

SECTION 33. DEMAND HISTORY DAILY UPDATE PROCESS

33.1 General. The Demand History Daily Update Process processes all transactions that update demand data, order ship time (OST), and repair data on the Demand History File.

33.2 Interfaces. This process interfaces internally with the following files:

- a. Department of Defense Activity Address File (DODAAF). The process uses the `dss_alloc_cd` from this file.
- b. Manager Review File (MRF). This file contains transactions that fail process edits and are awaiting manager action.
- c. Catalog Master File (CMF). The process reads this file for the catalog unit of issue (UI).
- d. Unit of Issue Conversion Code Table. The process uses this table when a change in the UI necessitates a quantity changes.

33.3 Process Overview. The Demand History Table contains two years' demand history data by Routing Identifier Code (RIC), national item identification number (NIIN), and End Item Code (EIC). This process and the Demand History Monthly Update Process update the table. The daily process adds new demand data while the monthly process deletes old demand data.

a. The process adjusts the transaction quantity, based on the age of the document number date. It derives the aging factor mathematically.

(1) Document Identifier Code (DIC) BAH and BAH reversals for non-DSS recurring demands (Demand Code R or blank) update the `dmd_fcst` (demand forecast), `dmd_qty` (demand quantity), and `ndss_dmd_rt` (non-DSS recurring demand rate) fields. DIC BAH and BAH reversals for DSS recurring demands update only the `dss_dmd_rt` (DSS recurring demand rate) field. DIC BAHs add demand data and DIC BAH reversals subtract it.

(a) The process adds a value of one to `dmd_qty` when the date of the first demand (`dtefst_dmd`) is less than two years old.

(b) For DIC BAH reversals, it subtracts a value of one when the date of the first demand is less than two years old. This applies to non-DSS BAHs only.

(2) DIC BAHs and BAH reversals for nonrecurring demands (Demand Code not R or blank) update either the `dss_nr_dmd_rt` or `ndss_nr_dmd_rt` fields.

(3) DIC D6Ms update the `rep_rt` (repair rate) field when the transaction's Condition Code is A, B, or C; transactions with other Condition Codes update the `wash_rt` (washout rate) field.

b. The OST forecast (`ost_fcst`) and OST deviation (`ost_devi`) contain OST data averaged and weighted toward the most recent receipts.

(1) The process computes OST days of supply (DOS) using the number of days between the document number date on the DIC D4S, D6S, or D6K and the transaction's date received. It then compares this transactional OST to minimum and maximum allowable values and constrained values, if necessary, before averaging it into the ost_fcst.

(2) In addition, the process adds a value of one, up to a maximum of 99, to the ost_qty for each DIC D4S, D6S, and D6K processed.

c. The process updates the repair cycle time forecast (rct_fcst) and the repair cycle time deviation (rct_devi) the same way it updates ost_fcst and ost_devi, except that the update transaction is DIC D6M.

d. It also updates the date of first demand (dte_fst_dmd) and the date of last demand (dte_lst_dmd) based on the DON date of the demand or receipt transaction. When the DON date is earlier than the date of first demand, the DON date is moved into that field. When the DON date is after the date of the last demand, the DON date is moved into that field.

e. The process checks the UI on DIC BAH, BAH reversals, and D6Ms against the UI on the Demand History Record. DIC BAH and D6M transactions reject to the MRF when:

(1) A Demand Record exists and the transaction UI does not match the UI on the Demand History Record and cannot be converted using the conversion factor from either the CMF or the Unit of Issue Conversion Code Table.

(a) This causes writing of a DIC YSU to the MRF with Reason Referred Code T4.

(b) This also causes writing of the DIC BAH or D6M to the MRF, but with Reason Referred Code T7. You cannot process these transactions and remove them from the MRF until you have processed the DIC YSU to correct the UI on the Demand Record.

(2) A Demand Record does not exist and the transaction UI does not match the catalog UI and cannot be converted using the conversion factor from the Unit of Issue Conversion Code Table. This causes writing of the DIC BAH or D6M to the MRF with Reason Referred Code T4.

f. You must change the UI on the transaction to the UI on the catalog (if it can be determined) and adjust the quantity accordingly.

g. You must release the Demand History Daily Update Process on the SARSS Master Control System (SMCS) Process Configuration File. The Demand History Daily Update Process will not run if the Demand History Monthly Update Process is due to run or is running.

33.4 Input. Transactions sent to the Demand History Daily Update Process come from two sources: the Document History Daily Update Process and the BAH Demand Conversion Process.

a. The Document History Daily Update Process receives SARSS customer transactions with DICs A0_, AT_, AM_, AC_, and AE_. Images of these transactions go to the Demand History Daily Update Process as DIC BAH transactions. DIC AC_ and AE_ cancellations generate DIC BAH reversal transactions.

b. The Demand History Daily Update Process also receives receipt transactions with DIC D6S, D4S, D6K, and D6M. Images of these transactions also go to this process, but the DIC does not change. Transactions come from SARSS and nonconverted Direct Support Unit Standard Supply System (DS4) customers.

c. The BAH Demand Conversion Process is the second source of input to the Demand History Daily Update Process. DIC BAH transactions come from nonconverted DS4 customers. This data remains on the Demand History File until the activity converts to SARSS.

33.5 Type Processing. The Demand History Daily Update Process is a batch process.

33.6 Edits. The Demand History Daily Update Process edits input transactions against the following files:

a. Demand History File. The process edits the transaction UI against the UI on the existing Demand History Record. When the UIs do not match and cannot be converted, the process writes the transactions to the MRF with Reason Referred Code T7.

b. CMF. The process also edits the transaction UI against the catalog. The transaction UI must match the catalog UI. If the transaction UI does not match the catalog UI, the process checks the old UI. If this matches, the process corrects the quantities, based on the correct UI, using the UI conversion factor.

c. Unit of Issue Conversion Code Table. The process checks this file if the UI does not match the Catalog Record and cannot be converted. If this matches, the process corrects the quantities, using the UI conversion factor. If conversion is not possible, the process writes the transaction to the MRF with Reason Referred Code T4.

33.7 Processing. The Demand History File contains two years of demand data by RIC, NIIN, and EIC. The EIC may be blank if a DIC BAH is processing.

a. The first step after the editing is completed is to determine if there is a Demand History File Record that matches the transaction being processed by RIC-FR, EIC, and NIIN.

(1) If a match is found and the transaction DIC is BAH and the transaction UI and the Demand History File Record UI are the same, the process computes a new demand rate (adds the old demand rate from the Demand History File Record to the aging factor for one month [.08] and multiplies the sum by the transaction quantity).

(a) If the dmd_cd on the DIC BAH is R (recurring) and the BAH Multiple Use Code (multi_use_cd) is C (cancellation of the active quantity on Document History Header File) or P (partial cancellation of the active quantity on the Document History File) and the dss_aloc_cd from the DODAAF for the BAH RIC-FR is 3, 6, or 9, the process subtracts the transaction quantity from the Demand History File Record ndss_dmd_rt. If the dss_aloc_cd is other than 3, 6, or 9, the process subtracts the transaction quantity from the dss_dmd_rt.

(b) If the dmd_cd is R and the Multiple Use Code (multi_use_cd) is not C or P and the dss_aloc_cd is 3, 6, or 9, the process adds the transaction quantity to the ndss_dmd_rt. If the dss_aloc_cd is other than 3, 6, or 9, the process adds the transaction quantity to the dss_dmd_rt.

(c) If the dmd_cd is not R, the process updates the ndss_nr_dmd_rt.

b. If the transaction matches the Demand History File but the DIC is D6M, the process determines the transaction OST (txn_ost) by subtracting the document number date from the system date. If there is not an rct_fcst (repair cycle time forecast) posted to the Demand History File Record, the process enters the txn_ost in the rct_fcst field. If there is an rct_fcst posted to the Demand History File Record, the process computes a minimum and maximum txn_ost and moves the maximum OST to the txn_ost field if the txn_ost is greater. If the txn_ost is less than the maximum txn_ost, the process moves the minimum OST to the txn_ost if it is larger than the txn_ost. The process updates the ost_fcst and the ost_devi fields.

c. If the transaction DIC is other than BAH or D6M, the process updates the txn_ost, and if the Demand History ost_fcst is blank or zero, the process enters the txn_ost in this field. Otherwise, the process updates the ost_fcst, txn_var, and ost_devi.

d. If a Demand History File Record that does not match the transaction and the transaction DIC is BAH and the multi_use_cd is C or P, the process takes no further action to process the transaction. If the multi_use_cd is not C or P, the process builds a skeleton Demand History File Record with the document date entered in the dte_fst_dmd and dte_1st_dmd fields. The process looks at the CMF for a record that matches the transaction NIIN. If it cannot find a CMF Record that matches the transaction NIIN, the process writes the transaction to the MRF with Reason Referred Code TC. If it finds a CMF Record that matches the transaction NIIN, the process continues.

e. If the transaction DIC is BAH or D6M and the transaction NIIN matches a CMF Record and the transaction UI and the CMF Record UI are the same or not the same, the process compares the transaction UI to the old UI on the CMF Record and attempts to resolve the UI discrepancy. If the process cannot determine the correct UI, it writes the transaction to the MRF with Reason Referred Code T4. If the process can determine the correct UI, it computes a new demand rate and continues processing the transaction the same way as it would for a transaction matching the Demand History File.

33.8 Formulas. The process uses a number of formulas to update demand data.

a. Exponential smoothing applies an average to demand data to weight the most recent demands most heavily. This reduces the space required to store the data and damps extreme oscillations in demand. The daily and the monthly processes work together with complementary formulas to maintain two years' demand data.

(1) The daily process totals the demand data each day during the month and the monthly process removes data over two years old.

(2) Instead of maintaining demand data for each month in the two-year period to be averaged when required, SARSS computes the average with each new demand.

b. The aging factor ensures that recent demands count more heavily than older ones. The document number on the DIC BAH or D6M provides the date of the transaction. Processing multiplies the transaction quantity, from the current month, by .0869. For subsequent months, this factor drops by 8 percent per month.

<u>Age of Transaction in Months</u>	<u>Aging Factor</u>
current month	.0869
1	.0800
2	.0736
3	.0677
4	.0623
5	.0573
6	.0527
7	.0485
8	.0446
9	.0411
10	.0378
11	.0348
12	.0320
13	.0294
14	.0271
15	.0249
16	.0229
17	.0211
18	.0194
19	.0178
20	.0164
21	.0151
22	.0139
23	.0128
24	.0118

(1) The process adds the transaction quantity, modified by the aging factor, to the applicable value on the Demand History File.

(2) It computes the DSS recurring demand rate, non-DSS recurring demand rate, demand forecast, DSS nonrecurring demand rate, non-DSS nonrecurring demand rate, repair rate, and washout rate as shown in the following examples.

Formula:

$$NR = OR + AF \times TQ$$

$$NR = OR - AF \times TQ \text{ (for reversals)}$$

Where:

NR = new rate
OR = old rate
AF = aging factor
TQ = transaction quantity

Example:

OR = 7 (from demand history)
AF = .08 (factor for age of one month)
TQ = 10 (from BAH)

Demand

$NR = 7 + .08 \times 10$
 $NR = 7 + .8$
 $NR = 7.8$

Demand reversal

$NR = 7 - .08 \times 10$
 $NR = 7 - .8$
 $NR = 6.2$

c. OST formulas apply to the update of OST (ost_fcst) and RCT (rct_fcst), using a smoothing technique similar to the demand rate update. OST or RCT smoothing depends only on the occurrence of the transaction without considering the passage of time. Smoothing works the same way for both OST and RCT; the difference is that the RCT transaction is a DIC D6M updating the rct_fcst and rct_devi fields. OST and RCT data are always recorded on the demand record with a blank EIC. Only non-backordered receipts update OST.

(1) The computation subtracts the DON date (on the DIC D4S, D6S, or D6K) from the date received to get the transaction OST (txn_ost).

(2) The computation derives minimum and maximum acceptable values by adding (or subtracting) the old OST deviation and the old forecast OST. Constraining values exceeding the maximum and minimum lessens the effect of an abnormally high or low OST.

(3) The formula merges the transaction OST (after constraining, if applicable) into ost_fcst and ost_devi. Smoothing factors base this on the last six receipts.

Example:

Step 1. Compute txn_ost and txn_devi
 $txn_ost = dte_rec - don_dte$
 $txn_ost = 3180 - 3155$
 $txn_ost = 25$
 $txn_devi = txn_ost - ost_fcst$
 $txn_devi = 25 - 20$
 $txn_devi = 5$

Where: dte_rec = date received on D4_ or D6_

don_dte = document number date on D4_ or D6_
ost_fcst from demand history

Step 2. Compute maximum and minimum OST
 $\text{max_ost} = \text{ost_fcst} + 2.5 \times \text{ost_devi}$
 $\text{max_ost} = 20 + 2.5 \times 4$
 $\text{max_ost} = 20 + 10$
 $\text{max_ost} = 30$
 $\text{min_ost} = \text{ost_fcst} - 2.5 \times \text{ost_devi}$
 $\text{min_ost} = 20 - 2.5 \times 4$
 $\text{min_ost} = 20 - 10$
 $\text{min_ost} = 10$

Where: ost_fcst = ost_fcst from demand history
 ost_devi = ost_devi from demand history

Step 3. Constrain txn_ost, if necessary. The txn_ost in this example does not require constraining because 25 is between the minimum of 10 and the maximum of 30.

Step 4. Update ost_fcst and ost_devi
 $\text{ost_fcst} = .2857 \times \text{txn_ost} + .7143 \times \text{ost_fcst}$
 $\text{ost_fcst} = .2857 \times 25 + .7143 \times 4$
 $\text{ost_fcst} = 21.4$
 $\text{ost_devi} = .5 \times \text{txn_devi} + .5 \times \text{ost_devi}$
 $\text{ost_devi} = .5 \times 5 + .5 \times 4$
 $\text{ost_devi} = 4.5$

33.9 Output. Output from this process consists of the following:

- a. A DIC CPC to the Demand Catalog Update Process as a result of a transaction being rejected to the MRF with Reason Referred Code T7.
- b. A DIC YSU to the MRF with Reason Referred Code T4 when the process cannot determine the correct UI for the transaction NIIN.
- c. A transaction to the MRF with Reason Referred Code TC when the process cannot find a CMF Record.

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