Comparison of Repair Cycle Item Failure Data (7WS Versus DAC)

SMSGT TONY PARRISH

AFLMA FINAL REPORT LS199810300

TEAM MEMBERS

1ST LT SEVERINE COLBORG   DR. DOUGLAS BLAZER
SMSGT TONY NICHOLSON   MS. GALE JARNAGIN

SEPTEMBER 1999

AIR FORCE LOGISTICS MANAGEMENT AGENCY

MAXWELL AFB, GUNTER ANNEX AL 36114-323

19991207 092

REPORT DOCUMENTATION PAGE

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services. Directorate for Information Operations and Reports(0704-0188), 1215 Jefferson Davis Highway, Suite 1204 Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED *(From - To)*
September 1999	Final Report	November 1998 - September 1999

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Comparison of Repair Cycle Item Failure Data - 7WS versus DAC	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)	5d. PROJECT NUMBER
SMSgt Woodrow Parrish, AFLMA/LGS, DSN 596-4165	5e. TASK NUMBER
	5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	8. PERFORMING ORGANIZATION REPORT NUMBER
Air Force Logistics Management Agency/LGS 501 Ward Street Maxwell AFB, Gunter Annex AL 36114-3236	LS199810300

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
HQ AFMC/LG 4375 Chidlaw Rd, Suite 6, Wright-Patterson AFB , OH 45433-5006	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES

SAF/PAS # 99-015, 29 Nov 99

14. ABSTRACT

Headquarters Air Force Materiel Command (AFMC/LG) tasked the AFLMA to determine which method (quarterly 7WS transactions or daily DAC transactions) more accurately records and reports reparable item failure data. AFMC receives DAC images on a daily basis and 7WS images on a quarterly basis. At this time, AFMC uses data obtained from DAC images to compute worldwide requirements computation. Data on 7WS images is compared to data contained on DAC images. Thus far, AFMC personnel have noted a big difference (both + and -) in the number of failures reported for reparable items on DAC images when compared to 7WS images. We analyzed 7WS and DAC data from 10 bases for the period 1 Jul – 30 Sep 99. When we compared data on each base's repair cycle record to data on 7WS images we found that 99.99 percent of 7WS images are direct reflections of failure data contained on the repair cycle record. When we compared DAC failure numbers to 7WS failure numbers we identified differences similar to those found by AFMC. We discovered several reasons for the difference in numbers reported by the two methods, all of which could be attributed to DAC images. The bottom line is buy and repair requirements are both under and over estimated when DAC data is used for worldwide requirements computation. The 7WS image is more accurate. Therefore, we recommend using 7WS images as the source of failure data for worldwide requirements computation. We propose come changes to the 7WS images as the source of failure data for worldwide requirements computation. We propose some changes to the 7WS process to make it even more accurate, and when these changes are completed, to eliminate the DAC process.

15. SUBJECT TERMS

7WS, DAC, Reporting Reparable Failures

16. SECURITY CLASSIFICATION OF			17. LIMITATION OF ABSTRACT	17. NUMBER OF PAGES	19. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			SMSgt Woodrow Parrish
Unclassified	Unclassified	Unclassified	Unlimited	19	20. TELEPHONE NUMBER DSN: 596-4165

EXECUTIVE SUMMARY

PROBLEM STATEMENT

There is a big difference (+ and -) in the number of repair generations (failures) recorded for reparable items when DAC images are compared to 7WS images. Air Force Materiel Command (AFMC) wants assurance that 7WS data is correct before feeding 7WS images to the Recoverable Item Requirements System (D041) for requirements computation use.

STUDY OBJECTIVES

Answer the following questions:
1. Is the 7WS accurate? Should it be used?
2. Is the repair cycle record (and therefore the 7WS) an accurate record of failures?
3. Has DAC transmission accuracy improved since changes were made to the process?
4. Are 7WS numbers different from DAC numbers? If so why?
5. Is the quarterly transmission of 7WS images more reliable than the daily transmission of DAC images?
6. What is the impact of using DAC failure data in the Air Force requirements computation?
7. Should the Air Force continue to report DACs?

CONCLUSIONS

1. The 7WS accurately reports base level reparable generation (failure) data.
2. Failure data is accurately recorded on the base-level repair cycle record.
3. The DAC transmission process has improved by 12 percent.
4. 7WS data is more accurate, but the 7WS transmission process is not 100% reliable.
5. The transmission of 7WS images is more reliable than the transmission of DAC images. However, an automated process is needed to identify bases that do not successfully transmit 7WS images to AFMC each quarter and to request retransmission of the 7WS file from identified bases.
6. Repair requirements are both over and under estimated when DACs are used for requirements computation.
7. The Air Force needs a standard set of procedures for collecting, reporting, and transferring contingency demand data.
8. The Air Force must record and report failures as non-recurring for base leveling purposes that are "recurring" for worldwide requirements
9. DACs can be turned off.

RECOMMENDATIONS

1. Use 7WS images as the source for failure data for the D041 worldwide requirements computation.
   OPR: AFMC/LGI.

2. Develop an automated system to ensure 7WS images are received from all bases.   OPR:
   AFMC/LGI. OCR: SSG/ILS.

3. Task the Air Force Logistics Management Agency (AFLMA) to analyze and recommend
   procedures for collecting, reporting, and transferring contingency demand data.   OPR:
   HQ USAF/ILS. OCR: AFLMA/LGS.

4. Task SSG to program SBSS to collect and report, via 7WS, recurring failures that are coded as
   non-recurring.
   OPR: HQ USAF/ILS. OCR: SSG/ILS.

5. When the 7WS process is completely implemented and AFMC's stock control is programmed to
   use the DWA as the source for the start date used to determine retrograde times, eliminate DAC
   reporting.
   OPR: SSG/ILS and AFMC/LGI.

TABLE OF CONTENTS

Page

LIST OF TABLES

CHAPTER 1

INTRODUCTION

BACKGROUND

Repair cycle item failure data is currently reported to Air Force Materiel Command (AFMC) two ways; via DAC and via 7WS images. DAC images are generated as a result of processing the Daily Air Force Recoverable Asset Management Program (RAMPS, D-28). The DAC is a daily transaction that reports condition changes for reportable (report code 6 or 7) items that result from a repair cycle turn-in generating an update to the repaired this station (RTS), not reparable this station (NRTS), or condemned (COND) areas of the repair cycle record in the Standard Base Supply System (SBSS). The 7WS image is a quarterly dump of SBSS repair cycle data reflecting asset and usage (failure) data for Air Force managed items. 7WS images are created as a result of processing the quarterly option of the D-28.

The accuracy of data contained in DAC and 7WS images is important. Air Force Materiel Command (AFMC) systems use this data to compute quarterly worldwide requirements for the Air Force. If failure data from retail supply accounts is inaccurate, future requirements will either be insufficient to support needs or too large and thus create excess conditions. In either case, supply support deteriorates.

For quite some time there has been justified skepticism concerning the accuracy of base-level repair cycle item failure data in AFMC requirements systems. AFLMA project LS9607310, Analysis of Retail-Wholesale Asset Usage Data Accuracy, February 1997, tracked the flow and content of DAC images from one reserve and four active Air Force bases during the month of August 1996. Specifically, the study tested the transmission success rate of DAC transactions and compared the accumulated usage data (RTS, NRTS, and condemned quantities) in the Recoverable Assembly Management Process System (D035C) to the data on base records.

The study concluded that roughly 76 percent (1953 of 2558) of the DACs generated by the five sample bases reached the applicable Air Logistics Center (ALC). The success rate varied greatly among the bases, ranging from 67 to 100 percent. The study discovered usage data maintained at the ALCs matched data residing at base level on only 62 percent of the stock numbers (856 of 1373). While the number of mismatched stock numbers was high, 96 percent (4,117 of 4,290) of the mismatched stock numbers were within three reparable generations (plus or minus) of matching. Four percent (173 of 4,290) of the mismatched stock numbers were off by four or more reparable generations.

In light of the significant number of unsuccessfully transmitted DAC images (24%), and the inconsistency between base and wholesale data, the study recommended reprogramming the SBSS to submit a 7WS image for all Air Force managed stock numbers on a quarterly basis. The 7WS image was to provide a

quarterly report of repair cycle asset usage data to be file transferred directly to the Worldwide Stock Balance and Consumption Reports Consolidation System (D104).

The AFLMA recommended AFMC program the D104 system to accept 7WS images and allow them to override the data transmitted via DAC images. In cases where 7WS images were not successfully received, the D104 would use data from DAC images.

The SBSS is programmed to send 7WS images when a base runs the quarterly option of the D-28. Also, the D104 has been programmed to accept 7WS images. However, 7WS images are not being used at this time because AFMC personnel are waiting for assurance that data contained on the 7WS image is valid and that all Air Force bases will submit 7WS images each quarter. That's where this study comes in. The main purpose of this study is to prove or disprove that 7WS images are reliable sources of repair cycle asset failure data.

PROBLEM STATEMENT

There is a big difference (+ and -) in the number of repair generations (failures) recorded for reparable items when DAC images are compared to 7WS images. AFMC wants assurance that 7WS data is correct before feeding 7WS images to D041 for requirements computation use.

OBJECTIVES

Answer the following questions:
1. Is the 7WS accurate? Should it be used?
2. Is the repair cycle record (and therefore the 7WS) an accurate record of failures?
3. Has DAC transmission accuracy improved since changes were made to the process?
4. Are 7WS numbers different from DAC numbers? If so why?
5. Is the quarterly transmission of 7WS images more reliable than the daily transmission of DAC images?
6. What is the impact of using DAC failure data in the Air Force requirements computation?
7. Should the Air Force continue to report DACs?

CHAPTER 2

ANALYSIS

METHODOLOGY

We compared 7WS images from 10 different supply accounts (OCONUS: Kunsan, Aviano, and Spangdahlem Air Bases, RAF Lakenheath, and CONUS: Langley, Ellsworth, Dover, Pope, Minot, and Luke Air Force Bases) to the stock number's repair cycle record (102 record).

AFMC personnel (the Requirements Interface Process Improvement Team (RIPIT)) provided DAC and 7WS images for the period 1 Jul 98 to 30 Sep 98. We obtained the corresponding base-level repair cycle record data for the 10 bases from our Air Force Supply Data Bank. For these 10 bases, we compared the 7WS to the DAC and the SBSS repair cycle records. We divide our analysis to cover a series of seven questions.

ANALYSIS

Do 7WS images provide an accurate picture of REPGEN transactions on repair cycle records?

The answer is yes—the 7WS matched the repair cycle record in 99.9% of the cases. We compared each 7WS and stock number at each base to the corresponding repair cycle record (102-record) at each applicable base. We found many 7WS images did not have corresponding repair cycle records because 7WS images are submitted on all Air Force managed items, including expendability/recoverability/reparability/cost (ERRC) code XB3 items. When we excluded 7WS images with an ERRC of XB3, we obtained a 100 percent match between 7WS images and 102-records.

Next, we compared the number of RTS, NRTS and COND actions on the 7WS to the RTS, NRTS and COND actions on the 102-record at each base. However, in order to ensure comparisons of like numbers, we made two adjustments to the repair actions reflected on the 102-record. First, we added repair actions recorded in the 5th quarter current (C-deck only) of the 102-record to the repair actions recorded in the current quarter of the 102-record. Repair actions recorded in the 5th quarter current (C-deck only) mostly account for repair actions to support Air Mobility Command's (AMC) forward supply systems (FSS) (C-deck type turn-ins update in the 5th quarter current bucket instead of the current quarter bucket). Next, we scanned the repair cycle records at each base for turn-in (TIN) transactions with a maintenance action taken code of D (NRTS D). We totaled the number of NRTS Ds at each base and subtracted that total from the total number of NRTS actions on the 102-record. We subtracted these items because the standard base supply system is programmed to subtract NRTS D actions from the repair cycle record and to add C-deck recorded repair generations prior to

3

submitting a 7WS. Turn-in transactions with a NRTS D identify items transferred to another base for intermediate repair action (NRTS D actions are prevalent throughout AMC's FSS). Including the NRTS D turn-ins in the 7WS would duplicate failures generated to AFMC; that's why they are subtracted out of the 7WS.

After making these two adjustments, we matched the data on the 102-record at the base to the data contained on 7WS images. At 7 of the 10 bases we achieved a 100 percent match. At the remaining three bases (Aviano, Kunsan, and Langley) we had a large number of mismatches. Upon further research, we discovered the data in their repair cycle buckets had been shifted prior to us capturing their data. So in the case of Aviano, Kunsan, and Langley we used failure data from the "1st quarter past" instead of the "current quarter".

When we compared the data on the 102-record to the data on 7WS images at the remaining three bases we found six mismatches at one base. All six stock numbers had turn-ins processed as NRTS D, supply condition code D, and a transaction exception code of "+". These turn-ins appeared on the 7WS image but did not show up on the 102-record. We know the turn-ins were recorded on the 102-record at some point, because the numbers were captured on the 7WS. However, our research did not reveal a reason why the numbers on the 102-record were lower than the numbers on the 7WS. We asked Standard Systems Group (SSG) personnel to help us determine a cause for the mismatch. When SSG personnel processed turn-ins using the same codes, the repair cycle records in their test database were correctly updated. Their success in processing these turn-ins validates that repair cycle records are correctly updated. Since the number of this unusual occurrence (six) is minimal, we did not devote further research to discover its cause.

The overall match rate of failure data on the 102-record compared to the data reported by the 7WS was almost perfect. The numbers are listed in table 2-1 below.

| | | | MISMATCHED | |
BASE	NSNs WITH REPGENS	NUMBER OF TIMES 102-RECORD REPGEN QTY MATCHED 7WS REPGEN QTY	NUMBER OF TIMES 7WS REPGEN QTY GREATER THAN 102-RECORD REPGEN QTY	NUMBER OF TIMES 7WS REPGEN QTY LESS THAN 102-RECORD REPGEN QTY
Aviano	428	428	0	0
Dover	750	750	0	0
Ellsworth	729	729	0	0
Lakenheath	844	844	0	0
Langley	635	635	0	0
Luke	761	761	0	0
Kunsan	347	341	6	0
Minot	419	419	0	0
Pope	595	595	0	0

Spangdahlem	181	181	0	0
TOTALS	**5,689**	**5,683**	**6**	**0**

Table 2-1. Repair Cycle Record Failure Data Compared to 7WS Failure Data

Out of 5,689 stock numbers with repair activity, 5,683 matched perfectly. Only 6 (as described above) of the 5,689 stock numbers had mismatched data. The 7WS is a direct reflection of the repair cycle record.

Is the repair cycle record (and therefore the 7WS) an accurate record of failures?

Again the answer is yes. We validated that turn-in, due-out cancellation, and turn-around transactions correctly update the RTS, NRTS, and COND "buckets" on the repair cycle record. We scanned the transaction history records of each of the 10 bases and selected transactions that update the repair cycle record. After reviewing the guidance in AFMAN 23-110, Volume II, Part Two, Chapter 13, Paragraph 13.7; we counted REPGEN transactions with a maintenance action taken code of A, F, G, K, L, or Z as an addition to the RTS quantity. We counted REPGEN transactions with a maintenance action taken code of D, 1, 2, 3, 4, 5, 6, 7, or 8 as an addition to the NRTS quantity. And finally we counted REPGEN transactions with a maintenance action taken code of 9 as an addition to the COND quantity.

Once we selected these transactions, we filtered them further by selecting and counting only those with supply demand codes that indicated the originating issue request was a recurring request. We did make one exception on this sort. We included in our counts, those originating issue requests that had a "C" activity code **and** a demand code indicating the request was non-recurring. We made this exception to allow for properly recording the repair cycle REPGEN data within AMC's forward supply system.

To provide a little more insight on how we handled the impact of the AMC FSS, let's walk through the life of an unserviceable 3-level-maintenance item at a forward supply location. First, a failed item is turned-in at a forward supply location (FSL) using a maintenance action taken code D. This turn-in results in a shipment to a CONUS primary supply point (PSP) for repair. At the time of the turn-in, the failure is recorded on the repair cycle record at the forward supply location; however, a DAC is not transmitted to the responsible ALC. The primary supply point receives the item and processes an issue to the appropriate maintenance shop, using activity code "C". This issue routes the item to maintenance and provides visibility of its whereabouts. When maintenance completes their actions, they turn the item back in to supply as either serviceable or unserviceable. In either case, at the time of turn-in, an update is made (providing an updateable maintenance action taken code is used) to the appropriate "bucket" on the repair cycle record at the primary supply point and a DAC is transmitted, for that transaction, the next time the D-28 is processed.

Now, at first blush, it may appear we double count failures at the forward supply location. However, we don't double count these failures. The failure was initially recorded on the repair cycle record at the forward supply location and then again on the repair cycle record at the primary supply point. So, the failure is actually recorded at two separate base-level accounts. However, recall that a DAC was not sent to the responsible ALC from the forward supply location, rather a DAC was sent to the

responsible ALC from the primary supply point. Therefore, the failure is only reported (via DAC) once to AFMC. And finally, note the 7WS at the forward supply location *subtracts* the total number of maintenance action taken code D turn-ins from the total not repaired this station quantity. At the primary supply point, activity code "C" turn-ins are recorded in the NRTS, 5th quarter current bucket. The quantity in the NRTS, 5th quarter current bucket is added to the quantity in the NRTS, current quarter bucket and the total quantity is reported on the 7WS. Bottom line, the NRTS quantity is only reported from one site (the PSP) via the DAC and via the 7WS.

So, back to the original question of "Is the repair cycle record an accurate record of failures?" Yes, the repair cycle record is an accurate record of failures. Using the criteria above, we obtained the numbers in table 2-2.

BASE	NSNs WITH FAILURE ACTIVITY	NSNs WITH MATCHING *RTS* ACTIONS	NSNs WITH MISMATCHING *RTS* ACTIONS	NSNs WITH MATCHING *NRTS* ACTIONS	NSNs WITH MISMATCHING *NRTS* ACTIONS
Ellsworth	729	729	0	729	0
Minot	419	412	7	419	0
Spangdahlem	181	181	0	181	0
Luke	761	761	0	761	0
Kunsan	347	347	0	347	0
Pope	595	595	0	595	0
Dover	750	750	0	750	0
Lakenheath	844	844	0	842	2
Langley	635	635	0	635	0
Aviano	428	428	0	428	0
TOTALS	**5,689**	**5,682**	**7**	**5687**	**2**

Table 2-2. REPGEN Transactions Compared to the Repair Cycle Record

The first column of Table 2-2 shows that the 10 test bases combined had 5,689 stock numbers that had some type of failure data recorded on the repair cycle record from 1 Jul – 30 Sep 98. Of those 5,689 stock numbers, we found only seven stock numbers whose RTS numbers did not match the numbers we came up with using the current SBSS business rules we described above. In these seven cases, the numbers reflected on the repair cycle record were less than the numbers we came up with using our criteria to scan the transaction history records. All seven of the mismatches were turn-ins from ICBM organizations at Minot AFB. All of the original issue transactions for the property were processed using a demand code of "T". AFMAN 23-110, Volume II, Part Two, Chapter 11, Table 11A8.1 states that demand code "T" is recurring and that it will record repair cycle data on the repair cycle record. However, in these seven cases the repair cycle record was not updated. We passed this information to SSG for testing and review. When SSG personnel processed turn-ins using demand code "T", the repair cycle records in their database were correctly updated. Their success in processing these turn-ins validates that repair cycle records are correctly updated. Again, since the number (seven) of this unusual occurrence is minimal we did not search further for the cause.

We had even better success matching the NRTS transactions to the repair cycle record. As Table 2-2 shows, we only found two stock numbers whose repair cycle NRTS numbers didn't match our transaction numbers. In both cases the repair cycle record reflected higher REPGEN numbers than our criteria identified. These two stock numbers experienced a change in ERRC code from XB3 to XD2 sometime between 1 July and 30 September 1998. A review of all transactions for both stock numbers did not reveal a transaction that should have updated the NRTS quantity on the repair cycle record. Our conclusion is that someone at the base in question processed a transaction that we don't capture in our Air Force Supply Data Bank to build-up the repair cycle demand level.

Based on our first two comparisons, we know that the 7WS matched the repair cycle record 99.99% (5682/5689) of the time and that failure data is accurately recorded on the repair cycle record 99.99% (5680/5689) of the time.

Has DAC transmission accuracy improved?

Yes, DAC transmission accuracy has improved, but it is still not completely accurate. To determine DAC transmission accuracy, we matched REPGEN transactions at each base to our file of DACs received by AFMC. To be considered a match, a REPGEN transaction had to have a matching DAC with the same stock number, document number and date processed. Table 2-3 displays the results.

BASE	MATCHING DAC	NO MATCHING DAC	TOTAL	PERCENT MATCHED
Ellsworth	1,908	316	2,224	86%
Minot	1,007	66	1,073	94%
Spangdahlem	1,628	233	1,861	87%
Luke	3,980	436	4,416	90%
Kunsan	1,519	120	1,639	93%
Pope	1,919	180	2,099	91%
Dover	3,335	1,089	4,424	75%
Lakenheath	2,396	538	2,934	82%
Langley	2,188	288	2,476	88%
Aviano	956	82	1,038	92%
TOTAL	**20,836**	**3,348**	**24,184**	**86%**

Table 2-3. DAC Transmission Accuracy

Table 2-3 shows that DAC transmission accuracy has improved since the changes AFLMA recommended were implemented. Accuracy has improved from 76% (1953/2,558) reported in the 1997 AFLMA report, to 88% (21,339/24,184) today (503 of the missing DACs were traced to data transmission errors (DZGs) not being corrected at base level). However, even though DAC transmission accuracy has improved to 88%, the failure data reported via 7WS images is much more accurate.

7

Are DAC numbers different than 7WS numbers?

Again the answer is yes. We compared 7WS images to REPGENs reported via DAC images by stock number. We totaled the action quantities on DAC images for each category (RTS, NRTS and COND) for each stock number. Since the 7WS reflects the total quarterly REPGENs on the repair cycle record we didn't have to sum the 7WS data. Table 2-4 shows the number of stock numbers with matching numbers of the RTS, NRTS, and COND and the number of mismatches.

BASE	*MATCH*			*MISMATCH*		
	RTS	NRTS	COND	RTS	NRTS	COND
Dover	633	495	756	132	270	9
Ellsworth	639	613	733	102	128	8
Langley	619	453	651	48	214	16
Luke	698	554	771	93	231	20
Minot	412	358	431	23	77	4
Pope	549	468	605	72	155	16
Aviano	422	346	465	49	125	6
Kunsan	327	233	365	47	145	9
Lakenheath	760	562	857	132	330	35
Spangdahlem	561	265	741	190	486	10
TOTALS	**5,620**	**4,347**	**6,375**	**888**	**2,161**	**133**

Table 2-4. 7WS Image Totals Compared to DAC Image Totals

Table 2-4 highlights the fact that REPGEN numbers captured via 7WS differ from REPGEN numbers captured via DACs. The NRTS category had the largest amount of stock numbers with mismatches, 33% (2,161/6,508). In the RTS category, 14% (888/6,508) of the stock numbers REPGEN totals didn't match and in the COND category less than 2% (133/6,508) of the stock numbers REPGEN totals didn't match.

There were 1,283 cases where DAC totals were larger than 7WS totals. We identified three reasons for the higher DAC totals: (1) turn-ins for items ordered as non-recurring, (2) turn-ins for C-deck NRTS items, and (3) duplicate DACs.

1. Turn-ins for non-recurring requests. We found three categories for non-recurring demands: contingency (transferred aircraft), transient aircraft, and special cases. These turn-ins do not update the repair cycle record and therefore do not record on the 7WS.

Contingency: There were 233 DACs for turn-ins on normal items ordered as non-recurring demands. We felt 233 an abnormally high number of non-recurring demands on XD2 items at only 10 bases. Since Spangdahlem and Aviano accounted for almost half (100 of 233) of the

turn-ins of non-recurring demanded items, we contacted personnel at Headquarters, United States Air Forces in Europe (USAFE) to determine if USAFE policy dictated the use of non-recurring demand codes in contingency situations. Note Spangdahlem and Aviano are involved in the Kosovo contingency and are supporting deployed units. Apparently base personnel were using non-recurring demand codes for the deployed unit's demands, since these demands could lead to demand levels being built and remaining after the deployed unit returns to it's home base.

After researching the question, USAFE personnel assured us there was not a policy advocating the use of non-recurring demand codes. Furthermore, they agreed some bases incorrectly used non-recurring demand codes. Those bases have since been briefed on the importance of using correct demand codes to accurately capture failure data on the repair cycle record. When we posed the same question to Headquarters Air Combat Command (ACC) personnel we received the same response...no ACC policy exists encouraging the use of non-recurring demand codes. The issue is not an easy one to solve. For if contingency sites use recurring demand codes, procedures are needed to "transfer" the failure data to the home base upon redeployment. That means the failure must be identifiable to the mission that generated the failure—either a home base or a deployed weapon system. And, the transfer of data must not create a duplicate report of failures. Both the USAFE and ACC examples point out the need for the Air Force to develop standard procedures for recording, collecting, and transferring demand data for contingencies.

We intend to send a message to all MAJCOMs to reemphasize the importance of using the correct demand codes on issue requests. When 7WS data is used for worldwide requirements computation, the only failure data used will come from the repair cycle record. So if items are issued as non-recurring, the failure will not record on the repair cycle record and therefore that failure data will be lost.

Transient aircraft: We found a small number of non-recurring failures (20 or fewer) at several bases. We traced these to transient aircraft. Current procedures instruct bases to record these failures as non-recurring so as not to update the transient base's demand rate and build levels for non-assigned aircraft. The SBSS produces (non-recurring) DACs for these transactions, so failures can be recorded in D041. However, failure to update the repair cycle record will mean these failures will not be included in the 7WS. These are legitimate failures and they must be communicated to D041. We discussed the issue with SSG and we propose recording selected non-recurring (those demands that are recurring but should not update the demand data used for leveling at that base) failures (NRTS, RTS, and Cond) in a currently unused field on the repair cycle record. SSG should reprogram the SBSS to collect "recurring" non-recurring demands on the repair cycle record and report them on the 7WS, but not use those failures for that base's levels (repair cycle demand level or readiness based level). In the interim (until SSG is able to reprogram the SBSS) AFLMA will provide AFMC business rules identifying which non-recurring DACs to continue to collect and use to update D041 failure data.

Special cases: Also in the category of transactions that do not update the repair cycle record, there were 25 DACs for turn-ins of Special Purpose Recoverables Authorized Maintenance

9

(SPRAM) assets and 457 DACs for turn-ins of condition code Q (suspended materiel (deficiency report/quality report (MDR/PQDR))) items. These transactions are correctly coded as non-recurring and should not update D041 failure data. They are not failures. The SPRAM turn-ins merely clear a detail record and the MDR failures were already recorded. Theoretically, the MDR turn-in reflects a "faulty" repair action not another failure.

2. Difficulty Report (DIREP) on NRTS turn-ins for items issued using activity code C.

Another 394 cases were non-recurring, C-deck NRTS turn-ins (most of which were repair actions at the AMC PSP for failures from the AMC FSL) that did not update the repair cycle record. These 394 turn-ins were processed with maintenance action taken codes that should have updated the repair cycle record. There is an open DIREP to reprogram the SBSS to record these REPGENs. The DIREP is scheduled for correction in October 1999; therefore, December 7WS images will include the AMC FSS demands (note due to Y2K concerns, the fix date of this DIREP could slip to March 2000). However, if 7WS data is used for requirements computation before that time, failure data from the AMC FSS will be lost unless a workaround is developed. We explained the situation to Headquarters AMC personnel. They agreed to capture non-recurring, "C" deck, NRTS failures from transaction history records and manually update the 7WS image before it is file transferred to AFMC. This will allow AFMC to use 7WS data for requirements computations starting in October 1999.

3. Duplicate DACs submitted on some turn-ins.

Finally there were 569 duplicate DACs. The earlier AFLMA report also identified the problem of duplicate RAMPS transactions.

There were 1,875 cases where DACs had a lesser number of REPGENs than recorded on the 7WS. We found two reasons for the lower DAC totals:
- There were 3,348 transactions without matching DACs. Apparently most were lost in transmission.
  -- There were 503 data transmission errors (DZGs) that the originating base did not correct and retransmit.

One final note in regards to data accuracy of 7WS and DAC images. The Air Force should modify the 7WS process as we propose and use the workarounds (AMC C-deck demands and AFMC business rules for capturing non-recurring DACs) we propose. By using the proposed businesss rules, AFMC will catch approximately $3.3 million of failure transactions that would otherwise be lost. If AFMC chooses not to use the business rules, 7WS images still provide a more accurate record of failure data ($3.3 million in failure transactions **lost** using 7WS images versus **overestimating** failures by $26.9 million and underestimating failures by $73.5 million using DAC images).

Is the 7WS transmission more reliable than the DAC transmission?

We believe it is. The SBSS uses file transfer protocol (FTP) to send the 7WS image direct to AFMC. Basically, with FTP it is all or nothing; the base FTPs the data or it doesn't. For the end of March 1999 submission, 23 stock record account numbers (SRANs) did not report failure data via 7WS. On the other hand, there were no DACs received from 27 SRANs over the same time frame.

The 7WS process is more reliable and accurate than the DAC, but the 7WS process is not perfect. AFMC needs a method (preferably automated) to identify non-reporting bases and prompt them to submit their 7WS files. There needs to be some method to ensure receipt of a 7WS file from each SBSS.

What is the impact of using DAC failure data in the Air Force requirements computation?

Using 1 Jul-30 Sep 98 DAC data, **D041 would have underestimated failures, and therefore repair/buy requirements, by as much as $73.6 million.** On the other hand, D041 **would have overestimated repair/buy requirements by a total of $26.9 million.** These estimates are for our 10 test bases only. The Air Force wide estimate could be 7 times larger (70+ active supply accounts) than these estimates. We arrived at these figures by summing the exchange price of the stock numbers whose summed failure numbers from DAC images did not match the failure quantity reflected on the 7WS image. Note, the two figures do not necessarily trade-off. These under and over estimates will cause erroneous requirements computations--buy and repair forecasts--and inaccurate supply management activity group budgets. Note: These estimates assume AFMC uses all DACs received, including DACs for non-recurring requirements.

Should the Air Force continue to use DACs?

If 7WS images replace DAC images as the source of failure reporting to D041, does the Air Force still need DACs? **It is our opinion that DACs can be eliminated.** The only other DAC uses we found were for AFMC to compute repair cycle times, and to determine the start date for retrograde time. The D035 technical refresh will use repair times (repair cycle and NRTS/condemned times) reported via the XCB. So the DAC is no longer needed for base level repair times. The DAC is not the most accurate method to compute the shipment part of the retrograde time. The DAC is created based on a turn-in. And, although most shipments are automatically created from the turn-in, not all are. A better transaction to measure shipment time would be the Prepositioned Materiel Receipt (DWA). The DWA is created upon creation of the shipping document. We suggest SSG modify the DWA image to include the shipment processing date and that AFMC's stock control use the DWA for recording retrograde times. So according to our review of the documentation, there are no longer any uses for the DAC and it can be discontinued.

THIS PAGE INTENTIONALLY LEFT BLANK

CHAPTER 3

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS
1. The 7WS accurately reports base level reparable generation (failure) data.
2. Failure data is accurately recorded on the base-level repair cycle record.
3. The DAC transmission process has improved by 12 percent.
4. 7WS data is more accurate, but the 7WS transmission process is not 100% reliable.
5. The transmission of 7WS images is more reliable than the transmission of DAC images. However, an automated process is needed to identify bases that do not successfully transmit 7WS images to AFMC each quarter, and to request retransmission of the 7WS file from identified bases.
6. Repair requirements are over and under estimated when DACs are used for requirements computation.
7. The Air Force needs a standard set of procedures for collecting, reporting and transferring contingency demand data.
8. The Air Force must record and report failures recorded as non-recurring for base leveling purposes, that are "recurring" failures for worldwide requirements.
9. DACs can be turned off.

RECOMMENDATIONS
1. Use 7WS images as the source for failure data for the D041 worldwide requirements computation. OPR: AFMC/LGI.
2. Develop an automated system to ensure 7WS images are received from all bases.   OPR: AFMC/LGI.
3. Task the AFLMA to analyze and recommend procedures for collecting, reporting and transferring contingency demand data. OPR: HQ USAF/ILS. OCR: AFLMA/LGS.
4. Task SSG to program SBSS to collect and report, via 7WS, recurring failures that are coded as non-recurring. OPR: HQ USAF/ILS. OCR: SSG.
5. When the 7WS process is completely implemented and AFMC's stock control is programmed to use the DWA as the source for the start date used to determine retrograde times, eliminate DAC reporting. OPR: SSG/ILS and AFMC/LGI.

DISTRIBUTION: Refer to attached Standard Form 298.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A

Business Rules to Identify "Recurring" Non-Recurring DACs

In order to exclude turn-in of SPRAM, time compliance technical order, and materiel deficiency report items, AFMC personnel should use the following business rules to extract from all non-recurring DACs just those failures that should be included in D041. These rules will eliminate non-recurring demands that should not be included in worldwide requirements computations.

> If a DAC image contains an "N" in card column 77 (supply demand code) **and** card column 30 (first position of document number) contains a "D" **or** card column 34 and 35 (shop code in document number) contain "TO" **or** card column 66 (condition code to) contains a "Q", then do not include information on this DAC in the worldwide requirements computation.

Business rules for SSG to capture non-recurring demands that should be reported via 7WS are as follows:

> For turn-ins with a type transaction phrase code equal to 2M, 2O, or 2U on the transaction history record (901 record)... if card column 24 (demand code) is equal to "N" **and** if card column 43 (first position of document number) is *__not equal__* to D **or** card columns 47 and 48 (shop code in document number) are *__not equal__* to "TO" **or** card column 196 is *__not equal__* to "Q" (supply condition code to) then add quantity listed in card column 89-94 (action quantity) to the appropriate bucket (RTS, NRTS, or COND) of the non-recurring demands field on the repair cycle record (102 record).