RQN < STU	522	6	1238	12	0	0	1760	9
K-< FULL STK-NO DUE-IN	209	2	470	4	0	0	679	3
P-COMMAND UNIQUE	52	0	0	0	0	0	52	0
R-FULL STK-INACCESSIBLE	441	5	3	0	0	0	444	2
Z-INITIAL SHORTAGE	34	0	2	0	0	0	36	0
TOTAL	7842		10259		3		18104	

DELETE

ACTION	367	2	554	4	1	20	922	3
WOTH SVCS	4799	26	2292	23	4	80	7095	24
EXCLUDE	141	1	3978	35	0	0	4159	14
ASSETS	1471	8	1654	14	2	0	3125	10
ST USED	1306	7	290	2	0	0	1596	5
TISFY	35	0	265	2	0	0	302	1
DR	450	2	543	4	0	0	993	3
	9878	49	1257	9	0	0	9935	34
	96	0	67	0	0	0	163	0
	334	1	545	4	0	0	879	3
	17917		11245		5		29167	

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