PLANNING AND CONDUCTING MANAGEMENT STUDIES

JUNE 2000

FOREWORD

This Standard Operating Procedure (SOP) outlines policies, responsibilities, and procedures to be used in planning and conducting management studies. It is not all-inclusive, but provides basic guidance to be used when conducting management engineering studies to develop manpower staffing standards. The steps and techniques presented can be used for any workyear determination effort.

This SOP is effective immediately and is applicable to the Studies and Requirements Division (DFAS-DE/CI) and all organizations at the Denver Center or its Operating Locations (OPLOC) who are the subject of a DFAS-DE/CI management study.

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ABBREVIATIONS AND/OR ACRONYMS

ABC   Activity Based Costing
DFAS-DE   Defense Finance and Accounting Service - Denver Center
DFAS-HQ   Defense Finance and Accounting Service - Headquarters
IAF   Indirect Allowance Factor
MAF   Manpower Availability Factor
MOA   Memorandum of Agreement
MOU   Memorandum of Understanding
OPLOC   Operating Location
OPR   Office of Primary Responsibility
PAT   Per Accomplishment Time
POC   Point of Contact
PWLF   Potential Workload Factor
RADSS   Resource Analysis Decision Support System
SMA   Subject Matter Area
TDY   Temporary Duty
WLF   Workload Factor

C1.   CHAPTER 1

GENERAL INFORMATION

C1.1.   **PURPOSE.**   This SOP outlines policy, responsibilities, and procedures for planning and conducting management studies performed by the Studies and Requirements Division, Directorate of Resource Management, Denver Center (DFAS-DE/CI). Management studies are performed for organizations within the Denver Center and its OPLOCs.

C1.2.   **APPLICABILITY AND SCOPE**.   This SOP applies to all DFAS-DE/CI analysts and their customers. A customer is defined as any organization or function within DFAS-DE or its OPLOCs for whom the DFAS-DE/CI staff performs a management study.

C1.3.   **POLICY.**

C1.3.1.   All management studies done by DFAS-DE/CI analysts for workyear determination (staffing standards) will follow the standard methodology presented in this SOP.

C1.3.2.   Techniques presented in this SOP will be adapted as necessary to perform related workyear determination efforts (Activity Based Costing (ABC), A-76, Benchmarking).

C1.4.   **RESPONSIBILITIES.**

C1.4.1.   Director of Resource Management, Denver Center. Approves study charter, milestones, study plans, and final report.

C1.4.2.   Director of Organization Being Studied.

C1.4.2.1.   Concurs/nonconcurs with study charter, milestones, and study plans.

C1.4.2.2.   Concurs/non-concurs on process descriptions, frequencies, and associated times; concurs/non-concurs on any required changes prior to the change being made.

C1.4.2.3.   Concurs/non-concurs on final report.

C1.4.2.4.   Implements the recommendations of the study. If recommendations are not implemented, provides justification/ rationale for non-implementation.

C1.4.3. DFAS-DE/CI Team Leader.

C1.4.3.1. Prepares all study documents to include study charter, milestones, final report, and other documents as required.

C1.4.3.2. Prepares necessary briefing material and presents required briefings.

C1.4.3.3. Trains team members as necessary.

C1.4.3.4. Assigns work to team members.

C1.4.3.5. Ensures all raw data collected undergoes analysis.

C1.4.3.6. Obtains functional coordination on process identification and measurement.

C1.4.4. DFAS-DE/CI Team Members. Assist team leader by facilitating workshops, identifying process improvements, and performing other assigned work.

C1.4.5. Functional Experts of Organization Under Study.

C1.4.5.1. Participate in workshops held for process identification and measurement.

C1.4.5.2. Provide suggestions for improvement.

C1.4.5.3. Review process descriptions, frequencies, and associated times to ensure accuracy.

C2.   CHAPTER 2

GENERAL PROCEDURES FOR CONDUCTING A MANAGEMENT STUDY

C2.1.   **PHASES OF A STUDY**. All management studies, regardless of purpose, consist of five basic phases. Each phase requires specific actions and results in standard products and deliverables. Each phase is addressed in detail later in this SOP. The phases are:

C2.1.1.   Study planning.

C2.1.2.   Study familiarization.

C2.1.3.   Data collection/measurement.

C2.1.4.   Data analysis.

C2.1.5.   Final reporting.

C2.2.   **PHASE ONE - STUDY PLANNING**. Requests for studies may come from DFAS-HQ, the Director of the Denver Center, the Director of Resource Management, an OPLOC Director, or the Director of an organization within DFAS-DE. Regardless of where the request originates, the analyst(s) who will perform the study will receive the tasking from the Division Chief, DFAS-DE/CI. When you receive a tasking for a study, take the following actions. (**NOTE TO DIRECTORS**: To request a study in your organization, send a letter to DFAS-DE/C.)

C2.2.1. Review the Tasking. Be sure you know exactly what you are to do. Make sure you understand:

C2.2.1.1. Why You Are Doing the Study (the Objective). Studies are done for a variety of reasons. You may be asked to do a study because of a change in procedures in a particular function, making it necessary to assess the workyear impact. Sometimes studies are done to prepare for a realignment or budget cut. You may be asked to address a specific problem and find a solution. The objective of the study affects how it will be done, resources required, time required, travel costs, etc.

C2.2.1.2. Who or What Will Be Studied (the Scope). Determine if you need to look at the overall structure of all Denver Center OPLOCs, a particular function of a single OPLOC, a Directorate within the Denver Center, or some other combination.

C2.2.1.3. When the Study Must Be Done (the Timeline).
Sometimes studies are done to provide a planning tool for
another major project such as a realignment, or equipment
purchase. In situations of this type, timing is crucial, and
study planning must take this into account.

C2.2.1.4. Where the Study Will Be Done. Some studies require
Temporary Duty (TDY) to an OPLOC, several OPLOCs, another DFAS
Center, or some other location. Other studies can be completed
at DFAS-DE.

C2.2.2. Determine Feasibility Based on Resource Requirements,
i.e., Cost, Number of Workyears Required, Etc. After you review
the tasking as described above, determine if the study is
feasible. Estimate the cost of the study, paying particular
attention to TDY requirements. Estimate the number of
DFAS-DE/CI resources required to perform the study. Determine
if the study can be done in the length of time allotted,
particularly if the study is being done as a planning tool for
another major project. In effect, you are doing an informal
cost/benefit analysis. The information you gather will assist
management in determining if the expected benefits to be derived
from the study justify the cost. Brief your findings to
DFAS-DE/C management.

C2.2.3. Prepare a Study Charter. After you receive approval to
proceed with the study from the DFAS-DE/C Director, prepare a
study charter. The charter is used to formally notify the
appropriate office(s) of primary responsibility (OPR) of intent.
It documents agreement between DFAS-DE/C and the organization(s)
being studied on what is to be done, how, when, by whom, etc.
Coordinate the charter with the Director(s) of the
organization(s) under study. When agreement has been reached,
the Director of the organization under study and the Director of
DFAS-DE/C will sign the study charter. (**NOTE**: If agreement
cannot be reached between the team leader and the Director of
the organization under study, elevate the issue to DFAS-DE/C
management for resolution.) The study charter will contain the
following sections.

         - Objectives
         - Scope
         - Statement of the situation
         - Background
         - Assumptions
         - Project methodology
         - Team composition

- Responsibilities
- Milestones and time line

C2.2.4. Identify Functional Point of Contact (POC). When you begin data collection, you will need one POC to serve as a liaison between you and the organization being studied. This person will assist in scheduling workshops and briefings, will identify subject matter experts for specific processes, will assist in providing resources such as meeting rooms and computers, and will provide other assistance of this type. If the organization to be studied does not assign a single POC, request one.

C2.3. **PHASE TWO - STUDY FAMILIARIZATION**. During this phase, you will research background material. Once you receive approval to proceed with the study, learn as much about the organization to be studied as possible. Good sources of information are pertinent directives, mission statements, Memorandums of Agreement (MOA)/Memorandums of Understanding (MOU), and previous studies. Review personnel data, organizational charts, overtime, backlogs, workload factors, and work units.

C2.4. **PHASE THREE - DATA COLLECTION AND MEASUREMENT**. This is generally the most time consuming and costly part of the study. It is imperative that enough time be spent on data collection to provide a reliable product. The value and credibility of the entire study is dependent upon the accuracy of data collection. Generally, data collection consists almost entirely of on-site visits at the organization being studied. The on-site visit consists of four parts - preparation, in-briefing, conducting the data collection workshops, and out-briefing. The final task in data collection is obtaining initial concurrence from the study location that data was accurately captured.

C.2.4.1. Preparation for the On-Site Visit.

C.2.4.1.1. Be sure you reach agreement with the organization being studied on when the on-site visit(s) will begin. Be as sensitive as possible to the customer's scheduling concerns while staying within the constraints imposed by your study schedule.

C.2.4.1.2. If the on-site visit requires TDY, arrange for travel orders, hotel reservations, car rental, etc.

C.2.4.1.3. Obtain necessary supplies. Be sure you have a large supply of 3.5" computer disks and a hand-held calculator for each member of the team.

C.2.4.1.4. Prepare at least one master copy of the Excel spreadsheet you will use for data collection for each member of the team. More information on the spreadsheet is provided in Chapter 3.

C.2.4.1.5. Prepare materials for in-brief (discussed below).

C.2.4.2. In-Brief. You will probably be required to do two in-briefs, one for the Director, Deputy, and management staff, and a second for employees. It is the Director's decision on whether you will brief the workers, but you must be prepared to provide separate briefings for management and employees. The following information should be covered in the in-brief; notice this is the same information you included in the Charter.

- Objectives
- Scope
- Statement of the situation
- Background
- Assumptions
- Project methodology
- Team composition
- Responsibilities
- Milestones and time line

C.2.4.3. Conducting Data Collection Workshops. The purpose of data collection workshops is to develop a process oriented description of the work performed in the organization being studied. Workshops are a joint effort between functionals and study analysts. A standard Excel spreadsheet for collecting data is used in the workshops. See Chapter 3 for a sample and explanation of the worksheet.

C.2.4.4. Out-Brief. When your on-site visit is complete, you will need to out-brief the Director. Generally, this is a very short courtesy visit. Express gratitude for hospitality shown, and explain what will happen next in the study. Answer any questions he or she may have.

C.2.4.5. Initial Coordination. After you complete data collection workshops, allow the study location to make a "first pass review" of the data collected. Obtain written concurrence that your initial data collection is accurate. Ask them to

verify that all processes were captured, all tasks within the processes were documented, and work-counts, frequency, and time appear to be accurate. Be sure they understand this is raw data and may require adjustment after data analysis. Assure them they will have another chance to review and coordinate after data analysis is complete.

C.2.4.6. Measurement. Measurement, which consists of processing the data collected in the workshops, is the first step in determining staffing requirements. Chapter 3 provides instructions for doing necessary calculations.

C2.5. **PHASE FOUR - DATA ANALYSIS**. The data analysis phase continues the work begun during measurement. During this phase, data collected is validated through intense analysis, and staffing requirements are established. Chapter 4 provides instructions for the necessary analysis.

C2.6. **PHASE FIVE - FINAL REPORTING**. This phase consists of three actions:

C2.6.1. Write the final report.

C2.6.2. Submit the report to study locations to obtain final concurrence. Final report includes new staffing standards and requirements. **(NOTE**: If agreement cannot be reached between the team leader and the Director of the organization under study, elevate the issue to DFAS-DE/C management for resolution.)

C2.6.3. Forward the report through the Director of Resource Management to the Center Director for approval. After you obtain the Center Director's approval, send the report to the study location for implementation. File a copy of the final report and all other documents created during the course of the study in the office files.

C3. CHAPTER 3

MEASUREMENT - USE OF SPREADSHEET

C3.1. **STANDARD SPREADSHEET**. A standard Excel spreadsheet is used to collect the data used for measurement. See Figure 3-2. The spreadsheet consists of 6 columns labeled Process, Count, Frequency, Conversion Code, Per Accomplishment Time (PAT), and Monthly Hours.

C3.1.1. Process Column. The process column is used to identify the process and list all tasks associated with the process.

C3.1.2. Count Column. The average number of times the task is performed during a given time period. All counts will be based on a year's data, if available. If a full year is not available, use a minimum of 6 months.

C3.1.3. Frequency Column. The time period over which the task is performed - day, month, week, quarter, or year. For example, a task may be done 2 times (count) a day (frequency; 5 times (count) a month (frequency) etc.

C3.1.4. Conversion Code Column. The conversion code converts all hours to monthly. For example, if a task is performed once a year, the count is 1, the frequency is year, and the conversion code is 0.08333 (1/12 = 0.08333). If a task is performed five times a day, the count is 5, the frequency is daily, and the conversion code is 20.91.

Codes

Frequency	Code
Daily	20.91
Monthly	1.000
Weekly	4.348
Quarterly	.3333
Yearly	.08333

C3.1.5. PAT Column. The average time (in minutes) it takes a trained person to perform the task **one time.** Do not base the time on the best performer or the worst, but use an average between the two.

C3.1.6. Monthly Hours. The number of hours per month required to perform the task. All times must be converted to monthly

hours which is done automatically by the spreadsheet using the calculations above (Count X Conversion Code X Time/60 = Monthly Hours).

C3.2. **PROCESSING DATA COLLECTED TO DETERMINE STAFFING REQUIREMENTS.** When all processes have been captured on the spreadsheet, you are ready to process the data to make initial projections for required workyears. Remember, these are initial projections and may change after data analysis is complete.

C3.3. **HOW TO DETERMINE WORKYEARS REQUIRED**. Workyears required are determined by dividing the monthly hours measured by the manpower availability factor (MAF). The MAF is currently 147. The MAF is explained fully in paragraph C3.4 below.

   Example: To determine the number of workyears if 2000 monthly hours measured:

   2000/147 = 13.610 workyears.

   NOTE: Hours measured include direct and indirect. Paragraph C3.6 below explains how to apply the indirect allowance factor (IAF).

C3.4. **EXPLANATION OF MANPOWER AVAILABILITY FACTOR (MAF)**. The MAF is used to compensate for time spent doing something other than the primary mission of the workcenter. A total workyear is comprised of both available and non-available hours. Both available and non-available hours are considered productive time, but only available hours are spent performing the mission of the workcenter. Non-available hours are spent away from the workcenter on activities such as annual leave, sick leave, directors call, additional duties, etc. The MAF, which applies to both civilian and military workyears, is the difference between hours assigned and hours spent on something other than the mission of the work center. The calculation is shown below.

167.00 Number of hours an individual is assigned per month
-20.00 Number of non-available hours per month
147.00 MAF

C3.5. **DIRECT AND INDIRECT WORKLOAD**. Direct workload is work supporting the mission of the workcenter. Indirect workload is work that must be done in the workcenter, but the work does not directly support the mission. Supervision, administration, training, meetings, supply, and clean-up are examples of indirect work. Only direct workload is measured.

(**Note:** Indirect workload should not be confused with non-available hours.)

C3.6. **INDIRECT ALLOWANCE FACTOR (IAF)**. To compensate for indirect workload, an Indirect Allowance Factor (IAF) is applied to the total direct hours measured. The IAF for accounting and finance operations is 19.3%. The example below shows how to apply the IAF to calculate total monthly hours, assuming 100 total direct hours were measured.

Step 1. Multiply 100 X 19.3% (100 X .193 = 19.30)
Step 2. Add the result to measured hours (100 + 19.30 = 119.30 total monthly hours)

C3.7. **ADDITIVES, EXCLUSIONS, AND DEVIATIONS**. Only similar work is included in standard development for all locations under study. Work unique to one or several locations is treated as an additive, exclusion, or deviation to the standard, and only credited to that location.

C3.8. **POTENTIAL WORKLOAD FACTOR (PWLF) SELECTION**. Before manpower standards can be developed, you must select the workload factor that will be used.

C3.8.1. Explanation of Workload Factor. In very simple terms, the workload factor is the basic unit of work performed by a business area. For example, in a restaurant, the workload factor would probably be the number of meals served. Even though there is other work performed in the restaurant (cooking, washing dishes), the amount of work required is dependent on the number of meals served. Demand for staffing (waiters, cooks, dishwashers) will go up or down depending on the number of meals served.

C3.8.2. Selecting a Potential Workload Factor. Identify what input best correlates with the workload performed. Then perform Correlation and Regression Analysis (instructions in Chapter 4) to find the best fit. Figure 3-1 below shows potential WLFs for accounting areas. (**NOTE:** These are examples only and not intended to be all-inclusive.)

Subject Matter Area (SMA)	WLF
Acquisition Section	CPAS Direct Disbursement Transactions
Business Funds Section	Total GAFS/BQ & SMAS Transactions
Intergovernmental Section	By-others lines
MAFR Section	For-others lines
Receivables Section	Accounts Receivable Billings

Figure 3-1. Workload Factors for Accounting Areas

NOTE: The staffing standard equation, developed through Correlation and Regression Analysis and based on the WLF, is applied to measured hours for each process in the subject matter area to determine required staffing in that area. See Chapter 4 for staffing standard equation development.

VENDOR PAY REWORK ANALYSIS						
			CONV		MONTHLY	
PROCESS ITEM	**COUNT**	**FREQ**	**CODE**	**PAT**	**HOURS**	**REMARKS**
INVOICE, RECEIVING REPORT RETURNS, AND VOIDS						
MAIL ROOM						
RECEIVES INVOICES/RECEIVING REPORTS AND DATE STAMPS	93,340	YR	0.08333	0.50	64.82	
DOCUMENT CONTROL SECTION						
PICKS UP MAIL						TIME ALREADY ACCOUNTED FOR
RECEIVES AND REVIEWS INVOICE/RECEIVING REPORTS FOR APPLICABLE DATA	93,340	YR	0.08333	2.00	259.27	
IF PROBLEM NOTED (95%):						
PREPARES MEMO TO IDENTIFY PROBLEM	88,673	YR	0.08333	3.00	369.46	
RETRIEVES FROM PRINTER	88,673	YR	0.08333	1.50	184.73	
PREPARES FOR MAILING	88,673	YR	0.08333	3.00	369.46	
HANDCARRIES TO MAIL ROOM	88,673	YR	0.08333	2.00	246.30	
IF PROBLEM NOT FOUND (5%):						
PULLS FOLDER AND PLACES INTO DISTRIBUTION BOX	4,667	YR	0.08333	2.00	12.96	
VENDOR PAY TEAMS						
RECEIVES, REVIEWS, AND VALIDATES FOLDER	4,667	YR	0.08333	4.00	25.93	
IF PROBLEM NOTED (3%)						
RETURNS TO DOCUMENT CONTROL FOR RETURN	2,800	YR	0.08333	2.00	7.78	
DOCUMENT CONTROL SECTION						
RECEIVES, REVIEWS, AND PREPARES MEMO TO IDENTIFY PROBLEM	2,800	YR	0.08333	4.00	15.56	
RETRIEVES FROM PRINTER	2,800	YR	0.08333	1.50	5.83	
PREPARES FOR MAILING	2,800	YR	0.08333	3.00	11.67	
HANDCARRIES TO MAIL ROOM	2,800	YR	0.08333	2.00	7.78	
IF PROBLEM NOT FOUND (2%)						
DISTRIBUTES FOR CERTIFICATION	1,867	YR	0.08333	1.00	2.59	
CERTIFICATION TEAM						

Figure 3-2. Standard Data Collection Spreadsheet

PROCESS ITEM	COUNT	FREQ	CONV CODE	PAT	MONTHLY HOURS	REMARKS
RECEIVES, REVIEWS, AND CERTIFIES OR VOIDS 1,867 PLUS AN ADDITIONAL 102,465 FOR A TOTAL OF 104,332 PAYMENTS YEARLY	104,332	YR	0.08333	6.00	869.40	
APPROXIMATELY 30% OF PAYMENTS ARE RETURNED TO VENDOR PAY TEAM FOR CORRECTION						
ANNOTATES SUMMARY OF PROBLEM ON APPLICABLE DOCUMENT	31,300	YR	0.08333	3.00	130.41	
HANDCARRIES TO APPROPRIATE VENDOR PAY TEAM	31,300	YR	0.08333	2.00	86.94	
LOGS ONTO IAPS AND MAKES CORRECTON	31,300	YR	0.08333	2.00	86.94	
RETURNS TO CERTIFICATION TEAM	31,300	YR	0.08333	2.00	86.94	
APPROXIMATELY 70% OF PAYMENTS ARE RETURNED TO CUSTOMER FOR APPLICABLE INFORMATION/ CORRECTION						
VENDOR PAY TEAMS						
RETURNS TO VENDOR PAY TO VOID	73,032	YR	0.08333	2.00	202.86	
VENDOR PAY TEAM LOGS ON IAPS AND VOIDS PAYMENT	73,032	YR	0.08333	2.00	202.86	
RETURNS TO DOCUMENT CONTROL FOR RETURN	73,032	YR	0.08333	2.00	202.86	
DOCUMENT CONTROL SECTION						
RECEIVES, REVIEWS, AND PREPARES MEMO TO IDENTIFY PROBLEM	73,032	YR	0.08333	4.00	405.72	
RETRIEVES FROM PRINTER	73,032	YR	0.08333	1.50	152.14	
PREPARES FOR MAILING	73,032	YR	0.08333	3.00	304.29	
HANDCARRIES TO MAILROOM	73,032	YR	0.08333	2.00	202.86	
MAILROOM						
RECEIVES VOIDED DOCUMENTS AND DATE STAMPS	73,032	YR	0.08333	0.50	50.71	
VENDOR PAY TEAMS						
RECEIVES, REVIEWS, AND LOGS ONTO IAPS TO MAKE CORRECTION AND SCHEDULE PAYMENT	73,032	YR	0.08333	4.50	456.43	
CERTIFICATION TEAM						
RECERTIFIES	104,332					TIME ALREADY ACCOUNTED FOR
MONTHLY HOURS					5025.49	
MONTH HOURS W/INDIRECT					5995.41	
TOTAL STAFFING REQUIREMENT					40.79	

Figure 3-2 (continued)

C.4. CHAPTER 4

DATA ANALYSIS

C4.1. **PURPOSE OF DATA ANALYSIS.** During the data analysis phase, measured data is subjected to intense analysis to ensure accuracy and completeness. The staffing standard is established during this phase. Computed hours are calculated based on the staffing standard, and required staffing for each workload factor is determined based on computed hours.

C4.2. **LOGIC CHECK**. The measured data must pass a logic check. For example, suppose your measurement shows a workcenter requires 20 workyears to perform the workload. However, the workcenter has performed the workload with 10 employees for the past five years. Logic tells you the measurement is suspect. There may be a simple mathematical or typographical error. If not, a work count may have been over-stated or an accomplishment time over-estimated. Talk to your POC at the study location to see if the discrepancy can be identified. If not, consider using other sources, such as Resource Analysis Decision Support System (RADSS), to get an accurate work count. You may need to actually observe a process being done so it can be timed.

C4.3. **BACKLOG AND OVERTIME**. Backlog and overtime must be considered during the data analysis phase.

C4.4. **CORRELATION AND REGRESSION ANALYSIS.** The most important task during this phase is correlation and regression analysis which serves three purposes.

- To prepare the staffing standard equation.
- To calculate computed hours based on the staffing standard equation.
- To develop equation statistics which show whether deviations in measurement from one study location to another are within expected tolerances.

See Figure 4-1 for a sample of the Correlation and Regression Analysis Worksheet and instructions for creating it. Complete a correlation and regression analysis worksheet for each workload factor identified.

C4.5. **COMPUTED VS MEASURED HOURS**. Measured hours show data collected from each study location individually. Computed hours adjust each location's measured hours based on data collected from all measurement locations. Because computed hours consider

input from several different study locations performing the same task, they provide a more reliable assessment of how much time is actually required to perform the task.

C4.6. **USING THE STAFFING EQUATION TO CALCULATE COMPUTED HOURS**. The staffing equation, developed through correlation and regression analysis, is used to calculate computed hours. In the sample shown in Figure 4-1, the equation is Y = 3.33+.0844(X). Notice that 3.33 is the Y intercept figured by the computer and .0844 is the X intercept figured by the computer.

        Y = Computed Hours
        X = Workload

The calculations below show how to apply the equation to figure Omaha's computed hours as shown on the sample worksheet.

        Y = 3.33+.0844*(X)
        Y = 3.33+.0844*(1803)
        Y = 155.59 (Computed hours)

C4.7. **EQUATION STATISTICS**. Equation statistics are useful because they provide a scientific method for measuring deviations. The most important entry in the equation statistics part of the spreadsheet is the R Square. This statistic, also known as the explained variation, shows whether differences in time required to perform a given task from one OPLOC to another are within the expected range. If the R Square is 75% or higher, differences fall within the expected range and no further action is necessary. If the R Square is less than 75%, differences are not within the expected range and you must determine why. An error may have been made in data collection, or there may be a legitimate reason for the difference. If there's a legitimate reason, you will need to process it as a deviation or variance.

C4.8. **FIGURING EXTRAPOLATION LIMITS**. After you figure computed hours for all study locations, calculate upper and lower extrapolation limits. The staffing equation can be used to determine required staffing until extrapolation limits are reached. If workload volume changes to the point where computed hours exceed or fall below the limits, a new measurement is necessary. The upper limit is 25% more than the highest computed hours and the lower limit is 25% below the lowest computed hours.

C4.9. **COORDINATION OF PRELIMINARY STUDY RESULTS**. After you complete data analysis, submit preliminary study results to management at the study location. Address any concerns they have, and obtain concurrence. When you receive concurrence, you are ready to write the final report. The final report is discussed in Chapter 2. (NOTE: If agreement cannot be reached between the team leader and the Director of the organization under study, elevate the issue to DFAS-DE/C management for resolution.)

		Correlation and Regression Analysis Worksheet					
	Subject Matter Area: Customer Service (Air National Guard)						
	Workload Factor: Certifications						
	Special Considerations: None						
	OPLOC	**Workload**	**Measured**	**Computed**		**Equation Statistics**	
1	Omaha	1803	160.6	155.59		Multiple R	0.995848411
2	Limestone	2825	230.7	241.88		R Square	0.991714058
3	Dayton	3821	334.21	325.99		Adjusted R Square	0.987571087
4	San Bernardino	4318	365.9	367.95		Standard Error	10.53716165
						Observations	4
NOTE: Steps 9 – 12 on the attached procedures show how to develop a graph showing the relationship of workload to staff hours. The graph is normally presented in this area of the worksheet, but due to software limitations, it cannot be shown here.							
						Y Intercept	3.339688281
						X Variable	0.084440452
						Upper Limit	459.94
						Lower Limit	116.69
						Equation	Y=3.33+.0844(X)

Figure 4-1. Correlation and Regression Analysis

PROCEDURES TO PERFORM

CORRELATION AND REGRESSION ANALYSIS

STEP	ACTION
1	Open Microsoft Excel program
2	Identify Subject Matter Area (SMA), Workload Factor, and any special considerations.
3	Load measurement locations, workload count, and measurement hours
4	Select tools, data analysis, and regression
5	Mark Y (measured) input and X (Workload) input
6	Statistics are provided (most important is R square; explained deviation). Also, a-intercept and b variable are provided to develop equation, i.e., Y = a + b = c
7	Derive computed hours by applying equation
8	Compute extrapolation limits (upper and lower limits): Upper limit = 25% more than highest computed hours Lower limit = 25% less than the lowest computed hours
9	Select CHART WIZARD to develop graph
10	Select line chart
11	Mark data range (measurement locations, workload, measured, and computed columns
12	Identify title, (x) axis, and (Y) axis
13	Print completed excel spreadsheet

Figure 4-1 (Continued)