Audit Report

OFFICE OF THE INSPECTOR GENERAL

**DEFENSE LOGISTICS AGENCY
VALIDATION OF THE 1995 DEFENSE BASE REALIGNMENT
AND CLOSURE DATA USED IN THE STRATEGIC ANALYSIS FOR
INTEGRATED LOGISTICS SYSTEMS MODEL**

Report No. 95-169

April 11, 1995

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Department of Defense

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Acronyms

DLA	Defense Logistics Agency
SAILS	Strategic Analysis for Integrated Logistics Systems
UPS	United Parcel Service

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-2884

Report No. 95-169

April 11, 1995

MEMORANDUM FOR DIRECTOR, DEFENSE LOGISTICS AGENCY

SUBJECT: Audit Report on Defense Logistics Agency Validation of the 1995 Defense Base Realignment and Closure Data Used in the Strategic Analysis for Integrated Logistics Systems Model (Project No. 4CG-5015.50)

Introduction

We are providing this audit report for your information and use. This report is one in a series of reports discussing the review of the process that the Defense Logistics Agency (DLA), Alexandria, Virginia, used to collect data to support recommendations to the Secretary of Defense for the 1995 Commission on Defense Base Closure and Realignment. This report focuses on the accuracy of data used in the Strategic Analysis for Integrated Logistics Systems (SAILS) model.

Audit Results

The DLA collected cost, capacity, and demand history data in an unbiased and impartial manner. The model will be used to support the DLA 1995 Defense base realignment and closure recommendations. Certain cost and capacity calculations contained errors that were entered into the SAILS model. The errors were subsequently corrected. The Quantitative Methods Division, Audit Planning and Technical Support Directorate, Office of the Assistant Inspector General for Auditing, DoD, determined that the SAILS model properly calculated the minimum system operating cost under a specific Defense distribution depot configuration.

Objectives

The overall audit objectives were to validate the DLA 1995 Defense base realignment and closure data collection process and the data that DLA provides to support recommendations for the 1995 Commission. The specific objectives for the audit were to validate Defense distribution depot cost, capacity, and demand history data used in the SAILS model as a part of the DLA 1995 Defense base realignment and closure process. In addition, the Quantitative Methods Division reviewed the application of the SAILS model.

Scope and Methodology

Cost, Capacity, and Demand History Verification. We verified the accuracy of the following data and the input of the data into the SAILS model:

- inbound and outbound transportation costs,
- fixed and variable costs,
- throughput capacity, and
- demand history.

Audit Standards and Locations. This program audit was conducted during January 1995 in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. Accordingly, we evaluated internal controls that would ensure an unbiased and impartial use of the DLA data elements. The Quantitative Methods Division, Audit Planning and Technical Support Directorate, reviewed the application of the SAILS model. The audit did not rely on statistical sampling procedures. The computer processed demand history data was certified as reliable by DLA, and other data input to the SAILS model was determined to be reliable. See Enclosure 2 for the organizations visited or contacted.

Internal Controls

We evaluated DLA internal controls for preparing and documenting information associated with the DLA 1995 Defense base realignment and closure data call. Specifically, we reviewed procedures that DLA used to collect and analyze transportation costs, fixed and variable costs, throughput capacity, and demand history data used in the SAILS model. Internal controls were adequate as they applied to the audit objectives. We did not review the DLA implementation of the DoD Internal Management Control Program because its provisions were not deemed applicable to the one-time data analysis process.

Discussion

DLA determined that Defense distribution depot operating costs can be measured by analyzing transportation costs, infrastructure costs (fixed and variable costs), the maximum utilization of the Defense distribution depot (throughput capacity), and the number of material release orders processed at a Defense distribution depot (demand history). DLA implemented the SAILS model to incorporate this data into the computation of the minimum system operating costs under a specific Defense distribution depot configuration.

Data Elements Included in the SAILS Model

Inbound and Outbound Transportation Costs. Inbound transportation costs are the costs incurred for shipments from the manufacturer or supplier to the DLA Defense distribution depots. Outbound transportation costs are the costs incurred for shipments from the DLA Defense distribution depot to the DoD customer.

Rates of Transportation Costs. Transportation costs are composed of three separate rates:

- United Parcel Service (UPS) rates,
- "Yellow 500" (standardized commercial rates) class rate tariffs, and
- Guaranteed traffic rates (rates negotiated by the Military Traffic Management Command).

UPS rates are used for both inbound and outbound transportation costs involving small shipments. Yellow 500 rates are used for inbound transportation costs involving large shipments while guaranteed traffic rates are used for outbound transportation costs involving large shipments.

Verification of Inbound and Outbound Transportation Costs. The SAILS model contains average Yellow 500 tariff rates for inbound transportation costs and negotiated guaranteed traffic rates for outbound transportation costs. The model also contains published UPS rates for both inbound and outbound transportation costs. The SAILS model contractor obtained Yellow 500 tariff rates and input the rates into the model using a contractor-unique coding system (source codes). The SAILS model contractor has the proprietary right to the source codes for the model. Therefore, we could not verify the Yellow 500 tariff rates. However, the SAILS model contractor certified the accuracy of the Yellow 500 tariff rates for inbound transportation costs. We selectively verified the accuracy of UPS and guaranteed traffic rates from source documents to the SAILS model. We concluded that DLA accurately recorded and input the UPS and guaranteed traffic rates into the SAILS model.

Fixed and Variable Costs. Fixed costs are costs that do not vary with Defense distribution depot workload fluctuations over the term of one year while variable costs do vary with Defense distribution depot workload fluctuations. DLA utilized fixed and variable costs for inclusion in the SAILS model for only the stand-alone Defense distribution depots (depots that are not collocated with maintenance activities). DLA excluded direct labor costs for the calculation of fixed and variable costs.

Verification of Fixed and Variable Costs. An independent contractor compiled fixed and variable costs based upon DLA-furnished data as of September 30, 1994. DLA certified the accuracy of fixed and variable costs.

Review of Input of Fixed and Variable Costs. We reviewed the input of fixed and variable costs into the SAILS model. Table 1 summarizes errors in calculating the unit variable costs for five of the six stand-alone Defense distribution depots:

Table 1. Computation of Unit Variable Costs

Defense Distribution Depot	Correct Unit Cost	Unit Cost Input in Model	Difference
Susquehanna	$0.23	$0.24	$(.01)
Richmond	0.84	0.75	.09
Memphis	1.06	1.07	(.01)
Ogden	1.75	1.11	.64
San Joaquin	0.76	0.75	.01

In addition, the input of fixed and variable cost data for three of the six Defense distribution depots contained minor errors. DLA corrected all the errors and entered the corrected data into the SAILS model. These errors could have impacted the relative operating costs of the DLA Defense distribution depots. For example, the Defense Distribution Depot Ogden, Utah, variable costs would have been understated by $274,000. Because DLA corrected the errors, we made no recommendation.

Throughput Capacity. The DLA used throughput capacity in the SAILS model to measure the total amount of inventory that can be processed (received and shipped) from the stand-alone Defense distribution depots to the customers in a given time period.

Inventory Storage. Defense distribution depots store inventory in a bin or in bulk. Bin throughput was measured by the application of the average weight of the material release orders issued. Bulk throughput was measured by multiplying the total attainable space with the inventory turnover ratio.

Verification of Throughput Capacity. We verified that the total cubic feet of bulk storage was supportable to the data gathered by DLA. We also verified that average weight, customer demand, and volume weight factors were consistently applied for bulk throughput capacity. The DLA inputs the excess throughput capacity of the 17 collocated Defense distribution depots into the SAILS model. Table 2 summarizes errors in calculating the excess covered bulk throughput capacity at 3 of the 17 collocated Defense distribution depots.

Table 2. Computation of Throughput Capacity Data

Defense Distribution Depot	Incorrect Capacity (cubic feet)	Corrected Capacity (cubic feet)	Difference (cubic feet)
San Antonio	(94,600)	408,951	503,551
Corpus Christi	992,358	15,398	(976,960)
Albany	(207,886)	265,522	473,408

In addition, the input of throughput capacity into the SAILS model contained minor errors. DLA corrected all the errors and entered the correct data into the SAILS model. These errors could have impacted the relative operating costs of the Defense distribution depots. Because DLA corrected the errors, we made no recommendation.

Demand History. Demand history summarizes, by weight and size, the total material release orders processed at all DLA Defense distribution depots. Material release order data are contained in the DLA Integrated Data Bank for each inventory control point.

Use of Demand History. Demand history data are used to determine:

- average weight of each material release order,
- inventory turnover,
- system density (the ratio of the weight of depot-stored items to the cubic feet of storage space), and
- the ratio of the total variable costs to the total weight of the bulk inventory.

Verification of Demand History. DLA directly entered demand history data from the Integrated Data Bank automated file to the SAILS model. Because of the volume of data that were input between the automated Integrated Data Bank and the SAILS model, we could not verify the accuracy of the demand history data. We concluded that the demand history data must be certified to ensure that accurate data were input from the Integrated Data Bank to the SAILS model. On January 4, 1995, DLA issued a memorandum to the appropriate Defense organizations to certify the demand history data that were input to the SAILS model (Enclosure 1). DLA certified the demand history data between January 30 and February 27, 1995. DLA also certified the accuracy of the demand history data input into the SAILS model. Because DLA properly certified demand history data, we made no recommendation.

Review of the SAILS Model

The SAILS Model. The SAILS model is a commercial software package used in modeling real-world multicommodity distribution networks. The model has been used by various Fortune 100 companies and Government organizations with applications to various distribution-related problems. The SAILS model was used by DLA to calculate the minimum system operating cost for the Defense distribution depots under the specific configuration being evaluated.

Review of the SAILS Model Application. The Quantitative Methods Division determined that the SAILS model properly calculated the minimum system operating cost under a specific Defense distribution depot configuration. The Quantitative Methods Division confirmed that DLA developed the in-house capability for using the SAILS model for the 1995 base closure process. Therefore, the Quantitative Methods Division made no recommendation.

Recommendations and Management Comments

We provided a draft of this report to the Defense Logistics Agency on February 13, 1995. Because this report contained no recommendations, written comments were not required, and none were received.

The cooperation and courtesies extended to the audit staff are appreciated. If you have questions on this report, please contact Mr. Wayne K. Million, Audit Program Director, at (703) 604-9312 (DSN 664-9312), or Mr. Nicholas E. Como, Audit Project Manager, at (703) 604-9303 (DSN 664-9303).

David K. Steensma

David K. Steensma
Deputy Assistant Inspector General
for Auditing

Enclosures

Defense Logistics Agency Data Certification Request

DEFENSE LOGISTICS AGENCY
HEADQUARTERS
CAMERON STATION
ALEXANDRIA, VIRGINIA 22304-6100

S: 1 Feb 95

REPLY REFER TO CAAJ(BRAC) 4 JAN 1995

Subject: Requirement for Certification of Data Used in the Strategic Analysis of Integrated Logistics Sytems (SAILS) Model

To: SEE DISTRIBUTION

1. The BRAC 95 policies and procedures require that all data used in the analysis and decision-making be certified as accurate and complete to the best of your knowledge and belief. The SAILS model has been approved by the HQ DLA BRAC Executive Group as one of the key evaluation tools for BRAC 95. Since this model uses a variety of data from numerous sources, it would not be prudent to ask a single individual to certify all of the data. Therefore, the commander of each DLA activity is responsible for certifying his/her respective portion of the data as follows:

a. SAMMS Files:

The Open Requisition History File (USDTORQH)
The Purged Requisition History File (USDTPRQH)
SAMMS Combined Address File (USDMSCAF)
Month End Asset File (USDTMEAF)
Supply Control File (USRMSCF)
Monthly Transaction History File (USFTMTRH)
Active Contract File (USPMACF)
Technical Contract History File (USPTCHF)

Points of Contact for the SAMMS Files Data:
DCSC (John Seitz)
DESC (Ken Barnett)
DGSC (Meggan McCarter)
DISC (Warren Peterson)
DPSC (C&T and Medical) (Jim Schnaitman)

b. MOWASP Central Data Bank File (YBA.YBDB03BV) - HQ DLA (MMDOI)
Stege Soission

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SUBJECT: Requirement for Certification of Data Used in SAILS Model

c. Depot Locator Files (UWR.UWMU990B)

Points of Contact :
Tracy/Sharpe (DDRW) (Larry Brink)
Richmond (DDRV) (John Keevin)
New Cumberland (Amy Kunkle)
Mechanicsburg (Deb Galloway)
Columbus (DDCO) (Ron Amidan)
Memphis (DDMT) (Ron Amidan)
Ogden (DDOU) (Ron Amidan)

2. Your letter of certification should include a copy of the data, as noted above, for the period April 1993 through March 1994, and the statement "I certify that the information contained herein is accurate and complete to the best of my knowledge and belief." Your response is needed no later than 1 February 1995 and should be directed to the following address:

Headquarters Defense Logistics Agency
ATTN: CAAJ(BRAC) - Ms. McGlaughlin
Cameron Station
Alexandria, Virginia 22304-6100

3. Questions or comments regarding this request may be directed to Ms. Nancy McGlaughlin, CAAJ(BRAC), DSN: 284-7147.

M. V. McManamay
Team Chief
DLA BRAC

ENCLOSURE 1
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DDRE New Cumberland (Amy Kunkle)
DDRE Mechanicsburg (Deb Galloway)
DDOU (Ron Amidan)

ENCLOSURE 1
(Page 3 of 3)

Organizations Visited or Contacted

Defense Organizations

Defense Logistics Agency, Alexandria, VA
Operations Research Office, Richmond, VA
Operations Support Office, Richmond, VA

ENCLOSURE 2

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