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**PRODUCTIVITY REVIEW AND ANALYSIS
DIRECTORATE OF ENGINEERING AND HOUSING**

US MILITARY COMMUNITY KARLSRUHE

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EUROPE**

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PRODUCTIVITY REVIEW AND ANALYSIS
DIRECTORATE OF ENGINEERING AND HOUSING
U.S. MILITARY COMMUNITY KARLSRUHE
FEDERAL REPUBLIC OF GERMANY

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TABLE OF CONTENTS

	<u>Page</u>
LIST OF EXHIBITS	iv
LIST OF TABLES	viii
LIST OF APPENDICES	viii
LIST OF ATTACHMENTS	viii
EXECUTIVE SUMMARY	E-1
I. INTRODUCTION	
1.1 Background	I-1
1.2 Purpose	I-1
1.3 Approach	I-2
1.4 Report Organization	I-3
II. WORK SAMPLING STATISTICAL ANALYSIS	
2.1 Introduction	II-1
2.2 Objective	II-2
2.3 Definitions	II-2
2.4 General Analysis	II-3
2.5 Workforce Survey	II-3
2.6 Summary	II-4
APPENDIX A	II-26
III. PROCESS ANALYSIS (ERMD and related work control areas)	
3.1 The Requirement to Improve Estimating, Planning and Feedback on RPMA Work	III-1
3.2 The Requirement to Conduct Facility Component Inspections to Provide Input to IFS	III-9
3.3 The Requirement to Use Engineered Performance Standards and IFS to Improve Productivity of the Blue Collar Workforce	III-10

		<u>Page</u>
3.4	The Implementation of IFS at DEH Karlsruhe is in Serious Trouble and will Require Major Application of Resources if it is to Remotely Meet Scheduled Implementation	III-13
3.5	The Need to Improve Scheduling and Conduct Variance Analysis when Actual Work Performed Differs Substantially from Scheduled Work	III-20
3.6	Evaluate Policy Letters, Letters of Instruction, and Standard Operating Procedures (SOPs)	III-23
3.7	The Requirement to Continue to Monitor Sick Leave and Reduce Abuse to the Maximum Extent Possible	III-27
3.8	Annual Work Plan	III-30
3.9	Planner/Estimator Workload Controls	III-32
3.10	Performance Indicators	III-35
IV.	ENGINEERING PLANS AND SERVICES DIVISION	
4.1	Review of DEH Contract Workload	IV-1
V.	BUILDINGS AND GROUNDS, AND UTILITIES DIVISIONS	
5.1	Preventive Maintenance Teams	V-1
5.2	Self Help	V-4
5.3	Do It Now Team (DIN) Concept	V-5
VI.	HOUSING	
6.0	Introduction	VI-1
6.1	Organization	VI-1
6.2	Budget Office Support	VI-1
6.3	Housing Referral Section	VI-3
6.4	Inspection Section	VI-4
6.5	Leased Housing Section	VI-6
VII.	RPMA SUPPLY SUPPORT	
7.1	Zero Balance Rate	VII-1
7.2	FESS Communications System	VII-2

		<u>Page</u>
7.3	Shop Stock Procedures	VII-5
7.4	Actual Inventory versus FESS Inventory	VII-6
7.5	FESS Supply Management Report	VII-7
VIII.	EMPLOYEE SURVEY	
8.1	Introduction	VIII-1
8.2	Background	VIII-1
8.3	Questionnaire, Part I	VIII-1
8.4	Questionnaire, Part II	VIII-3
8.5	Summary	VIII-3

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Dist	Avail and/or Special
A-1	



LIST OF EXHIBITS

		<u>Page</u>
SECTION II		
II-A	Summary, U.S. Military Community Karlsruhe	II-5
II-B	Computation of Major Categories - Statistical Summary (Total DEH)	II-6
II-C-1	Summary of Observations and Percent by Shops (Total DEH)	II-7
II-C-2	Computation of Percentages for Productive, Indirect Productive, and Nonproductive (Total DEH)	II-8
II-C-3	Computation of Relative Precision (Total DEH)	II-9
II-D	Computation of Major Categories - Statistical Summary (Karlsruhe Only)	II-10
II-E-1	Summary of Observations and Percent by Shops (Karlsruhe Only)	II-11
II-E-2	Computation of Percentages for Productive, Indirect Productive, and Nonproductive (Karlsruhe Only)	II-12
II-E-3	Computation of Relative Precision (Karlsruhe Only)	II-13
II-F	Computation of Major Categories - Statistical Summary (Germersheim Only)	II-14
II-G-1	Summary of Observations and Percent by Shops (Germersheim Only)	II-15
II-G-2	Computation of Percentages for Productive, Indirect Productive, and Nonproductive (Germersheim Only)	II-16
II-G-3	Computation of Relative Precision (Germersheim Only)	II-17
II-H	Shop Ranking by Category	II-18
II-I	Current versus Recommended Percentages	II-19
II-J	Direct Productivity Comparison, U.S. Installations and Germany	II-20
II-K	Indirect Productivity Comparison, U.S. Installations and Germany	II-20
II-L	Non-Productivity Comparison, U.S. Installations and Germany	II-20

	<u>Page</u>	
II-M	Direct Productivity Comparison by Shop, Karlsruhe	II-21
II-N	Indirect Productivity Comparison by Shop, Karlsruhe	II-21
II-O	Non-Productivity Comparison by Shop, Karlsruhe	II-21
II-P	Divisional Productive Comparison, Karlsruhe	II-22
II-Q	DEH Total Percentage Distribution	II-23
II-R	Karlsruhe Total Percentage Distribution	II-24
II-S	Germersheim Total Percentage Distribution	II-25
II-T	Productivity Improvement Cost Avoidance	II-38
II-U	Productivity Start - Morning	II-39
II-V	Productivity Stop - Morning	II-39
II-W	Productivity Start - Afternoon	II-40
II-X	Productivity Stop - Afternoon	II-40
II-Y	Computation of Average Wage	II-41
II-Z	Percent Work Sampled and Productivity by Type Work (S00, S0, IJ0)	II-47
	<u>WORK SAMPLING EXAMPLES</u>	
II-AA	Carpentry	II-48
II-BB	Electrical	II-51
II-CC	Plumbing	II-54
II-DD	Plumbing	II-58
II-EE	Preventive Maintenance	II-63
II-FF	Preventive Maintenance	II-67
II-GG	Entomology	II-75
SECTION III		
III-A	Analysis of Completed IJ0s (FY84)	III-36
III-B	Evaluation of Individual Job Orders Carpenter, Steamfitter, Electrician	III-40

	<u>Page</u>	
III-C	Completed IJO Tabulation by Shop	III-43
III-D	Analysis of Average Time to Complete SO (FY84)	III-46
III-E	Analysis of Engineered Performance Standards Utilization FY84 Active IJOs	III-56
III-F	List of EPS Manuals	III-59
III-G	Analysis of Scheduling Week of 20 August 1984	III-60
III-H	Analysis of Scheduled Shop Availability to Actual Shop Availability	III-66
III-I	Analysis of SO Hours Scheduled versus Service Hours Actually Performed	III-67
III-J	Analysis of SOO Scheduling	III-69
III-K	Analysis of Estimated, Scheduled and Actual Person Hours Shop 09, SOOs FY84	III-71
III-L	Scheduling Meeting and Productivity	III-72
III-M	Schweinfurt DEH SOPs	III-73
III-N	Sick Leave Use	III-74
III-O	Sick Leave Graph	III-76
III-P	Sick Leave Usage Rate Calculations	III-77
III-Q	Planner and Estimator Workload	III-78
SECTION V		
V-A	Type of Material Used by PM Teams	V-8
V-B	PM Task Codes	V-10
SECTION VI		
VI-A	Existing Organization	VI-8
VI-B	DEH Proposed Organization	VI-9
VI-C	HAMM ASSOCIATES' Proposed Organization	VI-10
VI-D	Sample Housing Referral Job Description	VI-11

	<u>Page</u>	
VI-E	Sample Housing Referral Job Description	VI-14
VI-F	Sample Housing Inspector Job Description	VI-17
VI-G	Sample Housing Inspector Job Description	VI-19
SECTION VII		
VII-A	Karlsruhe Total Line Items Stocked	VII-9
VII-B	FESS Communications Line Downtime Labor Costs Impact	VII-10
VII-C	Purchase Orders Waiting FESS Input as of 9/20/84	VII-11
VII-D	Shop Stock Lists	VII-12
VII-E	Supply Warehouse Inventory	VII-13
VII-F	Stock Items	VII-18
VII-G	Stock Excess	VII-19
VII-H	Stock Zero Balance	VII-20
VII-I	Fringe Items	VII-21
VII-J	Standby Items	VII-22
VII-K	Standby Zero Balance	VII-23
VII-L	Outstanding Orders	VII-24
VII-M	Due Outs	VII-25
SECTION VIII		
VIII-A	Survey Questions (1-28) Categories and Response Percentages	VIII-7
VIII-B	Survey Questions (29-37), Categories and Response Percentages	VIII-11
VIII-C	Employee Survey Results - Total Graphical	VIII-13
VIII-D	Employee Survey Results - Karlsruhe Only	VIII-14
VIII-E	Employee Survey Results - Germersheim Only	VIII-15
VIII-F	DEH Employee Questionnaire - Translation	VIII-16

LIST OF TABLES

	<u>Page</u>	
SECTION II		
II-A-1	Summary of Craft Time Spent in Job Preparation	II-28
II-A-2	Summary of Craftspersons Time Spent for Personal Time	II-32
II-A-3	Summary of Idle Time Not Controlled by Craftsperson	II-33
II-A-4	Average Start/Stop Times	II-34
SECTION IV		
IV-1	FY84 DEH Contract Workload	IV-1
IV-2	FY85 DEH Contract Workload Plan	IV-2
IV-3	FY84 Buildings and Grounds/Utilities Division Contracts	IV-3
IV-4	FY85 Buildings and Grounds/Utilities Division Contracts Plan	IV-4

LIST OF APPENDICES

II-A	Work Sampling Statistical Analysis	II-26
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LIST OF ATTACHMENTS

III-1	IFS Checklist	III-79
III-2	IFS Standard Operating Procedures for Functions: Service Order Clerk Work Reception Planner/Estimators Quality Control Clerk Material Coordinator Scheduler Shop Foreman Performance Indicators (Bound separately)	III-124

PRODUCTIVITY REVIEW
OF THE
DIRECTORATE OF ENGINEERING AND HOUSING
AT
THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.

* * * EXECUTIVE SUMMARY * * *

PRODUCTIVITY REVIEW
OF THE
DIRECTORATE OF ENGINEERING AND HOUSING
AT
THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.

* * * EXECUTIVE SUMMARY * * *

1.0 BACKGROUND

At the direction of the U.S. Army Installation Support Activity, Europe (USAISAE), a productivity review and management enhancement study of the Directorate of Engineering and Housing at the U.S. Military Community Karlsruhe, including the Engineer Support Division at Germersheim, was performed by E. L. HAMM & ASSOCIATES, INC., Virginia Beach, Virginia, during the months of August through November 1984.

2.0 OBJECTIVES

The objectives of this study are to provide a comprehensive review of the Directorate of Engineering and Housing at the U.S. Military Community Karlsruhe including the Engineer Support Division at Germersheim, to make tangible and intangible recommendations that will increase productivity, and to ensure maximum effectiveness of Real Property Maintenance Activity (RPMA) expenditures. Accomplishment of these objectives will assist the Directorate of Engineering and Housing in providing the necessary support to the community and specifically the units attached to Karlsruhe and Germersheim. This support will enhance the mission of the community through an increased state of readiness by keeping the morale of the soldier and his family high and making Karlsruhe a better place to live and work.

3.0 APPROACH

The approach used for this productivity review was to:

- Inbrief with the United States Army Installation Support Activity, Europe (USAISAE) and representatives from the Schweinfurt, Baumholder, and Karlsruhe Communities.
- Conduct a three week on-site visit at Karlsruhe and Germersheim to gather data.
- Conduct a preliminary analysis of collected data and identify potential adjustments and savings.
- Revisit the U.S. Military Community Karlsruhe for one week to verify initial analysis and gather additional data where required.
- Analyze data from other RPMAs to determine relative standing in control of work requirements and find areas of potential increased productivity.
- Compare data gathered and analyzed with that of other RPMAs.
- Complete analysis of data and develop a draft report.
- Develop a final comprehensive report, upon receipt of comments from USAISAE.

Prior to commencing the on-site data collection by E. L. HAMM & ASSOCIATES, meetings were held with the DEH, Deputy DEH and Division/Branch Chiefs, and with the workforce at Karlsruhe and Germersheim. After these meetings, E. L. HAMM & ASSOCIATES project personnel proceeded to review the in-house procedures and DEH management systems as well as beginning the work sampling phase of the study. Information gathered during other productivity studies was used as a basis for comparison as appropriate. Workload and job/task assignment datum was collected and analyzed with the goal of identifying areas of potential increased productivity. Extensive interviews with management and selected shop personnel were conducted to insure that E. L. HAMM &

ASSOCIATES understood the workload requirements and any constraints imposed due to regulations or local customs that could effect productivity.

4.0 SUMMARY OF MAJOR FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

A detailed review of current operations and available data from Fiscal Years (FY) 83 & 84 resulted in numerous findings, conclusions, and recommendations. The major points are summarized on the following pages.

- The direct productivity work sampling results for the blue collar work force was 66.4%. This is the highest productivity of the 21 Real Property Maintenance activities observed by E.L. HAMM & ASSOCIATES to date. Only Fort Sill, Oklahoma, at 62.6% productive and the U.S. Military Community Schweinfurt, at 60.4% productive have exceeded 60% direct productivity.
- The calculated productive, indirect productive, and nonproductive percentages for the Directorate of Engineering and Housing during the period observed were:

<u>Total Karlsruhe DEH</u>	<u>Productive</u>	<u>Indirect Productive</u>	<u>Non-Productive</u>
Percent	66.4%	25.4%	8.2%
Time Per Day	5 h 19 m	2 h 02 m	0 h 39 m
<u>Karlsruhe Only</u>	<u>Productive</u>	<u>Indirect Productive</u>	<u>Non-Productive</u>
Percent	66.9%	25.0%	8.1%
Time Per Day	5 h 21 m	2 h 0 m	0 h 39 m
<u>Germersheim Only</u>	<u>Productive</u>	<u>Indirect Productive</u>	<u>Non-Productive</u>
Percent	64.7%	26.4%	8.9%
Time Per Day	5 h 10 m	2 h 07 m	0 h 43 m

Stated in lay terms, the confidence interval is 99.73% (3 standard deviations) or the chances are approximately 9,973 out of 10,000 that the productive, indirect productive, and nonproductive percentages are within the following confidence limits:

	<u>Productive</u>	<u>Productive</u>	<u>Productive</u>
Total Karlsruhe DEH	65.7-67.1%	25.1-25.7%	8.1-8.3%
Karlsruhe Only	66.1-67.7%	24.7-25.3%	8.0-8.2%
Germersheim Only	63.3-66.1%	25.9-26.9%	8.8-9.0%

- Based on an analysis of the work sampling results the following percentages are recommended as a goal.

	<u>Productive</u>	<u>Indirect Productive</u>	<u>Non- Productive</u>
Percent	68.4%	23.4%	8.2%
Time Per Day	5 h 28 m	1 h 52 m	0 h 40 m

The increase in productivity represents 2.0% or 9 minutes per day per craftsperson, a total savings of \$23,930 or 4250 person-hours per year. There is no projected change in the nonproductive category. Eight point two percent is the lowest observed by HAMM ASSOCIATES at any activity. The increase in productivity can be gained from better planning on the part of the worker. The general lack of anticipating job tool requirements, and putting away and getting tools before and after lunch is costing the DEH 9 minutes per day per craftsperson or \$23,930 each year.

- The morale of the workforce is outstanding and is principally due to the open lines of communications. The ability of the Director to speak German is also a very positive attribute.
- Individual Job Order (IJO) variance analysis is not being performed by the DEH Community. Accuracy of reporting work performance is questionable in that significant amounts of work are reported either greater or less than 10% of the estimate or exactly as estimated. In several cases where no estimate was made in advance, the eventual estimated hours were forced to equal the actual hours. Recommend that the Management Engineering and Systems Branch (MESB) prepare a weekly variance analysis summary to be used as a performance indicator for shop and Planner Estimator (P&E) personnel.
- Service Order (SO) datum is not being maintained correctly and is not being analyzed. Average reported times by the craftspersons were about 2 hours more per service order versus actual time observed while work sampling. The SO backlog statistics were incorrect. No average times per SO overall and by shop are being calculated. This lack of analysis and incorrect record keeping is having an adverse effect on the scheduling effort. The proper assembly of information is paramount to the production of an executable schedule.

Recommend review of SO completions by shop emphasizing the importance of charging actual time and analysis of the SO data by shop to assist in the scheduling effort. Accurate record keeping will enhance the scheduling effort.

- The backlog of IJOs is very low in some shops and nonexistent in others. Recommend screening the Karlsruhe Maintenance and Repair (M&R) project listing and implementing the Facility Component Inspection program to build a 6-9 month backlog for the shops.
- Performance indicators are provided in a separately bound attachment to this report to assist management in measuring performance of the DEH organization. Functionally, the Management Engineering and Systems Branch (MESB) should be tasked with coordinating, compiling, and analyzing this information.
- The implementation of the Integrated Facilities System (IFS) is in trouble. A major application of resources is required to meet scheduled implementation. Areas of specific concern are the uncertainty as to what portions of IFS are to be provided, the training of DEH personnel in all aspects of IFS not having been planned in total and accomplished, and the preparation of information to load the system. Recommend that actions be initiated to obtain information as to what portions of IFS will be provided, insure the required personnel are trained, and prepare information for input into IFS.
- The current and past scheduling system is unsatisfactory. Although IFS is soon to be implemented, certain procedures are required if scheduling is to be effective. Recommend scheduling criteria be developed to include scheduling targets for IJOs, SOs, and SOOs, sizes of jobs, available hours, what jobs are available, equipment type and quantity, materials, and the backlog by shop. Weekly scheduling meetings are very important and should be chaired by either the Director or Deputy Director.
- Buildings and Grounds, and Utilities Divisions management personnel are expending significant effort in contract preparation and inspection which adversely impacts upon supervision and coordination within and between divisions. Recommend realignment of the contract preparation and inspection functions to the Engineering Plans and Services Division.
- The Preventive Maintenance (PM) system presently used does not define the tasks for each team. Annual Standing Operations Orders (SOOs) are issued to each Team at Karlsruhe with a frequency of visiting buildings/facilities once every 90 days. The PM teams are performing self-help work in all areas of the community. Recommend defining and estimating the PM tasks

required and issue monthly IJOs by cost accounting function. Also recommend that the frequency of team visits be revised according to TM5-610 and that continuing performance evaluation be accomplished.

- Provided comments on the DEH proposed revision of the Housing Division organization.
 - Budget Support -- consolidates responsibilities with ERMD Budget
 - Housing Referral Office -- clarify and consolidate responsibilities between Karlsruhe and Germersheim
 - Family Housing Inspection -- Redefine inspector responsibilities to include area inspections. Support Housing Management Branch with component type inspections to provide project documentation justifications.
 - Leased Housing Functions -- Place under Facilities Management Branch.
- The current FESS communications system is unsatisfactory and requires upgrading. Numerous trips are made to Mannheim for data input because local terminals were down as a result of U.S. Army communications line problems. The need to improve FESS communications is particularly important with IFS coming on-line. The leasing of a new communication line would virtually eliminate the travel to Mannheim, resulting in an annual cost avoidance of approximately \$3600.
- A review of the supply warehouse inventory showed 53% of the line items have incorrect balances compared to the FESS inventory. An improvement in the accountability of stock items will increase productivity of the workforce. Recommend conducting a monthly inventory of 10% of the line items stocked.
- A recap of potential cost avoidance is shown below:

- Increase Productivity to 68.4%	\$23,930
- Eliminate travel to Mannheim for FESS	<u>3,600</u>
TOTAL PROJECTED COST AVOIDANCE	\$27,530

SECTION I
PRODUCTIVITY REVIEW AND ANALYSIS
OF THE
DIRECTORATE OF ENGINEERING AND HOUSING
AT
THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.

* * * INTRODUCTION * * *

SECTION I
PRODUCTIVITY REVIEW AND ANALYSIS
OF THE
DIRECTORATE OF ENGINEERING AND HOUSING
AT
THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.

* * * INTRODUCTION * * *

1.1 BACKGROUND

During August and September 1984, E. L. HAMM & ASSOCIATES, INC. (hereinafter referred to as HAMM ASSOCIATES) conducted the initial on-site visit to perform a Productivity Review and Analysis of the Directorate of Engineering and Housing (DEH), U.S. Military Community Karlsruhe which includes the Engineer Support Division at Germersheim. This study was conducted under contract number DACA65-84-C-0011. The recommendations are the result of HAMM ASSOCIATES findings of fact and opinions based on these facts. The recommendations do not necessarily reflect the U.S. Military Community Karlsruhe's policy.

1.2 PURPOSE

The purpose of this study is to determine the productivity of the maintenance shops including the Engineer Support Division at Germersheim and to make recommendations to improve the efficiency and effectiveness of the organization. In addition, the organization, staffing, workload and information flow of the DEH Divisions were reviewed with the purpose of making recommendations which will improve the overall support and management of the maintenance force. Tangible and intangible improvements will be recommended which are cost effective and will ensure maximum efficiency and productivity thereby insuring the maximum return on Real Property Maintenance Activity (RPMA) expenditures.

1.3 APPROACH

The following steps were used in the development of this study:

- Gather data on site through the use of work sampling and extensive interviews.
- Conduct preliminary analysis of data and identify those areas of potential increased productivity and dollar savings.
- Compare relative data gathered and analyzed at other Army and Navy RPMAs.
- Complete analysis of data and develop a draft report.
- Revisit the U.S. Military Community Karlsruhe for verification and expansion, as necessary, of data originally collected.
- Upon receipt of comments from U.S. Army Installation Support Activity, Europe (USAISAE), develop a final comprehensive report including an Executive Summary.

The techniques and methods used for evaluation are listed below.

- Intensive Work Sampling
- Comparative Analysis
- Solicitation of Expert Opinion
- Review of Historical Data
- Informal Interviews
- General Observations

Prior to commencing the on-site data collection, three meetings were conducted. The first at USAISAE Headquarters with personnel from USAISAE, Schweinfurt, Baumholder, Karlsruhe and the Vth Corps, VIIth Corps and 21st Support Command. The second at Karlsruhe with DEH, Deputy DEH, Division/Branch Chiefs, and other representatives from the Community and the third with the remaining DEH workforce. In each of the meetings, the purpose of the data collection, the procedures to be used, and the areas which HAMM ASSOCIATES would investigate were discussed.

There are several methods of analysis that can be used in conducting the work sampling portion of the productivity study. HAMM ASSOCIATES has come to believe that the high intensity work sampling method, as described in the Engineer Manual TB 420-1, is the most effective. Some of the advantages of high intensity work sampling are:

- Firsthand observation of what really goes on avoids the pitfalls of making conclusions based on hearsay information arrived at during interviews.
- Avoids the pitfalls of basing future staffing recommendations on past recorded data. Historically it has been found that past records reflect not what was done or should have been done, but rather a workload ratio similar to the skills that existed during the period reviewed.
- While work sampling over an extended period of time, individual craftspeople freely reveal valuable information they do not reveal during shorter formal or informal interviews.
- While work sampling the analyst observes vast areas of the activity.

1.4 REPORT ORGANIZATION

This report is organized in sections relating to each division that was reviewed. Specific paragraphs in one section that may be applicable to another division are cross referenced for ease of reading.

1.4.1 Section II Work Sampling Analysis.

This section contains all work sampling results for the total U.S. Military Community and separately by shop at Karlsruhe and Germersheim. This section will be referred to throughout the remaining sections.

1.4.2 Sections III through VIII are as follows:

- Section III - Process Analysis (ERMD and related work control areas.)
- Section IV - Engineering Plans and Services Division

- Section V - Buildings and Grounds Division - Utilities Division
- Section VI - Housing Division
- Section VII - Supply (RPMA)
- Section VIII - Employee Survey

SECTION II
PRODUCTIVITY REVIEW AND ANALYSIS
OF THE
DIRECTORATE OF ENGINEERING AND HOUSING
AT
THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.

WORK SAMPLING
* * * STATISTICAL ANALYSIS * * *

SECTION II
PRODUCTIVITY REVIEW AND ANALYSIS
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DIRECTORATE OF ENGINEERING AND HOUSING
AT
THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.

WORK SAMPLING
* * * STATISTICAL ANALYSIS * * *

2.1 INTRODUCTION

A work sampling study utilizing the "high frequency method" (instantaneous observations at two-minute intervals) was conducted at the U.S. Military Community Karlsruhe, Federal Republic of Germany, during the initial on-site visit in August/September, 1984. Personnel from HAMM ASSOCIATES observed craftspersons in the following work centers (shops):

- 01 Carpentry
- 02a Electric
- 02b Alarm
- 03 Plumbing
- 04 Sheet Metal
- 05 Paint
- 06 Refrigeration and Kitchen Equipment
- 09 Oil Team
- 10 Preventive Maintenance
- 16 Masonry
- 19 Steam Fitters
- 21 Entomology

A detailed statistical analysis of the work sampling results is presented in Appendix A, page II-26, to this section.

2.2 OBJECTIVE

This portion of the productivity study is designed to measure the total productive, indirect productive, and non-productive activities of the blue collar work force. The statistics gathered in work sampling analysis do not reflect the efficiency/effectiveness or skill level of observed craftpersons. Engineering performance standards coupled with stopwatch time studies or other methods of estimating work efficiency must be used to determine craftpersons' ability to perform assigned tasks. The percentage measurements presented in this report establish the observed proportion of craft time that is spent performing tasks which are classified as either Direct Productive, Indirect Productive, or Nonproductive. The intensive work sampling method and accompanying statistical analysis discussed in Technical Bulletin 420-1, Chapter 3, Section 6, was employed to define productivity levels at the U.S. Military Community Karlsruhe.

2.3 Definitions

- Productive - Any activity which contributes directly to altering the composition, condition, conformation, or construction of the item or area being repaired or altered.
- Indirect Productive - Any activity performed that renders assistance or preparation for the productive portion of a task. It is necessary or required work that does not alter the composition, condition, conformation or construction of an item.
- Non-Productive - Idle time due to circumstances either controllable or uncontrollable by the Directorate of Engineering that does not contribute directly or indirectly to the accomplishment of a craft task.

2.4 General Analysis

Exhibit II-A, page II-5, contains a summary of the percentages and confidence limits for the work sampling. Exhibits II-B through II-G, pages II-6 through II-17, are the summary of observations and percent by shops, percentage by major category and relative precision, for the total DEH and the Karlsruhe and Germersheim shops. Exhibit II-H, page II-18, shows shop ranking by productivity category. Exhibit II-I through II-L, pages II-19 and II-20, present a comparison of observations recorded at the U.S. Military Community Karlsruhe with relative findings at other Army Real Property Maintenance Activities. Exhibits II-M through II-O, page II-21, show graphic illustrations of productivity findings by shop. Exhibit II-P, page II-22, represents a divisional productive comparison. The total percentage distribution of the observations is presented in Exhibit II-Q, page II-23. The distribution for the Karlsruhe shops and Germersheim shops is presented in Exhibits II-R and II-S, pages II-24 and II-25, respectively.

2.5 Workforce Survey

An analysis of the employee survey is discussed in detail in Section VIII. The survey results are shown on Exhibits VIII-A to VIII-E, pages VIII-7 to VIII-15.

2.6 Summary

Observations made during the work sampling at Germersheim support work sampling findings from the Karlsruhe DEH. Due to the similarity of sample data trends from both facilities, the analyses and recommendations made in the following Appendix are valid and applicable to both Karlsruhe and Germersheim.

While some aspects of the workforce are different, work sampling findings at both facilities indicate the same or similar problem areas. Therefore, these craft problem areas must reflect deficiencies in the overall Karlsruhe DEH managerial structure, rather than problems inherent to a workforce at a particular location.

EXHIBIT II-A

SUMMARY
U.S. MILITARY COMMUNITY KARLSRUHE

- The confidence interval is 99.73% (3 standard deviations) or the chances are 9973 out of 10,000 that the Productive, Indirect Productive, and Nonproductive times are within the following confidence limits:

<u>Total Karlsruhe DEH</u>	<u>Productive</u>	<u>Indirect Productive</u>	<u>Non-Productive</u>
Percent	66.4%	25.4%	8.2%
Time Per Day	5 h 19 m	2 h 02 m	0 h 39 m
Confidence Limits	65.7-67.1%	25.1-25.7%	8.1-8.3%
<u>Karlsruhe Only</u>	<u>Productive</u>	<u>Indirect Productive</u>	<u>Non-Productive</u>
Percent	66.9%	25.0%	8.1%
Time Per Day	5 h 21 m	2 h 0 m	0 h 39 m
Confidence Limits	66.1-67.7%	24.7-25.3%	8.0-8.2%
<u>Germersheim Only</u>	<u>Productive</u>	<u>Indirect Productive</u>	<u>Non-Productive</u>
Percent	64.7%	26.4%	8.9%
Time Per Day	5 h 10 m	2 h 07 m	0 h 43 m
Confidence Limits	63.3-66.1%	25.9-26.9%	8.8-9.0%

The calculations for the percentages, relative precision, and confidence limits are contained in the following Exhibits II-B thru II-G.

EXHIBIT II-B

COMPUTATION OF MAJOR CATEGORIES
STATISTICAL SUMMARY

U.S. MILITARY COMMUNITY KARLSRUHE
(Total DEH)

- Percentages for Productive, Indirect Productive and Non-Productive categories, Relative Precision, and Confidence Limits are computed using the following equations:

$$\bar{P}_k = \frac{\sum f_i P_{ik}}{\sum f_i} \quad \sigma_{\bar{p}}^2 = \frac{\sum \frac{f_i^2 (P_i)(1-P_i)}{n_i}}{(\sum f_i)^2} \quad CL = \bar{P}_k \pm (\sigma_{\bar{p}})(Z)(\bar{P}_k)$$

where:

- k = Productive (p), Indirect Productive (ip), or Nonproductive (np)
- \bar{P}_k = DEH percentage for category k
- f_i = Number of personnel in shop i who could have been sampled. (Shop strength less foreman, clerks, etc.)
- x_i = Number of observations by category k in shop i
- n_i = Total observations in shop i
- P_{ik} = Computed percentage of category k in shop i = x_i/n_i.
- $\sigma_{\bar{p}}$ = Standard deviation.
- P_i = Computed percentage in shop i by category k
- CL = Confidence Limits
- z = Confidence interval is 99.73% (3 standard deviations)

- Percentage calculations (see Tables II-C-1&2 for shop calculations).

<u>PRODUCTIVE</u>	<u>INDIRECT PRODUCTIVE</u>	<u>NON-PRODUCTIVE</u>
$\bar{p}_{k_p} = \frac{8,366.9}{126} = 66.4\%$	$\bar{p}_{k_{ip}} = \frac{3,194.5}{126} = 25.4\%$	$\bar{p}_{k_{np}} = \frac{1,038.6}{126} = 8.2\%$

- Relative Precision and Confidence Limit calculations (see Exhibits II-C-1&3 for shop calculations)

<u>PRODUCTIVE</u>	<u>INDIRECT PRODUCTIVE</u>	<u>NON-PRODUCTIVE</u>
$\sigma_{\bar{p}}^2 = \frac{.201}{15,876} = .0000127$	$\sigma_{\bar{p}}^2 = \frac{.174}{15,876} = .000011$	$\sigma_{\bar{p}}^2 = \frac{.068}{15,876} = .0000043$
$\sigma_{\bar{p}} = .0036$	$\sigma_{\bar{p}} = .0033$	$\sigma_{\bar{p}} = .0021$

Confidence Limits with 99.73% Confidence Level.

Productive	CL = .664 ± (.0036)(3)(.664) = 65.7% to 67.1%
Indirect Productive	CL = .254 ± (.0033)(3)(.254) = 25.1% to 25.7%
Nonproductive	CL = .082 ± (.0021)(3)(.082) = 8.1% to 8.3%

EXHIBIT II-C-1

SUMMARY OF OBSERVATIONS
AND PERCENT BY SHOP
(TOTAL DEH)

SHOP <u>i</u>	Persons <u>f_i</u>	<u>PRODUCTIVE</u>		<u>INDIRECT PRODUCTIVE</u>		<u>NON- PRODUCTIVE</u>		<u>TOTAL</u>
		$\frac{K_p}{P_i}$ %	<u>OBS</u> <u>x_{ip}</u>	$\frac{K_{ip}}{P_i}$ %	<u>OBS</u> <u>x_{iip}</u>	$\frac{K_{np}}{P_i}$ %	<u>OBS</u> <u>x_{inp}</u>	
01 Carpentry	14	67.0	1028	24.6	378	8.4	129	1535
02a Electric	21	69.5	1809	26.2	683	4.3	112	2604
02b Alarm	3	78.0	562	18.1	130	3.9	28	720
03 Plumbing	15	68.4	1638	27.0	648	4.6	110	2396
04 Metal	10	65.3	1028	24.8	390	9.9	155	1573
05 Paint	10	76.4	732	17.7	170	5.9	56	958
06 Kitchen	4	57.9	418	28.1	203	14.0	101	722
09 Heating Burner	4	66.2	546	25.7	212	8.1	67	825
10 Preventive Maintenance	22	59.6	1941	26.9	875	13.5	439	3255
16 Masonry	8	71.1	1032	22.2	322	6.7	98	1452
19 Pipefitting	10	63.6	764	27.4	330	9.0	108	1202
21 Entomology	<u>5</u>	56.0	<u>403</u>	31.4	<u>226</u>	12.6	<u>91</u>	<u>720</u>
TOTAL	126		11,901		4,567		1,494	17,962

EXHIBIT II-C-2

COMPUTATION OF PERCENTAGES
FOR PRODUCTIVE, INDIRECT PRODUCTIVE AND NONPRODUCTIVE
(TOTAL DEH)

SHOP <u>i</u>	PERSONS <u>f_i</u>	PRODUCTIVE <u>f_i^p_{ikp}</u>	INDIRECT PRODUCTIVE <u>f_i^p_{ikip}</u>	NON- PRODUCTIVE <u>f_i^p_{iknp}</u>
01 Carpentry	14	938.0	344.4	117.6
02a Electrical	21	1459.5	550.2	90.3
02b Alarm	3	234.0	54.3	11.7
03 Plumbing	15	1026.0	405.0	69.0
04 Metal	10	653.0	248.0	99.0
05 Paint	10	764.0	177.0	59.0
06 Refrigeration/ Kitchen	4	231.6	112.4	56.0
09 Heating Burner	4	264.8	102.8	32.4
10 Preventive Maintenance	22	1311.2	591.8	297.0
16 Masonry	8	568.8	177.6	53.6
19 Pipefitting	10	636.0	274.0	90.0
21 Entomology	<u>5</u>	<u>280.0</u>	<u>157.0</u>	<u>63.0</u>
	$\Sigma f_i = 126$	8366.9	3194.5	1038.6

$$\bar{p}_k = \frac{\Sigma f_i p_{ik}}{\Sigma f_i} \quad \frac{8,366.9}{126} = 66.4\% \quad \frac{3,194.5}{126} = 25.4\% \quad \frac{1,038.6}{126} = 8.2\%$$

COMPUTATION OF RELATIVE PRECISION
(TOTAL DEH)

SHOP <u>i</u>	PERSONS	PRODUCTIVE	INDIRECT PRODUCTIVE	NON- PRODUCTIVE
	f_i	$\frac{(f_i)^2(p_i)(1-p_i)}{n_{ip}}$	$\frac{(f_i)^2(p_i)(1-p_i)}{n_{iip}}$	$\frac{(f_i)^2(p_i)(1-p_i)}{n_{inp}}$
01 Carpentry	14	.028	.024	.010
02a Electrical	21	.036	.033	.007
02b Alarm	3	.002	.002	.000
03 Plumbing	15	.020	.019	.004
04 Metal	10	.014	.012	.006
05 Paint	10	.019	.015	.006
06 Refrigeration/ Kitchen	4	.005	.004	.003
09 Heating Burner	4	.004	.004	.001
10 Preventive Maintenance	22	.036	.029	.017
16 Masonry	8	.009	.008	.003
19 Pipefitting	10	.019	.017	.007
21 Entomology	<u>5</u>	<u>.009</u>	<u>.007</u>	<u>.004</u>
	$\Sigma f_i = 126$.201	.174	.068

$(\Sigma f_i)^2 = 15,876$

$$\sigma_{\bar{p}}^2 = \Sigma \frac{f_i^2(p_i)(1-p_i)}{n_i} \frac{1}{(\Sigma f_i)^2}$$

$\sigma_{\bar{p}}^2 = .0000127$ $\sigma_{\bar{p}}^2 = .000011$ $\sigma_{\bar{p}}^2 = .0000043$

$\sigma_{\bar{p}} = (\sigma_{\bar{p}}^2)^{\frac{1}{2}}$ $\sigma_{\bar{p}} = .0036$ $\sigma_{\bar{p}} = .0033$ $\sigma_{\bar{p}} = .0021$

EXHIBIT II-D

COMPUTATION OF MAJOR CATEGORIES
STATISTICAL SUMMARY

U.S. MILITARY COMMUNITY KARLSRUHE
(Karlsruhe Only)

- Percentages for Productive, Indirect Productive and Non-Productive categories, Relative Precision, and Confidence Limits are computed using the following equations:

$$\bar{p}_k = \frac{\sum f_i P_{ik}}{\sum f_i} \quad \sigma_{\bar{p}}^2 = \sum \frac{f_i^2 (P_i)(1-P_i)}{n_i (\sum f_i)^2} \quad CL = \bar{p}_k \pm (\sigma_{\bar{p}})(Z)(\bar{p}_k)$$

where:

- k = Productive (p), Indirect Productive (ip), or Nonproductive (np)
- \bar{p}_k = DEH percentage for category k
- f_i = Number of personnel in shop i who could have been sampled. (Shop strength less foreman, clerks, etc.)
- x_i = Number of observations by category k in shop i
- n_i = Total observations in shop i
- P_{ik} = Computed percentage of category k in shop i = x_i/n_i.
- σ_p = Standard deviation.
- P_i = Computed percentage in shop i by category k
- CL = Confidence Limits
- z = Confidence interval is 99.73% (3 standard deviations)

- Percentage calculations (see Exhibits II-E-1&2 for shop calculations).

<u>PRODUCTIVE</u>	<u>INDIRECT PRODUCTIVE</u>	<u>NON-PRODUCTIVE</u>
$\bar{p}_{k_p} = \frac{6,288.4}{94} = 66.9\%$	$\bar{p}_{k_{ip}} = \frac{2,354.4}{94} = 25.0\%$	$\bar{p}_{k_{np}} = \frac{757.2}{94} = 8.1\%$

- Relative Precision and Confidence Limit calculations (see Exhibits II-E-1&3 for shop calculations)

<u>PRODUCTIVE</u>	<u>INDIRECT PRODUCTIVE</u>	<u>NON-PRODUCTIVE</u>
$\sigma_{\bar{p}}^2 = \frac{.155}{8,836} = .0000175$	$\sigma_{\bar{p}}^2 = \frac{.132}{8,836} = .0000149$	$\sigma_{\bar{p}}^2 = \frac{.051}{8,836} = .0000058$
$\sigma_{\bar{p}} = .0042$	$\sigma_{\bar{p}} = .0039$	$\sigma_{\bar{p}} = .0024$

Confidence Limits with 99.73% Confidence Level.

Productive	CL = .669 + (.0042)(3)(.669) = 66.1% to 67.7%
Indirect Productive	CL = .250 ± (.0039)(3)(.250) = 24.7% to 25.3%
Nonproductive	CL = .081 ± (.0024)(3)(.081) = 8.0% to 8.2%

EXHIBIT II-E-1

SUMMARY OF OBSERVATIONS
AND PERCENT BY SHOP
(KARLSRUHE ONLY)

SHOP <u>i</u>	Persons <u>f_i</u>	<u>PRODUCTIVE</u>		<u>INDIRECT PRODUCTIVE</u>		<u>NON- PRODUCTIVE</u>		<u>TOTAL</u>
		<u>%</u> <u>p_i</u>	<u>OBS</u> <u>x_{ip}</u>	<u>%</u> <u>p_i</u>	<u>OBS</u> <u>x_{iip}</u>	<u>%</u> <u>p_i</u>	<u>OBS</u> <u>x_{inp}</u>	<u>OBS</u> <u>n_i</u>
01 Carpentry	10	69.4	666	22.2	213	8.4	81	960
02a Electric	12	63.0	737	32.5	380	4.5	53	1170
02b Alarm	3	78.0	562	18.1	130	3.9	28	720
03 Plumbing	10	74.9	1078	20.3	293	4.8	69	1440
04 Metal	7	67.9	744	22.6	247	9.5	104	1095
05 Paint	6	76.8	552	17.8	128	5.4	39	719
06 Kitchen	4	57.9	418	28.1	203	14.0	101	722
09 Heating Burner	4	66.2	546	25.7	212	8.1	67	825
10 Preventive Maintenance	17	62.3	1581	26.5	671	11.2	285	2537
16 Masonry	6	74.8	801	20.4	219	4.8	51	1071
19 Pipefitting	10	63.5	764	27.5	330	9.0	108	1202
21 Entomology	5	56.0	403	31.4	226	12.6	91	720
TOTAL	94		8,852		3,252		1,077	13,181

EXHIBIT II-E-2

COMPUTATION OF PERCENTAGES
FOR PRODUCTIVE, INDIRECT PRODUCTIVE AND NONPRODUCTIVE
(KARLSRUHE ONLY)

SHOP <u>i</u>	PERSONS <u>f_i</u>	PRODUCTIVE <u>f_iP_{ikp}</u>	INDIRECT PRODUCTIVE <u>f_iP_{ikip}</u>	NON- PRODUCTIVE <u>f_iP_{iknp}</u>
01 Carpentry	10	694.0	222.0	84.0
02a Electrical	12	756.0	390.0	54.0
02b Alarm	3	234.0	54.3	11.7
03 Plumbing	10	749.0	203.0	48.0
04 Metal	7	475.3	158.2	66.5
05 Paint	6	460.8	106.8	32.4
06 Refrigeration/ Kitchen	4	231.6	112.4	56.0
09 Heating Burner	4	264.8	102.8	32.4
10 Preventive Maintenance	17	1059.1	450.5	190.4
16 Masonry	6	448.8	122.4	28.8
19 Pipefitting	10	635.0	275.0	90.0
21 Entomology	<u>5</u>	<u>280.0</u>	<u>157.0</u>	<u>63.0</u>
	Σf _i = 94	6288.4	2354.4	757.2

$$\bar{p}_k = \frac{\sum f_i P_{ik}}{\sum f_i} \quad \frac{6,288.4}{94} = 66.9\% \quad \frac{2,354.4}{94} = 25.0\% \quad \frac{757.2}{94} = 8.1\%$$

EXHIBIT II-E-3

COMPUTATION OF RELATIVE PRECISION
(KARLSRUHE ONLY)

SHOP	PERSONS	PRODUCTIVE	INDIRECT PRODUCTIVE	NON-PRODUCTIVE
i	f_i	$(f_i)^2(p_i)(1-p_i)$	$(f_i)^2(P_i)(1-p_i)$	$(f_i)^2(p_i)(1-p_i)$
		n_{ip}	n_{iip}	n_{inp}
01 Carpentry	10	.022	.018	.008
02a Electrical	12	.029	.027	.005
02b Alarm	3	.002	.002	.000
03 Plumbing	10	.013	.011	.003
04 Metal	7	.010	.008	.004
05 Paint	6	.009	.007	.003
06 Refrigeration/ Kitchen	4	.005	.004	.003
09 Heating Burner	4	.004	.004	.001
10 Preventive Maintenance	17	.027	.022	.011
16 Masonry	6	.006	.005	.002
19 Pipefitting	10	.019	.017	.007
21 Entomology	<u>5</u>	<u>.009</u>	<u>.007</u>	<u>.004</u>
	Σf_i 94	.155	.132	.051

$$(\Sigma f_i)^2 = 8,836$$

$$\sigma_{\bar{p}}^2 = \frac{\Sigma f_i^2(p_i)(1-p_i)}{(\Sigma f_i)^2}$$

$$\sigma_{\bar{p}}^2 = \frac{n_i}{(\Sigma f_i)^2}$$

$$\sigma_{\bar{p}}^2 = .0000175$$

$$\sigma_{\bar{p}}^2 = .0000149$$

$$\sigma_{\bar{p}}^2 = .0000058$$

$$\sigma_{\bar{p}} = (\sigma_{\bar{p}}^2)^{\frac{1}{2}}$$

$$\sigma_{\bar{p}} = .0042$$

$$\sigma_{\bar{p}} = .0039$$

$$\sigma_{\bar{p}} = .0024$$

EXHIBIT II-F

COMPUTATION OF MAJOR CATEGORIES
STATISTICAL SUMMARY

U.S. MILITARY COMMUNITY KARLSRUHE
(Germersheim Only)

- Percentages for Productive, Indirect Productive and Non-Productive categories, Relative Precision, and Confidence Limits are computed using the following equations:

$$\bar{p}_k = \frac{\sum f_i P_{ik}}{\sum f_i} \quad \sigma_{\bar{p}}^2 = \frac{\sum f_i^2 (P_i)(1-P_i)}{n_i (\sum f_i)^2} \quad CL = \bar{p}_k \pm (\sigma_{\bar{p}})(Z)(\bar{p}_k)$$

where:

- k = Productive (p), Indirect Productive (ip), or Nonproductive (np)
- \bar{p}_k = DEH percentage for category k
- f_i = Number of personnel in shop i who could have been sampled. (Shop strength less foreman, clerks, etc.)
- x_i = Number of observations by category k in shop i
- n_i = Total observations in shop i
- P_{ik} = Computed percentage of category k in shop i = x_i/n_i .
- $\sigma_{\bar{p}}$ = Standard deviation.
- P_i = Computed percentage in shop i by category k
- CL = Confidence Limits
- z = Confidence interval is 99.73% (3 standard deviations)

- Percentage calculations (see Exhibits II-G-1&2 for shop calculations).

<u>PRODUCTIVE</u>	<u>INDIRECT PRODUCTIVE</u>	<u>NON-PRODUCTIVE</u>
$\bar{p}_p = \frac{2,069.3}{32} = 64.7\%$	$\bar{p}_{ip} = \frac{846.3}{32} = 26.4\%$	$\bar{p}_{np} = \frac{284.4}{32} = 8.9\%$

- Relative Precision and Confidence Limit calculations (see Exhibits II-G-1&3 for shop calculations)

<u>PRODUCTIVE</u>	<u>INDIRECT PRODUCTIVE</u>	<u>NON-PRODUCTIVE</u>
$\sigma_{\bar{p}}^2 = \frac{.052}{1,024} = .0000508$	$\sigma_{\bar{p}}^2 = \frac{.044}{1,024} = .000043$	$\sigma_{\bar{p}}^2 = \frac{.018}{1,024} = .0000176$
$\sigma_{\bar{p}} = .0071$	$\sigma_{\bar{p}} = .0066$	$\sigma_{\bar{p}} = .0042$

Confidence Limits with 99.73% Confidence Level.

Productive	CL = .647 + (.0071)(3)(.647) = 63.3% to 66.1%
Indirect Productive	CL = .264 + (.0066)(3)(.264) = 25.9% to 26.9%
Nonproductive	CL = .089 + (.0042)(3)(.089) = 8.8% to 9.0%

EXHIBIT II-G-1

SUMMARY OF OBSERVATIONS
AND PERCENT BY SHOP
(GERMERSHEIM ONLY)

SHOP <u>i</u>	Persons <u>f_i</u>	PRODUCTIVE		INDIRECT PRODUCTIVE		NON- PRODUCTIVE		TOTAL
		<u>K_p</u> % <u>p_i</u>	OBS <u>x_{ip}</u>	<u>K_{ip}</u> % <u>p_i</u>	OBS <u>x_{iip}</u>	<u>K_{np}</u> % <u>p_i</u>	OBS <u>x_{inp}</u>	OBS <u>n_i</u>
01 Carpentry	4	63.0	362	28.7	165	8.3	48	575
02a Electric	9	74.8	1072	21.1	303	4.1	59	1434
03 Plumbing	5	58.6	560	37.1	355	4.3	41	956
04 Metal	3	59.4	284	29.9	143	10.7	51	478
05 Paint	4	75.3	180	17.6	42	7.1	17	239
10 Preventive Maintenance	5	50.1	360	28.4	204	21.5	154	718
16 Masonry	<u>2</u>	60.6	<u>231</u>	27.0	<u>103</u>	12.4	<u>47</u>	<u>381</u>
TOTAL	32		3,049		1,315		417	4,781

EXHIBIT II-G-2

COMPUTATION OF PERCENTAGES
FOR PRODUCTIVE, INDIRECT PRODUCTIVE AND NONPRODUCTIVE
(GERMERSHEIM ONLY)

SHOP <u>i</u>	PERSONS <u>f_i</u>	PRODUCTIVE <u>f_iP_{ikp}</u>	INDIRECT PRODUCTIVE <u>f_iP_{ikip}</u>	NON- PRODUCTIVE <u>f_iP_{iknp}</u>
01 Carpentry	4	252.0	114.8	33.2
02a Electrical	9	673.2	189.9	36.9
03 Plumbing	5	293.0	185.5	21.5
04 Metal	3	178.2	89.7	32.1
05 Paint	4	301.2	70.4	26.4
10 Preventive Maintenance	5	250.5	142.0	107.5
16 Masonry	<u>2</u>	<u>121.2</u>	<u>54.0</u>	<u>24.8</u>
	Σf _i = 32	2069.3	846.3	284.4

$$\bar{p}_k = \frac{\sum f_i P_{ik}}{\sum f_i} \quad \frac{2,069.3}{32} = 64.7\% \quad \frac{846.3}{32} = 26.4\% \quad \frac{284.4}{32} = 8.9\%$$

COMPUTATION OF RELATIVE PRECISION
(GERMERSHEIM ONLY)

SHOP <u>i</u>	PERSONS <u>f_i</u>	PRODUCTIVE	INDIRECT	NON-
		$(f_i)^2(p_i)(1-p_i)$	$(f_i)^2(p_i)(1-p_i)$	$(f_i)^2(p_i)(1-p_i)$
		<u>n_{ip}</u>	<u>n_{iip}</u>	<u>n_{inp}</u>
01 Carpentry	4	.006	.006	.002
02a Electrical	9	.011	.009	.002
03 Plumbing	5	.006	.006	.001
04 Metal	3	.005	.004	.002
05 Paint	4	.012	.010	.004
10 Preventive Maintenance	5	.009	.007	.006
16 Masonry	<u>2</u>	<u>.003</u>	<u>.002</u>	<u>.001</u>
	$\Sigma f_i = 32$.052	.044	.018

$$(\Sigma f_i)^2 = 1,024$$

$$\sigma_{\bar{p}}^2 = \frac{\Sigma \frac{f_i^2(p_i)(1-p_i)}{n_i}}{(\Sigma f_i)^2}$$

$$\sigma_{\bar{p}}^2 = .0000508 \quad \sigma_{\bar{p}}^2 = .000043 \quad \sigma_{\bar{p}}^2 = .0000176$$

$$\sigma_{\bar{p}} = (\sigma_{\bar{p}}^2)^{\frac{1}{2}}$$

$$\sigma_{\bar{p}} = .0071 \quad \sigma_{\bar{p}} = .0066 \quad \sigma_{\bar{p}} = .0042$$

EXHIBIT II-H

SHOP RANKING BY CATEGORY
(Total DEH)

<u>PRODUCTIVE</u>		<u>INDIRECT PRODUCTIVE</u>		<u>NON-PRODUCTIVE</u>	
<u>Shop</u>	<u>%</u>	<u>Shop</u>	<u>%</u>	<u>Shop</u>	<u>%</u>
02b Alarm	78.0%	05 Painter	17.7%	02b Alarm	3.9%
05 Painter	76.4%	02b Alarm	18.1%	02a Electrician	4.3%
16 Mason	71.1%	16 Mason	22.2%	03 Plumber	4.6%
02a Electrician	69.5%	01 Carpentry	24.6%	05 Painter	5.9%
03 Plumber	68.4%	04 Metal	24.8%	16 Mason	6.7%
01 Carpentry	67.0%	09 Heat&Burner	25.7%	09 Heat&Burner	8.1%
09 Heat&Burner	66.2%	02a Electrician	26.2%	01 Carpentry	8.4%
04 Metal	65.3%	10 PM	26.9%	19 Pipefitter	9.0%
19 Pipefitter	63.6%	03 Plumber	27.0%	04 Metal	9.9%
10 PM	59.6%	19 Pipefitter	27.4%	21 Entomology	12.6%
06 Refr & Kit	57.9%	06 Refr & Kit	28.1%	10 PM	13.5%
21 Entomology	56.0%	21 Entomology	31.4%	06 Refr & Kit	14.0%

EXHIBIT II-I

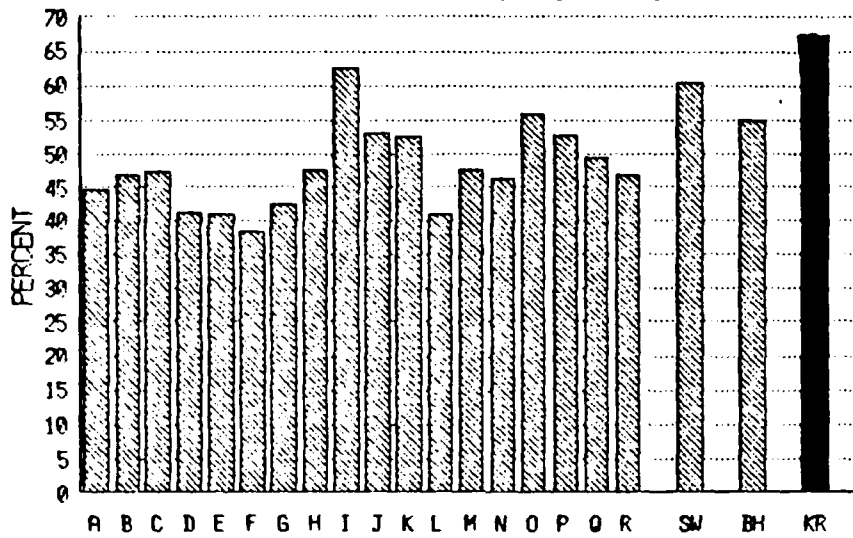
WORK SAMPLING SUMMARY
CURRENT VERSUS RECOMMENDED PERCENTAGES

FACILITY ¹	PRODUCTIVE		INDIRECT PRODUCTIVE		NON PRODUCTIVE	
	CUR	REC	CUR	REC	CUR	REC
A	44.8	60.0	40.0	27.0	15.2	13.0
B	46.9	60.0	40.7	27.6	12.4	12.4
C	47.0	61.9	35.8	27.8	17.2	10.3
D	41.0	60.0	26.6	26.6	32.4	13.4
E	40.7	59.8	33.8	24.8	25.5	15.4
F	38.3	60.0	26.2	25.4	35.5	14.6
G	42.4	60.0	31.2	27.6	26.4	12.4
H	47.2	60.0	28.7	27.6	24.1	12.4
I	62.6	65.0	23.6	21.2	13.8	13.8
J	53.0	61.0	31.3	24.3	15.7	14.7
K	52.4	66.9	32.8	20.6	14.8	12.5
L	40.7	59.0	35.9	24.8	23.4	16.2
M	47.2	62.8	37.4	23.7	15.4	13.5
N	46.1	61.1	39.4	26.2	14.5	12.7
O	55.8	66.3	29.1	21.2	15.1	12.5
P	52.6	66.6	38.2	24.2	9.2	9.2
Q	49.2	60.7	34.7	25.0	16.1	14.3
R	46.9	60.0	32.2	25.2	20.9	14.8
Karlsruhe	66.4	68.4	25.4	23.4	8.2	8.2

Note 1: Facilities A-R are state side installations.

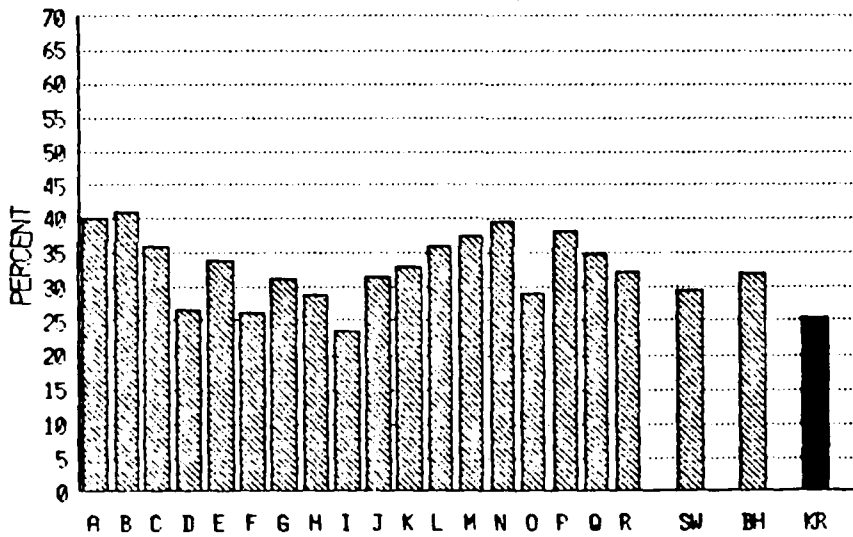
DIRECT PRODUCTIVITY COMPARISON

EXHIBIT II-J



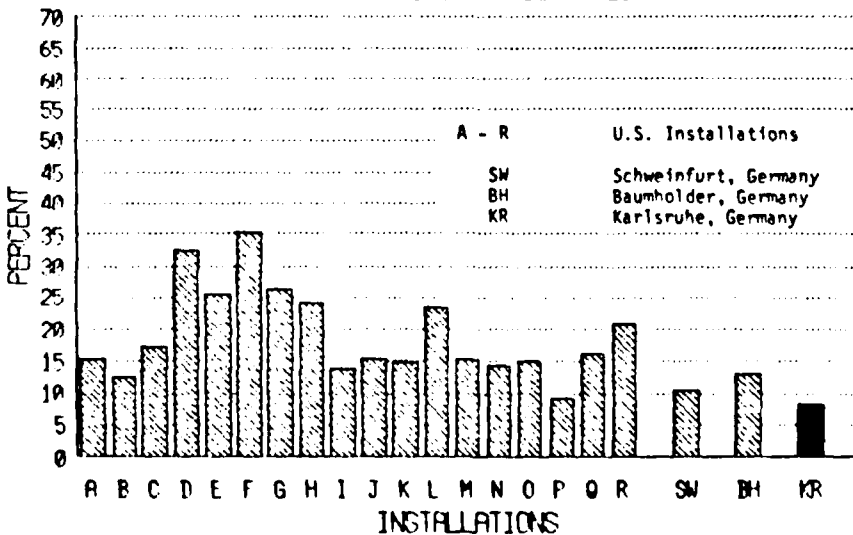
INDIRECT PRODUCTIVITY COMPARISON

EXHIBIT II-K



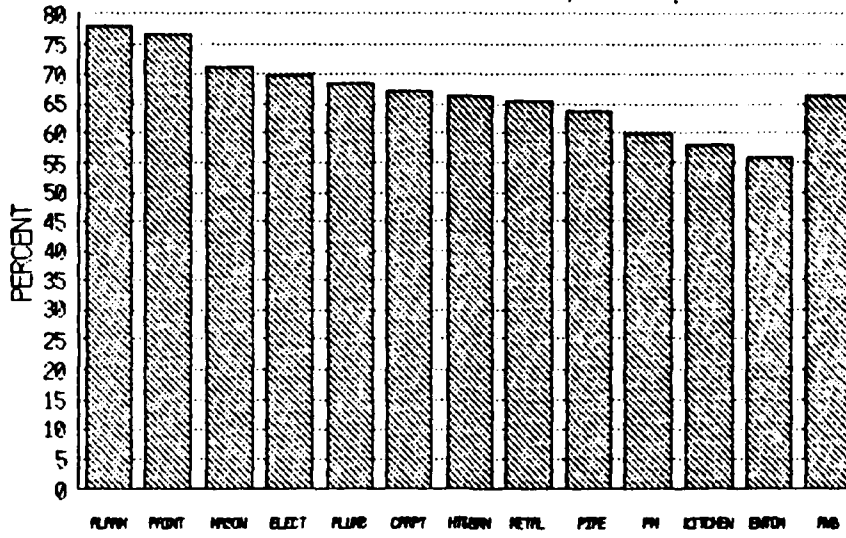
NON-PRODUCTIVITY COMPARISON

EXHIBIT II-L



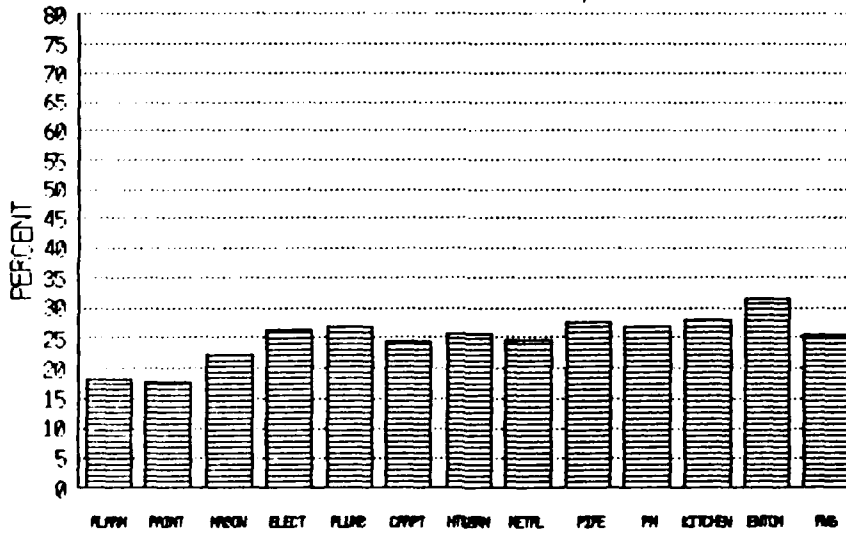
DIRECT PRODUCTIVE by SHOP

EXHIBIT II-M



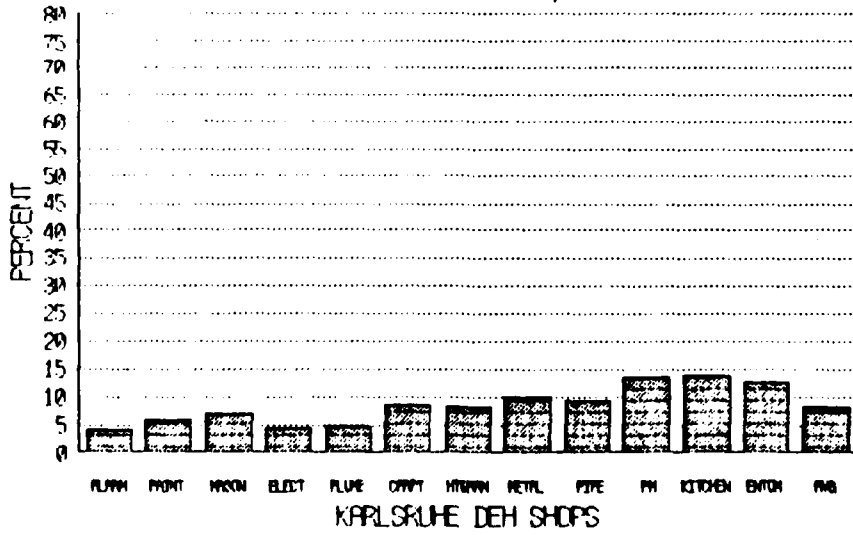
INDIRECT PRODUCTIVE by SHOP

EXHIBIT II-N



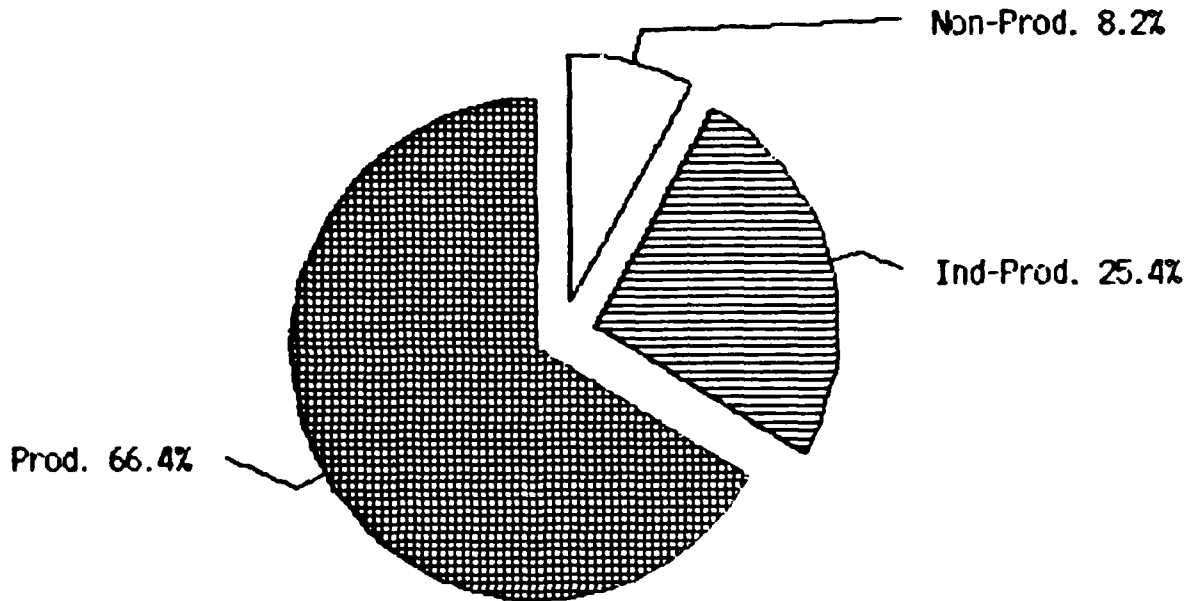
NON-PRODUCTIVE by SHOP

EXHIBIT II-O

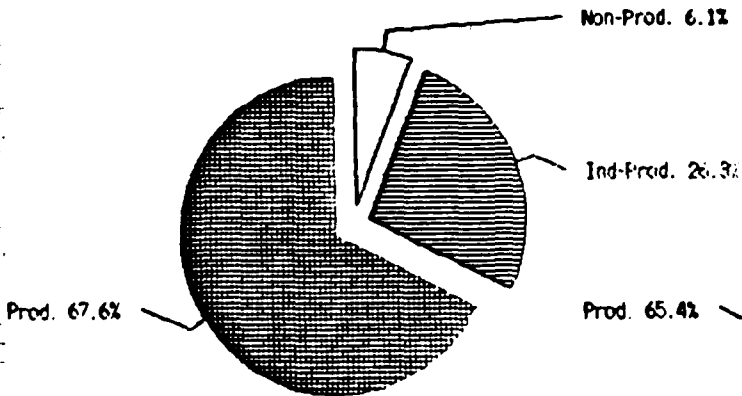


KARLSRUHE DEH SHOPS

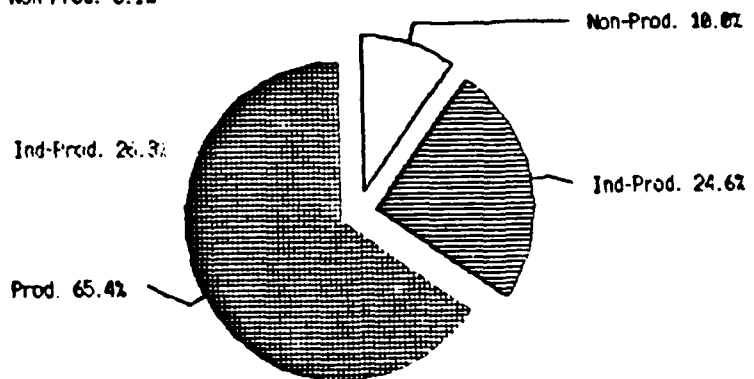
U.S. MILITARY COMMUNITY KARLSRUHE ¹



Utilities Division ¹



Buildings and Grounds Division ¹



NOTE 1 - TOTAL DEH

EXHIBIT II-Q

PERCENT DISTRIBUTION OF OBSERVATIONS

DEH TOTAL

<u>CATEGORY</u>		<u>PERCENTAGE</u>
100	Productive Craft Time	66.4
200	Indirect Productive	25.4
210	Job Preparation	14.7
211	Receiving Instructions Supervisor	0.6
212	Get and Put Away Tools and Equipment	1.0
213	Layout and Put Away Tools, Equipment, and Material at Job Site	9.9
214	Clean Up Job Site	2.3
215	Personal Clean Up at Job Site	0.6
216	Safety Precautions	0.3
220	Materials Handling	0.6
230	Travel	5.6
240	Planning	2.3
250	Balancing Delay	1.1
260	Maintenance of Shop Tools and Equipment	0.4
270	Housekeeping	0.1
290	Paperwork	0.6
300	Nonproductive	8.2
310	Personal	5.2
311	Latrine	0.3
312	Idle (Productive Work is Available)	2.3
313	Clean Up and Dressing	0.3
314	Coffee Breaks and Rest Periods	2.3
320	Official	0.0
330	Idle (Not Controlled by Craftsperson, but Controlled by DEH)	2.4
331	Await Transportation	0.1
332	Await Assignment	2.2
333	Await Tools, Material and Equipment	0.1
334	Two Persons on One Person Job	0.0
335	Poor Scheduling	0.0
340	Idle (Not Controlled by DEH) (Awaiting for Other Departments, Divisions, Customers)	0.6
341	Await Other Departments and Divisions	0.6
342	Power/Equipment Failure	0.0
343	Inclement Weather	0.0

EXHIBIT II-R

PERCENT DISTRIBUTION OF OBSERVATIONS

KARLSRUHE AREA SHOPS

<u>CATEGORY</u>		<u>PERCENTAGE</u>
100	Productive Craft Time	66.9
200	Indirect Productive	25.0
210	Job Preparation	14.3
211	Receiving Instructions Supervisor	0.6
212	Get and Put Away Tools and Equipment	0.9
213	Layout and Put Away Tools, Equipment, and Material at Job Site	10.3
214	Clean Up Job Site	1.9
215	Personal Clean Up at Job Site	0.3
216	Safety Precautions	0.3
220	Materials Handling	0.5
230	Travel	5.6
240	Planning	2.3
250	Balancing Delay	1.3
260	Maintenance of Shop Tools and Equipment	0.3
270	Housekeeping	0.0
290	Paperwork	0.7
300	Nonproductive	8.1
310	Personal	4.8
311	Latrine	0.2
312	Idle (Productive Work is Available)	2.0
313	Clean Up and Dressing	0.4
314	Coffee Breaks and Rest Periods	2.2
320	Official	0.0
330	Idle (Not Controlled by Craftsperson, but Controlled by DEH)	2.6
331	Await Transportation	0.1
332	Await Assignment	2.4
333	Await Tools, Material and Equipment	0.1
334	Two Persons on One Person Job	0.0
335	Poor Scheduling	0.0
340	Idle (Not Controlled by DEH) (Awaiting for Other Departments, Divisions, Customers)	0.7
341	Await Other Departments and Divisions	0.7
342	Power/Equipment Failure	0.0
343	Inclement Weather	0.0

EXHIBIT II-S

PERCENT DISTRIBUTION OF OBSERVATIONS

GERMERSHEIM SHOPS

<u>CATEGORY</u>		<u>PERCENTAGE</u>
100	Productive Craft Time	64.7
200	Indirect Productive	26.4
210	Job Preparation	15.9
211	Receiving Instructions Supervisor	0.6
212	Get and Put Away Tools and Equipment	1.0
213	Layout and Put Away Tools, Equipment, and Material at Job Site	9.6
214	Clean Up Job Site	3.1
215	Personal Clean Up at Job Site	1.3
216	Safety Precautions	0.3
220	Materials Handling	0.7
230	Travel	5.7
240	Planning	2.4
250	Balancing Delay	0.8
260	Maintenance of Shop Tools and Equipment	0.6
270	Housekeeping	0.1
290	Paperwork	0.2
300	Nonproductive	8.9
310	Personal	6.5
311	Latrine	0.4
312	Idle (Productive Work is Available)	3.2
313	Clean Up and Dressing	0.3
314	Coffee Breaks and Rest Periods	2.6
320	Official	0.0
330	Idle (Not Controlled by Craftsperson, but Controlled by DEH)	1.9
331	Await Transportation	0.0
332	Await Assignment	1.7
333	Await Tools, Material and Equipment	0.2
334	Two Persons on One Person Job	0.0
335	Poor Scheduling	0.0
340	Idle (Not Controlled by DEH) (Awaiting for Other Departments, Divisions, Customers)	0.5
341	Await Other Departments and Divisions	0.5
342	Power/Equipment Failure	0.0
343	Inclement Weather	0.0

APPENDIX A

SECTION II

DETAILED ANALYSIS OF THE WORK SAMPLING STUDY
OF THE
DIRECTORATE OF ENGINEERING AND HOUSING
AT
THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.

SEPTEMBER 1984

APPENDIX A

SECTION II

DETAILED ANALYSIS OF THE WORK SAMPLING STUDY
OF THE
DIRECTORATE OF ENGINEERING AND HOUSING
AT
THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.

II.A DETAILED ANALYSIS OF WORK SAMPLING STUDY

II.A.1 100 Direct Productive - 66.4%

A. Craft Time - 66.4%

(1) This category identifies craft time applied to the performance and ultimate completion of an assigned task or function.

(2) It must be emphasized that the intensive work sampling method does not measure the skill level or performance rate of observed craftsmen. Engineered Performance Standards and/or stopwatch time studies are necessary to determine the efficiency of the craft workforce. However, when obvious discrepancies between productivity and effectiveness/efficiency were observed and are significant, they are noted.

(3) The work sampling results from the Directorate of Engineering and Housing indicate that for approximately 5 hours and 19 minutes per day (or 66.4% of craft time) Karlsruhe craftsmen are engaged in directly productive labor leading to the performance or accomplishment of an assigned craft task. Of the 21 RPMAs (DEHs) work sampled by HAMM ASSOCIATES, this is the highest direct productivity ever observed. Karlsruhe DEH is commended for achieving this high level of productivity. It is the conclusion of the work sampling team that the craftsmen productivity can be even further increased by better time

management. Specific recommendations are contained in this Appendix and in Sections III and V.

II.A.2 200 Indirect Productive - 25.4%

A. 210 Job Preparation - 14.7%

(1) This subcategory defines the portion of craft time devoted to communication with a shop supervisor or foreman in receiving instructions, obtaining and replacing tools and equipment at the job site, cleaning up refuse or debris resulting from craft activity, personal clean-up at the job site, and time spent taking safety precautions.

(2) The craft time observed in each category is presented in Table II-A-1 along with the average of 18 stateside RPMAs and the average of 3 RPMAs in Germany. (Karlsruhe included in Germany average.)

TABLE II-A-1
 SUMMARY OF CRAFT TIME SPENT
 IN JOB PREPARATION

(Based on 8-Hour Work Day)

Category	Karlsruhe		States Average		Germany Average	
	Minutes	Percent	Minutes	Percent	Minutes	Percent
211 Receiving Instructions from Supervisor	2.9	.6	7.2	1.4	4.3	0.9
212 Getting & Putting Away Tools & Equipment	4.8	1.0	11.0	2.2	6.7	1.4
213 Handling Tools & Equipment at Job Site	47.5	9.9	17.3	3.6	34.5	7.2
214 Clean Up Job Site	11.0	2.3	5.3	1.1	10.6	2.2
215 Personal Clean Up at Job Site	2.9	.6	.9	.2	1.9	0.4
216 Safety Precautions	1.4	.3	4.3	.9	1.0	0.2
210 Category TOTAL	70.5	14.7	46.0	9.4	59.0	12.3

(3) Based upon other activities work sampled, as noted in the table above, the total time expended per day for job preparation, 70.5 minutes, is excessive. The major concern is category 213 (Layout and put away tools, equipment and material at job site). 47.5 minutes per day or 9.9 percent of the craftsperson's time was expended in this category.

Initially it was thought that this was due to the high relative proportion of IJO versus SOs and SOOs -- 48.6%, 20.3% and 31.1% respectively. Further analysis of category 213 for each of these revealed:

IJO - 8.3%
 SOs - 14.1%
 SOOs - 9.5%

(4) The most significant reasons for category 213 to be 47.5 minutes per day are:

(a) General lack of anticipating what tools would normally be required at the job site.

(b) Lack of the use of tool belts/aprons by some shops.

(c) Putting away and getting out of tools and equipment before and after the lunch break.

The handling of tools includes the time expended going from building to the truck and return. By anticipating the appropriate tools and equipment to carry initially, together with the use of tool belts or jackets, a significant portion of this motion would be eliminated. By craftsmen eating lunch on the job site, the time normally expended handling tools before and after the lunch break would be eliminated.

(5) It is concluded by HAMM ASSOCIATES, based on findings from other studies, that an average of 38 minutes a day for handling tools and equipment, or 7.9 percent is a reasonable goal for Karlsruhe to achieve.

(6) Categories 211, 212, 214, 215 and 216 are considered reasonable. It is, however, noted that category 216 (Safety Precautions) may increase depending on the effectiveness of an increased safety awareness program which appears to be warranted.

B. 220 Material Handling - 0.6%

(1) Material handling consists of physically obtaining material, loading and unloading the truck and locating material to be obtained.

(2) The Material Handling time was 2.9 minutes per day. This time is considered reasonable.

C. 230 Travel Time - 5.6%

(1) Travel time for this study is the time expended by the craftsperson in checking out the vehicles in the morning, traveling to the job sites, traveling back and forth to the shop and returning to the shops for lunch and at night.

(2) The amount of travel time by craftspersons observed during the work sampling study averaged 26.9 minutes per day. This time is considered very reasonable and commendable. On numerous occasions the craftspersons were already traveling at the official start time and also when traveling back to the shop for lunch some of that travel was done on the craftsperson's lunch period.

D. 240 Planning On the Job Site - 2.3%

(1) This category identifies that phase of job preparation devoted to obtaining an understanding of job requirements planning (job site), and is usually the responsibility of the craftsperson assigned to the specific job.

(2) Job site planning consists of studying the job site, reading drawings and sketches, making calculations, and discussing the job with other craftspersons. This planning consumed an average of approximately 11 minutes per day. On-site observations indicate the time spent was valid.

E. 250 Balancing Delay - 1.1%

(1) This category reflects that portion of time during multi-person jobs when one craftsperson's productive effort is halted by the supporting efforts of another.

(2) The time per day, 5.3 minutes, results largely from the type of work being performed and is considered reasonable.

F. 260 Maintenance of Shop Tools and Equipment; 270 Housekeeping - 0.4%, 0.1%

(1) These categories reflect: (a) the time used by craftspersons to assure tools and equipment are functional, (b) required time to perform necessary in-shop cleanup, and (c) time expended in fueling vehicles.

(2) Time spent for these categories is considered reasonable.

G. 290 Paperwork - 0.6%

(1) This category includes the time craftspersons spend preparing issue slips for material being withdrawn from the warehouse, preparing time sheets, recording work done on SOs, listing materials used on the job, etc.

(2) The time per day, 2.9 minutes, is considered reasonable.

II.A.3 300 NONPRODUCTIVE - 8.2%

A. 310 Personal - 5.2%

This category identifies that time required to satisfy normal personal needs. Included in this category is the time required for clean-up and dressing, washroom, coffee breaks, and rest periods.

TABLE II-A-2

SUMMARY OF CRAFTSPERSON'S TIME SPENT FOR PERSONAL TIME

	<u>Percent</u>	<u>Average Minutes Per Day</u>
311 Latrine (Urinal)	0.3	1.4
312 Idle (Productive Work Available)	2.3	11.0
313 Clean Up and Dressing	0.3	1.4
314 Coffee Breaks and Rest Periods	<u>2.3</u>	<u>11.0</u>
	5.2	24.8

(2) This study shows an average of 24.8 minutes per day in this category. This time is well within acceptable limits. In fact, in several cases craftspersons observed did not stop for their authorized 14 minute break.

B. 320 Official Temporary Absence from Job - 0.0%

(1) This category identifies that time expended on meetings, blood donations, physicals and other administrative requirements.

(2) No activity in this category was observed.

C. 330 Idle - (Not Controlled by Craftsperson, but Controlled by DEH - 2.4%

(1) This category covers that portion of time spent by the craftsperson resulting from factors that are not under the control of the craftsperson, but are under the control of the DEH. Exhibits II-AA thru II-GG, pages II-48 thru II-75, illustrate examples of this situation. Table II-A-3 presents the 330 category and its subcategories.

TABLE II-A-3

SUMMARY OF IDLE TIME (NOT CONTROLLED BY CRAFTSPERSON)

	<u>Percent</u>	<u>Minutes per Day</u>
331 Await Transportation	0.1	0.5
332 Await Assignment	2.2	10.6
333 Await tools or materials	0.1	0.5
334 Two persons on a one person job/poor scheduling (not observed)	<u>0.0</u>	<u>0.0</u>
	2.4	11.6

D. 340 Idle (Not Controlled by DEH) - 0.6%

(1) This category reflects the idle time spent by the craftspersons that is caused by factors outside the control of the Directorate of Engineering and Housing.

(2) The time of 2.9 minutes is considered reasonable.

II.A.4 Analysis of First and Last Productive Effort

This data is based on actual observations during the work sampling process. Table II-A-4 shows how soon the first productive effort takes place in the morning, how early it stops before and starts after lunch, and how early it ends before quitting time. In addition, the same information for the best stateside RPMA activity work sampled, Ft. Sill, OK., is shown in table II-A-4 as a comparison of an activity whose craftspersons ate lunch at the job site and exceeded 60% direct productivity.

TABLE II-A-4

KARLSRUHE AND FORT SILL
 AVERAGE START/STOP TIMES
 (FIRST AND LAST CODE 100 PRODUCTIVE WORK)

<u>MORNING START</u>	<u>TIME LOST</u>	<u>MORNING STOP</u>	<u>TIME LOST</u>	<u>AFTERNOON START</u>	<u>TIME LOST</u>	<u>AFTERNOON STOP</u>	<u>TIME LOST</u>	<u>TOTAL AVG. PRODUCTIVE TIME LOST PER PERSON PER DAY</u>
* * * GERMERSHEIM * * *								
0730	15	1145	15	1257	12	1537	23	65
* * * KARLSRUHE * * *								
0749	19	1152	8	1238	8	1542	18	53
* * * KARLSRUHE DEH * * *								
(Times Adjusted for 0730 Start, 30 minute Lunch)								
0748	18	1150	10	1238	8	1541	19	55
* * * FORT SILL * * *								
0751	21	1117	13	1205	5	1538	22	61

The type of items that influence these start and stop times are:

- Job preparation prior to starting work in the morning
- Travel to and return from job site.
- Returning to shop for lunch and returning to the same vicinity or job after lunch
- Stopping early to return vehicles to mobile equipment holding section and leaving work once the vehicles are parked.
- Being at the shop 15 to 50 minutes before quitting time.

This lost productive time averages 65 minutes and 53 minutes per day per worker for Germersheim and Karlsruhe craftspersons, respectively. The overall lost productive time averages 55 minutes for the Karlsruhe DEH.

As indicated in Exhibit II-U, page II-39, 21 percent of the craftspersons were observed beginning their first productive effort 11 to 15 minutes after start time. Another 21 percent began work 16 to 20 minutes; with 9 percent beginning as late as 21 to 25 minutes and 11 percent starting as late as 26 to 30 minutes. Also observed, as indicated in Exhibit II-V, page II-39, productive work stopped around 6 to 10 minutes (25%) before lunch with 12 percent stopping between 11 to 15 minutes before lunch.

As shown on Exhibit II-W, page II-40, 15 percent of the craftspersons work sampled did not begin a productive effort until 11 to 15 minutes after finishing their lunch break; 11 percent did not begin any effort until 16 to 20 minutes after lunch and 8 percent until 21 to 25 minutes after lunch time. During the last productive effort in the afternoon (Exhibit II-X, page II-40) 15 percent were observed quitting 16 to 20 minutes before the end of the day and another 9 percent, 26 to 30 minutes before the end of the work day. Karlsruhe/Germersheim productive start/stop times are among the best of military installations work sampled to date. This can be attributed in part to Foremen arriving to work early to prepare days work, and numerous craftspersons eating on the job site.

II.A.5 SUMMARY AND RECOMMENDED OBJECTIVES

(a) Based on the results of this work sampling study and a comparative analysis to the average of several other DEH activities, (see Exhibits II-I thru II-L, pages II-19 and II-20) the following productivity objectives are considered reasonable for Karlsruhe.

	<u>Percent</u>	<u>Time</u>
Productive	68.4	5 h 28 m
Indirect Productive	23.4	1 h 52 m
Nonproductive	<u>8.2</u>	<u>0 h 40 m</u>
	100.0	8 hours

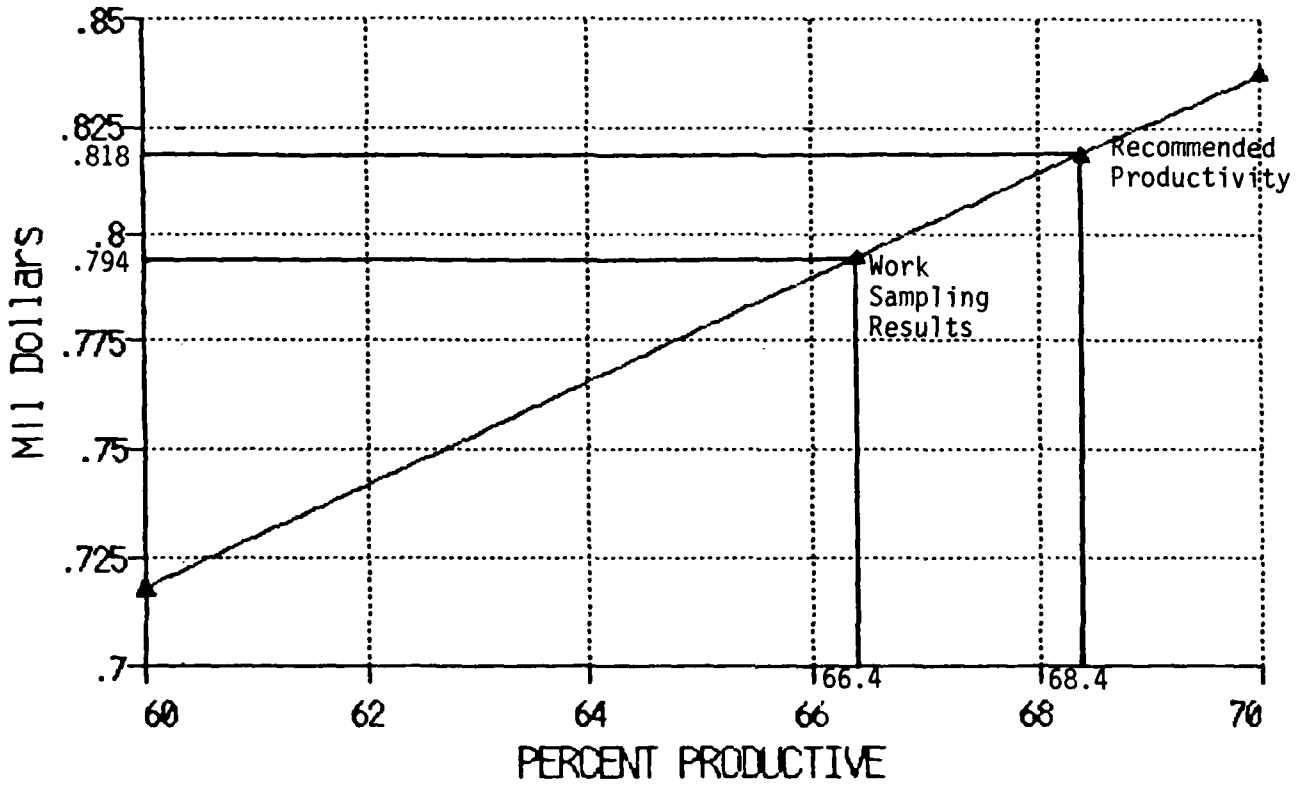
(b) Results of work sampling have shown Karlsruhe to be superior in most categories to the averages established by HAMM & ASSOCIATES research and data collection both stateside and in the Federal Republic of Germany. Karlsruhe's performance is commendable.

(c) It should be noted that the 68.4 percent projected goal should be achieved if all craftspersons eat lunch on the job (not just those on certain IJOs), and learn to anticipate their tool requirements. This procedural change will save 2.0 percent or 9.6 minutes of craft time per person per day for a total annual cost avoidance of \$23,930, computed as follows: $2.0 \times \$11,965$ (1% of available labor) = \$23,930. See Exhibit II-Y, page II-41, for Average Wage Computations. Exhibit II-T, page II 38, illustrates graphically this savings, should this goal be attained. While this is not a common practice at other activities, Fort Sill and 15 of 16 private commercial activities in the Tidewater, Virginia area have their work forces eat on the job site. The commercial firms included air conditioning/heating shops, carpentry, electrical, plumbing, painting and general contractors.

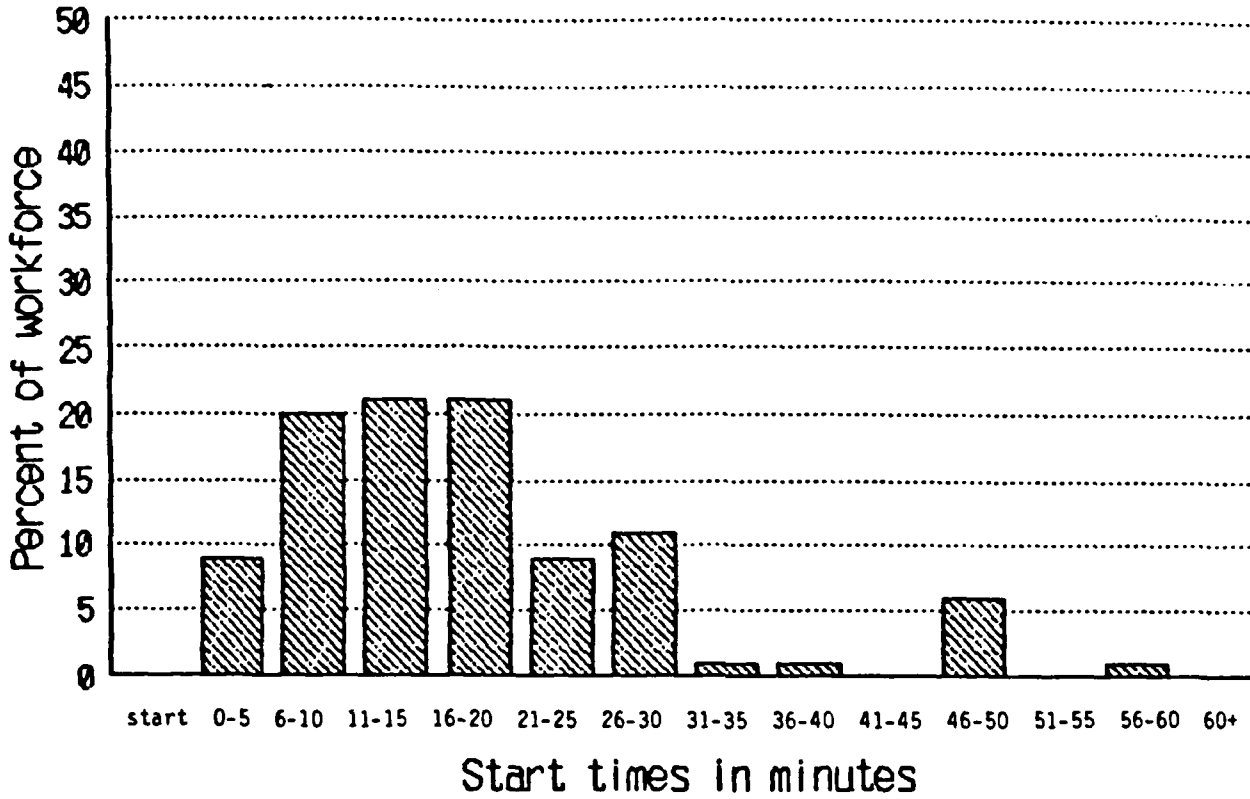
Exhibits II-Q thru II-S, pages II-23 thru II-25, contain the percentage and time distribution based on the 17,962 observations made during the initial on-site phase of this study. Exhibit II-Z, page II-47, contains the percentage and productivity distributions of these observations according to type work -- S00, S0, and IJO.

Exhibit II-AA thru Exhibit II-GG, pages II-48 to II-79, are examples that present daily recounts of observations made during the course of this study, with conclusions and recommendations that will assist in improving Karlsruhe's productive time to 68.4 percent. No attempt is made to place any individual on report or any particular shop under scrutiny. These examples are findings of fact and are used solely as factual support for conclusions drawn and recommendations made by HAMM ASSOCIATES.

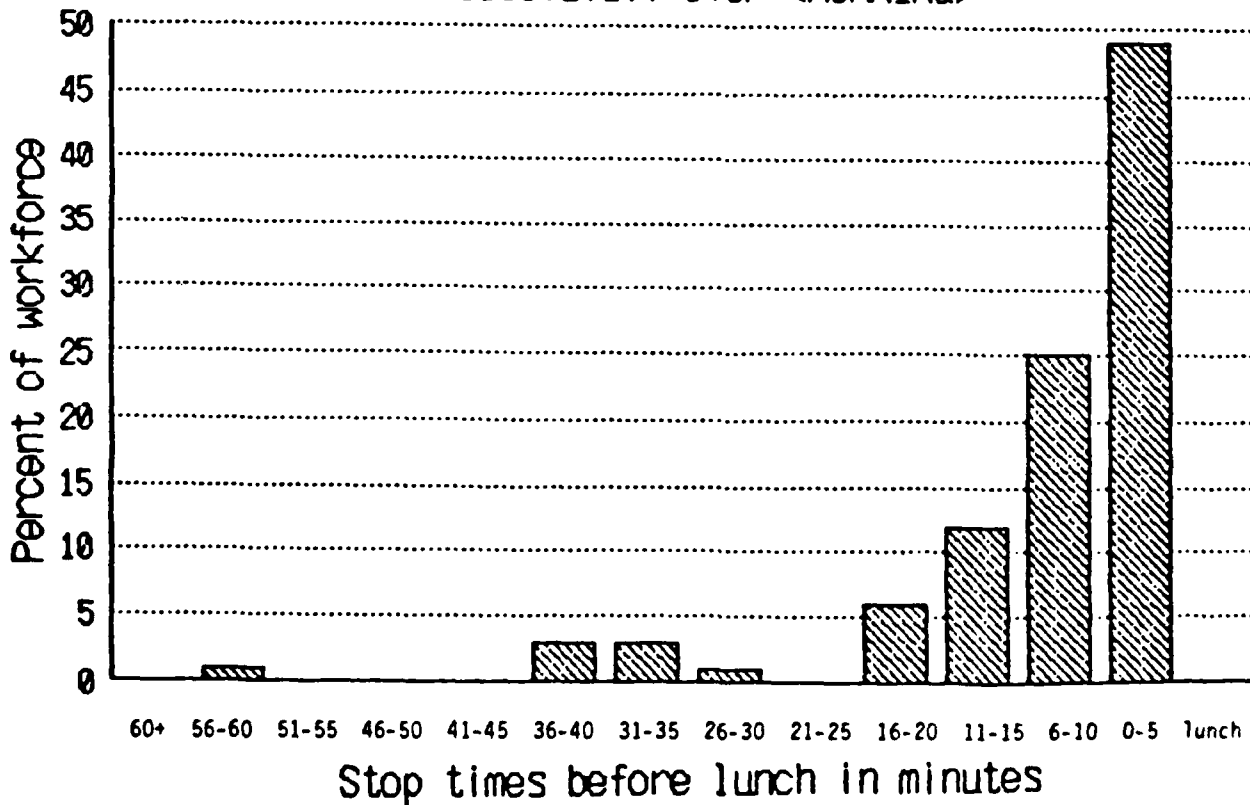
PRODUCTIVITY IMPROVEMENT COST AVOIDANCE



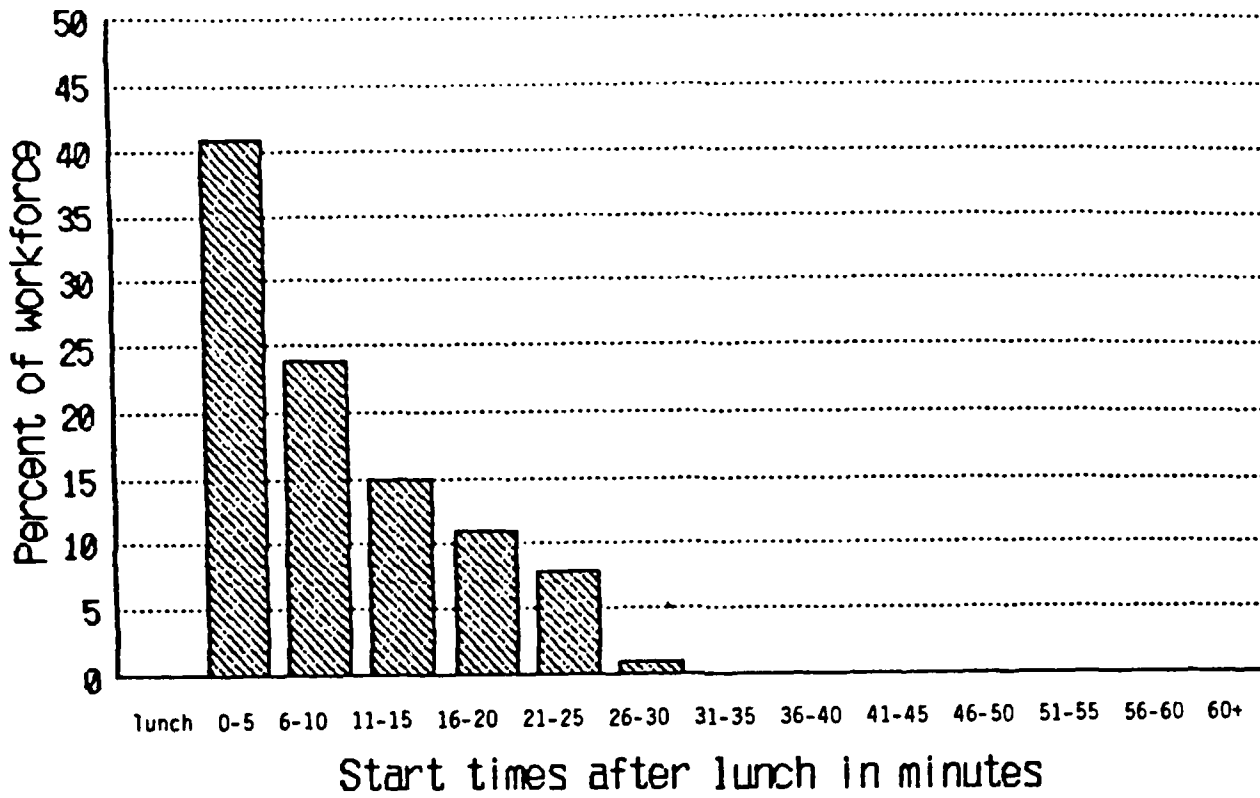
PRODUCTIVITY START (MORNING)



PRODUCTIVITY STOP (MORNING) EXHIBIT II-V



PRODUCTIVITY START (AFTERNOON)



PRODUCTIVITY STOP (AFTERNOON)

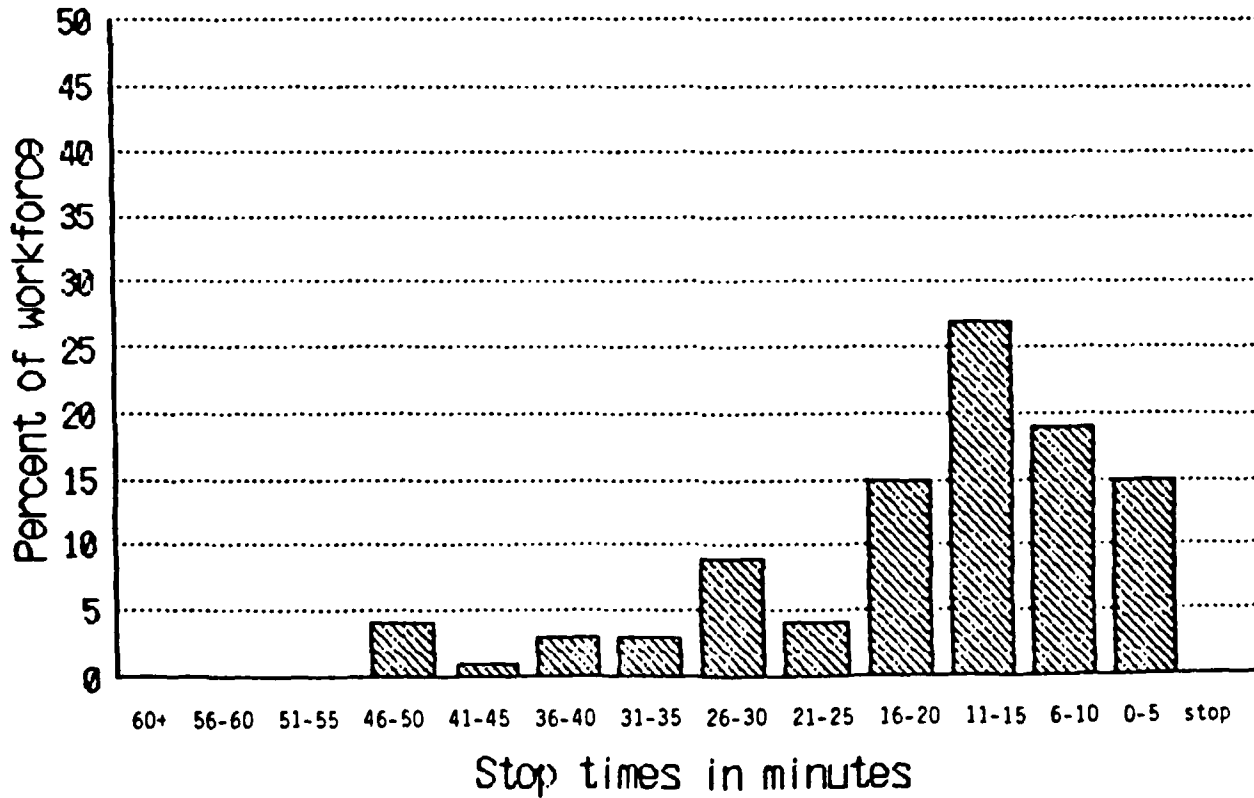


EXHIBIT II-Y

COMPUTATION OF AVERAGE WORKER WAGE
KARLSRUHE (LESS GERMERSHEIM)

<u>SECTION</u>	<u>GRADE¹</u>	<u>NO.</u>	<u>(DM) COST²</u>	<u>TOTAL COST BY SECTION</u>
<u>Carpentry/Masonry</u>				
Mason	A4-6	6	250,788	
Roofer	A4-6	1	41,798	
Roofer	A4-5	1	37,820	
Carpenter	A4-6	8	334,384	
		<u>16</u>		<u>664,790</u>
<u>Preventive Maintenance</u>				
Electrician	A4-6	5	208,990	
Plumber	A4-6	6	250,788	
Carpenter	A4-6	6	250,788	
		<u>17</u>		<u>710,566</u>
<u>Metal Working</u>				
Metal Worker	A4-6	7	292,586	
		<u>7</u>		<u>292,586</u>
<u>Painting</u>				
Painter	A4-6	5	208,990	
Sign Painter	A4-6	1	41,798	
		<u>6</u>		<u>250,788</u>
<u>Entomology</u>				
Pest Controller Leader	A2-6/L	1	40,134	
Pest Controller	A2-4	4	132,100	
		<u>5</u>		<u>172,234</u>
<u>Refrigeration/Mechanical Kitchen Equipment</u>				
Air Cond Equip Mech	A4-7	2	89,318	
Kitchen Equip Mech	A4-7	2	89,318	
		<u>4</u>		<u>178,636</u>
<u>Plumbing</u>				
Plumber Leader	A4-6/L	1	45,978	
Plumber	A4-6	9	376,182	
		<u>10</u>		<u>422,160</u>

EXHIBIT II-Y (continued)

<u>SECTION</u>	<u>GRADE</u> ¹	<u>NO.</u>	<u>(DM) COST</u> ²	<u>TOTAL COST BY SECTION</u>
<u>Pipefitting</u>				
Pipefitter Leader	A4-7/L	1	49,125	
Pipefitter	A4-7	<u>9</u>	401,931	<u>451,056</u>
<u>Electrical</u>				
Electrician Leader	A4-6/L	1	45,978	
Electrician	A4-6	<u>11</u>	459,778	<u>505,756</u>
		<u>12</u>		
<u>Alarm Systems</u>				
Electronics Mechanic	A4-7	<u>3</u>	133,977	<u>133,977</u>
		<u>3</u>		
<u>Heating Burner Mechanics</u>				
Electronics Mechanic	A4-7	1	44,659	
Heating Equip Mechanic	A4-7	<u>3</u>	133,977	<u>178,636</u>
		<u>4</u>		
GRAND TOTAL		94		3,961,185
TOTAL U.S. DOLLARS ³			\$1,461,692	
Total Workers			divided by 94	<u>\$15,550</u>
Hours per Person Year			divided by 2080	<u>\$7.48</u>
Average Hourly Wage Burdened ⁴				<u>\$7.48</u>
Average Hourly Wage Unburdened				\$5.71

EXHIBIT II-Y (continued)

COMPUTATION OF AVERAGE WORKER WAGE
GERMERSHEIM

<u>SECTION</u>	<u>GRADE¹</u>	<u>NO.</u>	<u>(DM) COST²</u>	<u>TOTAL COST BY SECTION</u>
<u>Carpentry/Masonry</u>				
Carpenter Leader	A4-6/L	1	42,861	
Mason	A4-6	2	77,930	
Carpenter	A4-6	3	116,895	
		<u>6</u>		<u>237,686</u>
<u>Preventive Maintenance</u>				
Mechanic Leader	A4-6/L	1	42,861	
Electrician	A4-6	1	38,965	
Plumber	A4-6	2	77,930	
Carpenter	A4-6	1	38,965	
		<u>5</u>		<u>198,721</u>
<u>Metal Working</u>				
Metal Worker	A4-6	3	116,895	
		<u>3</u>		<u>116,895</u>
<u>Painting</u>				
Sign Painter - Leader	A4-6/L	1	42,861	
Painter	A4-6	3	116,895	
		<u>4</u>		<u>159,756</u>
<u>Plumbing/Pipefitter</u>				
Pipefitter Leader	A6-7/L	1	40,583	
Pipefitter	A4-7	2	82,016	
Plumber	A4-6	2	77,930	
		<u>5</u>		<u>200,529</u>
<u>Electrical</u>				
Electrician - Leader	A4-7/L	1	45,109	
Electrician H.T.	A4-7	1	41,008	
Air Cond Equip Mech	A4-7	2	82,016	
Electrician	A4-6	5	194,825	
		<u>9</u>		<u>362,958</u>

EXHIBIT II-Y (continued)

<u>SECTION</u>	<u>GRADE</u> ¹	<u>NO.</u>	<u>(DM) COST</u> ²	<u>TOTAL COST BY SECTION</u>
GRAND TOTAL		32		1,276,545
TOTAL U.S. DOLLARS ³				\$471,050
Total Workers			divided by	32
				\$14,720
Hours per Person Year			divided by	2080
Average Hourly Wage Burdened ⁴				\$7.08
Average Hourly Wage Unburdened				\$5.40

EXHIBIT II-Y (continued)

AVERAGE WORKER WAGE - SUMMARY

	<u>Total Employees</u>	<u>Total U.S. Dollars</u>
Karlsruhe (Less Germersheim)	94	\$1,461,692
Germersheim	32	471,050
	<u>126</u>	<u>\$1,932,742</u>
Average Yearly Pay		\$15,339
Hours per Person Year	divided by	<u>2,080</u>
Average Hourly Wage Burdened		\$7.37
Average Hourly Wage Unburdened		\$5.63
Percent of Total Labor Dollars Available for Productive Work [(1686/2080) x (1,932,742)]		\$1,566,636
Total Workers	divided by	<u>126</u>
		\$12,434
Hours per Person Year	divided by	<u>2,080</u>
Annual Average Hourly Wage ⁴		\$5.98

 Average Wage Burdened = \$1,932,742/126/2080 = \$7.37

% Labor Available = 1686/2080 x 100 = 81.1%

Cost of Labor = 81.1% x \$1,932,742 = \$1,567,454

1% of Available Labor = \$15,675

Average Wage Unburdened = \$1,475,376/126/2080 = \$5.63

% Labor Available = 1686/2080 x 100 = 81.1%

Cost of Labor - 81.1% x 1,475,376 = \$1,196,530

1% of Available Labor - \$11,965

Work Sampling Productive Cost of Available Labor = 66.4% x \$1,196,530 = \$794,496

Recommended Direct Productive Cost of Available Labor = 68.4% x \$1,196,530 = \$818,427

NOTES:

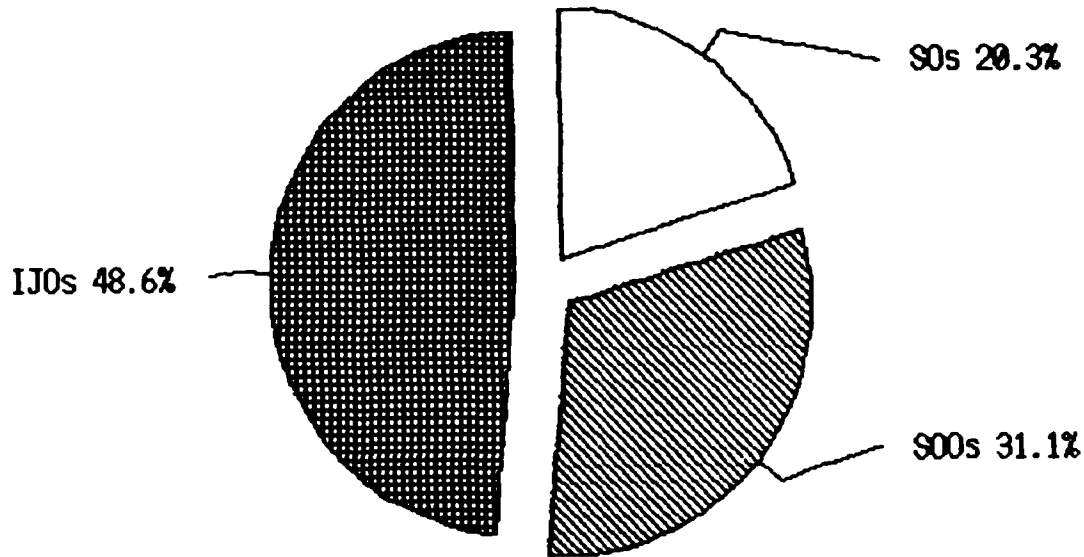
1 Actual pay grades were obtained from the 20 August 1984 Sick Status Report.

2 Costs are based on hourly rate tables (Trade Union OTV) dated 27 June 1984. The hourly wage was burdened 31.0% to reflect fringe benefits. Work leader wage supplement is 10% of the craftspersons wage. (Ref. USAREUR PAM 690-60, USAFE PAM 40-31).

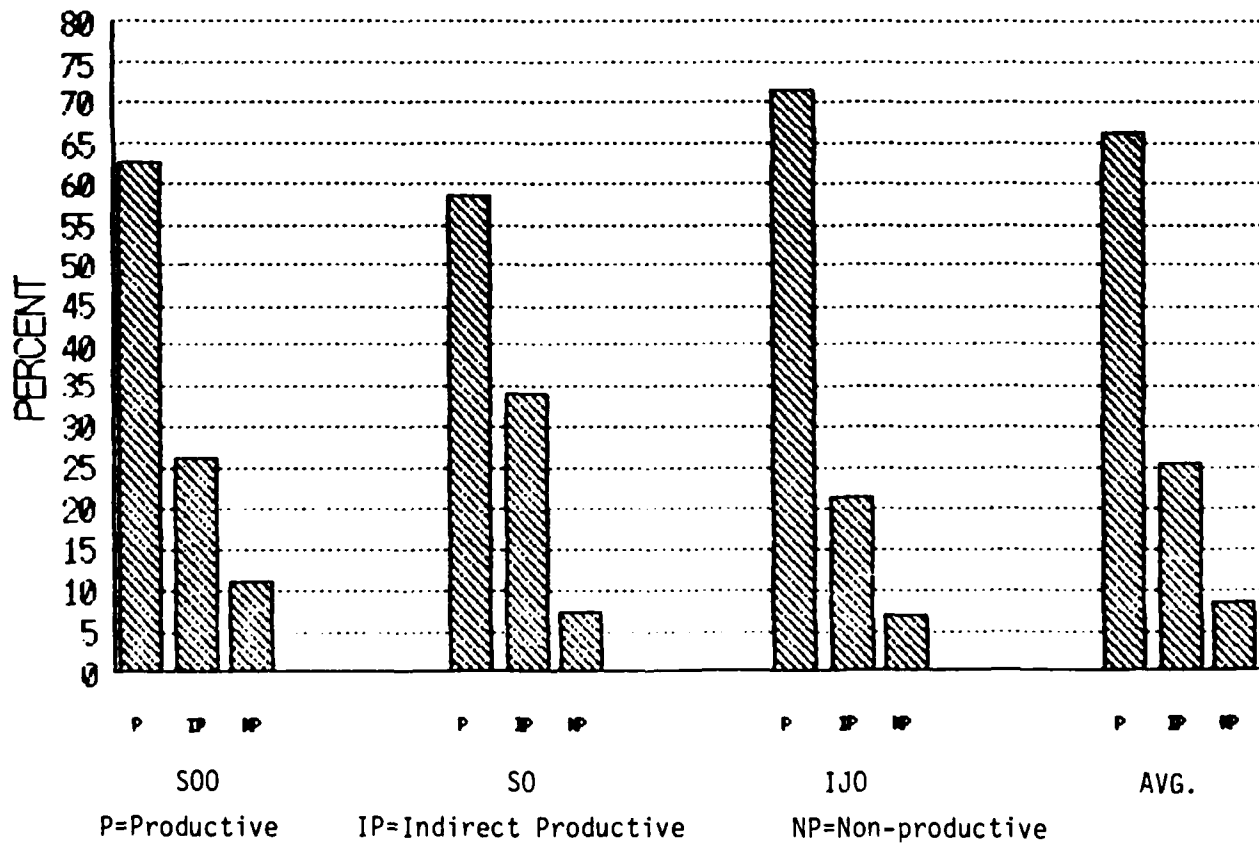
3 To convert DM to U.S. Dollars, the conversion rate of \$1.00 = DM 2.71 for FY84 was used.

4 The Average Hourly Wage represents the wage or salary a craftsperson would receive throughout the course of a year's employment, even during vacation and sick leave. Of the 2,080 hours (40 hours x 52 weeks) per man year used in calculating that wage, only 1,686 hours (approximately 81%) are available for on-site work. The Annualized Average Hourly Wage represents the available productive wage spread over a 12 month period.

% of WORK SAMPLED BY TYPE (S00, S0, IJO)



PRODUCTIVITY BY TYPE WORK (S00, S0, IJO)



Findings of Fact

SHOP: Carpentry - One craftsman shown below; however, two craftsmen were on the job.

0730 - 0734 Loading 2 doors
 0736 Putting tools in truck
 0738 Cutting shims with shop band saw
 0740 Measuring doors for glass inserts
 0742 - 0752 Travel to gym at Smiley Barracks
 0754 Unloading doors
 0756 Parking truck
 0758 - 0810 Removing 2 old doors -- second craftsman called shop for drill
 0810 - 0902 Fitting door - door 3/4" too long. No skill saw on site. Power planing 3/4" off door.

* * * * *

(0820) Shop truck arrived at 0820 with glass inserts, door trim and drill. The drill chuck and key were so badly worn that excessive time was required to change bits which aggravated and frustrated the craftsmen.

* * * * *

0904 - 0914 Break
 0916 - 0942 Fitting doors
 0944 Discussing door problem (3/8" gap between doors) with other craftsman
 0946 Fitting door
 0948 Discussing problem -- discovered wrong swing hinges on one door -- craftsman called shop requesting proper hinges
 0950 - 1052 Installing door

* * * * *

(1008) Truck arrived with hinges for problem door

* * * * *

1054 Waiting for other craftsman to complete hinge
replacement (room for one person only)

1056 - 1158 Installing glass

* * * * *

Locking bolt for one door is 3/4" too long -- no hack saw
at job site

* * * * *

1202 - 1214 Travel back to shop (one person only)

1216 Looking for hack saw -- only one in carpentry shop

1218 Sawing lock bolt

1220 - 1228 Lunch

1230 - 1240 Travel to job

1242 - 1308 Installing doors -- coworker removing hardware and kick
plates from old door

1310 Receiving instruction from foreman

1312 - 1342 Installing door

1344 Obtaining screws from truck to install kick plates

1346 - 1438 Installing kick plates -- 16 screws per plate, 4 plates --
all by hand

1440 Door won't close -- strike plate and keeper off by 1/2
thickness of kick plates. (No file on job)

1442 - 1500 Redoing strike plate

1500 - 1512 Patching door jamb

1514 Picking up tools

1516 - 1520 Clean up job site

1522 Picking up tools

1524 Idle

1526 - 1528 Putting tools in truck

1530 Clean up

1532 - 1540 Travel back to shop

- 1542 - 1546 Putting tools away in shop
1548 - 1558 Rescreening window screens (28 screws per window)

Conclusions

Although the craftsperson worker was 80% productive, more hand tools (hack saw, file, chargable screw driver, and a functional drill chuck and key) could have increased his effectiveness and precluded the trip to the shop for a hack saw over the lunch period. Each craftsperson had individual hand tools and shop tools signed out -- power planer and electric drill. There was no evidence of team tools other than the vehicle.

Recommendation

Supplying the craftspersons with modern, well maintained individual and team tools will lead to both increased productivity and effectiveness. Recommend the carpenter shop review the entire requirement for individual, team and shop tools in terms of kinds of tools and quantity. It is recognized that each carpenter does not need a skill saw, electric drill and power screw driver but it also does not seem exorbitant to have one of these tools for each carpenter team.

- 1324 - 1326 One craftsman collecting old fixtures; other craftsman checking/fixing one circuit
- 1328 Fixing circuit
- 1330 Obtaining more fixtures
- 1332 - 1346 Install fixture #21
- 1348 - 1412 Working on fixture - X bracing causing mounting problem
- 1414 - 1416 One craftsman working on fixture #21; other craftsman securing fixtures delivered earlier in storage room
- 1418 - 1550 Installing fixture #21 thru #27-1/2
- 1552 - 1554 Putting away tools and equipment
- 1556 - 1600 Travel to shop

Conclusion

	Worker #1	Worker #2
Direct Productive	84.9	86.2
Indirect Productive	12.6	11.3
Nonproductive	2.5	2.5
	<u>100.0</u>	<u>100.0</u>

This is an excellent example of a well planned, well executed IJO. Productivity of 84.9% and 86.2% respectively and effectiveness of 0.58 MH/fixture (16 MH/27.5 fixtures) is commendable. This part of the IJO involved removing old incandescent fixtures, installing new fluorescent fixtures, and circuit wire in one of the warehouses at Germersheim. The work was approximately 15 feet high. However, across the street, same type warehouse, same work; high productivity of 67.4% was observed, but effectiveness of only 1.3 MH/fixture (16 MH/12 fixtures) and 0.66 equipment hours (bucket truck) per fixture. The rolling scaffold method of doing the work is 229% more effective in addition to freeing a bucket truck for other work. It was noted by management that the DEH owns only one rolling scaffold. It was also noted that buildings that are empty now will not be at the close of Reforger.

Recommendation

On IJO work, management should be constantly checking the effectiveness of the work. Is there a more cost effective way of doing the same thing? Communication between the worker, foreman, planner estimators and higher levels of management is essential. In this particular case, many alternative courses of action could be pursued. Some are:

Findings of Fact

SHOP: Electric - 2 craftspersons

0716 - 0720 Travel to Bldg. 7957

0722 - 0728 Placing fluorescent fixtures on rolling scaffold
(approximately 15 ft. high)

0730 - 0742 Installing fluorescent fixture #1, new circuit wire and
removing old fixture

0744 - 0758 Installing fluorescent fixture #2, etc. (Foreman checked
job at 0752)

0800 - 0816 Installing fluorescent fixture #3, etc.

0818 - 0830 Installing fluorescent fixture #4, etc.

0832 - 0844 Installing fluorescent fixture #5, etc.

0846 - 0858 Installing fluorescent fixture #6, etc.

0858 - 0900 Started fixture #7

0902 - 0912 Break

0914 - 0958 Installing fixtures #7, etc. thru #10

1000 Moving scaffold to next bay

1002 - 1006 Placing fixtures on scaffold

1008 - 1154 Installing fixtures #11 thru #19-1/2

1156 - 1158 Securing tools

1158 - 1200 Travel back to shop for lunch

1200 - 1245 LUNCH

1246 - 1248 Travel back to Bldg. 7957

1250 Getting tools

1252 - 1313 Installing fixtures #19 and #20

1314 - 1322 Removing top section of scaffold and moving to next bay.

- A. Rent an additional rolling scaffold
- B. Purchase an additional rolling scaffold
- C. Use of swing shifts to use the DEH scaffold
- D. Employ overtime using the DEH scaffold
- E. Place a wood scaffold in back of 5 ton for the lower parts of building

The best course is the most economical of the above.

It is recommended that a mini-review process be set up for all IJOs over a certain dollar value (to be set by the DEH) to review the planning, construction methods and progress at the 10-20% completion point. The review should be brief and attended by the foreman, the planner estimator involved, and the branch chief.

Finding of Fact

SHOP: Plumbing - 2 Craftspersons

0730 Unloading tools and materials from vehicle

0732 - 0802 Constructing metal flashings and drain pipes in the shop for use at Bldg. 9609

0804 Idle

0806 - 0834 Continue construction of metal flashings and drain pipes

0836 - 0838 Material handling in the shop

0840 - 0852 Constructing metal flashings and drain pipes

0854 - 0858 Material handling in the shop

0900 - 0914 Break

0916 Idle

0918 - 0928 Constructing metal flashings and drain pipes

0930 - 0932 Material handling in the shop

0934 - 1016 Constructing metal flashings and drain pipes

1018 - 1020 One craftsperson loading materials on vehicle while the other continues to construct drain pipes

1022 Loading tools and materials on vehicle

1024 - 1028 Travel to Bldg. 9609

1030 Unavoidable delay (train crossing)

1032 - 1038 Travel to Bldg. 9609

1040 - 1042 Unloading tools and materials from vehicle

1044 - 1120 Cleaning debris from gutter and roof area

1122 - 1124 Securing tools and materials from vehicle

1126 - 1146 Removing old flashing from roof seam

1148 - 1158 One craftsman laying out 4x4 wood stock to be used in the roof seam while the other cleans debris from roof area

1200 - 1230 LUNCH

1232 - 1340 One craftsman sawing 4x4 wood stock while the other installs 4x4 wood stock in roof seam

1342 - 1344 One craftsman measuring angle in roof seam while the other installs 4x4 wood stock

1346 - 1348 One craftsman securing drain pipes from vehicle while the other continues to install 4x4 wood stock in roof seam

1350 - 1354 One craftsman installing flashing over 4x4 wood stock while the other assembles drain pipe sections

1356 One craftsman continues to install flashing while the other obtains materials from vehicle

1358 - 1400 One craftsman installing a drain pipe while the other continues to install flashing

1402 - 1404 One craftsman installing a drain pipe while the other continues to install flashing

1402 - 1404 One craftsman idle while the other installs drain pipe section

1406 - 1410 One craftsman chiselling masonry wall, to recess the flashing, while the other obtains tools and materials from vehicle

1412 - 1414 One craftsman chiselling masonry wall while the other installs drain pipe section

1416 Obtaining tools and materials from vehicle

1418 One craftsman obtaining tools from vehicle while the other chisels masonry wall

1420 - 1454 One craftsman replacing drain pipe sections while the other chisels masonry wall

1456 One craftsman replacing drain pipe sections while the other installs flashing retainer strips

1458 Obtaining materials from vehicle

1500 Unclogging drain pipe

1502 - 1506 One craftsperson sawing 4x4 wood stock while the other installs drain pipe section

1508 - 1510 One craftsperson installing 4x4 wood stock while the other is idle

1512 - 1516 One craftsperson chiselling masonry wall while the other solders joint on drain pipe

1518 - 1526 One craftsperson unclogging drain pipe while the other cleans up the job site

1528 One craftsperson continues to clean up the job site while the other is idle

1530 One craftsperson cleaning up the job site while the other solders joint on drain pipe

1532 One craftsperson cleaning up the job site while the other is idle

1534 - 1538 One craftsperson cleaning up the job site while the other solders joint on drain pipe

1540 - 1546 One craftsperson securing tools and materials on vehicle while the other installs drain pipe section

1548 - 1550 One craftsperson securing tools and materials on vehicle while the other is idle

1552 - 1556 Cleaning up the job site

1558 Securing tools on vehicle

1600 End of work day

Conclusion

TASK ASSIGNED TO THE WRONG CRAFT

The work performed was Sheetmetal and Carpentry, and should have been assigned to those shops. The craftspersons, while displaying the capacity to perform the above mentioned work, were not equipped with the proper tools to perform the work in a timely manner.

TASK OBJECTIVE AS OF 1126 INCLUDED

- a. Remove approx. 50 linear ft. strip of metal flashing in roof seam.

- b. Install approx. 50 linear ft. of 4x4 wood stock in roof seam (requiring approx. 16 angles to be cut).
- c. Cut an approx. 1-1/2 inch trench in masonry wall to recess flashing
- d. Install approx. 16 metal strips to hold flashing in place
- e. Place and secure flashing

Phase a and c from above were completed while phases b, d, and e required follow-up work.

In addition to the craftspersons being assigned to the wrong tasks, an excessive amount of time was spent sawing lumber, using hand miter saw instead of a power saw, and chiseling a trench in a masonry wall, using a hand-held chisel instead of a power saw, which was the major reason for the slow job progression.

Although the craftsperson's productivity level was high, it is concluded that more work could have been accomplished if: (1) the craftspersons were equipped with the proper tools to perform the work; and (2) the craftspersons had been assigned tasks related to their craft.

Recommendation

Notwithstanding improper tasking, the above conclusion is an indication of insufficient backlog in this shop. It is recommended that the craftspersons be tasked based upon their job description; and also, that a backlog of work be maintained to keep the craftsperson gainfully productive throughout the work day. Otherwise, the shop foreman should reassess manpower requirements -- adjusting, as required -- transferring craftspersons to other shops where both the craftsperson's skills and talents match the available workload.

Findings of Fact

SHOP: Plumbing (Germersheim)

- 0716 - 0720 Obtaining tools, equipment and materials from shop
- 0722 - 0726 Travel to Warehouse #10-11 to drop off worker
- 0728 Assisting craftsperson from the heating section to obtain tools and equipment from van for his job site
- 0730 - 0732 Travel to Bldg. 7826, to see if keys were required to enter work area
- 0734 - 0736 Craftsperson drove back to shop to pick up materials for the first job assignment
- 0738 - 0740 Began loading propane tanks onto trailer hitched to the back of the van
- 0742 Waiting for keys from Work Reception office in order to gain access to work area
- 0744 - 0746 Travel back to Bldg. #7826
- 0748 - 0756 Craftsperson replacing old propane tanks with new ones on van
- 0758 Loading old tanks onto trailer
- 0800 - 0802 Travel back to shop to unload trailer
- 0804 Craftsperson unloaded tanks and unhitched trailer from van
- 0806 - 0808 Travel to next job site Bldg. 7985
- 0810 Obtaining tools from van at job site
- 0812 - 0818 Began repairs to clogged urinal; Craftsperson pulled all the urinals off the wall and began replacing the entire drain pipe system according to IJO #KU001193
- 0820 Obtaining more tools from van
- 0822 - 0838 Craftsperson still replacing entire pipelines to urinal drain system

0840 Obtaining materials from van

0842 - 0850 Still replacing entire drain piping system to urinals

0852 - 0854 Obtaining more tools from van

0856 Cleaning up debris at the job site

0858 Putting away tools and equipment into tool box at job site

0900 Craftsperson washing hands

0902 - 0914 Break

0916 Obtaining equipment and tools from truck

0918 - 0930 Craftsperson began installing new drain pipes for urinals

0932 Washing hands again

0934 Obtaining more materials and parts from van

0936 - 0940 Continue installing new drain pipes

0942 - 0944 Laying out drilling equipment

0946 - 1002 Craftsperson continues installing new pipes

1004 Receiving instructions from shop foreman

1006 - 1052 Continue installing new drain pipes for urinals

1054 Craftsperson washing hands

1056 - 1130 Continue installing drain pipes

1132 - 1134 Obtaining more materials and parts from van

1136 - 1140 Continue installing drain pipes

1142 - 1144 Obtaining more parts from van

1146 - 1148 Receiving more instructions from foreman at the job site

1150 Craftsperson washing tools

1152 - 1156 Craftsperson putting away tools, equipment and materials on van

1158 Travel back to shop for lunch

1200 - 1245 LUNCH

1246 Obtaining more equipment for later use at the job site

1248 - 1250 Travel back to job site

1252 - 1254 Unloading tools, materials and equipment off van at job site

1256 - 1258 Continued installing drain pipes

1300 Obtaining drill from tool box

1302 - 1340 Craftsperson finished installing entire drain pipe system to urinals

1342 - 1344 Obtaining more materials from truck

1346 Making last pipe connection

1348 Craftsperson cleaning tools

1350 - 1352 Cleaning up debris at job site

1354 - 1420 Craftsperson began replacing all inlet water pipes and old flushers on urinals

1422 Planning course of action to be followed in accomplishing the job

1424 - 1434 Craftsperson sawing flush valve supply line with hacksaw

1436 - 1438 Obtaining more materials and parts from van

1440 - 1446 Craftsperson removing main valve from water line

1448 - 1500 Installing new pipes on urinals

1502 - 1508 Plastering and repairing holes in wall

1510 Cleaning up job site

1512 Washing plaster/cement from tools

1514 - 1518 Cleaning up job site

1520 - 1528 Loading and putting away tools, materials and equipment onto van

1530 - 1536 Cleaning up debris at job site

1538 Paperwork
 1540 - 1544 Travel to pick up another rider
 1546 Idle
 1548 - 1552 Travel back to shop
 1554 - 1556 Craftsperson unloading tools and equipment off van
 1558 Personal cleanup and dressing

Conclusion

Direct Productive	60.7%
Indirect Productive	35.1%
Nonproductive	4.2%
	<u>100.0%</u>

The craftsperson was productive for 60.7% of the first working day and 64.4% of the second day performing job tasks for IJO #K001193 dated 28 Feb 1983 Depot GY451. This productive effort however was performed in the wrong building. According to the IJO, the address for the job site was Bldg. 7970 but the craftsperson worked in Bldg. 7985 for two days. This is an indicator that management has problems with documentation standards and procedures. It was also observed that the electrical shop had been issued duplicate work orders from work reception. Additionally, no foreman or worker was observed logging or filling out any type of documentation at the end of the work day to capture:

1. Labor applied to assigned tasks
2. Material usage
3. To maintain status of job tasks (incomplete, complete, etc.)

The lack of documentation and application of procedures raises questions about the accuracy and validity of history files, and the accuracy of DEH's forecasting and estimating ability for future projections of budgets.

Recommendations

- Develop a policy requiring craftspersons to log their own labor hours at the end of the working day and have the shop foremen review these hours to the work orders issued by them. This procedure will capture the actual costs involved with labor and material usage for all tasks accomplished, for more reliable variance analyses and forecasting. This will also permit more utility from the IFS system once implemented.

- Develop a more reliable accounting system as to what has been assigned, where, and status of assignments that can be retrieved in a more timely manner.
- Issue a copy of the IJO, S00, or S0 to the craftsperson before he leaves the shop for materials or travel to the job site.
- Reexamine workflow documentation to eliminate communications breakdown between the installations, work reception, ERMD, and the shop level so that the transition to IFS will not be as complex during implementation.

Findings of Fact

SHOP: Preventive Maintenance

0716 - 0718 Travel to Bldg. S-7902

0720 - 0722 Obtaining materials and tools from truck

0724 - 0726 Craftsperson laying out tools and materials at job site

0728 - 0808 Craftsperson began repairs to faucets on sink in men's locker room of motor pool garage

0810 Obtaining more parts from tool box

0812 - 0814 Finished repairs on three (3) faucets on sink

0816 - 0818 Putting away equipment and unused materials

0820 - 0822 Craftsperson repairing sink in eating room

0824 Putting away tools

0826 Craftsperson washing hands

0828 Craftsperson using bathroom

0830 Obtaining parts from tool box

0832 - 0834 Began replacing shower nozzle on shower rod in men's locker room

0836 Obtaining more parts from truck

0838 - 0842 Craftsperson finished repairs on shower

0844 Putting away tools

0846 Craftsperson using bathroom

0848 - 0852 Obtaining more materials and parts from truck

0854 - 0906 Break

0908 - 0910 Idle time beyond break

0912 - 0914 Obtaining tool box from truck

0916 - 0918 Craftsperson began replacing toilet seats in same locker room

0920 Obtaining more parts from tool box

0922 - 0928 Craftsperson finished replacing toilet seat on 1st toilet

0930 Obtaining more materials from tool box

0932 Receiving instructions from work leader

0934 - 0936 Obtaining tools, equipment and materials from truck

0938 Repairing seat on 2nd toilet

0940 Obtaining more tools from tool box

0942 - 0950 Craftsperson still replacing same toilet seat

0952 Putting away tools

0954 Cleaning up job site

0956 - 1002 Craftsperson finished replacing seat on 2nd toilet

1004 - 1006 Obtaining more parts and tools from truck

1008 - 1028 Craftsperson began replacing seat on 3rd toilet

1030 Cleaning up debris at the job site

1032 Craftsperson washing his hands

1034 Craftsperson finished replacing seat on 3rd toilet

1036 - 1038 Idle

1040 - 1042 Obtaining equipment from truck

1044 - 1056 Laying out and positioning tools and equipment on the job site

1058 - 1106 Craftsperson began to repair clogged drain pipes under urinals in men's locker room

1108 - 1110 Trying to repair equipment

1112 - 1114 Craftsperson waiting and watching coworker attempt to fix equipment

1116 Still trying to repair equipment

1118 - 1122 Craftsperson used Drain-0 chemicals to complete repairs on clogged pipes

1124 Personal clean up at job site

1126 Putting away equipment

1128 - 1132 Craftsperson repairing hose; replacing metal clamps and connection pieces on end of rubber hose

1134 - 1138 Loading tools, equipment and unused parts back on truck

1140 - 1152 Craftsperson washing his hands

1144 Loading more tools onto truck

1146 - 1152 Idle

1154 Loading more materials on truck

1156 - 1158 Travel to shop for lunch

1200 - 1245 LUNCH

1246 - 1248 Travel back to same job site

1250 - 1252 Obtaining tools, equipment and parts from truck

1254 - 1300 Craftsperson began performing PM on women's bathroom, putting compound around base on toilets and unclogging a drain in shower

1302 - 1304 Obtaining more tools from truck

1306 Still unclogging shower drain

1308 Worker washing his hands

1310 - 1312 Craftsperson finished unclogging shower drain in women's bathroom

1314 Obtaining more materials from tool box

1316 - 1330 Craftsperson finished performing PM in women's bathroom. Installed a towel rack, changed faucets on bathroom sinks

1332 Idle - craftsperson beginning to run out of work

1334 Obtaining a part for water faucet from tool box

1336 - 1340 Idle - smoke break

1342 - 1400 Idle due to lack of an assignment

1402 - 1404 After policing the motor pool garage craftsperson decided to clean out a sink drain

1406 - 1410 Idle - smoke break

1412 - 1426 Idle due to lack of an assignment

1428 - 1430 Craftsperson cleaning another sink drain in motor pool shop

1432 Craftsperson washing his hands

1434 - 1438 Idle due to lack of an assignment

1440 - 1444 Putting away unused parts and materials on truck

1446 - 1548 Idle - craftsperson walking around looking for work

1550 - 1552 Travel back to shop

1554 - 1558 Craftsperson cleaning up at the end of the work day

1600 END OF DAY

Conclusion

Direct Productive	35.6%
Indirect Productive	30.5%
Nonproductive	33.9%
	<u>100.0%</u>

Major Problem Areas:

- 23.8% of the craftsperson's time was spent in job preparation.
- 28.5% of the craftsperson's time was nonproductive because of the lack of work assignments to keep the craftsperson occupied for the full work day.

Recommendations

For additional discussion and conclusions for PM Teams, see the following Exhibit II-FF. See Section V, pages V-1 thru V-5 for discussions and recommendations for the PM Team, Self-Help, and the Do-It-NOW (DIN) Team(s) concept.

Findings of Fact

SHOP: Preventive Maintenance

0730 Craftsperson #1 obtaining vehicle from holding area;
Craftsperson #2 waiting for transportation

0732 - 0744 Travel to work site, Bldg. 9615 at Gerszewski Kaserne

0746 Obtaining tools, materials and equipment from truck

0748 - 0750 Idle - due to lack of an assignment; looking for jobs to
perform

0752 Craftsperson #1 idle; #2 lubing hinges on door

0754 Idle due to lack of an assignment

0756 - 0758 Craftsperson #1 lubing hinges on door; #2 idle

0800 - 0802 Craftsperson #1 changing fluorescent lamp tubes; #2
repairing window hinges

0804 Idle due to lack of an assignment

0806 - 0808 Craftsperson #1 changing more fluorescent lamp tubes; #2
idle due to lack of an assignment

0810 - 0812 Idle due to lack of an assignment

0814 - 0818 Craftsperson #1 changing more fluorescent lamp tubes; #2
idle due to lack of an assignment

0820 Craftsperson #1 changing fluorescent lamp tubes; #2
obtaining materials from tool box

0822 Craftsperson #1 still changing lamp tubes; #2 idle

0824 Craftsperson #1 idle; #2 obtaining more materials from
tool box

0826 - 0834 Craftsperson #1 changing more lamp tubes; #2 idle due to
lack of an assignment

0836 Installing door stops on floor

0838 Craftsperson #1 idle due to lack of an assignment; #2
still installing door stops on floor

0840 Craftsperson #1 idle; #2 putting away tools and unused parts back in tool box

0842 Craftsperson #1 changing more fluorescent lamp tubes; #2 idle

0844 Craftsperson #1 still changing lamp tubes; #2 putting away more materials and tools

0846 Craftsperson #1 obtaining more parts from truck; #2 idle

0848 Craftsperson #1 changing more lamp tubes; #2 adjusting hinges on windows

0850 - 0854 Craftsperson #1 idle due to lack of an assignment; #2 adjusting hinges on windows

0856 - 0858 Idle due to lack of an assignment

0900 - 0912 Break

0914 Idle after break time

0916 Craftsperson #1 idle; #2 repairing door knob in office building

0918 - 0920 Craftsperson #1 changing ceiling lamp tubes; #2 idle due to the lack of an assignment

0922 - 0924 Craftsperson #1 still changing fluorescent lamp tubes; #2 receiving instructions from shop foreman at job site

0926 Craftsperson #1 replacing cover plates on wall outlets

0928 - 0934 Craftsperson #1 still replacing cover plates on electrical outlets; #2 began replacing broken glass in front door

0936 Craftsperson #1 repairing lamp fixture; #2 obtaining tools from tool box

0938 Craftsperson #1 obtaining drill equipment from truck, #2 still obtaining tools from tool box

0940 Craftsperson #1 receiving instructions from shop foreman at job site; #2 cleaning up debris

0942 Craftsperson #1 still repairing same lamp fixture; #2 still cleaning up job site

0944 - 0952 Craftsperson #1 finished repairing lamp fixture; #2 idle due to lack of an assignment

0954 Craftsman #1 changing more ceiling lamps fluorescent tubes; #2 obtaining materials from truck

0956 - 1006 Craftsman #1 repairing a wall electrical outlet; #2 replacing door knob on back door

1008 - 1010 Craftsman #1 idle; #2 still replacing same door knob

1012 - 1014 Craftsman #1 idle due to lack of an assignment; #2 putting away tools

1016 - 1020 Craftsman #1 changing fluorescent lamp tube and repairing lamp fixture; #2 repairing bathroom toilet door latch

1022 Craftsman #1 repairing same lamp fixture; #2 idle

1024 Both craftsmen are idle

1026 Craftsman #1 idle due to lack of an assignment; #2 adjusting door handle on a bathroom door

1028 Craftsman #1 obtaining materials from shop foreman's truck at the job site; #2 finished adjustments on bathroom door

1030 Craftsman #1 obtaining more materials from foreman's truck; #2 idle

1032 Craftsman #1 receiving instructions from shop foreman; #2 idle due to the lack of an assignment

1034 - 1036 Craftsmen idle due to lack of an assignment

1038 - 1040 Craftsman #1 changing light bulb in hallway broom closet; #2 idle

1042 - 1044 Craftsmen idle due to the lack of an assignment

1046 - 1050 Craftsman #1 replacing entire fluorescent ceiling lamp; #2 still idle due to lack of an assignment

1052 Craftsman #1 replacing the same ceiling lamp fixture; #2 obtaining parts from tool box

1054 Craftsman #1 idle; #2 installing rubber door stop on floor

1056 Craftsman #1 replacing electrical outlets; #2 idle

1058 - 1100 Both craftsmen are replacing electrical outlets

1102 Craftsman #1 obtaining more electrical outlets from tool box; #2 idle

1104 Craftsman #1 replacing more electrical outlets; #2
 still idle

1106 Both craftsmen are replacing electrical outlets

1108 Craftsman #1 still changing electrical outlets; #2 idle

1110 Craftsman #1 finished replacing electrical outlets; #2
 installing a door stopper

1112 - 1120 Both craftsmen idle due to the lack of an assignment

1122 - 1124 Craftsman #1 installing a door stop; #2 idle

1126 - 1134 Both craftsmen idle due to lack of an assignment

1136 Craftsman #1 changing light bulb in exit sign of
 hallway; #2 idle

1138 Both craftsmen idle

1140 Craftsman #1 idle; #2 measuring glass to be cut

1142 - 1144 Craftsman #1 removing old window pane; #2 idle -- two
 persons on a one person job

1146 Both craftsmen removing old glass from window

1148 - 1150 Craftsman #1 cleaning up broken glass; #2 removing old
 glass from window

1152 Both craftsmen cleaning up broken glass

1154 - 1158 Craftsman #1 still cleaning up job site; #2 began
 removing sealing compound from window frame

1200 - 1228 LUNCH

1230 - 1238 Both craftsmen idle

1240 Both craftsmen obtaining tools and materials from truck

1242 Craftsman #1 using bathroom; #2 began chipping away
 sealing compound from window frame

1244 - 1250 Craftsman #1 idle; #2 still chipping away sealing
 compound from window frame

1252 Craftsman #1 obtaining more materials from truck; #2
 chipping away sealant from window frame to be repaired

1254 - 1256 Craftsman #1 replacing damaged electrical outlet; #2
 repairing same window frame chipping away sealing compound

1258 Craftsperson #1 obtaining more parts from tool box; #2 still chipping sealant from same window frame

1300 - 1302 Craftsperson #1 changing more ceiling lamp tubes #2 removing sealant from same window frame

1304 Craftsperson #1 idle; #2 removing sealant from same window

1306 Craftsperson #1 changing more fluorescent tubes in ceiling lamps; #2 removing nails from window strips

1308 - 1310 Craftsperson #1 changing ceiling lamp tubes; #2 cleaning up job site

1312 Craftsperson #1 idle; #2 applying sealing compound on window seals

1314 Craftsperson #1 obtaining more materials from truck; #2 applying more sealant to window frame

1316 Craftsperson #1 obtaining more materials from truck; #2 washing sealant off his hands

1318 - 1324 Both craftspersons began installing new glass into window of game room

1326 - 1328 Craftsperson #1 changing electrical outlets; #2 cleaning up debris

1330 Craftsperson #1 changing more electrical sockets; #2 putting away tools

1332 Craftsperson #1 changing more electrical outlets; #2 idle

1334 - 1336 Craftsperson #1 obtaining materials and parts from tool box; #2 idle due to lack of an assignment

1338 - 1340 Craftsperson #1 repairing light switch in hallway; #2 still idle

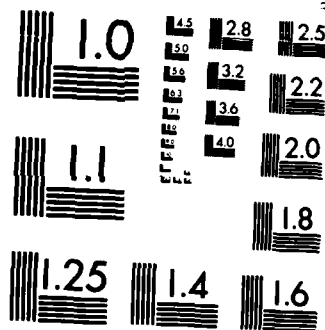
1342 - 1344 Craftsperson #1 repairing second light switch in hallway; #2 adjusting hinges on window

1346 Craftsperson #1 still repairing same light switch; #2 obtaining more parts from tool box

1348 Craftsperson #1 repairing same light switch; #2 replaced two nameplates on doors

1350 - 1354 Craftsperson #1 still repairing same light switch; #2 idle due to the lack of an assignment

1356 Craftsperson #1 repairing light switch in hallway; #2 repairing bathroom door



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

1358 - 1400 Craftsman #1 obtaining equipment from truck; #2 still repairing same bathroom door

1402 Craftsman #1 laying out equipment at job site; #2 idle

1404 Craftsman #1 changing more ceiling lamp tubes; #2 idle

1406 Craftsman #1 obtaining more parts from tool box; #2 idle

1408 - 1410 Craftsman #1 changing more fluorescent lamp tubes; #2 still idle due to lack of an assignment

1412 - 1414 Craftsman #1 still changing same ceiling lamp tubes; #2 adjusting the hinges on a window

1416 Both craftsmen are idle

1418 Craftsman #1 securing electrical wiring along ceiling; #2 idle

1420 Craftsman #1 obtaining more materials from tool box; #2 idle

1422 - 1424 Craftsman #1 securing more wires along ceiling; #2 replacing broken glass from door

1426 Craftsman #1 repairing his ladder; #2 lubricating and adjusting door latch

1428 - 1434 Craftsman #1 idle due to lack of an assignment; #2 adjusting and lubricating same door

1436 Craftsman #1 adjusting light switch in attic; #2 repairing same door

1438 Craftsman #1 idle; #2 finished adjusting door latch

1440 Both craftsmen are idle

1442 Craftsman #1 receiving instructions from foreman at job site; #2 measuring frame to replace broken window

1444 Craftsman #1 laying out equipment at job site; #2 began removing the broken glass from door

1446 - 1456 Craftsman #1 began repairing light fixture in closet; #2 chipping away sealing compound from the door's window frame

1458 - 1502 Craftsman #1 finished repairing light fixture; #2 cleaning up job site

1504 Craftsman #1 putting away tools and equipment; #2 began installing new glass in door window

1506 Craftsman #1 discussing problems with customer; #2 installing same glass in front door

1508 - 1510 Craftsman #1 changing more ceiling lamp tubes; #2 still installing same window glass in door

1512 Craftsman #1 discussing problems with customer; #2 installing same glass in front door

1514 - 1518 Craftsman #1 began repairing fluorescent ceiling lamp fixture; #2 finished installing glass and began applying sealing compound around glass

1520 - 1522 Craftsman #1 obtaining more materials from truck; #2 applying sealing compound to window frame on front door

1524 - 1528 Craftsman #1 finished repairing fluorescent lamp fixture; #2 still applying window sealant

1530 - 1532 Craftsman #1 putting away tools, materials and equipment; #2 finished applying sealing compound around glass

1534 - 1536 Craftsman #1 loading tools, materials, equipment and unused parts onto truck; #2 cleaning up truck

1538 Craftsman #1 doing paperwork; #2 idle

1540 - 1542 Craftsman #1 doing same paperwork; #2 washing hands

1544 - 1554 Travel back to shop from Gerszewski Kaserne

1556 Craftsman #1 finishing paperwork; #2 idle

1558 Both craftsmen cleaning up

1600 End of Day

Conclusion

Direct Productive	44.8%
Indirect Productive	20.6%
Nonproductive	34.6%
	<u>100.0%</u>

Major Problem Areas:

- 13.3% of the craftsmen's time was spent in job preparation.
- 30.6% of craftsmen's time was nonproductive because of the lack of work assignments to keep the craftsmen occupied for the full workday

Conclusion

The only management involvement with the PM Team was which buildings were on the PM schedule. The fact that the craftspersons are traveling to work sites and determining the level and extent of the work to be accomplished demonstrates how lack of planning and scheduling contribute to 28.5% and 30.6% of the PM team's work being nonproductive. While some of the tasks performed were actual preventive maintenance tasks, it was observed that a majority of the light switch covers that were replaced, window and door lubrications performed, and other repair jobs done were not required. At these installations HAMM ASSOCIATES observed tenants actually complaining to craftspersons about doing unnecessary repairs that were not listed on the deficiency checklist and in areas of the apartments where the tenants considered that no repairs were necessary.

Much of the work accomplished by the craftspersons in the two examples Exhibits II-EE and II-FF above was self-help in nature. See Section V, page V-4, for further discussion regarding self-help.

Recommendations

- See Section V, pages V-1 thru V-5, for discussions and recommendations for the PM Team, Self-Help, and the Do-It-Now (DIN) Team(s) concept.

Findings of Fact

SHOP: Entomology 1 C5/6

0730 - 0732 Obtaining vehicle from central storage
0734 - 0736 Loading materials on vehicle
0737 Travel to Bldg. 9093
0740 - 0744 Unloading materials from vehicle and foot travel to attic area of building
0746 Pressurizing insecticide spray canister
0748 - 0810 Applying insecticide spray to attic area
0812 - 0816 Foot travel to first floor area to refill spray canister and return
0818 Craftsman putting on and taking off respirator
0820 - 0834 Spraying insecticide in general area of attic
0836 Idle
0838 - 0842 Spraying previously sprayed area
0844 - 0846 Securing materials and supplies
0848 Planning at the job site
0850 Filling out paperwork
0852 - 0854 Travel to shop
0845 - 0858 Personal clean up
0900 - 0914 Break
0916 Securing supplies and materials on vehicle
0918 - 0920 Travel to NCO Club
0922 - 0924 Obtaining supplies and materials from vehicle

0926 - 0956	Spraying insecticide throughout the club and public areas of building
0958	Mixing chemicals
1000	Planning at the job site
1002 - 1020	Spraying insecticide throughout club and public areas of building
1022 - 1024	Mixing chemicals
1026	Planning at the job site
1028 - 1036	Spraying insecticide throughout club area
1038 - 1050	Spraying insecticide in previously sprayed areas
1052 - 1054	Securing supplies and materials on vehicle
1056	Travel to warehouse Bldg. 9054
1058	Obtaining supplies and materials from vehicle
1100	Foot travel to job site
1102 - 1108	Spraying insecticide in one aisle of warehouse
1110 - 1118	Spraying insecticide in area previously sprayed and overlapping area sprayed by other craftsman
1120 - 1122	Idle
1124 - 1126	Foot travel to vehicle for supplies
1128	Foot travel to shop area
1130	Mixing chemicals
1132 - 1134	Spraying insecticide in warehouse storage area
1136	Idle
1138 - 1142	Craftsman spraying insecticide in areas previously sprayed and "criss-cross" spraying done by two other craftsmen
1144 - 1152	Idle
1154	Securing supplies and materials on vehicle
1156	Travel to shop

1158 Personal clean up
 1200 - 1230 LUNCH
 1232 - 1234 Material handling in shop area
 1236 - 1240 Waiting for foreman to return with key for next job site
 1242 Travel to theater building
 1244 - 1246 Planning at the job site
 1248 - 1250 Obtaining supplies and materials from vehicle
 1252 - 1314 Spraying insecticide in general areas of theater building
 1316 - 1318 Planning at the job site
 1320 Spraying insecticide in general areas of theater building
 1322 - 1326 Planning at the job site
 1328 - 1330 Idle
 1332 Obtaining supplies and materials on vehicle
 1334 Travel to Bldg. 9249
 1336 - 1338 Securing supplies and materials from vehicle
 1340 - 1354 Spraying insecticide - top floor area of Bldg. 9249
 1356 - 1358 Idle
 1400 - 1412 Spraying insecticide - top floor area of Bldg. 9249
 1414 - 1422 Spraying insecticide in previously sprayed areas
 1424 Planning at the job site
 1426 Securing supplies and materials on vehicle
 1428 - 1430 Filling out paperwork
 1432 Travel to Bldg. 9247
 1434 Foot travel to top floor of Bldg. 9247
 1436 - 1440 Craftsperson delayed -- contractor varnishing floor at
 this location -- craftsperson moves to other wing of
 building

1442 - 1502 Craftsman spraying insecticide in same area in which contractor personnel are currently working

1504 - 1506 Idle

1508 - 1516 Spraying insecticide in basement area of building

1518 - 1520 Obtaining supplies and materials on vehicle

1522 Travel to Bldg. 9091

1524 Obtaining supplies and materials from vehicle

1526 - 1540 Spraying insecticide in basement area of building

1542 Planning at the job site

1544 Securing supplies and materials on vehicle

1546 Filling out paperwork

1548 - 1550 Travel to shop

1552 Material handling in shop area

1554 Travel to central vehicle storage (to park vehicle)

1556 - 1558 Personal clean-up and dressing

1600 End of Work Day

Conclusion

Throughout the day, the craftsman (one craftsman serving as part of a 3-man team) spent a total of 42 minutes back-tracking -- spraying areas previously sprayed and overlapping areas sprayed by the other craftsmen. Conversely, had the other two craftsmen been observed the full day, the time spent back-tracking would have been much greater. This represented a waste of time and chemicals and created a hazardous condition -- due to the over use of chemicals in inhabited areas. The craftsman did not use a respirator throughout the day, thus creating a hazardous condition for himself.

The job site (NCO Club) was not prepared for insecticide spraying, however, the spraying took place.

Recommendation

It is recommended that appointments for insecticide spraying be set in advance -- to allow customers sufficient preparation time. This will provide safety precautions for the spraying process as well as reduce the craftsman's site preparation time.

It is also recommended that the shop foreman study the work description of the various job orders to determine the best use of resources. Efforts should be made to spread the craftspersons over many jobs and to avoid the over use of manpower at a single job site. The shop foreman should emphasize safety precautions with his craftspersons and make periodic inspections at the job sites to determine that safety precautions are being followed.

SECTION III
PRODUCTIVITY REVIEW AND ANALYSIS
OF THE
DIRECTORATE OF ENGINEERING AND HOUSING
AT
THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.

* * * PROCESS ANALYSIS * * *
(ERMD and related work control areas)

SECTION III

PRODUCTIVITY REVIEW AND ANALYSIS
OF THE
DIRECTORATE OF ENGINEERING AND HOUSING
AT
THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.

* * * PROCESS ANALYSIS * * *
(ERMD and related work control areas)

3.1 The Requirement to Improve Estimating, Planning and Feedback on RPMA Work. Variance Analysis is a Must if High Productivity is to be Maintained.

A. Findings of Fact

A.1 Individual Job Orders (IJOs)

- An analysis of 64 IJOs completed during FY 1984 (See Exhibit III-A, page III-36) revealed the following:
 - Actual person hours equalled estimated person hours 28 times or 43.8% of the time.
 - Actual and estimated person hours differed by greater than +10%, 15 times or 23.4% of the time.
 - Estimated hours were in multiples of four, 38 times or 59.4% of the time.
 - Actual hours were in multiples of four, 44 times or 68.8% of the time.
- Currently variance analysis is not performed by the Karlsruhe DEH Community.
- Variance analysis was performed in October, November, and December 1983, however the variance analysis was performed incorrectly and was of little, if any, value. The analysis of a random sample of IJOs on which variance analysis was performed revealed the following:

<u>Shop</u>	<u>Total IJOs</u>	<u>Actual Time Charged to IJO in Days</u>	<u>Percent Actual Time in Days</u>
Mason	7	7	100%
Electrical	10	9	90%
Steamfitter	10	7	70%
Carpentry	5	4	80%
Plumbing/ Kitchen	9	1	11%
	<u>41</u>	<u>28</u>	<u>68.3%</u>

As noted below several "Open IJOs" were issued (Estimated and Unestimated). "Open IJOs" are defined as IJOs issued by ERMD to a shop or shops for collecting recurring maintenance and/or repair costs. Exhibit II-B, page III-40 illustrates examples of Evaluation of Individual Job Orders indicating open IJOs where no estimate was made in advance and the effectiveness as being 100% or forced to equal actual hours. Shown below is a summary of Exhibit III-C, page III-43, indicating the percent of IJOs forced to equal the actual hours.

1 person working		2 people working	
- morning	4.5 hours ¹	- morning	9 hours
- afternoon	3.5 hours	- afternoon	7 hours

	<u>Total IJOs</u>	<u>Open IJOs (Est. Forced to Equal Act.)</u>	<u>Percent</u>
Mason	7	0	0%
Electrician	10	4	40%
Steamfitter	10	6	60%
Carpentry	5	3	60%
Plumber/ Kitchen	9	8	88.9%
	<u>41</u>	<u>21</u>	<u>51.2%</u>

- Backlog of IJOs awaiting scheduling and material.

	<u>KARLSRUHE (9/7/84)</u>			<u>GERMERSHEIM (9/12/84)</u>		
	<u>Number</u>	<u>Hours</u>	<u>Person Years²</u>	<u>Number</u>	<u>Hours</u>	<u>Person Years²</u>
Awaiting Scheduling	41	8871	5.3	28	3096	1.8
Awaiting Material	<u>30</u>	<u>6899</u>	<u>4.1</u>	<u>45</u>	<u>10769</u>	<u>6.4</u>
TOTALS	71	15770	9.4	73	13865	8.2

A.2 Service Orders (SOs)

- A random sampling of 453 service orders completed during FY 1984 (see Exhibit III-D, page III-46) revealed the following:
 - The average time required to complete a service order was 5 hours and 32 minutes.

¹ The morning consists of 4.5 hours.
The afternoon consists of 3.5 hours.
² Person-years = Total Hours/1686

- One hundred forty-eight or 27.3% were reported in days or half days.
- Forty seven or 10.4% of the service orders were completed (time charged) in under two hours.
- Two or 0.4% were completed (time charged) in under one hour
- In numerous cases it was evident that time was charged in daily or half daily increments. For example:
 - 3 people working together - 24 hours
 - 2 people working together - 16 hours
- Historically the average time charged against a service order at DoD RPMAs is 2.26 hours.
- The average time charged against service orders at DoD RPMAs while work sampling is 48.9 minutes.
- The average time per service order at DEH Schweinfurt Historically was 2.2 hours per SO.
- The average time per service order at DEH Schweinfurt while work sampling was 58 minutes per service order.
- The average time per service order at DEH Karlsruhe while work sampling was 3 hours 7 minutes per service order.
- An analysis of the Service Order (SO) records for the period of August 1983 to August 1984 revealed the following:
 - Analysis of Service Order data is not being accomplished.
 - Service Orders received (8/83 - 7/84) - 11,535. Average 961 per month.
 - Service Orders completed (8/83 - 7/84) by Preventive Maintenance (PM) Teams - 100.
 - Service Orders completed (8/83 - 7/84) by Repair and Utility (R&U) Teams - warehouse issue - 224.
 - Service Orders completed (8/83 - 7/84) by shops (less PM) - 9,905. Average 825 per month (Range 608 to 937). Average time per SO - 4.79 hours or 4 hours, 47 minutes.
 - Service Orders cancelled (8/73 - 7/84) - 700.
 - The entries for paragraph 6, number of completed SOs, form AER 8-15c includes cancelled SOs, issued to R&U Teams, and SOs accomplished by the PM Teams. Times reported in this paragraph include hours for accomplishment by shops (less PM).

- A total of 614 SOs were backlogged as of September 21, 1984.
- Backlog of SOs reported at the end of July '84 - 193 (from form AER-15c).
- The scheduler is asking each shop by week, how many SO hours to schedule or he is assigning a set number of hours or a percentage of net available hours by shop.
- Backlog statistics for SOs are not being calculated for each shop.
- Average time for SO completion is not being calculated for each shop.
- SOs complete in August 84 - 1,348. Total hours - 5,628.
- Actual hours for SOs reported on the Monthly Scheduling Feeder Report HQ AER Q FM 28-36-R do not coincide with hours reported on service order form (DA Form 4887) totaled for each month by shop.

B. Conclusions

B.1 Individual Job Orders (IJOs)

Purposes of the ERM Division should be to:

- Provide the DEH and the Deputy DEH with the information required for decision making, and
- Actively seek out on a continuing basis processes and techniques that will increase the productivity of the RPMA operations.

The general objective of Real Property Maintenance Management reports is to provide managers at various echelons of command the wherewithall to manage rationally rather than by the seat of their pants. The DoD has invested considerable money, time, and effort in providing an outstanding management tool (EPS). Unfortunately the potential value of EPS has never been fully utilized. By utilizing EPS, collecting actual workload data, and performing variance analysis, management can establish realistic goals, objectives, and plans for

accomplishment of work which supports assigned missions and functions, and within known parameters of time and resources. By planning ahead of time, optimum use can be made of manpower, machinery, materials, and money. The collection and display of actual job performance data in the same array and detail as the plan progresses, which then will permit identification of variances between plan and accomplishment, enabling the manager to either:

- Alter the next plan to more closely match actual capability, or
- Identify and correct deficiencies in the execution of tasks, or
- Change capabilities to better accomplish tasks.

Unfortunately the DEH at Karlsruhe is not collecting actual results and comparing these results, through variance analysis with Planner/Estimator craft estimates.

Cost data (manpower, machinery and material) will only be accurate if properly accumulated: "Garbage In, Garbage Out" is an appropriate statement. If costs are put into the wrong account, then that account and the account to which costs should have gone, will show incorrect totals.

Cost accounting is a basic tool for the management of the DEH operations, however, cost accounting is not an end in itself. The cost accounting system will produce the cost data but will not control the cost. Action must be taken to check the factors making up the cost during the progress of the work. If one waits until the job is completed to compare actual costs with estimated costs, it is too late for corrective action, as the costs and procedures cannot be changed. For this reason it is very important to collect actual costs as they occur and perform variance analysis as the job is being completed. Through variance analysis some actions that may be taken are:

- Improving cost estimates for future jobs
- Increasing efficiency in the use of labor, plant, and materials
- Improving estimates of the cost required to finish the jobs
- Determining the causes for differences in cost on similar jobs
- Promoting competition between various groups in doing similar jobs more economically

Labor is usually the most flexible item in any project and requires maximum attention and control. EPS can, with a high degree of accuracy, estimate labor hours and therefore costs. EPS assumes proper planning, coordination of crafts, and good job supervision. Efficient job supervision includes the following?

- Keeping nonproductive time to a minimum
- Insisting that craftspersons report to the job site promptly
- Ensuring adequate transportation is available
- Ensuring that time is not wasted by one trade waiting for another
- Seeing that the necessary materials and tools are available

Through the use of variance analysis, management can determine if job supervision is efficient.

- The backlog of IJOs awaiting scheduling and materials is very low (17.6 person years combined). This backlog should be increased through screening of projects from the Engineer Project Acquisition Plan (EPAP) and through input from the Facility Component Inspection Program (see paragraph 3.2, page III-9, this section, for further discussion).

B.2 Service Orders (SOs)

The very high average time per SO at DEH Karlsruhe may be due to any of the following:

- Very low productivity
- Failure to report all work accomplished
- A combination thereof

Incorrect/inaccurate data collection and analysis procedures are illustrated as follows:

- Lack of analysis of SO data and incorrect computations regarding this data is having an adverse effect on the scheduling effort at the DEH. For example, over the twelve month period (8/83 - 7/84) 11,535 SOs were received. Subtracting those completed by PM Teams (100), issued to R&U Units (224), completed by the shops (9,905), and cancelled (700) reveal about 600 SOs remain in the backlog as of July 84. The calculations made by the work receptionist revealed only 200. This error is the result of subtracting the cancelled SOs twice during the month rather than once. The scheduler is consulting the shops regarding hours to schedule however without an accurate backlog by shop, an analysis of average time to complete an SO by shop, and the monthly receipt of SOs by shop, the scheduler does not have an accurate data base to calculate how many hours should be scheduled each week.
- The necessity to assemble accurate information by the scheduler is paramount if the preliminary master schedule for each week is to be of beneficial use by the shops. The assembled information includes IJOs, SOOs, SOs, and hours available for scheduling in sufficient detail by shop code.
- To further illustrate the inaccurate data collection for scheduling and performance evaluations, 5,628 hours were reported by work reception for completed SOs during August '84; however, 4,426 hours, or 21.3% less, were reflected on the Monthly Scheduling Feeder report, (HQ ERQ FM 28-36-R) for the same period. Although it is not known which figure is correct, it is possible that incorrect charges have been made regarding SOs. 809 of the 1,348 completed SOs that month were accomplished in housing, which is a reimbursable cost to the DEH.

The high average time per SO, and the high direct productivity observed while work sampling are a dichotomy. While the productivity of the workforce prior to HAMM ASSOCIATES' visit is at best conjecture on our part, we consider that:

- DEH Karlsruhe made a major effort to be highly productive while we were work sampling
- The difference between the productivity of DEH Karlsruhe while work sampling compared to the apparent productivity of DEH Karlsruhe when not work sampling, based on review of records, is greater than most other RPMAs work sampled. For example, the average reported times by the craftpersons were about 2 hours more per service order versus actual time observed while work sampling.

- There is a strong possibility that work is being accomplished which is not being documented.

C. Recommendations

- That the DEH review SO completions and instruct the employees in the importance of charging actual time to the correct document number on a daily basis. No work should be performed without a document number (4284 or 4287).
- That the average time required to complete SOs be plotted by shop on a weekly basis. See a proposed chart on page III-105.
- That a procedure be developed to conduct variance analysis on a weekly basis as described in chapter 5 of DA PAM 420-6.

NOTE: With the introduction of IFS the above will be greatly simplified. Procedures for accomplishing the above are discussed in detail in paragraph 3.4, page III-13, of this section.

- The procedure for issuing estimated or unestimated open IJOs be discontinued. Open IJOs in CONUS are referred to as Standing IJOs and as indicated by Mr. Ed Watling of the Office, Chief of Engineers, "Standing IJOs" are neither recognized nor acceptable.
- The necessity to assemble accurate information by the scheduler is paramount if the preliminary master schedule for each week is to be of beneficial use by the shops. The assembled information includes IJOs, SOOs, SOs, and hours available for scheduling in sufficient detail by shop code. The work reception clerk, the master scheduler, and Management Engineering System Branch personnel should coordinate data assembly for accurate input into the scheduling process. DA PAM 420-6 "Facilities Engineering Resource Management System" is an excellent guide for input to the complete scheduling process, in addition to the items noted in the above conclusions.
- The suggested methods of SO analysis as described in DA PAM 420-6, should be used to provide information to assist the DEH in measuring responsiveness to customers and to realign as necessary, resources for workload accomplishment.
- Screen the EPAP and implement the Facility Component Inspection Program for additional projects to be placed in the backlog. A 6-9 month backlog should be the target goal. A minimum of 35% of the total person hours in Buildings and Grounds and Utilities Divisions should be expended on IJOs.

3.2 The Requirement to Conduct Facility Component Inspections to Provide Input to the Integrated Facilities System (IFS).

A. Findings of Fact

- Facility Component Inspections are being conducted on an informal basis with no overall plan of action at the DEH.
- The Karlsruhe Military Community is preparing areas for equipment and has received some equipment for installation of IFS commencing in FY85.
- No training program has been established to accommodate the Facility Component Inspection Program.
- The Department of the Army, Corps of Engineers, has issued a Revised Facilities Component Inspection Policy by letter DAEN-MPO-M dated 23 July 1982. (Copy provided to Chief ERMD during the site visit.)

B. Conclusions

- With the onset of IFS installation, a plan of action should be developed for Facility Component Inspection. A training program should be included in this plan of action for all ERMD Planner/Estimator/Inspectors.
- As noted in the 23 July 1982 letter, the primary purpose of facility component inspection is to identify valid maintenance and repair requirements. Identifying and establishing an accurate Backlog of Maintenance and Repair (BMAR) is an important part of an effective RPMA management system. Establishing and maintaining the facility inspection program will provide an accurate and reliable statement of BMAR for the Karlsruhe Military Community. Using the standard Facilities Engineering work management policies, procedures, forms, and terminology when the Facilities Component Inspection procedures are established will ensure accurate input of requirements into the work management system for planning, programming, budgeting and execution.

C. Recommendations

- Develop a plan of action for Facility Component Inspections using the 23 July 1982 letter as guidance.
- Develop and conduct a training program for Planner/Estimator/Inspector personnel for the Facility Component Inspection Program.
- See paragraph 3.8, page III-30, for the impact on the Annual Work Plan.

3.3 The Requirement to Use Engineered Performance Standards and the Integrated Facilities System to Improve Productivity of the Blue Collar Work Force.

A. Background. During the mid-1950s the Department of Defense directed that standards for maintenance-type work should be developed to the maximum FEASIBLE EXTENT and applied throughout the military establishment. As a result of the above, Engineered Performance Standards (EPS) were developed.

Engineered Performance Standards are designed for maintenance-type work. They differ from both the private industrial standards for highly repetitious work and the conventional standards for construction work. Neither industrial standards nor construction standards are applicable to maintenance-type work.

Subsequent to the development of EPS the Department of the Army installed the Integrated Facilities System (IFS) at Army Real Property Maintenance Activities (RPMAs). The Facilities Engineering Management System (FEMS) module of IFS is designed to be used with EPS. So utilized, FEMS and EPS are powerful tools that provide for more efficient utilization of management time and better allocation of resources. In particular, EPS utilized in conjunction with the following IFS (FEMS Module) reports provide management with outstanding information in regard to productivity.

- Shop Performance Report Service Orders (FKO)
- Shop Performance on Completed IJOs (FLO)

B. Findings of Fact

- A random sampling of 52 job orders (29 special projects and 23 IJOs) completed during FY 1984 revealed the following (see Exhibit III-E, page III-56, for details).

	<u>EPS UTILIZED</u>	<u>EPS NOT UTILIZED</u>	<u>TOTAL</u>
Number of Phases	47	66	113
Percent Phases	41.6%	58.4%	100%
Number of Person Hours	2825	3651	6476
Percent Person Hours	43.6%	56.4%	100%

Using the laws of mathematics, it can be stated that there is a 95% probability EPS was utilized at Karlsruhe to date in FY 1984 between 34.4% and 52.8% of the time.

$$p = .436 \text{ or } 43.6\%$$

$$sp^1 = \sqrt{\frac{pq}{n-1}} = \sqrt{\frac{(.436)(.564)}{113-1}} = .0469$$

where:

sp = sample proportion
 p = Percentage using EPS
 q = 1-p = Percentage Not Utilizing EPS
 n = Sample Size (number of phases)

At 95% confidence level $Z = +1.96$

$$p + 1.96Sp = .436 + 1.96 (.0469) \\ = .344 \text{ to } .528 \text{ or } 34.4\% \text{ to } 52.8\%$$

- During FY83 EPS was utilized at DoD RPMAs as shown below²:

	<u>DoD</u>	<u>Army</u>	<u>DLA</u>	<u>Navy</u>	<u>Air Force</u>	<u>Marine Corps</u>
Average Usage of EPS for IJOs	56	52	46	56	62	55
Average Usage of EPS for All Types of Work	36%	37%	31%	42%	31%	55%
FY84 (YTD)	32%	33%	19%	37%	24%	54%

- Of the seven planner-estimators currently assigned to the Karlsruhe Community DEH only four have had Engineered Performance Standard (EPS) training.

¹ Steven P. Shao - Statistics for Business and Economics, page 340 - 2nd Edition

² Information obtained from Atlantic Division Naval Facilities Engineering Command Industrial Engineering Division. Information by Mr. Danny Leigh 804-444-9859. TRADOC data obtained from TRADOC I.E. Branch 804-727-4232.

- Until recently a bilingual Army master sergeant taught EPS courses in German. Currently there is no one available to teach EPS in German.
- DEH Karlsruhe management feel it is highly desirable to have EPS procedures taught in German.
- The planner-estimators do not hold the latest EPS manuals. A list of the current effective manuals is provided in Exhibit III-F, page III-56.

C. Conclusion. The utilization of standards to measure the productivity of a workforce engaged in maintenance or repair operations has long been recognized. Engineered Performance Standards (EPS) are an accurate and readily available source of time standards for use in estimating the time to be allocated to craftspersons for completion of jobs. Therefore, they are an excellent source of information for use in planning, scheduling, and measuring the performance of Real Property Maintenance (RPMA) Engineering work. Currently the Karlsruhe Community DEH is not utilizing EPS to the fullest extent. While emphasis by management might increase EPS utilization, a major contributing factor to the current low utilization rate is the lack of an individual assigned to teach EPS in Europe. It is highly desirable that a space be allocated for an individual who is bilingual (German/English) to teach EPS. This individual might also be utilized in visits to evaluate EPS utilization at the various communities throughout Europe.

D. Recommendations

- DEH Karlsruhe should initiate a request for EPS training for the three P&Es who have never received any training as well as refresher training for the other P/Es.
- ERMD should set up a system to randomly check for EPS utilization. The use of EPS should be continually emphasized.
- U.S. Army Installation Support Activity, Europe (USAISAE) should be tasked to provide EPS training. The individual assigned to provide the training should be bilingual.

- DEH Karlsruhe should request the latest copies of all EPS manuals (See Exhibit III-F, page III-59).

3.4 The Implementation of IFS at DEH Karlsruhe is in Serious Trouble and will Require Major Application of Resources if it is to even Remotely Meet Scheduled Implementation

A. Background

The Integrated Facilities System (IFS) is an automated management information and job order cost accounting system that is currently being implemented at U.S. Army Communities in Europe. IFS is specifically designed to assist the Director of Engineering and Housing with the day-to-day management of operations and maintenance of facilities and with the resource management functions of the four base operations accounts listed below:

- J - Operations of Utilities
- K - Maintenance and Repair of Real property
- L - Minor Construction (Alteration)
- M - Other Engineering Support

The system consists of three interrelated modules. They are:

- The Assets Accounting (AA) module
- The Facilities Engineering Management Systems (FEMS) module
- The Real Property Maintenance Activities (RPMA) module

DEH Karlsruhe will receive only the "AA" and "FEMS" modules. A brief description of the "AA" and "FEMS" modules follows.

The Assets Accounting Module

This module addresses the establishment, maintenance, and use of individual records which identify and describe each parcel of land, building, structure, pavement, utility plant, and utility distribution

system found on an Army installation. Facilities are registered in the assets module with unique six-digit facility numbers. If an entity is listed in AR415-28 with a category code (F4C/FCCCC), it is considered a facility. An entity which does not appear in AR415-28 with a category code is a component. The asset accounting master reference file provides information in three distinct functional areas. They are:

- Facilities Data - Describes a single facility and its condition.
- Force and Mission Data - Provides stationing, planning and mobilization information on facilities and groups of facilities.
- Cost Data - History of expenditures against a facility.

The Assets Accounting Module facility records constitute the accountable inventory of installation real property required by Title 10 United States Code 2701.

The Facilities Engineering Management System (FEMS) Module

This module is designed to provide the tools that are necessary for the effective day-to-day management of the Facilities Engineering workforce at the installation level. Used properly, it allows more efficient utilization of management time, better allocation of resources, and increased simplicity through reduction of clerical work required by shop and office personnel. FEMS basically provides an automated assist to and expands upon the management concepts that are presented in DA Pamphlet 420-6. The FEMS system is batch-oriented utilizing conventional 80-card column input. It consists of five distinct cycles with frequencies of daily, weekly, monthly, quarterly, and annually. The output reports of these cycles are grouped below by purpose:

- Job Status and Workload Reports
 - Job Order Request/Individual Job Order Status Report (FAO)
 - Facility Reference Report (FWO)

- Service Order Register (FGO)
 - Individual Job Orders Awaiting Materials Report (FBO)
 - Engineering Design Status Report (FCO)
 - Contract Status Report (FDO)
 - Master Schedule of Individual Job Orders (FEO)
 - Shop Schedule Report (FFO)
 - Service Order Backlog Report (FJO)
- Cost Control Reports
 - Special Projects Report (FQO)
 - Standing Operations Report (FMO)
 - Family Housing Costs Report (FRO)
 - Functional Costs Report (FRO)
 - Reimbursable Job Cost Report (FTO)
 - Family Housing Prestige Quarters Report (FUO)
 - Preventive Maintenance Report (FVO)
 - Minor Construction and Alteration Report (FXO)
 - Contract Cost Report (CSO)
- Job Performance Reports
 - Shop Performance Report Service Orders (FKO)
 - Shop Performance on Completed IJOs (FLO)
 - Shop Backlog and Workforce Distribution Report (FNO)
 - Tech Data Feeder Report (FZO)
 - Mission Support Report (FYO)
 - Jobs Sent to the History Master (FYO)(YOL)

The FEMS data is maintained on four master files. These files are:

- Uniques Master File (A05AKB)
- Labor/Equipment/Shop File (A29AKB)
- Work Order Master File (A35AKB)
- Task Code Master File (A55AKB)

B. Findings of Fact

- Five personnel attached to DEH Karlsruhe have been to an IFS course taught by ALMAC in January 1983. They are:
 - IFS Project Officer (Leaving in March 1985)
 - Budget Chief
 - One Person in Real Property
 - One Person in MESB
 - Supervisor at Germersheim
- The Director and Chief ERMD have not been to IFS school.
- As of 5 September 1984 DEH Karlsruhe was uncertain as to what portions of IFS would be provided. They were of the opinion that they were to receive only the "assets module". The IFS Project Officer was informed by phone (conversation with USAISAE) that they would receive both the FEMS module and the Assets module on 6 September 1984.

- The IFS Project Officer, a Captain in the Army and detailed as Operations Officer, will leave the service in March 1985. To date, no one has been identified to fill this key space.
- DEH Karlsruhe has (stated by IFS Project Officer and Chief ERMD) received no guidance on what parts of the assets module are to be filled in and by what date. The filling in of data in the assets module is a major undertaking.
- The filling in of the uniques tables listed below has not yet commenced (as of 10 September 1984).

F02 - Functional Group Record
 F03 - Installation Priority Record
 F04 - Military Pay Record
 F05 - GS/WB Benefit Percent Record
 F06 - Prestige Quarters Record
 F07 - Family Housing AMS/APC Record
 F08 - Error Message Record
 F09 - Family Housing Record
 F12 - STANFINS Interface APC Record
 FR1 - Labor Update
 FS1 - Shop File Update
 FT1 - Equipment Update
 FU1 - Labor Header Update
 FMJ0 - Update
 FW1 - Task Description/Standard Hours
 R01 - Facility Mean Time Between Inspection Table
 R03 - Facility Condition Percent Table
 R05 - Preventive Maintenance Mean Time R10 Local Recurring
 Maintenance Factor Between Inspection

- Labor and Equipment (L&E) Cards have not been distributed. Craftspersons have not been trained on how to fill out L&E cards.
- Planner/Estimators have not been instructed on how to fill out 4284 for use with IFS.
- Current IJOs and FY85 Standing Operation Orders (S00s) have not been converted to IFS required format.
- The current Chief of Budget does not understand how the IFS system will effect budget.
- Work Reception has not been trained on filling out 4287 (S0s).
- No assist visit by FESA is scheduled.

- ALMAC is scheduled to conduct IFS training in Germany the weeks of 12-21 November 1984 and 6-17 January 1985.

C. Conclusion

Unless immediate action is taken to devote major resources to implementing IFS at DEH Karlsruhe the successful utilization of IFS is doomed to failure and the problems (still existing) with IFS utilization in the Continental United States are bound to repeat themselves. The FEMS module of IFS is a powerful tool, that if properly utilized, can and will increase productivity. FEMS makes the management and analysis of workload data possible and simple. By management, we mean the process of establishing realistic goals, objectives and plans for accomplishment of work which supports assigned missions and functions, and within known parameters of time and resources. By planning ahead of time, the optimum use can be made of manpower, machinery, materials and money. Through FEMS, the collection and display of actual job performance data in the same array and detail as the plan then permits identification of variances between plan and accomplishment and enables the manager to either:

- Alter the next plan to more closely match actual capability, or
- Identify and correct deficiencies in the execution of tasks, or
- Change capabilities to better accomplish tasks.

By the same token, an information system must provide potential benefits that exceed its additional costs. Often the benefits are difficult to measure, but the cost benefit criterion implicitly underlies the decision about information systems. The reluctance to adopt new procedures is frequently because of reluctance to change, but is also often because the apparent benefits (failure of training program) do not

exceed the more obvious costs of gathering and interpreting the information.

D. Recommendations

- Clarify by official correspondence what part(s) of IFS DEH Karlsruhe is to receive and what key events and what time schedule DEH Karlsruhe is expected to meet. Specifically, how much of the asset module is expected to be filled in, and how soon.
- Make arrangements for IFS forms and users manuals. As a minimum, the following individuals (sections) should have the IFS manuals as indicated.
 - IFS Project Officer - Complete Set
 - Budget - FEMS Volumes (all)
 - MESB - Complete Set
 - Real Property - Asset Module Volumes (All)
 - Gemersheim - All
 - P/E - FEMS Volume IIIA
 - Work Reception - FEMS Volume IIIA
 - B&G/Utilities - FEMS Volume IIIA (1 each)
 - Director/Deputy - Complete Set
- Initiate action to fill the MES Branch Chief space with an Industrial Engineer. Send to IFS school.
- Commence filling out the FOI Unique File (User Requestor Identification Number Table).
- Immediately commence in-house IFS training. Specifically the following training is required:
 - Planner/Estimators - Procedures for filling out 4284s as required for IFS to function.
 - Work Reception - Procedures for filling out 4287s.
 - Craftspersons - Procedures for filling out L&E cards.
 - All Personnel - Procedures for filling out L&E cards.
 - Quality Control Clerk - How to read and correct error listings.
 - Budget Personnel - How to fill out unique files and utilize cost reports.
 - MESB Personnel - How to utilize performance reports and prepare graphical displays of information for senior management.

- Work Coordination - How to use the master schedule and shop schedule reports and all backlog reports.

- Arrange for the Chief ERMD to attend the two week IFS course to be conducted 12 thru 21 November 1984. If possible it is also recommended that someone from Budget attend.
- Continue to update the existing Real Property Inventory and Building Information Schedule (RPI/BIS). Commence filling in DA Forms 4276, 4276-1, 2, 3, 4, 4281, 4279, 4279-1, 2, 3, 4, 5, 4274, 4263, and 4263-1. NOTE: In order for the FEMS module of IFS to function the following data elements must be completed.
- Commence filling out the remainder of the unique files.

<u>Data Element</u>	<u>Input Transaction</u>
Functional Group Code	AA1
Category Code	AA4
Activity Status Code	AA2
User Code	AA6
Complex Code (Family Housing)	AA7

Attachment III-1, page III-79, contains a self-evaluation guide developed for use by command and DEH personnel in evaluating their knowledge of and the status of data in the IFS. Attachment III-2, page III-124, contains standard IFS operating procedures for the following functions:

- Service Order Clerk
- Work Reception
- Planner/Estimators
- Quality Control Clerk
- Material Coordinator
- Scheduler
- Shop Foremen

DEH Karlsruhe holds a listing of commonly used task codes from the DEH Baumholder with standard times. Both the task codes and standard

times should be adjusted for local conditions; however, the listing is a good starting point.

3.5 The Need to Improve Scheduling and Conduct Variance Analysis when Actual Work Performed Differs Substantially from Scheduled Work.

A. Findings of Fact (Karlsruhe only)

- Analysis of the actual work performed vis a vis the work scheduled for the week of 20 August 1984 (See Exhibit III-G, page III-60) revealed the following:
 - Time actually expended performing service orders exceeded time scheduled for service orders by 405.5 person hours or 90.9% (446 scheduled; 851.5 actually worked [(851.5-446)/446 = 90.9%].
 - Time scheduled for performance of IJOs exceeded time actually spent working on IJOs by 414.5 person hours or 31.0% (1338 scheduled; 923.5 hours actually worked [(1338-923.5)/1338 = 31.0%].
 - Eleven IJO phases scheduled had no work performed. Eleven IJO phases had work performed but no work scheduled.
- Analysis of scheduled shop availability (Carpentry and Interior Electric shops) to actual shop availability for the months of October 1983 thru August 1984 revealed the following (see Exhibit III-H, page III-66).
 - Scheduled hours in the shops for performing productive work exceeded actual hours in the shops available for performing productive work as shown below:

<u>Shop</u>	<u>Scheduled Hours</u>	<u>Actual Available Hours</u>	<u>Difference</u>	<u>% Short</u>
Carpentry	16,802	12,509	4,293	25.6 •
Int. Electric	28,112	18,029.5	10,082.5	35.9

- Analysis of SO hours scheduled to SO hours actually performed (see Exhibit III-I, page III-67) revealed the following:
 - Based on a random sample of 12 weeks, actual hours performed on SOs exceeded hours scheduled for SOs by 1695 hours or 39.6%. Prorated to an annual basis this would be 7,345 hours worked on SOs that are not scheduled.

- Analysis of two Standing Operations Orders (SOOs) selected at random revealed the following:

- For SOO KA000244S (See Exhibit III-J, page III-69) the following information is ascertained.

	<u>Person Hours</u>		
Annual Estimate (4284)	3840		3840
Annual Scheduled	2775	2775	
Estimate > Scheduled	<u>1065</u>		
Actual Annual Hours		1850	1850
Annual Scheduled > Actual		<u>925</u>	
Annual Estimate > Actual			<u>1990</u>

- The shop has 3 craftspersons assigned. This equates to approximately 5058 person hours available for work in a FY. If 3840 person hours were worked against the SOO as estimated 75.9% of all work would be spent on that SOO alone.
- For SOOs KA 000224S and KA 000234S (See Exhibit III-K, page III-71) (Shop 09) the following information is ascertained.

	<u>Person Hours</u>		
Annual Estimate (4284)	7200		7200
Annual Scheduled	8258	8258	
Estimate > Scheduled	<u>(1058)</u>		
Actual Annual Hours		7208	7208
Annual Scheduled > Actual		<u>1050</u>	
Annual Estimate > Actual			<u>(8)</u>

- The current and past scheduling procedures at DEH Karlsruhe make no allowance for supervision time.
- If Shop "A" has 6 craftspersons assigned and a foreman the current practice is to start the scheduling process with 280 hours available for a 5 day week. No time is subtracted out for supervisory duties.

B. Conclusion

The current and past manual scheduling system is unsatisfactory. Since IFS will be implemented at DEH Karlsruhe in October 1984 no major development of new forms is required. On the other hand certain procedures are required if scheduling is to be effective. Good scheduling ensures that direction of the craftspersons is exercised in a

way that will assist in obtaining maximum productivity. Effective scheduling will provide for the orderly and economical accomplishment of work, as well as the orderly assignment of work to the individual shops. The Scheduler is a key position to affect the efficiency of resource usage and the smoothness of total work flow. In order to schedule effectively the following is required.

- Master Scheduling Criteria must be established.
 - Optimum Scheduling Levels
 - Range of Job Size
 - Normal Variations of Available Person-Hours (Summer Hire, Leave Periods, Historical Sick Leave)
- Listing of which jobs are available
- Copies of the 4284s (know what crafts are required)
- Type and quantity of equipment required
- Availability and location of materials
- Backlog in each shop

The weekly schedule itself should be formatted to contain at least the following:

Shop 02	Week Ending _____		M	T	W	T	F	S	S
Total Personnel	S								
	A								
Leave (All Types)	S								
	A								
Other ¹	S								
	A								
Total Productive Labor	S								
	A								
SO Hours									
S00 Hours									
Job Order No.									
IJO Hours									
Job Order No.									

¹ Supervision, Safety Meetings, Official, Etc.

The scheduling process should essentially flow as follows:

- Monday - Foremen submit previous week's completed work information. Where a variance of greater than +10% has occurred an explanation should be provided.
- Scheduler updates master schedule and reconciles scheduled and actual hours.
- Monday thru Wednesday - Scheduler prepares new schedule for next week
- Monday thru Friday - Foremen supervise current weeks work adhering to schedule wherever possible.
- Thursday Schedule Meeting
PM or - New Master Schedule is Approved.
Friday AM Foremen provided new unit schedule for following week.

The weekly scheduling meeting is very important. In our opinion either the Director or Deputy Director should chair the scheduling meeting.

C. Recommendations

- Consider "other" (overhead) in determining hours available for scheduling.
- Require a written explanation from foremen when actual hours vary by more than +10% and by more than +4 hours.
- Ensure that all service orders are authorized by work reception. Only those that are valid emergencies should be performed in excess of SO hours scheduled.
- The DEH or Deputy DEH should chair all scheduling meetings. (See Exhibit III-L, page III-72)
- Consideration should be given to forming a DIN shop. This would remove the fluctuations in IJO work due to SO workload.
- See Section V, page V-5, for discussion of DIN Team concept for performing SOs.

3.6 Evaluate Policy Letters, Letters of Instruction, and Standard Operating Procedures (SOPs)

A. Finding. The DEH is in the process of updating or developing the following Policy Letters, SOPs, and Letters of Instruction.

- Letter of Instruction for DEH Work Request Submission/ Processing dated 17 Nov 1983
- Policy Letter Customer Service Questionnaires
- Policy Letter Standing Operations Orders
- Policy Letter Open Individual Job Orders
- Policy Letter Weekly Scheduling Meetings
- SOP for Short Form Contracts
- SOP for Work Sampling
- SOP for Preventive Maintenance (see para. 5.1, page V-1, for a discussion of this SOP).

B. Conclusions. The following comments are based on a review of the above documents.

- Letter of Instruction for DEH Work Request Submission/ Processing.

The DEH was in the process of revising this Letter of Instruction (LOI). Our comments are based on the proposed revision. A draft of our proposed changes was given to the Chief ERMD during the initial on-site visit. The primary concern is with Appendix D, Work Coordinating Office Schedule. This appendix limits the time the seven Installation Coordinators have access to the Work Coordination Office. In discussing this schedule with Chief ERMD and other personnel within the Division it was determined that this schedule is not enforced. This has not created any workload problem in the Work Coordination Office. In the interests of customer satisfaction, any indication that customer access to the Work Coordination Office is or should be restricted ought to be eliminated. The proposed draft eliminates Appendix D. The Appendix F flow charts attempt to eliminate, or at least show the attempt to eliminate, any decision making requirements. This appendix puts every type of work into a specific category and defines the process by which the work will be accomplished. For example, by using these charts all maintenance and repair work over 40 hours but less than \$10,000 will be done in-house and all new work in the range of \$1,000 to \$10,000 will be done in-house. In neither case should the work be restricted to in-house because of the size. Consideration must be given to the following as a minimum.

- What skills are required to perform the work?
- Are the required skills available in-house?

- What is the backlog for the shop(s) impacted?
- What is the impact on the overall schedule?
- What is the priority of the requested work?

Both flow charts should show a yes/no possibility under the in-house category. If yes, proceed with estimating, etc. If no, draw an arrow to the short form contract box.

- Policy Letter Customer Service Questionnaire.

The procedures proposed by this Policy Letter will, we believe, create an administrative nightmare. It will result in 1000-1500 additional pieces of correspondence being generated by the DEH. Any improvements realized will, at best, be negligible. If customer comments are considered beneficial, it is suggested that a supply of preprinted post cards be provided the shops and that the craftsperson leave one when the service order is signed off by the customer. Cards returned with positive or negative comments should be sent to the respective branch chief for comment when required. Articles should be periodically published in the community newspaper emphasizing the need for customer feedback and let the public know what is being done to improve DEH service.

- Policy Letter Standing Operations Orders

This proposed Policy Letter is basically a repeat of Chapter 4, paragraph 4-2.b. of DA PAM 420-6 Facilities Engineering Resources Management System and is not needed.

- Policy Letter Open Individual Job Orders

See paragraphs 3.1, A.1 & C, pages III-2 and III-8 for a discussion of "Open IJOs". Emergencies should be stopped with a service order. If additional work is needed to follow up and fix the damage, an IJO should be issued under normal procedures. Even if the followup work should continue immediately on arresting the emergency, a P&E should be assigned to produce an estimated IJO and the work scheduled as any other job would be handled. The only exception may be support to the annual "Reforger" exercise but this too should be based on historical requirements in order to avoid a truly "unestimated" IJO.

- Policy Letter Weekly Scheduling Meetings

This policy letter should be revised to require the branch chiefs to attend both scheduling meetings. The theme running throughout Section II, Work Sampling Results, is that more attention is needed in supervision of shop resources. Force the branch chiefs to be a part of supervision. Do not give

them an out with the excuse they don't know what is going on just because a decision was made at a schedule meeting of which they were not in attendance. Either the Director or the Deputy Director should be in attendance.

- SOP for Short Form Contracts

We do not concur with this SOP as it perpetuates the Utilities Division and Buildings and Grounds Division in the contracting effort to the extent it detracts from supervision of the in-house workforce. See Section IV, page IV-1, for a discussion on contract administration within these divisions.

- SOP for Work Sampling

The main concern with this proposed SOP is in the designation of who will perform the work sampling. When performed properly, work sampling is time consuming. Only when a supervisor's workload will allow an extended absence from his/her duties should they be spared. The team should consist of personnel from the Management Engineering Systems Branch, Planners & Estimators (P&E), and engineer interns. The advantage of having P&Es work sample is that it gives them a firsthand look at what effect their preparation of IJOs has on the workforce.

- Exhibit III-M, page III-73, is a list of SOPs the Schweinfurt DEH has issued. Copies of these SOPs are being provided separate from this report. Karlsruhe DEH should consider the following SOPs from Exhibit III-M for their use: Nos. 1, 2, 5, 7, 8, 10 thru 21 and 23.

C. Recommendations

- Letter of Instruction for DEH Work Request Submission/Processing
 - Delete Appendix D - Work Coordination Office Schedule
 - Revise flow charts showing choice of accomplishment for work under \$10,000
- Policy Letter Customer Service Questionnaire
 - Revise procedures. Craftsperson performing service order should leave preprinted post card for customer response.
- Policy Letter Standing Operations Orders
 - This is a repeat of DA PAM 420-6 procedures. Do not issue.
- Policy Letter Open Individual Job Orders
 - Do not issue.

- Policy Letter Weekly Scheduling Meetings
 - Revise attendance requirements.
- SOP for Short Form Contracts
 - Do not issue.
- SOP for Work Sampling
 - Revise portion identifying team makeup
- Review Schweinfurt DEH SOPs for applicability at Karlsruhe and issue those considered appropriate.

3.7 The Requirement to Continue to Monitor Sick Leave and Reduce Abuse to the Maximum Extent Possible.

A. Findings. Sick leave use continues to exceed the U.S. Army Europe target of 95 hours average per year per employee for 1984 which is down from the 100 hour average in 1983. These targets were provided by Mr. Ulrich CPO Heidelberg at the USAISAE inbrief on 9 July 1984. The use by shop for CY83 and projected for CY84, based on data accumulated through July 84, is shown in Exhibit III-N, page III-74. The high users (total used/number of persons) for 1983 were:

	<u>Hours per Person</u>
Electrical Shop	148.2
Fire Prevention and Protection	137.0
Housing Division	102.0
Housing Furnishings Management Office	145.3
Supply/Storage Division	126.8
Pipefitting Shop	119.1
Plumbers Shop	110.2
Sanitation Shop	116.2
Carpentry Shop	141.3
Masonry Shop	129.8
Metalwork Shop	136.8
Paint Shop	185.1
Roads	155.7
Germersheim Overhead	129.6
Germersheim Buildings & Grounds	220.4
Germersheim Heating	164.7
Germersheim Utilities	168.8
DEH Average 1983 (USAREUR TARGET 100 HOURS)	114.5

Projected 1984 High Users:

	<u>Hours per Person</u>
Engineering Services Branch	141.1
Housing Furnishings Management Office	193.1
Work Coordination	206.3
Utilities Overhead	209.8
Electrical Shop	104.9
Heating Burner Mechanics Shop	109.4
Plumbing Shop	181.0
Refrigeration/Kitchen Equipment Shop	100.3
Entomology	314.7
Grounds	113.3
Masonry Shop	118.6
Metalwork Shop	160.1
Organizational Maintenance	118.2
Painting Shop	175.9
Roads	143.2
Germersheim Overhead	165.0
Germersheim Buildings & Grounds	153.4
Germersheim Heating	238.1
DEH Average 1984 (USAREUR TARGET 95 HOURS)	118.4

For 1983 the overhead functions were 6.2 hours per person under the target (1029 hours/166 persons). This could switch to 10 hours per person (1651 hours/165 persons) over target for FY84. The Utilities Division Shops were 12.7 hours per person over target for 1983 and are projected to be 10.5 hours (913 hours/87 persons) over for 1984. The Buildings and Grounds Division Shops exceeded the target in 1983 by 19.3 hours per person (1829 hours/95 persons) and could exceed it by as much as 39.1 hours per person (3795 hours/97 persons) in 1984. This equates to 1.1 person years of lost effort (1829 hours/1686 available hours per person) for 1983 with a possible increase to 2.3 person years in 1984 (3795 hours/1686). The shops at Germersheim exceeded the target in 1983 by 80 hours per person (6479 hours/81 persons), which equates to 3.8 person years (6479 hours/1686 hours) or 4.7% of what should be available hours [6479 hours over target/(81 persons x 1686 available hours per person)]. The Germersheim shops rate of usage reduces to a projected

47.1 hours over target per person. The high use of sick leave is a constant concern of the DEH. Use is tracked on a monthly "Sick Status Report" by shop by individual. Memos are sent to foremen of shops where there are high use rates requiring a followup with the employee concerned and a reply back as to what the reason for use is. The DEH is particularly concerned with the amount of sick leave being used at Germersheim.

B. Conclusions. There are many factors that impact on the use of sick leave beyond bonafide illnesses. They are:

- Individual's physical condition is not suitable for assigned duties.
- Dissatisfied with the rate of pay.
- Dissatisfied with the work hours.
- Dissatisfied with the worksite conditions.
- Dissatisfied with colleagues.
- Dissatisfied with supervisor.
- Low shop morale.
- Perceived as earned time off.
- Observe others abusing it and not being questioned or disciplined so "why not me".
- Taken in conjunction with weekends or holidays.

USAREUR PAM 690-80 paragraph 57, page 32, contains good guidance in identifying causes and procedures for dealing with abusers. Higher visibility on the rate of use and the overall impact on the DEH workforce will make the workforce more aware of the problem and should bring peer pressure on those who abuse it.

C. Recommendations. Managerial emphasis should continue to be placed on reducing sick leave. The following specific recommendations apply:

- That the DEH communicate to the employees the effect that sick leave abuse has on the productivity levels of the Directorate and request input from the employees for possible solutions to the problem.
- That actions and procedures outlined in the USAREUR PAM 690-80 be fully implemented to place abusers on notice.
- That a portrayal of sick leave usage by shop be placed conspicuously in each shop area and at a central location to bring peer pressure aspects into the problem solving. Exhibit III-0, page III-76, is an example of how the use rate can be calculated and pictured for each shop.
- That sick leave taken by employees "intending" to retire be closely monitored and not authorized if not in accordance with criteria contained in USAREUR Reg. 690-75.
- That sick leave of temporary employees (who are normally younger than the permanent workforce) be monitored.
- That the white collar shops turn in L&E Cards as required by the IFS User Manual and that their use of sick leave continue to be monitored.

3.8 Annual Work Plan

A. Finding. With the exception of a formal Facilities Component Inspection Program the Annual Work Plan is prepared in accordance with the DA PAM 420-6 and 21st Support Command letter AEREH-FI of 22 Dec 1983. Due to staffing constraints, with the exception of roofs and railroads, there is no planned Facilities Component Inspection Program. As a result the accuracy of the Unconstrained Requirements Report (URR) is questionable. The data contained in the URR is developed from information provided by the Chief, Buildings and Grounds Division and the Chief, Utilities Division. This data is developed by the Division Chiefs based on random unscheduled, unplanned inspections of facilities. The only formal written inspection reports are for the roofs and railroads. The 21st Support Command letter of 22 Dec 1983 called for the FY84

financed Annual Work Plan to be submitted by 28 January 1984 and the FY85 unconstrained Annual Work Plan to be submitted by 16 February 1984.

USAISAE has prepared, in draft form, an Annual Work Plan Handbook which was distributed at the 9th Annual USAREUR DEH Conference at Bad Kissingen, F.R.G., 16-19 October 1984. Comments have not been solicited to date from the U.S. Military Community Karlsruhe by the 21st Support Command.

B. Conclusion. The FY84 plan was not used as a source document for planning workload execution. The FY84 plan submitted in January 1984 was not approved by the 21st Support Command until June 1984. With the exception of the various projects listings provided with the AWP, virtually every activity HAMM ASSOCIATES has reviewed does not use the AWP as a work management document after it has been submitted and approved. At Karlsruhe the Engineer Project Acquisition Plan (EPAP) is used to manage projects.

There are many reasons given as to why the plan is not used by the various commands. The following is a quotation from the Scope of Work from the U.S. Army Engineer Division, Huntsville, Alabama, Request for Quotation DACA87-84-Q-0140 dated 10 August 1984, Revision of the Annual Work Plan which sums up all the reasons we have heard.

"2.4 As a financial tool, the current AWP format is acceptable. However, as a management tool, the AWP format has its shortfalls. The preponderance of numbers tends to cloud the relative importance of each requirement and the capability of specific resources; the lack of reflection of any historical experience leaves a gap in the ability to use the AWP as an effective tool for adjusting resources; and the segregation of information by fiscal appropriation makes it difficult to relate the impact of specific requirements on the total requirement to be accomplished by the engineers. These and other shortfalls necessitate revision to the AWP formats and associated descriptive preparation and use guidance."

Given the current staffing level in the P&E Section a formal Component Inspection Program cannot be developed without a sacrifice in some other area. The number of required inspectors should be determined based on DA PAM 570-551, Staffing Guide for U.S. Army Garrisons, page 2-331.

In view of the initiatives by the U.S. Army Engineer Division, Huntsville, Alabama and USAISAE toward possible revisions of the AWP, the various Military Communities should be requested to input comments regarding the draft AWP Handbook through the 21st Support Command to USAISAE and comments transmitted as appropriate to the Huntsville Division.

C. Recommendations. No changes in the procedures used to develop the AWP are recommended in view of pending revisions by the Huntsville Division, COE and the formal publication of the USAISAE Handbook. Until the AWP is more closely aligned with the budget process the communities will continue to resist using it as a management tool. The DEH should be provided adequate resources in order to accomplish the Component Inspection Program as discussed in paragraph 3.2 above. Until this is done the AWP will not contain an accurate identification of the maintenance and repair deficiencies.

The 21st Support Command should review the schedule for submitting and approving the Annual Work Plans. Requiring a plan for a current fiscal year not to be submitted until four months of the year has passed and taking another four to five months for approval reinforces the communities arguments that the Annual Work Plan is a bureaucratic hinderance and not a usable workable document. Twenty-first Support Command should request an input to the Handbook from the respective communities.

3.9 Planner and Estimator Workload Controls

A. Findings. The IJOs are recorded in two log books. In one book they are recorded in sequence of receipt from Work Coordination and in the second they are recorded by Kaserne. The IJOs are then placed in bins labeled by primary craft. Routine work is placed in the bins in sequence of receipt. If they are priority they are placed by priority in a folder. Priorities are:

- Top Five
- Reimbursable
- Emergency
- Urgent

There are no specific assignments made to the respective P&Es. As a P&E completes a job he first checks the priority folder or selects a routine IJO from a bin depending on his primary expertise, carpentry, electrical or mechanical, if there is no work in the priority folder. Other than entering in the log book when and who completed the respective IJOs there is no easy way to track how much work the individual P&E is producing either by number of IJOs estimated or number of shop hours generated. There is no schedule for reviewing and/or revising SOOs. While not counted it was noted that there are several SO scope IJOs backlogged waiting estimating. The Chief ERMD recently instituted weekly, Monday morning meetings with the Chief P&E to review status of the P&E backlog. Specific items discussed are:

- Status of Top Five
- What IJOs were completed previous week
- What priorities are backlogged
- Chief ERMD "prioritizes" priority backlog

Exhibit III-Q, page III-78, summarizes the previous twelve months workload for the P&E Section.

B. Conclusions. Effective work control requires positive actions by the work unit manager, in this case the Chief P&E Section. In order to accomplish this, IJOs should be assigned directly to the respective P&Es. By allowing the P&Es to select their work from the bins allows human nature to dictate what will be done. The difficult jobs will be bypassed and the easy work estimated. By assigning work directly to the respective P&Es, they will have a clearer understanding of the backlog and influence the amount of work they complete. Without a backlog directly assigned and priorities identified for the respective P&E, they do not have the sense of urgency that a specific workload assignment provides. The Chief should have a method by which to measure how much shop loading each P&E produces and to determine where the weaknesses are in the staff as far as what crafts the P&Es can estimate and where training is required. An annual schedule should be promulgated for reviewing and reestimating SOOs. The current backlog should be screened for SO scope of work and these jobs turned back to Work Coordination for issue to the shops. Work Coordination should more thoroughly screen incoming JORs for SO scope and issue that work directly to the shops.

C. Recommendations. In order to improve the effectiveness of the P&E Section the following actions are recommended:

- The Chief, P&E Section, should assign IJOs directly to the respective P&Es. The P&Es backlog should be reasonable. The Chief P&E should withhold low priority work keeping the backlog at his level. Do not unduly burden the P&Es as this will frustrate them with no improvement in their productivity. Give them schedules or deadlines for completing a certain amount of work. Measure their output in person-hours of shop work generated.

- Develop an annual schedule for reviewing SOOs. Integrate the SOO reviews into the priorities for preparing IJOs.
- Review the backlog of IJOs waiting estimating. Screen out those of obvious SO scope and return them to Work Coordination for immediate assignment to the shops as SOs.

3.10 Performance Indicators

In order to assist the Director in measuring performance of the DEH organization, examples of several indicators are provided in a separately bound attachment. These indicators are not all inclusive as each activity should tailor weekly/month information to satisfy its particular needs and requirements.

The Management Engineering and System Branch (MESB) should be the coordinators, compilers, and analyzers of feeder information provided by all divisions, branches, and staffs of the DEH. Also, as noted on the individual performance indicators, many inputs are obtained from IFS reports. Until these IFS reports become available to the DEH, manual preparation will be necessary.

In addition, visits should be made to the DEH Community at Schweinfurt, who were very strong in this area, to observe and review their methods and techniques of analysis and presentation of management performance indicators.

EXHIBIT III-A

ANALYSIS OF COMPLETED IJOs
(FY 1984)DOCUMENT NUMBER/FUND CITATION

<u>Phase #</u>	<u>Shop #</u>	<u>Est Hours</u>	<u>Act Hours</u>	<u>Percent Effective</u>
<u>KSO10014P/MFAC L1000-2</u>				
01	01	40	40	100
02	05	30	30	100
03	04	80	80	100
04	02	28	28	100
05	03	48	48	100
06	19	12	12	100
<u>KUO10784J/HEND K2800-1</u>				
01	16	78	78	100
02	05	170	176	97
03	04	16	16	100
+10% Contingency \$				
<u>K5020274J/HENT-K1400-1 [Open IJO]</u>				
01	19	212	212	100
<u>KVO10714J/HEME K2200-1</u>				
01	19	48	56	86
02	07	32	16 ¹	200
+10% Contingency \$				
1 (No Adjustment Made to Cost)				
<u>KVO10823J/HEML K2400-1</u>				
01	02	80	80	100
02	19	90	99	91
+10% Contingency \$				
<u>016872J/HEMVK26001</u>				
01	19	285	285	100
02	03	75	75	100
<u>KV000754J/ ?</u>				
01	07	96	110	87

EXHIBIT III-A (continued)

DOCUMENT NUMBER/FUND CITATION

<u>Phase #</u>	<u>Shop #</u>	<u>Est Hours</u>	<u>Act Hours</u>	<u>Percent Effective</u>
<u>KU010734J/ ?</u>				
01	19	35 +10% Contingency \$	40	88
<u>KU002113J/HE5LK6300-1</u>				
01	04	50	56	89
02	05	16	16	100
03	07	10	10	100
<u>KV001164P/HFAAL1000-1</u>				
01	07	120	120	100
<u>KV000774J/HEMVK2600-1</u>				
01	02	65 +10% Contingency \$	64	101
<u>KV000824J/HEGQK1300-1</u>				
02	02	65	64	101
07	07	32 +10% Contingency \$	32	100
<u>KV010914J/HENAK2700-1</u>				
01	16	60	62	97
<u>KV000634J/ ?</u>				
01	05	370	370	100
<u>KW000024P/HFAAL1000-1</u>				
01	02	18	24	75
02	01	43	82	52
<u>K3020224P/HFAA-L1000-1</u>				
01	03	40	43	93
02	02	16	16	100
03	16	8	48	17
04	04	16	16	100

EXHIBIT III-A (continued)

DOCUMENT NUMBER/FUND CITATION

<u>Phase #</u>	<u>Shop #</u>	<u>Est Hours</u>	<u>Act Hours</u>	<u>Percent Effective</u>
<u>K7020074J/HEQBK2912-4</u>				
01	16	16	16	100
02	02	8	8	100
03	03	48	44	109
<u>KN020073J/HEUJK2920-1</u>				
01	16	40	32	126
02	03	60	53	113
<u>K902043J/HEKDK1451-1</u>				
01	16	48	48	100
02	19	86	88	98
<u>K6000073J/HE NAK2700-1</u>				
01	03	300	197	152
02	04	48	48	100
03	02	16	16	100
04	16	-	56 (added)	NA
<u>KW002123P/HF AA-L1000-6</u>				
01	01	6	8	75
02	16	18	48	38
03	04	18	56	32
04	05	7	8	88
<u>KA000363J/HELKK1951-1</u> (Repair & Maintenance of All Alarms within Karlsruhe Area for Month of August 1 - September 2)				
01	02	-	686 (Written After the Fact)	
<u>K5000203J/HENAK2700-1</u>				
01	03	32	31	103
<u>KW020050J/HEUJK2920-1</u>				
01	03	27	28	96
<u>KV020403J/HENAK2700-1</u>				
01	03	64	66	97

EXHIBIT III-A (continued)

DOCUMENT NUMBER/FUND CITATION

<u>Phase #</u>	<u>Shop #</u>	<u>Est Hours</u>	<u>Act Hours</u>	<u>Percent Effective</u>
<u>K7020134J/ ?</u>				
01	02	384	376	102
<u>KV020204J/HE5L-K6300-1 for Material Issue Only</u>				
01	14	NA	NA	-
<u>KU000654P/HFAA L1000-6</u>				
01	02	135 +10% Contingency	136	99
<u>KSO13891J/HENDK2800-2</u>				
01	05	48	48	100
<u>KW001663P/HFAAL1000-6</u>				
01	02	22	24	92
02	01	48	CANCELLED	-
03	05	16 +10% Contingency	16	100
<u>KU00263J/HEGV-K-1322-1</u>				
12	12	120	132	110
19	19	65	?	-
<u>K9000753P/HFAA-L1000-1</u>				
01	04	32	32	100
02	05	8 +10% Contingency \$	8	100
<u>K5-020204J/HENA-K2700-1</u>				
01	19	144	155	93

7784

Carpenter

CHART #4

SHOP _____
 FACILITY _____
 DISTRICT _____
 PERIOD DEC 83

EVALUATION OF INDIVIDUAL JOB ORDERS

INDIVIDUAL JOB ORDER NUMBER	MANHOURS		EFFECTIVE-NESS	INDIVIDUAL JOB ORDER NUMBER	MANHOURS		EFFECTIVE-NESS
	ESTIMATED	ACTUAL			ESTIMATED	ACTUAL	
1	2	3	4	1	2	3	4
No K5-00223-83	OPEN 170	16	100				
" K4-00007-83	OPEN 170	32	100				
" KV-0017-84	OPEN 150	16	100				
" KV-00306-83	80	88	80				
" KW-00005-86	43	82	52				
TOTAL	187	234	79	TOTAL			

MAINTENANCE & REPAIR
 SCHEDULED INSPECTIONS
 & MAINTENANCE

AEUEC Form 238, 15 Sept 70 (supersedes AEUEC Form 238, Jan 69)

FY 84

Steamfilter

SHOP FACILITY DISTRICT PERIOD
 CEART #4
Dec 83

EVALUATION OF INDIVIDUAL JOB ORDERS

INDIVIDUAL JOB ORDER NUMBER	HOURS		EFFECTIVENESS	MANHOURS		INDIVIDUAL JOB ORDER NUMBER	MANHOURS		EFFECTIVENESS
	ESTIMATED	ACTUAL		ESTIMATED	ACTUAL				
1	2	3	4	1	2	3	4		
KS-02007-83	115	118	97						
KS-02012-82	570	572	99						
KS-02017-86	9134 170	48	100						
KS-02019-83	9504 170	120	100						
KS-02021-83	9511 170	80	100						
KS-02025-83	125	125	96						
KS-02028-83	9508 170	40	100						
KS-02029-84	9511 170	48	100						
KV-02017-84	9511 170	40	100						
KS-02017-84	9511 170	73	100						
KS-02022-83	60	60	100						
TOTAL	1317	1326	99	TOTAL					

9

MAINTENANCE & REPAIRS
 SCHEDULED INSPECTIONS
 & MAINTENANCE

AEUIC Form 238, 15 Sept 70 (supersedes AEUIC Form 238, Jan 69)

FY 84

Electrician

SHOP _____
 FACILITY _____
 DISTRICT _____
 PERIOD *Dec 83* SHEET #4

EVALUATION OF INDIVIDUAL JOB ORDERS

INDIVIDUAL JOB ORDER NUMBER	HOURS		EFFECTIVE-NESS	INDIVIDUAL JOB ORDER NUMBER	HOURS		EFFECTIVE-NESS
	ESTIMATED	ACTUAL			ESTIMATED	ACTUAL	
1	2	3	4	1	2	3	4
<i>MC KA-00020-83</i>	<i>17</i>	<i>16</i>	<i>106</i>				
<i>K5-00007-83</i>	<i>28</i>	<i>32</i>	<i>87</i>				
<i>KA-00125-82</i>	<i>18</i>	<i>16</i>	<i>112</i>				
<i>KA-00007-83</i>	<i>16</i>	<i>16</i>	<i>100</i>				
<i>KA-00171-83</i>	<i>28</i>	<i>32</i>	<i>87</i>				
<i>KA-00009-83</i>	<i>208</i>	<i>208</i>	<i>100</i>				
<i>KA-00035-83</i>	<i>ESTIMATE</i>	<i>686</i>	<i>100</i>				
<i>KA-00035-83</i>	<i>ESTIMATE</i>	<i>376</i>	<i>100</i>				
<i>KA-00029-83</i>	<i>48</i>	<i>48</i>	<i>100</i>				
<i>KA-00102-86</i>	<i>8</i>	<i>8</i>	<i>100</i>				
TOTAL	<i>1433</i>	<i>1438</i>	<i>99</i>	TOTAL			

MAINTENANCE & REPAIR
 SCHEDULED INSPECTIONS
 & UTILITANCE

AEUEC Form 238, 15 Sept 70 (supersedes AEUEC Form 238, Jan 69)

EXHIBIT III-C

COMPLETED IJO TABULATION BY SHOP

<u>SHOP</u>	<u>EST HOURS</u> <u>(DAYS)</u>	<u>ACT HOURS</u> <u>(DAYS)</u>	<u>PERCENT</u> <u>EFFECTIVE</u>
<u>JOB ORDER NUMBER</u>			
16 MASON			
KW-00202-83	96 (12)	144 (18)	67
KN-02194-82	38	32 (4)	119
KV-590-82	10	16 (2)	63
KF-02022-83	30	24 (3)	125
KQ-00022-83	88 (11)	64 (8)	138
K5-01855-82	160 (20)	432 (54)	37
M5-2197-82	15	24 (3)	63
02 ELECTRICAL			
KW-02020-83	17	16 (2)	106
K5-02007-83	28	32 (4)	88
KA-02185-82	18	16 (2)	113
K6-00007-83	16	16 (2)	100
K5-00174-83	28	32 (4)	88
KA-02009-83	OPEN IJO ¹	208 (26)	100
KA-00036-83	NO ESTIMATE	686 (85.75)	100
KA-00035-83	NO ESTIMATE	376 (47)	100
K3-00089-83	48	48 (6)	100
K3-02018-84	OPEN IJO	8 (1)	100

¹ See paragraph 3.1.A.1, page III-2 for the definition of an "Open IJO".

EXHIBIT III-C (continued)

SHOP

<u>JOB ORDER NUMBER</u>	<u>EST HOURS (DAYS)</u>	<u>ACT HOURS (DAYS)</u>	<u>PERCENT EFFECTIVE</u>
19 STEAMFITTER			
K5-02007-83	115	118 (14.75)	97
KA-2322-82	570	572 (71.5)	99
K7-02019-83	OPEN IJO	120 (15)	100
K7-02021-83	OPEN IJO	80 (10)	100
KW-02020-83	124	128 (16)	96
K7-02028-83	OPEN IJO	40 (5)	100
K9-02009-84	OPEN IJO	48 (6)	100
KV-02017-84	OPEN IJO	40 (5)	100
K5-02017-84	OPEN IJO	72 (9)	100
K9-02022-83	60	60 (7.5)	100
01 CARPENTRY			
K5-00223-83	OPEN IJO	16 (2)	100
K4-00007-83	OPEN IJO	32 (4)	100
KV-02017-84	OPEN IJO	16 (2)	100
KV-00306-83	80 (10)	88 (11)	91
KW-00002-84	43	82 (10.25)	52

EXHIBIT III-C (continued)

SHOP

<u>JOB ORDER NUMBER</u>	<u>EST HOURS</u> <u>(DAYS)</u>	<u>ACT HOURS</u> <u>(DAYS)</u>	<u>PERCENT</u> <u>EFFECTIVE</u>
03/06 PLUMBER & KITCHEN			
KV-02016-84	OPEN IJO	44 (5.5)	100
K9-020005-84	OPEN IJO	18 (2.25)	100
K7-00273-83	OPEN IJO	24 (3)	100
K4-00007-83	OPEN IJO	140 (17.5)	100
K3-02005-84	OPEN IJO	30 (3.75)	100
KV-02012-84	OPEN IJO	70 (8.75)	100
K5-02001-84	OPEN IJO	59 (7.375)	100
K7-02016-83	16	12 (1.5)	133
KV-02006-84	OPEN IJO	52 (6.5)	100

EXHIBIT III-D

ANALYSIS OF AVERAGE TIME TO COMPLETE SO
(FY 1984)

<u>DOCUMENT NUMBER</u>	<u>PERSON-HOURS CHARGED</u>
KV2 10714	4
KV211774	12
K5211604	16
KW3 10164	8
K4312324	7
KA3 13024	16
K90 10704	6
K7 103894	16
K7000304	8
KW2 15064	6
KV113194	12
K52 12124	4
KV3 14264	16
K33 13984	7
K52 15214	9
KV1 12944	9
K32 11364	7
KV3 12474	16
KVN15 194	16
KV3 12944	23 (7) (16)
K33 14034	4
K33 14134	4
K52 14354	24 (4 persons + day)
KN3 10944	6
K53 10704	6
KV2 14324	24 (3 persons + day)
K6114094	3 (2 persons)
KV2 15704	16
K52 15304	16
K53 10144	5
K32 14224	16
KC2 13174	16
? 213084	16
K33 10844	2
K33 11604	2
K53 13394	7
K33 12954	7
KW3 10654	3.5
K33 11364	9
K33 12264	7
K5D13604	9
K5D14464	6
K93 10484	7
K33 10904	7

EXHIBIT III-D (continued)

DOCUMENT NUMBERPERSON-HOURS CHARGED

K9311024	7
KN215274	6
K3214904	7
K5215634	5
KV215084	9
KW212484	7
K3215004	7
K6115124	8
K5213934	24
KC214884	16
K5214004	2
K3011834	4
KA214374	2
KV212854	2
K5211464	2
KV113334	8
K5D12294	8
KS211504	8
K7202124	1
KV210444	2
KV211984	2
K9214854	7
KN215344	24
KN215454	8
K5310624	2
K6114604	4
KW112384	8
KV012864	24
KA214394	7
K6213864	3
K9310564	8
KA213874	16
K7214634	1
KV213654	2
KV310254	1
K9015994	16
K6312084	4
KV2144414	4
KW310154	16
KN214604	16
K5311944	2
KW311774	4
K514734	3.5
KW214124	1.5
K7214714	3
K5213284	3
K5213444	1.5
KV212784	3.5

EXHIBIT III-D (continued)

DOCUMENT NUMBERPERSON-HOURS CHARGED

KV2 13374	3.5
KW2 132 14	6.5
KW3 12644	8
K631 1654	16
K93 12984	16
K53 12304	7
KW2 13604	5
KV3 10354	8
K33 12564	3
KA2 15384	8
K33 10884	6
KW3 10874	2
K5115 144	7
K33 10094	4
KA1 14644	8
KC2 153 14	16
K33 10054	8
K32 15504	2
KW2 15254	5
KN10 1904	8
K33 110 14	2
K62 15524	16
KS3 11594	2
KW1 14554	2
KV3 10204	5
KW3 10304	2.5
KW2 13404	1.5
K32 15394	4.5
KV2 15724	2.5
KW3 10 124	4.5
KV2 154 14	4
K33 10 134	8
KN2 10504	3.5
KN2 12494	4.5
K32 15054	4
K32 12434	2
KW2 14844	1
K52 14944	2
KV2 15234	3
KV2 15044	2
K32 15404	4
KW2 15524	3
KA2 15624	1
K92 12524	3.5
K32 14774	3
KW3 10064	7
KW3 11064	2
KW3 11 184	2

EXHIBIT III-D (continued)

DOCUMENT NUMBERPERSON-HOURS CHARGED

KV3 11204	6
KV31 1224	10
K33 10224	2
KW3 10574	3
K53 14474	3
K521 1494	5
K53 11954	3
K53 13004	4
KV3 12854	3
K73 13504	3
K53 13254	3
KA3 13324	1
KS3 13594	2
K53 13524	4
KV3 14 114	3
KW3 10334	3
K72 15274	5
KW2 15294	3
KA1 13344	7
K53 13924	2
K42 14884	2
K32 14094	7
K52 13824	2
K3D 16604	4
K52 100 14	3
K32 15734	2
K92 15664	4
K32 156 14	4
K92 15644	2
KV3 10324	3
K32 13424	2
K32 155 14	2
KV2 15554	4
KV3 10764	10
KP2 15694	7
K53 10854	3
K33 11804	1
KW31 1564	4
K53 11744	2
K33 10894	2
K53 11484	3
K331 1354	2
KW3 10694	3
KV31 1494	3
K33 11464	2
K331 1994	2
K33 12494	3
KV3 12284	2

EXHIBIT III-D (continued)

DOCUMENT NUMBERPERSON-HOURS CHARGED

KV3 120 14	3
KV3 12404	2
KR311584	1.5
K92 133 14	3
K33 10664	16
KV3 12594	5
KV3 107 14	16
K7D03884	8
K32 14 174	3
KV3 10444	6
KV2 11284	2
K93 10284	8
K92 13324	3
K92 13 124	7
K92 14 754	2
K52 12694	3
K52 14 134	16
KV3 10074	32
KV2 12244	1
KV2 109 14	2
K92 12224	1
K32 12234	4.5
KG2 11584	16
K32 15744	16
K93 10 194	16
K52 135 14	8
K52 13074	8
K92 138 14	7
K52 14 144	4
K92 13244	6
K53 13054	4
KVD12674	2
KV3 107 14	6
KV3 12394	1
KQ3 11624	2
K53 123 14	4
K53 13424	4
K53 1 1667	16
K32 15204	4
KW2 14764	2
K32 13734	1.5
KW2 14479	3
K52 13454	16
K52 13804	16
K9 10 1164	4
K9D 155 14	3
K51 12824	2
K5D 16054	3

EXHIBIT III-D (continued)

DOCUMENT NUMBERPERSON-HOURS CHARGED

K9D11934	4
KV16524	2.5
KV114634	3.5
K5100274	2.5
KV014754	4
KW113384	1
K9D15054	1
K3112374	2
KW101144	2
KSD13094	1
KW11024	2
KW100854	2
KV113304	1
KVN11784	2
K3D15104	1
K3101744	2
K3101624	2
K7102164	16
K3D16344	12
K9D10164	24
KAT01244	4
KND12774	8
K5912163	16
K7101794	2
KVD16134	8
KWD10804	2
KAN14207	4
K6102154	3
KV112827	2
KAD10924	16
K6011644	3
K5D15844	2
KD101784	2
KWN13324	3
K5D15894	5
KWD15534	7
KV100694	5
K3100674	2
K3100494	1.5
K910110	9
K3101304	3
KW101694	2
K9101754	4.5
KV112934	3.5
K5101764	4.5
KV101684	8
K5D16384	7
KS100534	1

EXHIBIT III-D (continued)

DOCUMENT NUMBERPERSON-HOURS CHARGED

KV 10 1994	0.5
K5 100454	1
K5 10 10 14	1
KW100 1 14	1.5
KWD10734	16
K3D12 124	7
K3D13494	3
KWD10234	9
KV 100501	1
KSD16354	1
K6D16324	3
K61 13364	2
K6100954	4
K61 13624	5
K6113004	2
K51 14494	1.5
KV113464	1.5
KV1 14621	2.5
K310 1964	2
KW10 1864	2
K5112364	2
KW102 104	2
K710 1164	1.5
KA6 10264	4
K36 11644	4
KW6 1 1394	8
KV612504	8
K55 109 14	3
KV5 14714	5
K55 15234	5
K35 14 124	3
K35 13534	4
K55 14 744	16
K55 13094	8
KV4 11244	8
K95 14 104	16
K95 14 764	2
KW6 1 1604	16
KV5 125 14	16
KW5 15044	8
KW6 115 44	16
KA6 10694	8
KW5 13 15 4	8
K55 12424	8
KV4 10274	12
K36 10764	8
K96 11524	8
K36 1 1684	6

EXHIBIT III-D (continued)

DOCUMENT NUMBERPERSON-HOURS CHARGED

K66 11574	10
KP6 106 14	16
K35 15264	2.5
K75 15224	5.5
KN6 10254	16
K65 14504	8
KV5 14854	2
KW6 10224	8
KV6 11764	2
KN6 11624	2
KV5 14954	1
K36 10754	3
KA5 15204	4
KA6 10 184	4
KA6 10 394	0.5
K46 11484	5
K66 113 14	1
K36 10034	1
KV6 10 104	2
KW5 12664	3
K35 11034	5
KW4 125 14	3
K36 10744	1
KV6 10884	4
K35 12324	2
K55 155 184	3
KV5 11824	2
K35 15244	3
KW5 15 164	3
K35 14874	2
KW5 15 124	3
KA5 14904	3.5
KV5 15004	2.5
K56 10974	1.5
K36 11004	2
KW6 10734	2
KW6 10604	12
K36 10994	10
KV6 11194	2
K76 107 14	4
KV6 10804	3
KV6 10234	2
K56 11894	2.5
KW6 11974	2
K56 11554	1
K36 11964	1
KV6 12494	1
K36 12224	1.5

EXHIBIT III-D (continued)

DOCUMENT NUMBER

PERSON-HOURS CHARGED

K36 12358	3.5
K36 12594	2.5
K66 13024	2
K36 12944	1
K36 12474	2
KN6 1 1044	13
K7600664	3
K75 12254	4
KV5 14734	6
K36 1 1063	2
K96 102 14	3
KV6 103 14	3
KV6 10074	3
K35 13474	7
KV6 10 384	2
K36 10674	2
K7600884	3
K96 10 144	6
KW4 14 114	7
K34 14564	5
KW5 15089	2
KV5 150 14	4
K96 10 124	3
KW5 146 14	2
KV5 12904	2
K95 14924	3.5
KA5 14 784	1
KA5 15374	1.5
KK5 13204	16
K35 15244	3
K95 15344	3
K55 14 174	3
K55 14754	2
K55 14864	4
KW5 14524	3
KS5 10324	9
KW5 11924	3
KV5 10564	4
KW5 13934	3
K56 1 1264	2
K56 10984	3
K56 1 1494	3
KA5 118 14	2
K55 15 174	4.5
K36 11474	1.5
K96 10844	4
K56 11244	2
KQ6 10654	3

EXHIBIT III-D (continued)

DOCUMENT NUMBERPERSON-HOURS CHARGED

K66 12394	4.5
KS6 12664	4.5
K56 126 14	6
K36 10047	4
K96 10934	7
K56 10564	9
KV6 10924	7
K96 10724	7
K36 10814	9
K56 10424	3.5
K56 10064	7
K35 15 104	6
K55 15024	3
KV5 151 14	4
K35 15054	2
K35 14264	1
K35 12744	3
KW5 15064	2
KA6 10454	8
KA5 15 194	8
KW5 11964	8
KA5 13 144	16
KW3 14984	2
K53 10501	1
KW4 11054	4

EXHIBIT III-E

ANALYSIS OF ENGINEERED PERFORMANCE STANDARDS
UTILIZATION FY84 ACTIVE IJOs

DOCUMENT NUMBER	SHOP #	PERSON HOURS	EPS UTILIZATION		CORRECT
			YES	NO	
KJ000034J	04	160		X	NA
K4020124J	04	295	X		YES
	07	158	X		YES
	19	48		X	NA
K3020044J	19	48		X	NA
K5000274P	02	16		X	NA
K5001404P	07	48		X	NA
	12	74		X	NA
	03	96		X	NA
K5001994P	03	96		X	NA
K300024P	01	29	X		YES
	05	7	X		YES
K3020384J	16	400		X	NA
K3020464J	05	192		X	NA
K3020134P	04	223		X	NA
	02	164		X	NA
	05	15	X		YES
	16	36		X	
	16	6	X		YES
K3000544J	02	16		X	NA
	03	48		X	NA
	03	40		X	NA
K3020224P	02	16		X	NA
	16	8		X	NA
	04	16		X	NA
	04	52		X	NA
K3020374J	04	52		X	NA
K3020584J	04	100	X		YES
	07	232		X	NA
K3020684P	01	18	X		YES
	04	7	X		YES
	05	8	X		YES
	07	17	X		YES
	16	330	X		YES
	01	100	X		YES
K3000554J	01	5		X	NA
	02	26	X		YES
	01	9	X		NO
K7010234J	01	9	X		YES
K3000144P	16	32	X		YES
	04	8		X	NA
	05	16		X	NA
KS000114P	04	95		X	NA
	02	32		X	NA
	01	90		X	NA
KS000144P	01	90		X	NA
	05	125	X		YES
KS000574P	16	49	X		?

EXHIBIT III-E (continued)

DOCUMENT NUMBER	SHOP #	PERSON HOURS	EPS UTILIZATION		CORRECT
			YES	NO	
KW000344P	08	40		X	NA
	02	60		X	NA
KW001484P	03	24		X	NA
KW001614J	02	86	X		YES
	16	24		X	NA
	03	48		X	NA
KW000024P	02	7	X		YES
	02	11	X		YES
	01	27	X		YES
	01	16		X	NA
KW000264P	01	24	X		YES
	05	4	X		YES
KW001663P	02	22		X	NA
	05	16		X	NA
	01	48		X	NA
KW002084J	01	84	X		YES
KW020044P	02	3	X		YES
	01	132	X		YES
	05	8	X		YES
KW000664J	16	26	X		YES
	05	320	X		YES
KW002274P	04	92		X	NA
KW002784P	02	75	X		YES
	02	12		X	NA
KW020274P	02	11	X		YES
KW000224P	02	8		X	NA
KW000444P	01	24	X		YES
	05	4	X		YES
KW001444P	16	136	X		YES
	01	47	X		YES
	05	25	X		YES
	16	8		X	NA
	05	8		X	NA
KV020184J	19	95		X	NA
	02	26		X	NA
KV002874J	19	165		X	NA
KV000594J	04	20	X		YES
	05	6	X		YES
KV000614P	01	16		X	NA
	02	6		X	NA
	02	49	X		YES
KV001204P	02	17	X		YES
	02	2		X	NA
KV000534P	03	32		X	NA
	02	20		X	NA
KV000184P	02	16		X	NA
K5000203J	03	32		X	NA

EXHIBIT III-E (continued)

<u>DOCUMENT NUMBER</u>	<u>SHOP #</u>	<u>PERSON HOURS</u>	<u>EPS UTILIZATION</u>		<u>CORRECT</u>
			<u>YES</u>	<u>NO</u>	
K5020273J	16	112		X	NA
	03	120		X	NA
	07	64		X	NA
	04	16		X	NA
K5001223J	16	80		X	NA
K5020344J	16	22	X		YES
	05	160	X		YES
	04	25		X	NA
	01	60		X	NA
K5000604P	02	59		X	NA
K5001294J	16	32	X		YES
	16	8		X	NA
	05	8		X	NA
K5020324J	19	48		X	NA
K5000434P	02	40		X	NA
	16	8		X	NA
	01	8		X	NA
K5001534J	01	105	X		YES
	05	16	X		YES
	16	13	X		YES
	01	15		X	NA
	16	5		X	NA
	05	8		X	NA

ENGINEERED PERFORMANCE STANDARDS
HANDBOOK PUBLICATIONS

<u>HANDBOOK</u>	<u>PUB DATE</u>	<u>ARMY PUB</u>
Engineer's Manual	Sep 63	TB-420-1
General	Jun 64	TB-420-2
Carpentry	Mar 82	TB-420-4
Electric, Electronic	Feb 82	TB-420-6
Heating, Cooling, Ventilating	Feb 82	TB-420-8
Janitorial	Apr 81	TB-420-10
Machine Shop, Machine Repairs	Apr 83	TB-420-12
Masonry	Sep 80	TB-420-14
Moving, Rigging	Apr 81	TB-420-16
Paint**	Nov 78	TB-420-18
Pipefitting, Plumbing	Aug 83	TB-420-20
Roads, Grounds, Pest Control & Refuse Collection**	Sep 80	TB-420-22
Sheet Metal, Structural Iron & Welding**	Apr 79	TB-420-24
Trackage	Nov 79	TB-420-26
Wharfbuilding	Nov 79	TB-420-28
Service	Mar 84	TB-420-30
Planner and Estimator's Workbook - Instructor's Manual	Mar 80	TB-420-31
Planner and Estimator's Workbook - Student's Manual	Mar 80	TB-420-32
Unit Price Standards	Aug 83	TB-420-33
Preventive/Recurring Maintenance	Mar 84	TB-420-34

**FY-1983 revisions should be published and distributed by the beginning of FY85.

Publications are available from:

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St. Louis, MO 63114

General

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U.S. Government Printing Office
Washington, DC 20402
(202) 783-3238

ANALYSIS OF SCHEDULING
ALL WORK WEEK OF 20 AUGUST 1984
(Karlsruhe only)

<u>SHOP</u>	<u>SCHEDULED</u>	<u>ACTUAL</u>	<u>DIFFERENCE</u>
<u>ELECTRICAL 02</u>			
Nonavailable Time	222	240	18
S0s	49	178	129
S00s			
21-4	16	0	(16)
30-4	16	0	(16)
54-4	-	-	-
55-4	-	-	-
58-4	40	40	0
59-4	0	16	16
TOTAL S00s	<u>72</u>	<u>56</u>	<u>(16)</u>
IJOs			
K300055-4	0	24	24
KD00012-4	57	0	(57)
K702008-3	-	-	-
K302040-3	-	-	-
K702012-4	-	-	-
K3A02023-4	160	40	(120)
K902030-4	-	-	-
K32031-84	0	6	6
KW00426-81	0	16	16
TOTAL IJOs	<u>217</u>	<u>86</u>	<u>(131)</u>
		Balance	0

EXHIBIT III-G (continued)

<u>SHOP</u>	<u>SCHEDULED</u>	<u>ACTUAL</u>	<u>DIFFERENCE</u>
<u>CARPENTRY 01</u>			
Nonavailable Time	117	112	(5)
S0s	30	160	130
IJOs			
K300055-4	80	0	(80)
K300002-4	29	0	(29)
K302002-4	-	-	-
K3402023-4	24	24	0
KA02018-4	40	0	(40)
K702026-3	40	0	(40)
KV00337-4	-	-	-
K500022-4	0	32	32
K300038-4	0	32	32
TOTAL IJOs	213	88	(125)
		Balance	0
<u>ALARM 02B</u>			
Nonavailable Time	47	53	6
S0s	10	0	(10)
S00s 58-4	103	107	4
		Balance	0
<u>PLUMBING 03</u>			
Nonavailable Time	157	128	(29)
S0s	83	206.5	123.5
IJOs			
K302007-4	40	0	(40)
K32031-4	40	0	(40)
K201007-4	120	60.5	(59.5)
K502027-3	-	-	-
KW02030-4	0	45	45
TOTAL IJOs	200	105.5	(94.5)
		Balance	0

EXHIBIT III-G (continued)

<u>SHOP</u>	<u>SCHEDULED</u>	<u>ACTUAL</u>	<u>DIFFERENCE</u>
<u>STEAMFITTING 19</u>			
Nonavailable Time	290	220	(70)
SOs	30	16	(14)
IJOs			
K902013-4	40	16	(24)
KW02003-4	40	96	56
K502029-4	-	-	-
K702011-4	80	88	8
KV02056-84	-	44	44
TOTAL IJOs	<u>160</u>	<u>244</u>	<u>84</u>
		Balance	0
<u>LOCKSMITH 04</u>			
Nonavailable Time	166	160	(6)
SOs	14	72	58
IJOs			
K900051-4	-	-	-
KV00149-4	-	-	-
KC00777-2	-	-	-
KW00227-4	60	0	(60)
KV00206-3	-	-	-
K502027-3	-	-	-
KV02025-4	-	-	-
KA02017-4	160	168	8
KV00062-4	-	-	-
TOTAL IJOs	<u>220</u>	<u>168</u>	<u>(52)</u>
		Balance	0

EXHIBIT III-G (continued)

<u>SHOP</u>	<u>SCHEDULED</u>	<u>ACTUAL</u>	<u>DIFFERENCE</u>
<u>PAINTER 05</u>			
Nonavailable Time	164	200	36
S0s	36	32	(4)
S00s			
19-84	-	-	-
20-84	-	-	-
IJOs			
K302040-3	-	-	-
K400002-3	40	16	(24)
KS00012-4	40	0	(40)
KV02025-4	-	-	-
KV00337-4	-	-	-
K302012-84	0	16	16
KW00182-83	0	16	16
TOTAL IJOs	80	48	32
		Balance	0
<u>MASON 16</u>			
Nonavailable Time	86	136	50
S0s	34	40	6
IJOs			
K302007-4	-	-	-
K312031-4	-	-	-
K312023-4	40	40	0
K502027-3	-	-	-
K302038-4	80	64	(16)
KV02025-4	-	-	-
K302049-4	-	8	8
KV00061-84	-	16	16
KA2118-82	80	0	(80)
K300008-84	40	56	16
TOTAL IJOs	240	184	(56)
		Balance	0

EXHIBIT III-G (continued)

<u>SHOP</u>	<u>SCHEDULED</u>	<u>ACTUAL</u>	<u>DIFFERENCE</u>
<u>GROUNDS 08</u>			
Nonavailable Time	104	140	36
S00s			
45-4	120	76	(44)
46-4	56	96	40
TOTAL S00s	<u>280</u>	<u>372</u>	<u>32</u>
			*DOES NOT BALANCE
<u>OIL TEAM 09</u>			
Nonavailable Time	83	84	1
S0s	10	0	(10)
S00s			
22-4	56	47	(9)
23-4	51	69	18
TOTAL S00s	<u>107</u>	<u>116</u>	<u>9</u>
		Balance	0
<u>SEWER MAINTENANCE 14</u>			
Nonavailable Time	207	264	57
S00s			
16-4	330	254	(76)
25-4	10	8	(2)
26-4	30	45	15
27-4	40	35	(5)
28-4	63	74	11
TOTAL S00s	<u>473</u>	<u>476</u>	<u>(57)</u>
		Balance	0
<u>ENTOMOLOGY 21</u>			
Nonavailable Time	63	105	42
S0s	37	19	(18)
S00s 18-4	140	116	(24)
		Balance	0

EXHIBIT III-G (continued)

<u>SHOP</u>	<u>SCHEDULED</u>	<u>ACTUAL</u>	<u>DIFFERENCE</u>
<u>MOBILE EQUIPMENT MAINTENANCE 25</u>			
Nonavailable Time	223	223	0
S00s			
15-4	297	313	16
19-4	-	-	-
20-4	-	-	-
TOTAL S00s	297	313	16
			*DOES NOT BALANCE
<u>KITCHEN TEAM 18</u>			
Nonavailable Time	2	0	(2)
S0s	78	80	2
		BALANCE	0
<u>REFRIGERATION 06</u>			
Nonavailable Time	42	48	6
S0s	35	48	13
S00s 24-4	35	24	(11)
IJOs K029114	8	0	(8)
		BALANCE	0
<u>HEAT & COLD STORAGE 30/35</u>			
Nonavailable High Pressure	160	106	(54)
Nonavailable Low Pressure	146	303	157
S00s			
47-4	220	190	(30)
48-4	228	185	(43)
49-4	220	200	(20)
50-4	24	14	(10)
TOTAL S00s	692	589	(103)
		Balance	0

ANALYSIS OF SCHEDULED SHOP AVAILABILITY
TO ACTUAL SHOP AVAILABILITY
(Karlsruhe only)

<u>Month</u>	<u>Total Scheduled Person Hours</u>	<u>Available Person Hours</u>	<u>Lost Availability</u>
01 CARPENTRY SHOP			
Aug 84	1440	952	488
July 84	1810	1126	684
June 84	1440	896	544
May 84	1800	1312	488
Apr 84	1440	1104	336
Mar 84	1440	1176	264
Feb 84	1440	1278	162
Jan 84	1720	1416	304
Dec 83	1280	992	288
Nov 83	1616	1233	383
Oct 83	1376	1024	352
	<u>16802</u>	<u>12509</u>	<u>4293</u>

% Short $\frac{4293}{16802} = 25.6\%$

02 ELECTRICAL SHOP

Aug 84	2240	1426	814
July 84	2800	1800	1000
June 84	2240	1600	640
May 84	2880	1720	1160
Apr 84	2352	1640	712
Mar 84	2400	1626	774
Feb 84	2400	1800	600
Jan 84	3000	1829.5	1170.5
Dec 83	2400	1148	1252
Nov 83	3000	1928	1072
Oct 83	2400	1512	888
	<u>28112</u>	<u>18029.5</u>	<u>10082.5</u>

% Short $\frac{10082.5}{28112} = 35.9\%$

EXHIBIT III-I

ANALYSIS OF SO HOURS SCHEDULED
vs
SERVICE HOURS ACTUALLY PERFORMED
(Karlsruhe only)

<u>Date</u>	<u>Shop #</u>	<u>Scheduled</u>	<u>Actual</u>	<u>Diff</u>	<u>% Diff</u>
24 Aug	01	34	88	54	159
	02	58	128	70	121
	03	84	168	84	100
	19	30	54	24	80
27 Jul	01	28	120	92	329
	02	66	88	22	33
	03	91	183	92	101
	19	45	80	35	78
29 Jun	01	41	56	15	37
	02	92	88	(4)	4
	03	163	141.5	(21.5)	13
	19	40	112	72	180
1 Jun	01	68	104	36	53
	02	78	120	42	54
	03	105	198.5	93.5	89
	19	30	64	34	113
11 May	01	113	96	(17)	15
	02	129	160	31	24
	03	34	240	206	606
	19	70	192	122	174
13 Apr	01	55	32	(23)	42
	02	41	136	95	232
	03	105	187	82	78
	19	36	64	28	78
16 Mar	01	67	120	53	79
	02	246	168	(78)	32
	03	105	158	53	50
	19	38	100	62	163
17 Feb	01	115	144	29	25
	02	210	136	(74)	35
	03	143	153	10	7
	19	55	72	17	31
20 Jan	01	59	184	125	212
	02	205	88	(117)	57
	03	191	254	63	33
	19	50	112	62	124
23 Dec	01	63	64	1	1.6
	02	110	56	(54)	49
	03	217	119	(98)	45
	19	102	104	2	2
25 Nov	01	103	104	1	1
	02	50	112	62	124
	03	103	206	103	100
	19	95	160	65	68

EXHIBIT III-I (continued)

<u>Date</u>	<u>Shop #</u>	<u>Scheduled</u>	<u>Actual</u>	<u>Diff</u>	<u>% Diff</u>
7 Oct	01	57	72	15	26
	02	86	104	18	21
	03	123	241	118	96
	19	47	40	(7)	15
			<u>4276</u>	<u>5971</u>	<u>1695</u>

SERVICE ORDERS
DIFFERENCE IN HOURS SCHEDULED vs ACTUAL HOURS WORKED

<u>DATE</u>	<u>SHOPS</u>				<u>TOTAL</u>
	<u>01</u>	<u>02</u>	<u>03</u>	<u>19</u>	
	HOURS WORKED OVER HOURS SCHEDULED				
24 Aug	54	70	84	24	232
27 July	92	22	92	35	241
29 June	15	(4)	(21.5)	72	61.5
1 June	36	42	93.5	34	205.5
11 May	(17)	31	206	122	342
13 Apr	(23)	95	82	28	182
16 Mar	53	(78)	53	62	90
17 Feb	29	(74)	10	17	(18)
20 Jan	125	(117)	63	62	133
23 Dec	1	(54)	(98)	2	(149)
25 Nov	1	62	103	65	231
7 Oct	15	18	118	(7)	144
TOTALS	<u>381</u>	<u>13</u>	<u>785</u>	<u>516</u>	<u>1695</u>

WHILE WORK SAMPLING

31 Aug	(10)	(0)	(72)	(76)	(158)
--------	------	-----	------	------	-------

ANALYSIS OF SOO SCHEDULING
(Karlsruhe only)

SOO 24-4 PM Refrig & AC Family Housing Service Calls
APC HEKX K1521-1
Estimated Person Hours 3840

<u>WEEK OF</u>	<u>EST</u>	<u>ACT</u>	<u>DIFF</u>
20 August	8	0	(8)
13 August	8	16	8
6 August	8	16	8
27 July	0	16	16
20 July	0	8	8
13 July	63	32	(31) Insp. of Ice Mach. & Water Coolers
6 July	33	28	(5)
29 June	63	7	(56)
22 June	88	24	(64)
15 June	59	44	(15)
8 June	32	41	9
1 June	38	17	(21)
25 May	17	30	13
18 May	48	21	(27)
11 May	63	10	(53)
4 May	63	78	15
27 April	59	56	(3)
20 April	49	31	(18)
13 April	64	25	(39)
6 April	63	25	(38)
30 March	63	41	(22)
23 March	63	5	(58)
16 March	68	41	(27)
9 March	73	16.5	(56.5)
2 March	93	5	(88)
24 February	103	27	(76)
17 February	98	43	(55)
10 February	88	23	(65)
3 February	63	17	(46)
27 January	63	77.5	14.5
20 January	83	64	(19)
13 January	63	99	36
6 January	38	31.5	(6.5)
30 December	27	10	(17)
23 December	32	27.5	(4.5)
16 December	63	39	(24)
9 December	53	82.5	29.5
2 December	53	78	25
25 November	63	91.5	28.5
18 November	53	45	(8)

EXHIBIT III-J (continued)

<u>WEEK OF</u>	<u>EST</u>	<u>ACT</u>	<u>DIFF</u>
11 November	49	48	(1)
4 November	Missing		-
28 October	Missing		-
21 October	Missing		-
14 October	Missing		-
7 October	63	57	(6)
	<u>2241</u>	<u>1494</u>	<u>(747)</u>

46 - 4 = 42 weeks

$$1494/2241 = 66.7\%$$

$$2241 \times 52/42 = 2774.6$$

$$1494 \times 52/42 = 1849.7$$

Annual Estimate	3840	3840
Annual Scheduled	<u>2775</u>	
Scheduled Short	1065	
Annual Actual		<u>1850</u>
Actual Short		1990

$$3 \text{ Person Shop } 1735.8 \times 3 = 5207.4$$

EXHIBIT III-K

ANALYSIS OF ESTIMATED, SCHEDULED, AND ACTUAL
PERSON HOURS SHOP 09 SOOs FY84
(Karlsruhe only)

KA 00022 4S	SHOP 09	OIL TEAM	3000
KA 00023 4S	SHOP 09		4200
			<u>7200</u>

<u>Month</u>	<u>Estimated</u>	<u>Actual</u>	<u>Difference</u>
August	468	418	(50)
July	719	777	58
June	564	440	(124)
May	823	637	(186)
April	628	591	(37)
March	753	649	(104)
February	748	660.5	(87.5)
January	895	742	(153)
December	524	531	7
November	818	716	(102)
October	630	446	(184)
	<u>7570</u>	<u>6607.5</u>	<u>(962.5)</u>
x 12/11 =	8258	7208	(1050) ¹
Annual Estimate		7200	7200
Annual Schedule		8258	
Excess Hours Scheduled		+1058	
Actual Hours Worked			<u>7208</u>
Actual Estimate Over Actual			<u>8</u>

¹ Adjusted for 12 months.

EXCERPT FROM FACILITIES ENGINEERING, ITEMS OF INTEREST
INFORMATION EXCHANGE BULLETIN VOL. 1, NO. 3, JUN 82

Your Scheduling Meeting and Productivity

DA Pam 470-6 defines scheduling as "...the act of matching up the requirements with the resources in an organized manner." What type of "reviews" is your scheduling "act" receiving? Critical acclaim or just criticism?

Effective scheduling provides for the orderly and economical accomplishment of jobs as well as the orderly assignment of work to the individual shops. Your scheduler, therefore, is in a key position to affect the efficiency and productivity of your workforce.

During preparation of the weekly schedule, your scheduler must aggressively seek out all the needed information on jobs themselves and factors that will affect the scheduling of those jobs. This information gathering is the heart of scheduling. Is your scheduler trying to "wing it" with only part of the needed information? Available man-hours, current status of scheduled work, availability of materials, relative priorities, transportation, weather impacts, skill availability in shops, coordination on multi-shop jobs, hours to be expended on SOO's and SO's, utility outages, fire protection requirements, pretest marshal coordination, and contacting the requestor to insure access to job sites are only some of the things your scheduler needs to be aware of.

Then how about your scheduling meeting? Is it weekly or weekly? If conducted effectively, this meeting can be the most productive hour of the entire week. If not managed effectively, it can tie up highly paid employees in an unproductive "bull" session. Who attends the weekly scheduling meeting at your installation?

The following personnel should attend:

- The DEH/DPE or the Deputy
 - Chief EWI
 - Chiefs of Operating Divisions
 - All Shop Foremen
 - Material Coordinator
 - Scheduler
- And what should this august group do each week?
- Identify carry-over work
 - Review new jobs for the coming week
 - Resolve problems associated with work to be accomplished
 - Determine what work will be accomplished next week
 - Determine what day the work should be scheduled, especially multi-shop jobs
 - Determine how many craftspeople/man hours should be assigned for each job
 - Coordinate multiple-shop jobs
 - Review all work for consolidation of assignment

You as DEH/DPE are charged with planning, directing and controlling RMA work. You can do this and achieve substantial productivity gains with more effective, more accurate job scheduling.

Scaffolding Practices

Low overall productivity is most often a result of numerous little inefficiencies. During a recent staff visit, we sat in on a good scheduling meeting. A multiple-shop job being reviewed included scaffold erection by the carpenter shop. The need for erection by the carpenter shop of routine scaffolding was questioned, and all the shop foremen and Division chiefs agreed that this practice wasn't necessary, wasn't productive and would be discontinued immediately. Scaffolding would simply be picked up and erected by painters, masons or other craftspeople needing routine scaffolding. Only the more complex scaffolding work would automatically be assigned to the carpenter shop. Result? Less complex scheduling (fewer multiple-shop jobs), fewer workers per job and higher productivity! Could you use this idea to improve your productivity?

Are You Effective in Your Scheduling Operation?

Have you ever taken the time to review and analyze the effectiveness of your scheduling operation? A very simple means to gauge your scheduling efficiency is to compare, for any given week, the actual man-hours worked against master scheduled man-hours. This percentage would then be measured against a goal established by your MACOM or at your installation. A reasonable starting goal is 70%

A more in-depth scheduling analysis procedure consists of:

- recording the cause of each scheduling change that occurred during the week.
 - noting how many times a specific cause contributes to a scheduling change.
 - investigating the major causes of scheduling disruptions. This process should be initiated by the scheduler. Variances/causes should be discussed at the weekly scheduling meeting and appropriate actions initiated to preclude reoccurrences.
- These types of basic analyses are essential if we are to streamline our scheduling operations and hence, reduce non-productive craft time that results from scheduling disruptions.

SCHWEINFURT DEH SOPs

1. Classified Documents Handling 20 Sep 83
2. Normal Duty Hours, Standing Work Attendance Regulations, and Absence from Duty 20 Sep 83
3. Engineer Resources Management Division 22 Sep 83
4. Organizational Plan for EP&S Division 1 Oct 81
5. Contract Supervision and Inspection 1 Oct 81
6. Building and Grounds Division 19 Sep 83
7. Building Maintenance 14 Sep 83
8. Maintenance and Inspection of Cranes, Derricks and Hoists 23 Sep 83
9. Roads and Grounds 15 Sep 83
10. Grass Cutting Policy 14 Sep 83
11. Entomology Services 15 Sep 83
12. Emergency Repairs Performed by On-Call Directorate of Engineering & Housing (DEH) Personnel 5 Oct 83
13. Utilities Heating Section (Boiler Plants and Heating Systems) 13 Sep 83
14. Preparation of DA Form 4367 - Repairs and Utilities Operating Log 13 Sep 83
15. Accountability of Hand Tools 13 Sep 83
16. Assignment, Operation and Maintenance of Washracks 16 Sep 83
17. Community Spill Prevention and Clean-up Plan 21 May 84
18. Handling of Waste Battery Acid 27 Jan 84
19. Solid Fuels Operating Procedures 1 Sep 83
20. Fuel Management 1 Sep 83
21. Sampling Procedures of Fuel Oil #6 1 Sep 83
22. Fire Prevention and Protection 30 Aug 83
23. Fire Protection Plan for Unimproved Grounds 6 Sep 83

EXHIBIT III-N

SICK LEAVE USE¹

UNIT	CY 83				CY 84 PROJECTED			
	# PERS	TARGET	USED	OVER (UNDER)	# PERS	TARGET	USED	OVER (UNDER)
OVERHEAD FUNCTIONS								
A&E Liaison	4	380	240	(140)	6	570	246	(324)
Admin	5	475	416	(59)	4	380	205	(175)
Budget	5	475	488	13	5	475	438	(37)
Const Insp	14	1330	542	(788)	14	1330	828	(502)
DEH	2	190	128	(62)	3	285	96	(189)
Eng Svc Br	16	1520	1344	(176)	16	1520	2257	737
Env/Energy	3	285	100	(185)	2	190	0	(190)
ERM/MES	6	570	406	(164)	6	570	547	(23)
Est & Fac Insp	7	665	448	(217)	7	665	96	(569)
Fire Prev	8	760	1096	336	7	665	691	26
Housing Div	17	1615	1736	121	17	1615	879	(736)
Housing/BOQ	6	570	40	(530)	6	570	192	(378)
Housing/CFMO	18	1710	2616	906	17	1615	3283	1668
Master Plan	11	1045	744	(301)	10	950	930	(20)
Supply/Storage	10	950	1268	318	11	1045	944	(101)
Work Coord	9	855	684	(171)	9	855	1857	1002
Works Council	1	95	0	(95)	1	95	0	(95)
Utilities	8	760	581	(179)	9	855	1888	1033
B&G	6	570	568	(2)	7	665	629	(36)
Germer	10	950	1296	346	8	760	1320	560
Subtotal	166	15770	14741	(1029)	165	15675	17326	1651
UTILITIES DIVISION SHOPS								
Boil/Htg Sys	19	1805	1896	91	19	1805	1353	(452)
Elect	13	1235	1926	691	12	1140	1259	119
Htg Burn Mech	5	475	168	(307)	5	475	547	72
Pipefitting	13	1235	1548	313	12	1140	1149	9
Plumbing	13	1235	1432	197	13	1235	2353	1118
Refer/Kit Eq	3	285	352	67	3	285	301	16
Sanitation	17	1615	1976	361	17	1615	2038	423
Alarm Sys	6	570	288	(282)	6	570	178	(392)
Subtotal	89	8455	9586	1131	87	8265	9178	913

EXHIBIT III-N (continued)

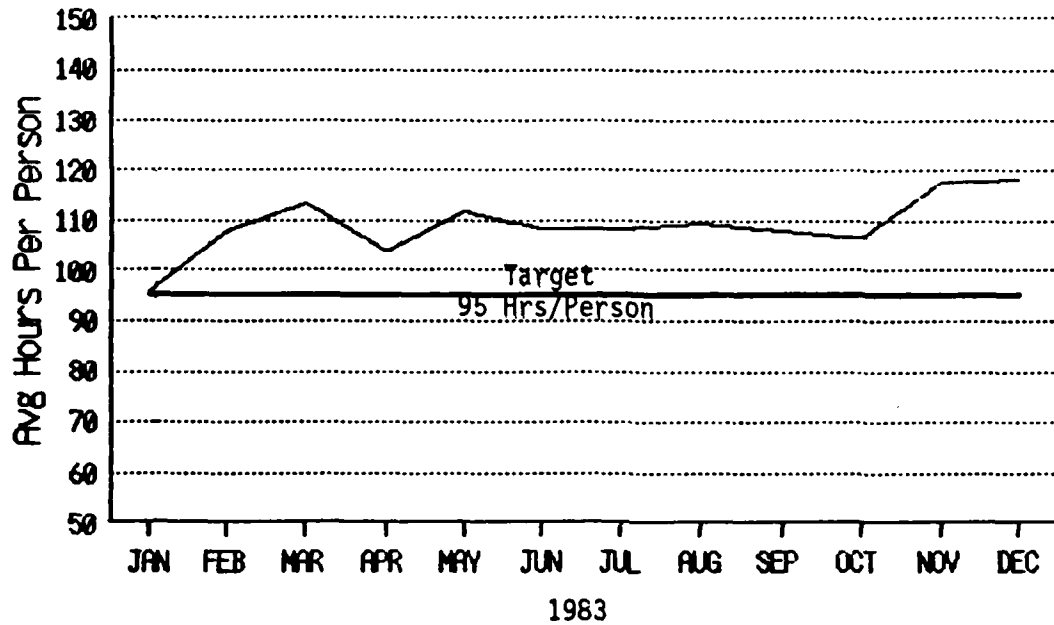
UNIT	CY 83				CY 84 PROJECTED					
	#	PERS	TARGET	USED	OVER (UNDER)	#	PERS	TARGET	USED	OVER (UNDER)
BUILDINGS AND GROUNDS DIVISION SHOPS										
Carpentry	9	855	1272	417	10	950	985	35		
Entomology	6	570	560	(10)	6	570	1888	1318		
Grounds	8	760	728	(32)	7	665	793	128		
Masonry	9	855	1168	313	9	855	1067	212		
Metalwork	10	950	1368	418	10	950	1601	651		
Org Maint	15	1425	1160	(265)	14	1330	1655	325		
Painting	7	665	1296	631	7	665	1231	566		
PM	19	1805	1434	(371)	19	1805	1642	(163)		
Roads	12	1140	1868	728	15	1425	2148	723		
Subtotal	95	9025	10854	1829	97	9215	13010	3795		
GERMERSHEIM SHOPS										
B&G	35	3325	7714	4389	33	3135	5062	1927		
Fire Prev	14	1330	1116	(214)	13	1235	1190	(45)		
Heating	14	1330	2306	976	14	1330	3333	2003		
Utilities	18	1710	3038	1328	17	1615	1358	(257)		
Subtotal	81	7695	14174	6479	77	7315	10943	3628		
DEH TOTAL	431	40945	49355	8410	426	40470	50457	9987		

¹ Statistics are from the "Sick Status Reports".

² CY 84 projections are based on the July 84 "Sick Status Report".

SHOP: Fictitious

SICK LEAVE USAGE RATE



	<u>NO. PERSONS</u>	<u>HOURS USED</u>	<u>COMMULATIVE HOURS</u>	<u>ANNUAL¹ RATE</u>
Jan	10	80	80	96.0
Feb	10	100	180	108.0
Mar	9	75	255	113.3
Apr	10	90	345	103.5
May	10	120	465	111.6
Jun	11	130	595	108.2
Jul	11	100	695	108.3
Aug	11	105	800	109.1
Sep	11	90	890	107.9
Oct	11	85	975	106.4
Nov	10	100	1,075	117.3
Dec	10	105	1,180	118.0

¹ See Exhibit III-P on following page for the monthly rate calculation formula.

SICK LEAVE USAGE RATE CALCULATIONS

January	$\frac{12 \times \text{cumulative}}{\text{no. employees}}$ hours for shop
February	$\frac{6 \times \text{cumulative}}{\text{no. employees}}$
March	$\frac{4 \times \text{cumulative}}{\text{no. employees}}$
April	$\frac{3 \times \text{cumulative}}{\text{no. employees}}$
May	$\frac{12/5 \times \text{cumulative}}{\text{no. employees}}$
June	$\frac{2 \times \text{cumulative}}{\text{no. employees}}$
July	$\frac{12/7 \times \text{cumulative}}{\text{no. employees}}$
August	$\frac{3/2 \times \text{cumulative}}{\text{no. employees}}$
September	$\frac{4/3 \times \text{cumulative}}{\text{no. employees}}$
October	$\frac{6/5 \times \text{cumulative}}{\text{no. employees}}$
November	$\frac{12/11 \times \text{cumulative}}{\text{no. employees}}$
December	$\frac{\text{cumulative}}{\text{no. employees}}$

EXHIBIT III-Q

PLANNER AND ESTIMATOR'S WORKLOAD

	<u>IN</u>	<u>OUT</u>	<u>BACKLOG</u>
November 1983	6	80	282
December 1983	34	90	247
January 1984	18	147	115
February 1984	105	139	81
March 1984	109	111	79
April 1984	31	33	77
May 1984	85	79	83
June 1984	41	63	61
July 1984	216	140	137
August 1984	105	41	201
September 1984	81	79	203
October 1984	167	142	228

SELF-EVALUATION OF IFS TRAINING REQUIREMENTS

FEMS MODULE

Functional Area. Craftspersons (WLs, WGs)

Reference. IFS Users Manual Volume IIIB Chapter Four (4)

Skill Required. Proper completion of L&E Cards

Summary. The Labor & Equipment (L&E) Card is the most important input to the Integrated Facilities System. It is designed to accomplish the following:

1. Capture the time and cost of all personnel assigned to the Facilities Engineering Organization, both Military and Civilian (except Firefighters)
2. Provide the basis for utilization data and rental/depreciation costs of all FE assigned M&S equipment and all borrowed M&E equipment.
3. Provide actual person hour data for measuring performance.
4. Provide the primary source of workload data for preparing Performance Work Statements.

Personnel Affected. All DEH employees identified in the STANFINS K9200 account. This is normally all except 56 hour per week Firefighters.

Evaluation Procedures. Random Sample 100 L&E Cards from each shop and Overhead Division/Branch.

1. Do the daily L&E Cards total 8 hours, or if more than 8 hours, does a "B" appear for the excess over 8 in card column 49?
2. Do the L&E Cards turned in weekly or biweekly total 40 or 80 hours respectively or have a "B" in column 49 for hours in excess of 40 or 80?
3. Are skill codes utilized?
4. Is column 55 filled in? (If it is blank a majority of the time for craftspersons, they are not reporting their time properly.)
5. When service orders are performed, are the following filled in correctly:
 - Component Code (Columns 42 & 43)
 - Task Code (Columns 44 & 45)
 - Task Units (Columns 46 & 47)

ATTACHMENT III-1 (continued)

6. What is the Error Rate? (It should be under 1%.)
7. Visit the shops and observe the following:
 - A. When are L&E Cards filled out by the craftspersons?
 - Completion of each job
 - End of day
 - They don't, the Foreman does

NOTE: In order to obtain correct and reliable information, the craftspersons should fill out his L&E Card after completing each task.
 - B. Randomly select 4 or 5 craftspersons. Ask the following questions:
 - Have you received training on filling out L&E Cards?
 - What is the purpose of the L&E Card?
 - Did you know that filling out the L&E Cards correctly can save your job?
 - Does the Foreman or leading man fill out your card for you?
 - How do you fill out your card when you work overtime?
 - Do you understand how to fill in your L&E Card to record multiple task codes/units?
 - C. Is there a list of Labor Codes (see page 4-15 of reference) posted in the shop?
8. Randomly check 15 vehicles.

Is there a Task Code list in the vehicle?

Functional Area. Shop Foremen (craft shops) (WSs)

References.

1. IFS Users Manual Volume IIIB, Chapter four (4).
2. IFS Users Manual Volume IIIA, Sections 6.10, 6.19, 6.20, 6.21.

Skill Required.

1. Proper completion of L&E Card
2. Understanding of:
 - Service Order Backlog Report (FJO)
 - Shop Performance Report Service Orders (FKO)
 - Shop Performance on Completed IJOs (FLO)
 - Shop Backlog and Workforce Distribution Report (FNO)

L&E Cards. Foremen should be thoroughly versed in the utilization of L&E Cards. The functional checklist for craftspersons may be utilized, in addition, the following should be ascertained:

1. Do foremen review, verify the accuracy and sign the L&E Cards?
2. Do foremen understand the use of the Labor Codes in Table I, page 4-15, of IFS Users Manual Volume IIIB?
3. Ask the Foremen: "If three of his craftspersons are sent to work in another shop, how do they record their time at the end of the day?"

Records Analysis.

1. Service Order Backlog Report (FJO)
 - A. Does the Foreman have a copy of the report for his shop?
 - B. Is the report substantially correct? Are there jobs (SO) listed that, in fact, have been completed weeks or months ago?
2. Shop Performance Report Service Orders (FKO). This is a monthly report that shows the effectiveness of shop personnel in completing standard service order tasks. It also reflects the effectiveness of the shop foreman in handling resources and the ability of ERMD in recognizing backlog and scheduling requirements. From this report the foreman can track, on a monthly basis, the average time per service order task, shop stock cost per hour, and shop effectiveness.

ATTACHMENT III-1 (continued)

The Foreman should also review the individual task codes on this report. When actual and standard times vary by more than plus or minus 10%, the foreman should bring this to the attention of ERMD and ERMD should investigate the cause.

- A. Do the foremen receive a copy of the FK0 Report?
- B. Do the foremen:
 - Know how to compute average time per service task?
 - Understand percent effective?
 - Know where the standard hours come from?
 - Know where the actual hours come from?
- C. Do the foremen monitor the:
 - Average time per service order task
 - Shop stock cost per hour, and
 - Shop effectiveness on a monthly basis?

3. Shop Performance on Completed IJOs (FLO). This weekly report gives a rundown of all in-house IJOs completed by each shop. It should be reviewed by shop foremen to evaluate the performance of their personnel. If the shop foremen feel that the time estimates are inaccurate, ERMD should be notified.

- A. Do the foremen receive copies of the FLO Report?
- B. Do the foremen understand the Report and use it to monitor their craftspersons performance?

4. Shop Backlog and Workforce Distribution Report (FNO). This report is generated weekly to serve a multitude of functions. Foremost, this report shows foremen and other managers how time was spent, both by area and skill, within their operating organizations.

- A. Do the foremen receive copies of this report?
- B. Do the foremen understand how to utilize this report?

ATTACHMENT III-1 (continued)

Functional Area. Budget

Reference. IFS Users Manual Volume IIIA and IIIB and IIA

Skills Required.

1. Proper completion of L&E Cards.
2. Detailed knowledge of the following uniques files:
 - Military Pay XJD (F04)
 - General Schedule - Wage Board Benefit Percent Record XJE (F05)
 - Family Housing AMS/APC Record XJG (F07)
 - STANFINS Interface APC Record XJN (F12)
 - Labor Header Update XFX (FU1)
 - Functional Group Record XJB (F02)
 - Family Housing Record XJJ (F09)
3. Understanding the use of the following cost control reports:
 - Special Projects Report (FQ0)
 - Standing Operations Orders Report (FMO)
 - Family Housing Costs Report (FRO)
 - Functional Cost Reports (FS0)
 - Reimbursable Job Cost Report (FT0)
 - Family Housing Prestige Quarters Report (FU0)
 - Preventive Maintenance Report (FV0)
 - Minor Construction and Alteration Report (FX0)
 - Contract Cost Report (CS0)

L&E Card Completion. All DEH personnel (except 56 hour per week Firefighters) must be familiar with the purpose and procedures for filling out L&E Cards. If IFS is to allocate costs properly, all DEH personnel must account for 2080 hours per annum plus any overtime or other differential pay received.

1. Do Budget Personnel understand how to fill out L&E Cards?
2. How often are they filled out?
3. How often are they turned in?
4. Does the Budget Chief review them for accuracy and completeness?

Detailed Knowledge of Uniques Files. There are eight transactions which must be prepared and processed in the BASOPS Environment before cost data may be submitted to IFS. They contain information necessary for the system to perform cost calculations. Five of these files are the responsibility of the Budget Branch.

ATTACHMENT III-1 (continued)

1. Military Pay XJD (F04). Establishes the hourly pay scale for military personnel by rank. The record is mandatory and distributes the cost of labor entered on the L&E Card (FM1 or 2 transaction) for assigned, loaned, or borrowed military personnel performing work for the FE/DEH. The military pay rates are provided by FESA. The Budget Branch must immediately update the XJD (F04) file when notified of changes to military pay, and verify the entire record for accuracy and completeness.

- A. Obtain a copy of the XJD portion of the Uniques Table (FRT) showing current information. Obtain a copy of the latest correspondence from the installation FESA (or the installation F&AO) which identifies changes to military labor rates. (NOTE: AR 47-108 is the formal authorization for changing the rates; however, the lagtime for its publishing/distribution may necessitate implementation of the rates prior to receipt of the regulation change.

(1) Are the current hourly rates correct?

2. General Schedule - Wage Board Benefit Percent Record XJE (F05). Establishes percentages for benefits which are applied to cost of jobs for productive labor. Included are insurance, retirement, and FICA benefits. This record is used by the computer to calculate the amount of money which must be prorated to each job to account for employee fringe benefits.

- A. Obtain a copy of the XJE portion of the Uniques Table (FRT) showing current information. Obtain a copy of the latest correspondence from FESA (or the installation F&AO) showing the benefit percentages and how the percentages were derived. The correspondence should specify the date when the new percentages were effective and when they were input to IFS.

(1) Are the current percentages correct?

(2) Were they promptly input into IFS?

3. Family Housing AMS/APC Record XJG (F07). Establishes Account Processing Codes (APC) to be used in the financial system interface. Established for detailed Family Housing Cost Accounts and Summary Level Engineering Cost Accounts. This record is used by the computer program to distribute FE Labor & Equipment expenses to appropriate APCs within the purview of the STANFINS interface. This table provides the vehicle which enables IFS expenses to be reflected by both Base Operations Engineer AMS Codes and Family Housing AMS Codes and to be passed to STANFINS by APC. In IFS operations, expenses incurred against Family Housing Facilities are normally automatically reimbursables. These expenses are reported in the following FEMS reports:

- FH Reimbursable Cost Report - FRO (by FH AMS)
- Functional Group Cost Report - FSO (by Engr AMS)

ATTACHMENT III-1 (continued)

- Reimbursable Job Cost Report - FTO (by User Code)
- FH Prestige Quarters Report -FUO (by Facility number)
- A. Obtain a copy of the XJG portion of the Uniques Table (FRT) showing current information. Obtain a copy of the latest correspondence identifying the required APCs assigned by the installation F&AO. This correspondence should specify the required changes to the Automated Files and the date when the changes were effective.

(1) Are the current APC correct?

4. STANFINS Interface APC Record XJN (F12). Establishes a cross-reference table relating IFS detail level functional Group Codes to the AR 37-100-XX Detail level AMS codes and the applicable Engineer Direct APCs. (Optional Record). This table relates IFS Functional Group Codes to APCs to permit the processing of labor and equipment utilization data to STANFINS.

- A. Obtain a copy of the latest correspondence from the installation F&AO which identifies APC changes, or from FESA identifying Functional Group Code changes. Obtain a copy of the XJN portion of the Uniques Table (FRT) showing the current information.

(1) Are the Army Management Structure Codes (AMS-CD) correct?

(2) Are the Account Processing Codes (APCs) correct?

5. Labor Header Update XFX (FUI). Establishes the Wage Board Grade 10, Step 2, rate and general schedule maximum overtime rate (per Title 5US Code) to be used in cost calculations of Hazardous Duty and Overtime Pay respectively. When applicable, it also establishes the Cost of Living Allowance (COLA) for the installation.

- A. Obtain a copy of the latest correspondence from the installation F&AO which identifies Wage Board and General Schedule rates. Obtain a copy of the XFX record showing current information and verify the MAX-OT-RATE-HR (CC 10-13), WB10-2-RATE-HR (CC 14-17) and DATE-OVHD-COMPUT (CC 18-23).

(1) Are the Rates correct?

6. Functional Group Record XJB (F02). Establishes a table of valid functional group codes which relate to detail level J and M Account Codes in AR 37-100-XX.

ATTACHMENT III-1 (continued)

- A. Obtain a copy of the XJU unique file. Find the "J" or "M" functional group codes (position 5 through 9) in the XJU table. List those having a "1" in card column position 70. Does the XJB (F02) file list all those contained in the XJO table?
- B. Is there a functional group code for PM material and shop stock material in the XJO table?

7. Family Housing Record XJJ (F09). Establishes percentages of work by functional group to be prorated to the different family housing categories.

- A. Does a F09 (XJJ) file exist?

Cost Control Reports

1. Special Projects Report (F00). The Special Projects Report is the most complex of the FEMS Reports. It is processed daily. The report is broken into two sections. The first contains only special projects ("P" type code) which are shown from their inception until their completion. The second section contains all other conventional IJOs ("J" type code) from the time they attain an installation-determined percentage complete (Input on the FMJO Update Transaction XFY (FUI); see VOL IIA page IIA-B-137) based on actual vs estimated hours) until they are also completed.

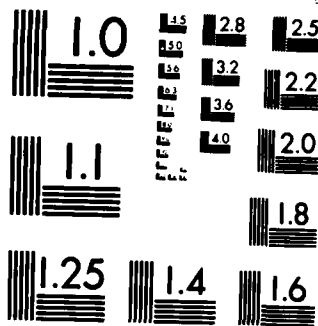
- A. Each job is divided into three sections.
 - (1) The first is a header line which shows:
 - Document Number
 - Job Description
 - Fund Citation
 - JOR Date
 - (2) The second shows:
 - Job Phase
 - Facility Number
 - Break out showing:
 - . Estimated
 - . Obligated
 - . Actual Data
 - (3) The last section shows:
 - Job Totals
 - . Estimated
 - . Obligated
 - . Actual

ATTACHMENT III-1 (continued)

- B. Actual Expenses come from:
- L&E Cards (Labor & Equipment)
 - Material Issue/Turn In
 - Contract Data by Phase
 - Actual Resources Input, and/or
 - Fuel/Sales Input Transactions (See VOL IIIB)
- C. For purposes of capitalization and job accounting, the costs are broken down into two areas:
- Funded Costs
 - Unfunded Costs (military labor/equip. dep.)
 - Total Costs
- D. All completed jobs are displayed for 30 days then dropped from report.
- E. Two situations will generate a flag to appear.
- Job involving a 10% or greater material cost overrun. (Flag right of Material column)
 - Jobs having no transactions for week or more.
- F. This report satisfies requirements of:
- AR 415-35
 - AR 420-21
- G. Does Budget obtain daily copies of the Special Projects Report?
- Do at least 3 persons or 50% of the Budget Branch personnel understand how to read the Special Projects Report?
 - Do the Budget personnel understand from where the estimated and actual costs come and how they are computed?
 - Do Budget personnel verify the type codes and functional group codes?

2. Standing Operations Order Report (FMO). This report is intended to provide the scheduler and division chiefs with the status of progress on all SOOs as well as to give the Budget Branch up-to-date information on cost expenses against specific SOOs. There are several major types of SOOs. They are:

- SOOs to accumulate work costs (may or may not count repetitive tasks)
- Administrative SOOs (accumulate personnel time)
- Shop stock SOOs (act as suspense account for material)



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

ATTACHMENT III-1 (continued)

S00s remain on this report for a period of 30 days following the job completion entry.

The report displays both in-house and contract phases.

- Does budget receive copies of and monitor this report for?
 - . other fund citation
 - . functional group code
 - . reimbursable code
 - . cost data

3. Family Housing Cost Report (FRO). This report is designed to accumulate all costs for work performed on Family Housing on a monthly basis. It shows both the cost of the most recent month and the year to date costs.

The report provides the Budget Branch with a detailed cost summary to determine FE (DEH) workforce contribution to Family Housing. Report total should be cross-checked against totals for the Family Housing reimbursable codes on the Reimbursable Jobs Costs Report (FTO). These totals should equal those on the Family Housing Cost Report (FRO). However, if costs of utilities and engineering services are prorated to the various Family Housing costs accounts using the Family Housing Record XJJ (F09), the prorated costs will not appear on the Reimbursable Costs Report. To determine the validity of such costs, the Standing Operations Orders Report (FMO) and the Contract Status Report (FDO) must be used and manual calculations made to verify the costs reflected on the report.

- Does Budget receive a copy of the report?
- Do Budget personnel understand how to utilize this report?

4. Functional Cost Reports (FSO). This report shows on a monthly basis total FE expenses (both reimbursable and non-reimbursable) for the preceding month and the fiscal year-to-date. All expenses are included except:

- TDY
- PCS travel
- Office supplies
- Transportation of things
- Awards

This report provides a summary level picture of FE costs to date. When compared to the RPMA Financed/Unfinanced Requirements Report (FURR), it enables the Budget Section to continuously evaluate expenses versus budget estimates. It also provides the Budget Branch a tool which can be used to advise the FE in budgeting actions based on accurate, up-to-date data.

ATTACHMENT III-1 (continued)

At present, the use of this report is restricted.

- Do not investigate use of the report.

5. Reimbursable Job Costs Report (FTO). This is a monthly report which presents the total costs incurred against each reimbursable account for the preceding month. If an FE direct fund APC has been cited for a job, a manual billing should be made for all current month costs displayed on this report. If a cross reference APC has been cited on a given job, (via the material issue and turn in XFE or XFN), a manual billing should be prepared for the current month costs associated only with contract costs since all other costs will already have been processed as reimbursements through the STANFINS and SAILS interfaces.

Costs displayed in the SO line are to be treated exactly as described above, with one exception. Material costs, when shown, must always be handled on a manual billing (i.e., the system cannot process these through the SAILS interface).

All costs displayed on the PM line must be processed as a manual billing with the exception of Family Housing. For Family Housing, only material costs and contract costs associated with PM must be billed manually.

- Does Budget maintain copies of this report?
- Does Budget understand how to use this report?

6. Family Housing Prestige Quarters Report (FUO). The purpose of this report is to provide a summary of expenses on the quarters as required by Family Housing regulations. Specifically:

- Prestige quarters
- General officer quarters
- Oversize quarters

The report contains a single line for each job cost that was accrued (by document number) during the month (current month) against every applicable facility. This includes IJOs, SOOs, SOs, PM and contracts. There are also total lines reflecting all expenses for the previous month year-to-date, the current month, PM current month, and SO current month for each facility.

The report does not include the cost of utilities expended in support of prestige quarters. This data must be manually annotated.

- Does Budget maintain a file of these reports?
- Are the reports utilized?

ATTACHMENT III-1 (continued)

7. Preventive Maintenance Report (FV0). The purpose of this report is to provide PM expenses by element of expense for:

- Each PM job performed (by document number) on a facility since the last report cycle.
- Each facility since the beginning of the FY.
- The entire installation since the beginning of the fiscal year.

In addition, total civilian and military labor hours expended on PM since the beginning of the FY is provided.

The L&E cards are the basic source document for all information.

- Does Budget maintain a copy of this report?
- Is the report verified and utilized?

8. Minor Construction and Alteration Report (FX0). This report provides monthly detailed cost expenses for all work classified as minor construction and alteration ("L") work by Facility Class and Construction Category Code (F4C) and numerically sequenced by facility number within each F4C. The primary purpose is to provide visibility of total expenses on "L" work to insure that statutory limitations for any given year are not exceeded.

9. Contract Cost Report (CS0). This report provides detailed cost information by contract including modifications.

ATTACHMENT III-1 (continued)

Functional Area. Work Reception (Service Order Clerks)

Reference. IFS Users Manual Volume IIIA & IIIB

Skills Required.

Proper completion of L&E Cards

Ability to understand and fill out service order requests (DA Form 4287 or equivalent local form)

General understanding of Facilities Engineering Work Request (DA Form 4283) and the Facilities Engineering Work Order (DA Form 4284)

Working knowledge of the following job status and workload reports:

- Job Order Request/Individual Job Order Status Report (FAO)
- Facility Reference Report (FWO)
- Service Order Register (FGO)

Labor and Equipment (L&E) Card

1. See functional area summary for budget.
2. Do the service order clerks turn-in L&E cards?
3. How often?
4. Does the work reception supervisor review the L&E cards?

Service Order Request (DA Form 4287 or Equivalent). Service Orders are generally written for emergency or routine maintenance that can be accomplished in 24 hours or less. (It is permissible to go up to 40 hours and there is no limit on emergency work.) Family Housing work should be limited to 16 hours and/or \$350 materials. A complete description of the service order procedure is found in the IFS Manual Volume IIIA, Section 4-6, commencing on page 4-108.

Randomly sample 35 service orders processed during the past week.

1. Are work receptionists familiar with the use of "Special number" for "J" or "M" work in Family Housing? (See IFS Users Manual Volume IIIA, Appendix A, Page A-6).
2. Do work receptionists understand the definition of "J", "K", "L" and "M" work?
3. Is the reimbursable code (columns 24 and 25) filled in on all reimbursable work? (i.e. Family Housing, Commissary, etc.)

ATTACHMENT III-1 (continued)

4. Is there a logic table available for establishing priorities? Who authorizes emergency work?

5. Do the work receptionists have a list of shop codes and skill codes posted? Do they use the skill codes? How often is "X" used in column "34"?

6. Is there a list of task codes posted? Is the list complete? How often is task code 99 used?

7. Have the service order clerks ever been given any indoctrination with craftsman performing SO?

8. Is the number of task units filled in? Are task units mixed?

9. For "J" or "M" work, is the functional group code entered? Do SO clerks know what a functional group code is?

10. Is the other fund citation (XFP transaction) filled in? Is it correct?

NOTE: Obtain a copy of AR 37-100-YR from Budget -- Randomly select 35 SOs to see if the XFP transaction is used extensively. If unique files are correct, this transaction is normally not required.

Non-IFS

It is very important to record location (Room number) and telephone number. Is this being accomplished?

Facilities Engineering Work Request (DA Form 4283). This form is prepared by customers to establish requirements for work. All work accomplished using FE resources requires the prior submission and approval of either this form or a Service Order (DA Form 4287). The form is divided into three sections:

1. The work request transaction XFA/XFB which is initiated by the customer to show detailed work requirements, justification, and impact if work is not accomplished. This form is completed by the work receptionist;

2. The forward for approval transaction which is completed by FE personnel to submit the request to the approving authority; and

3. The approval action transaction XFC which is used to show approval/disapproval action on the requested work.

Detailed information on DA Form 4283 is found in the IFS Users Manual Volume IIIA, pages 4-2 through 4-19.

ATTACHMENT III-1 (continued)

1. Does the work receptionist understand the use of codes "A", "C", and "D" in column 4.
2. Does the work receptionist understand the use of codes "P", "J", and "S" in column 13?
3. Is the work receptionist familiar with AR 37-115? Is there a copy of AR 37-115 readily available?
4. If a work request involves more than one facility, does the work receptionist understand what to do?
5. Does the work receptionist have a list of valid facility numbers and suffixes? Are customer submissions verified against this list?
6. Does the work receptionist understand the use of "other fund citation"?

Facilities Engineering Work Order (DA Form 4284). This form is used to record the estimate and pertinent data concerning in-house Individual Job Orders (IJOs), Standing Operations Orders (SOOs), and special projects. The form is not utilized for SOs or contracts, except for reopening of the job. The form is not recommended for use with buildings and structures PM. The form is basically divided into two sections:

1. The work order transaction dates (XFD) which is used to input significant job related status dates, SOO effective dates, remarks, etc; and
2. The work order estimate by phase (XFE, XFF) which is used to record the job estimate data.

The work order estimate by phase (XFE) must be preceded by a work request (XFA) and approval action (XFC) before the work can be processed. If not, the XFE transaction will be rejected. Detailed information on DA Form 4284 is found in the IFS Users Manual, Volume IIIA, pages 4-20 through 4-54.

1. Does the work receptionist understand the priority system as outlined in DA Pam 420-6?
2. Does the work receptionist understand functional group codes? Are they entered for work classifications "J" and "M"? What does the work receptionist do if a job involves several phases of work involving M&K work?
3. Is the work receptionist familiar with the XJB unique table? Does the work receptionist have a copy of the XJB (F02) table?

ATTACHMENT III-1 (continued)

4. Does the work receptionist understand how the "dates to" work? (rather than overlaying, a new date can be added up to four times).

5. Does the work receptionist understand how to close out a job? When? How to reopen a job?

6. Does the work receptionist understand the use of the "Family Housing Indicator" (column 68)?

7. Does the work receptionist receive a copy of the EFO (error) report?

NOTE: The XFE/XFF transaction is discussed in the Planner/Estimator Functional Area.

ATTACHMENT III-1 (continued)

Functional Area. Planner/Estimators (WDs) and Work Reception

Reference. IFS Users Manual Volume IIIA

Skills Required.

Proper completion of L&E Cards

Understanding of Work Order Estimate by Phase (XFE/XFF)

Work Order Estimate by Phase (XFE/XFF). The purpose of this input is to record the work order estimated data as calculated by the estimator. A detailed description of the work order estimate by phase is found in the IFS Users Manual, Volume IIIA, pages 4-30 through 4-56.

1. Do the P/Es and work reception personnel understand the use of the changed codes "A", "C" and "D"?
2. When can "D" be used? (See ref. page 4-30, para. (2)(b).)
3. When are alpha-alpha phases utilized?
4. How are phases reflected on the output reports?
5. Do single phases contain more than one facility or component?
6. Do the P/Es understand that reimbursable work must be isolated?
7. If both in-house civilian labor and troop labor are being utilized on a work order, how are the estimates entered?
8. Do P/Es understand that different classification codes cannot be combined? (e.g. "K" and "L")
9. Do P/Es utilize craft skill codes properly? Do P/Es utilize helper and laborer skill codes for helper and laborer work? Are skill codes by shop available?
10. Do P/Es understand the use of assigned proper component codes?
11. Are reimbursable codes being utilized properly? Are the special facility numbers for "J" and "M" work in Family Housing being entered?
12. Are the proper "recurring/deficiency (R/D)" codes being utilized?
13. Are inspection codes being entered?
14. Are the P/Es familiar with AR 415-35 (est. equipment rental costs)?

ATTACHMENT III-1 (continued)

15. Are depreciation costs being estimated for "L" work?

16. Do the P/Es understand the use of the funded design indicator?

17. In regard to the XFF transaction, do P/Es utilize the task code for repetitive type operations? (S00 type work) This can be important in gathering workload data.

18. Do P/Es understand the purpose and use of the "other fund citation"?

ATTACHMENT III-1 (continued)

Functional Area. Director/Deputy Director; Operations Officer; Chief ERMD; Division Chiefs of Operating Division

Reference. IFS Users Manual Volume IIIA, IIIB, IIA

Skills Required.

Ideally, an in-depth knowledge of how IFS functions.

Realistically, a general knowledge of IFS and how the information contained therein may be utilized to optimize resources.

Summary. IFS output reports provide a large amount of useful information. Currently, the information is presented in numerous reports, many of which are bulky and difficult to use if untrained. However, with minimal effort, a trained analyst can extract information from the reports and provide that information to DEH managers in easy-to-understand tabular or graphic format. Exhibit "A" contains a series of graphs that display valuable information for DEH management. Each graph is briefly discussed below:

1. Backlog of Jobs (IJOs). The FAO report provides the status of jobs by requestor ID. Extracting information from this report and displaying it monthly in graphic format will provide DEH management valuable information regarding backlog and backlog trends. Periodic checks of the information extracted from the FAO report should be accomplished by tabulating the number of IJOs in estimating, design, awaiting material, and scheduling.

Responsibility for Preparing: Work Reception
Responsibility for Verifying: MESB
See Exhibit A-1 for Example

2. Jobs Awaiting Material (IJOs). The FBO report provides management with an indication of the effectiveness of their supply procedures. The graphic display of this information on a monthly basis will provide management with trends and indicate when a more in-depth investigation of problem areas is required.

Responsibility for Preparing: Supply
Responsibility for Verifying: MESB
See Exhibit A-2 for Example

3. Status of Service Order Backlog (FJO). This report displays all service orders that have not been completed. Through graphic displays of this information, management can spot trends and take corrective action such as shifting resources.

Responsibility for Preparing: Scheduler
Responsibility for Verifying: MESB
See Exhibit A-3 and A-4 for Examples

ATTACHMENT III-1 (continued)

4. Shop Performance Report - Service Orders and Preventive Maintenance (FK0). This report shows the effectiveness of shop personnel in completing standard service order tasks or, conversely, the failure to develop proper task codes and standard times. Through minor manipulation of the data in this report, the following information can be displayed for each shop:

- Shop Stock Cost Per Hour (See Exhibit A-5)
- Percent Effective (See Exhibit A-6)
- Task Code Percent Utilization (See Exhibit A-7)
- Average Time Per SO Task (See Exhibit A-8)

Responsibility for Preparing: MESB

5. Shop Performance on Completed IJOs (FLO). This report shows shop effectiveness in completing in-house IJOs. It provides feedback of planned vs actual work, and is an excellent source for evaluating both shop performance and planner/estimator performance. A graphic display of this information will provide valuable information to management.

Responsibility for Preparing: MESB
See Exhibits A-9 and A-10 for examples

6. Shop Backlog and Workforce Distribution Report (FNO). This report provides a wealth of information for DEH management. The following can be displayed in graphic format for the installation and by shop.

- Backlog of work in shop days (See Exhibit A-11)
 - . in shop
 - . awaiting scheduling
 - . awaiting material
- Percentage of backlog by category (See Exhibit A-12)
 - . SOs
 - . IJOs
 - . PM/CM
 - . SOOs
- Percentage sick leave (See Exhibit A-13)
- Percentage workforce availability (See Exhibit A-14)

Responsibility for Preparing: MESB

ATTACHMENT III-1 (continued)

7. Shop File Report (FSI). This report reflects labor cost by individual shop. The graphic display of the following information should be useful to management:

- Shop effective rate
- Shop overhead rate

Responsibility for Preparing: MESB
See Exhibit A-15 for example

8. Standing Operations Orders Report (FMO). This report provides the Budget Branch up-to-date information on accumulated cost against specific SOOs. By tracking the actual costs vs the estimated, costs management can, if required, reprogram funds. It would be particularly useful to tract estimated vs actual shop stock costs.

Responsibility for Preparing: Budget
See Exhibit A-16 for example

9. Reimbursable Job Costs Report (FTO). This report presents total costs incurred against each reimbursable account for the preceding month and year-to-date.

Responsibility for Preparing: Budget
See Exhibit A-17 for example

ATTACHMENT III-1 (continued)

C. XJC (F03) - Installation Priority Record. Establishes service order priority days for completion which are used to calculate days backlogged for service orders.

1. How many days are allowed for service order:

- priority 1
- priority 2
- priority 3

D. XJD (F04) - Military Pay Record. Establishes the hourly pay scale for military personnel.

1. Obtain a copy of the current military pay rates from the F&AO. Are the hourly rates listed in positions 20-23 correct?

E. XJE (F05) - Wage Board Benefit Percent Record. Establishes percentages for benefits, including insurance, retirement, FICA, etc., which are applied to cost of jobs for productive labor.

1. Obtain a copy of the current benefit rates from the F&AO. Are the rates correct?

F. XJF (F06) - Prestige Quarters Record. Establishes those facilities for which detailed cost accounting is required.

1. Obtain from housing a list of prestige quarters. Are they listed in the XJE table? Are the suffix codes (column 19) correct? (See Asset Accounting Module Volume 11, pages 3-11).

G. XJG (F07) - Family Housing AMS/APC Record. Establishes account processing codes (APC) to be used in the financial system interface. Established for detailed family housing cost accounts and summary level engineering cost accounts.

1. Is there an entry for at least the following cost accounts?

"J", "K", "L", "M", and "A"

H. XJH (F08) - Error Message Record. Establishes messages to be printed for each error code (FEMS).

1. Are the error codes entered and are they in accordance with IFS Users Manual, Volume IIA, page IIA-B-59?

ATTACHMENT III-1 (continued)

- I. XJJ (F09) - Family Housing Record. Establishes percentages of work by functional group to be prorated to the different family housing categories.
1. Does a F09 (XJJ) file exist?
- J. XJL (F10) - Utilities Operation Record. Establishes percentages of work by functional group to be cost prorated to different reimbursable customers.
- K. XJM (F11) - Family Housing AMS Logic Table. Provides for the automatic posting of job costs to the functional group, reimbursable code, Family Housing and General Officer's Prestige Quarters cost reports.
- L. XJN (F12) - STANFINS Interface APC Record. Establishes a cross-reference table relating IFS detail level functional group codes to the AR 37-100 XX detail level AMS codes and applicable engineer direct APC codes.
1. Are the correct APC and AMC codes listed? (Ref. AR 37-100-YR)
- M. XFU (FR1) - Labor Update. Establishes records with which to compute job and shop cost information.
1. Obtain a copy of the most recent STARCIPS report and the latest GS/WG wage - obtain the current Shop File Report. Are the following correct?
 - shop code
 - normal duty category
 - base rate per hour
 2. Are all employees listed correctly?
- N. XFV (FS1) - Shop File Update. Establishes and maintains for each shop the criteria by which are calculated shop overhead, PM material, and shop stock cost data.
1. Is the shop overhead rate entered correctly?
 2. Is the shop benefit - percent current and correct?
 3. Is the computer processing PM and SO shop stock material costs per hour?
- O. XFW (FT1) - Equipment Update. Establishes records for each item of Maintenance and Service equipment assigned to the FE directorate.

ATTACHMENT III-1 (continued)

Functional Area. Management Engineering and Systems Branch

Reference. IFS Users Manuals

Skills Required. Detailed knowledge of IFS. The Chief MESB and his/her key assistants must be graduates of the Integrated Facilities System course taught by ALMAC.

It is difficult for a facility to evaluate its own MESB. Outside assistance from the MACOM or FESA is recommended. The following checklist may be used as a guide.

1. What courses have the MESB Chief and the IFS Project Officer/Quality Control Clerks attended? When?

2. Does the MESB Chief understand the purpose of the system unique tables listed below, and how to maintain them? (See IFS Users Manual, Volume IIA for details.)

A. XJA (F01) - User Code/Requestor ID - Installation Number Record. This table establishes a two digit identifying code for customers, it also identifies location, sorts jobs, and establishes cost relationships in FEMS and RPMA programming, and provides a source for retrieving Assets and RPMA data.

1. When was the XJA table last updated?
2. If the activity has sub-installations, do separate sub-installation numbers exist in card column 7-11?
3. Are the appropriate numbers (card columns 12-21 correct?) (See AR 37-100)
4. Are the program element codes correct?
5. Are the Family Housing reimbursable codes correct?
6. Is the unit identification code entered correctly?
7. Is the tenant command code correct?
8. Is the appropriation cited correct?

B. XJB (F02) - Functional Group Record. Establishes a table of valid functional group codes which relate to detail level J and M Account Codes in AR 37-100-XX.

1. Obtain a copy of the XJU unique file. Find the "J" or "M" functional group codes (position 5 through 9) in the XJU table. List these having a "1" in card column position 70. Does the XJB (F02) file list all those contained in the XJO table?
2. Is there a functional group code for PM material and shop stock material in the XJO table?

ATTACHMENT III-1 (continued)

1. Obtain a listing of all M&S equipment (See AR 420-83) from the Buildings and Grounds Division. Is all the equipment listed?
 2. Are equipment rental and depreciation costs IAW AR 415-35?
 3. Is transportation motor pool (TMP) equipment listed?
- P. AFX (FV1) - Labor Header Update. Establishes the means to calculate COLA and overtime costs and allowances.
1. Is the AFX maximum overhead rate correct:
 - GS
 - WB
 2. If cost of living allowance exists, is it correct?
- Q. AFX (FV1) - FMJO Update. Establishes the FEMS Master File and provides a percentage for job completion at which special projects and IJO commence being reported.
1. What is the current percent completed for IJOs to print on the special projects report?
 2. How many days are required for special projects to be purged?
- R. AFX (FV1) - Task Description/Standard Hours. Establishes a file of standard tasks and standard hours.
1. Check shop performance service orders and PM. Are proper task codes and standard times assigned?
- S. XJP (R01) - Facility Mean Time Between Inspection Table. Establishes criteria for the automatic scheduling of facility inspections.
- T. XJR (R03) - Facility Condition Percentage Table. Establishes the criteria for the automatic calculations of the relationship between calculated facility condition code and the satisfactory facility condition code C-1 (100%).
- U. XJT (R05) - Preventive Maintenance Mean Time Between Inspection Table. Establishes the criteria by which the preventive maintenance inspection schedule is prepared.

ATTACHMENT III-1 (continued)

- V. XJY (R10) - Local Recurring Maintenance Factor Table. Provides the criteria required for the automatic calculation of the Budget and Target year recurring maintenance dollar requirements.
- W. XJZ (R11) - Base Data and Analysis Table. Establishes data for the automatic computation of secondary performance factors and for Command Analysis/Tech Data review information for reports to higher headquarters.
- X. XJ3 (R12) - Installation Table. Provides a source for retrieval of several installation level data elements required by Assets and RPMA programming.

NOTE 1: Several other uniques currently exist in the IFS but are not in the purview of the installation and are not discussed. These are the XJ2 (R02), XJS (R04), XJU, R07, R08, & XJ4 computer control tables.

ATTACHMENT III-1 (continued)

Functional Area. Director/Deputy Director/ERMD/MESB/Budget

Reference. IFS Users Manual Volume IIIB Chapter Five (5)

Skill Required. Understanding of How IFS Allocates Labor Costs from K9200 Suspense Account to "STANFIN" AMS Accounts

Summary. Under IFS the salaries of all DEH civilian personnel, except firefighters, are initially charged to the .K9200 account. This includes personnel accounted for under the .P2000 and .N9000 accounts. IFS then spreads the costs to AMS accounts as follows:

1. Labor rate per hour FR1 (XFU) unique table X hours reported on L&E Cards = \$ Amount (Base Rate)
2. Proper Element of Expense is obtained from matching the labor entry code from the XFU to the XJ4 unique table.
3. Overtime is limited by input to the XFX (FUI) table for GS employees. Environmental and hazardous duty pay is based upon the WB10 Step 2 rate via the XFX (FUI) transaction.

Evaluation Procedures. Was the residual remaining in the .K9200 account greater than plus or minus five percent of last quarter? If it was, MESB/Budget are not following correct operating procedures. The following items should be checked:

1. Does the F&AO civilian payroll have an accurate list of all FE employees?
 - Compare the current "Shop File Report" with the "STARCIPS" interface employee APC listing
2. Are all employees in the .K9200 account submitting L&E cards?
3. Is budget accounting for civilian awards, terminal leave, TDY, etc.
4. Is there a backlog of L&E cards awaiting processing?
5. Monitor the miscellaneous obligation document (MOD) procedures in "STANFINS".
 - Are MODS being reversed out of the .K9200 account?
6. Are base pay rates correct?
7. Check benefit percent figure - should be approximately the same as the sum of the benefit percent figures contained in the F05 (XJE) unique file. Are they correct?

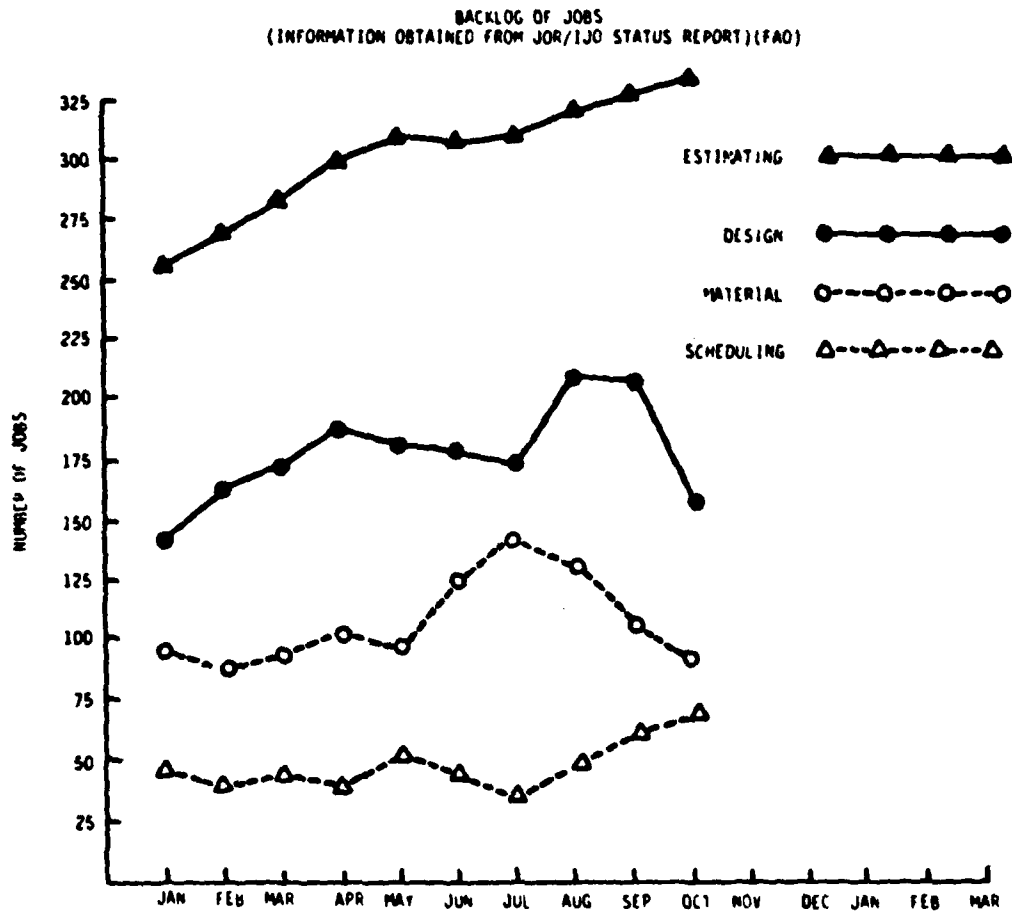
ATTACHMENT III-1 (continued)

8. Is there a backlog of rejected L&E transactions?

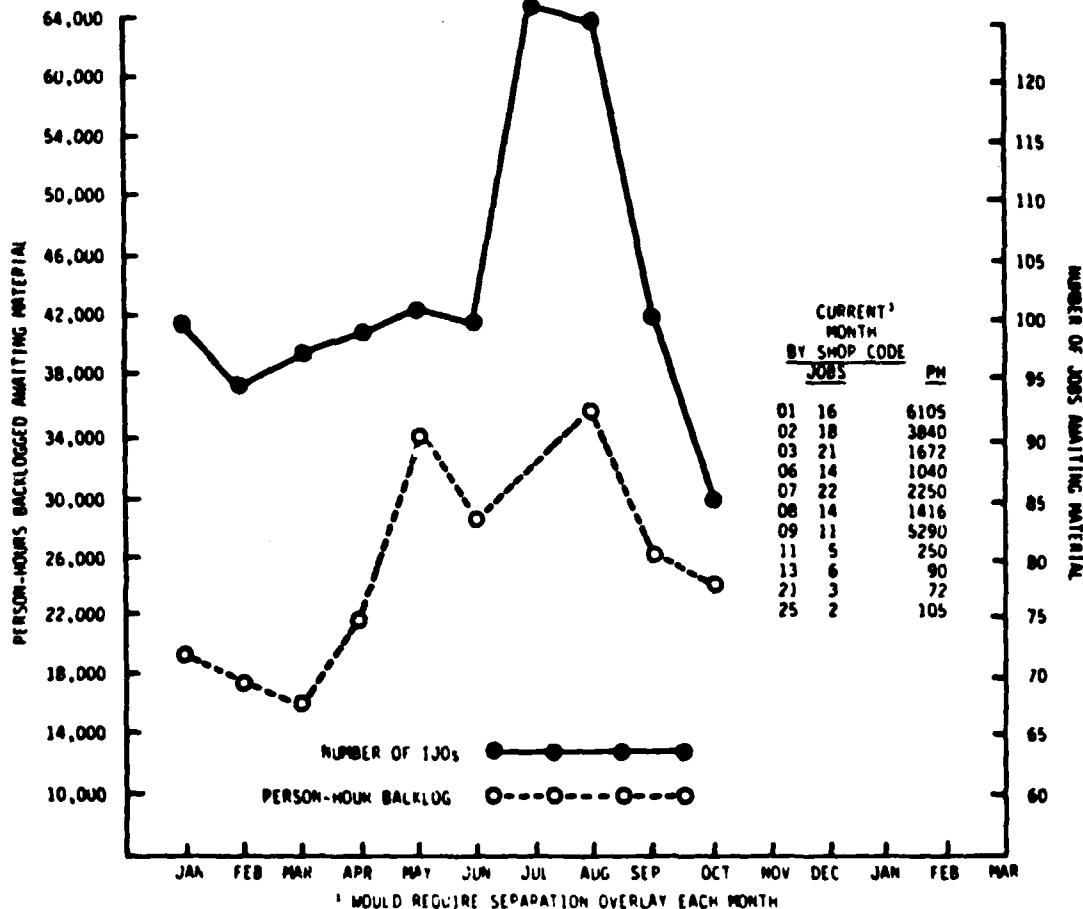
9. Are the STANFINS interface tapes created by IFS (A40AKB) systematically and expeditiously entered into STANFINS?

NOTE: A formal procedure should exist to insure the correct processing of all interface tapes. Failure to process one, or a mistake in the handling of tapes (e.g., processing the same one twice) will have a drastic impact on not only the .K9200 residual, but the IFS distribution of costs as well.

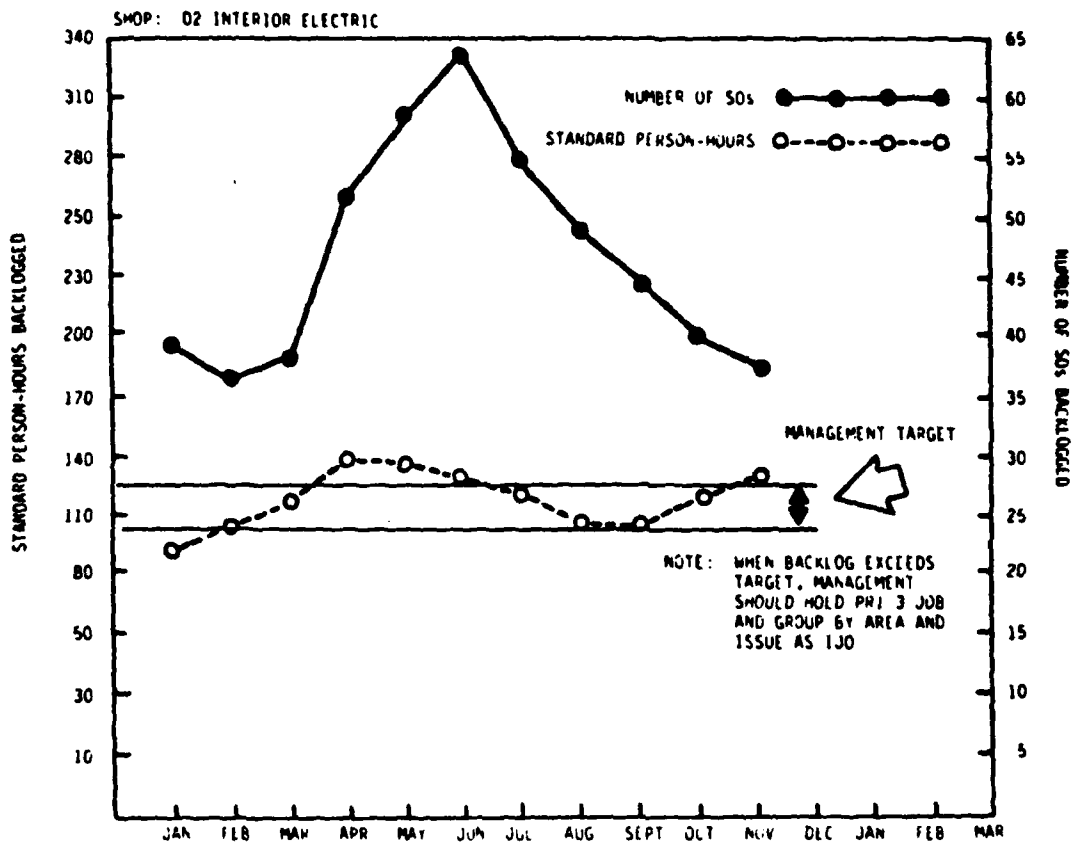
EXHIBIT A-1



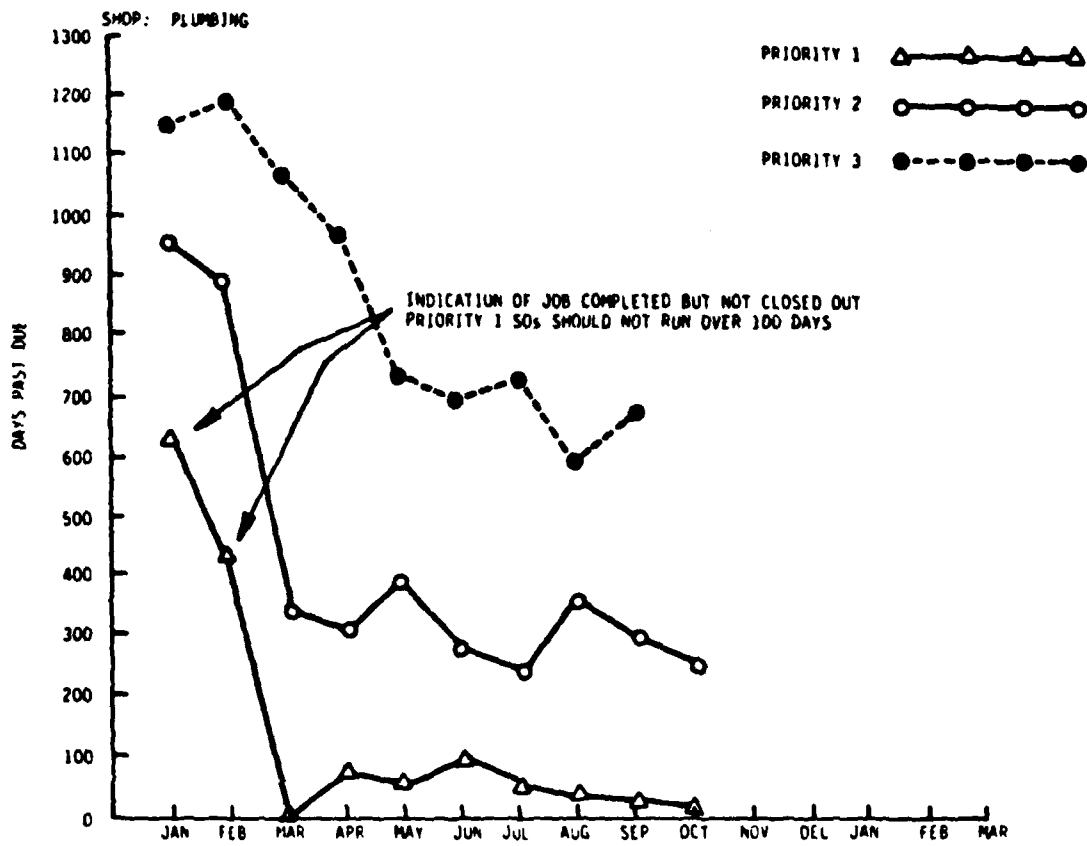
ANALYSIS OF JOBS AWAITING MATERIAL
(INFORMATION OBTAINED FROM IJOs AWAITING MATERIAL REPORT) (FBO)



STATUS OF SERVICE ORDER BACKLOG
 INFORMATION OBTAINED FROM SERVICE ORDER BACKLOG REPORT (FJO)



STATUS OF SERVICE ORDER BACKLOG
 DAYS PAST DUE
 (INFORMATION OBTAINED FROM SO BACKLOG REPORT)(FJO)



SHOP STOCK COST PER HOUR
(INFORMATION OBTAINED FROM SHOP PERFORMANCE REPORT SOs AND PM) (FRD)

SHOP: INTERIOR ELECTRIC

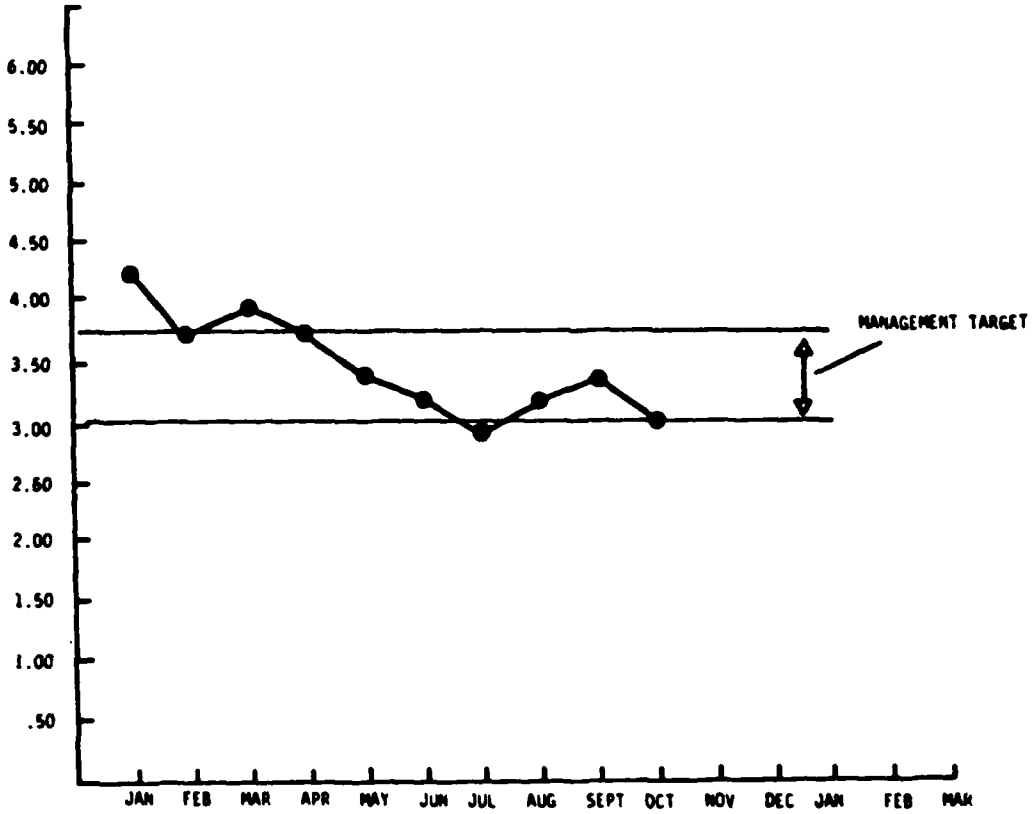


EXHIBIT A-6

PERCENT EFFECTIVE
INTERIOR ELECTRIC SHOP
(INFORMATION OBTAINED FROM SHOP PERFORMANCE REPORT SOs AND PM) (FKO)

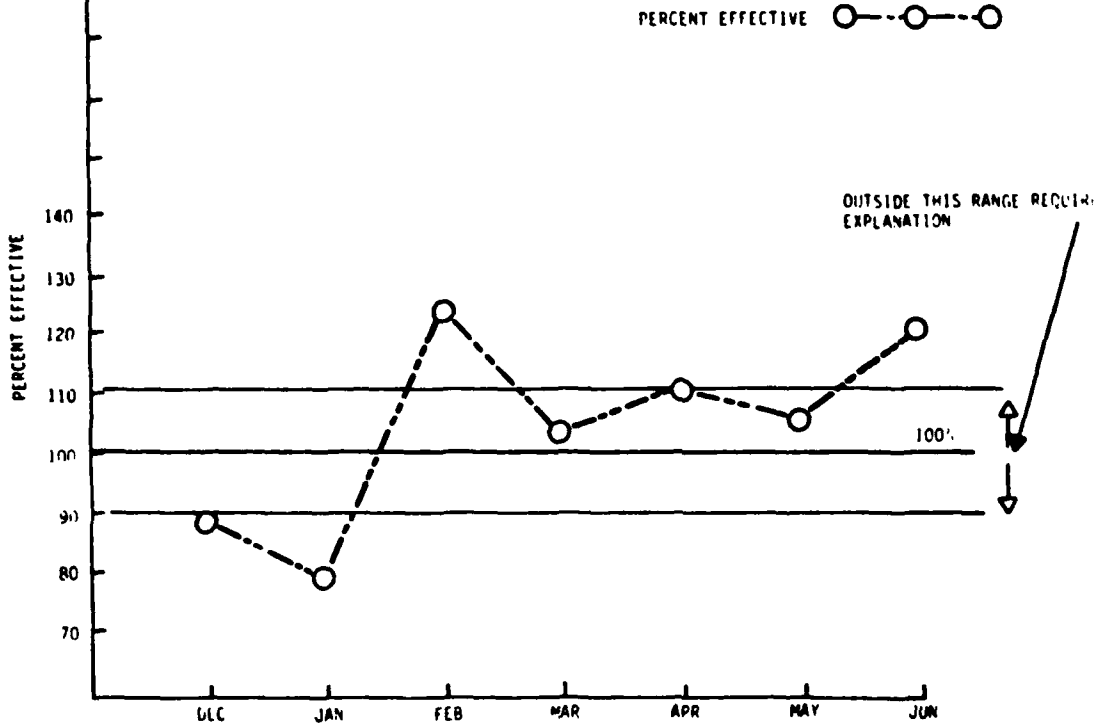


EXHIBIT A-7

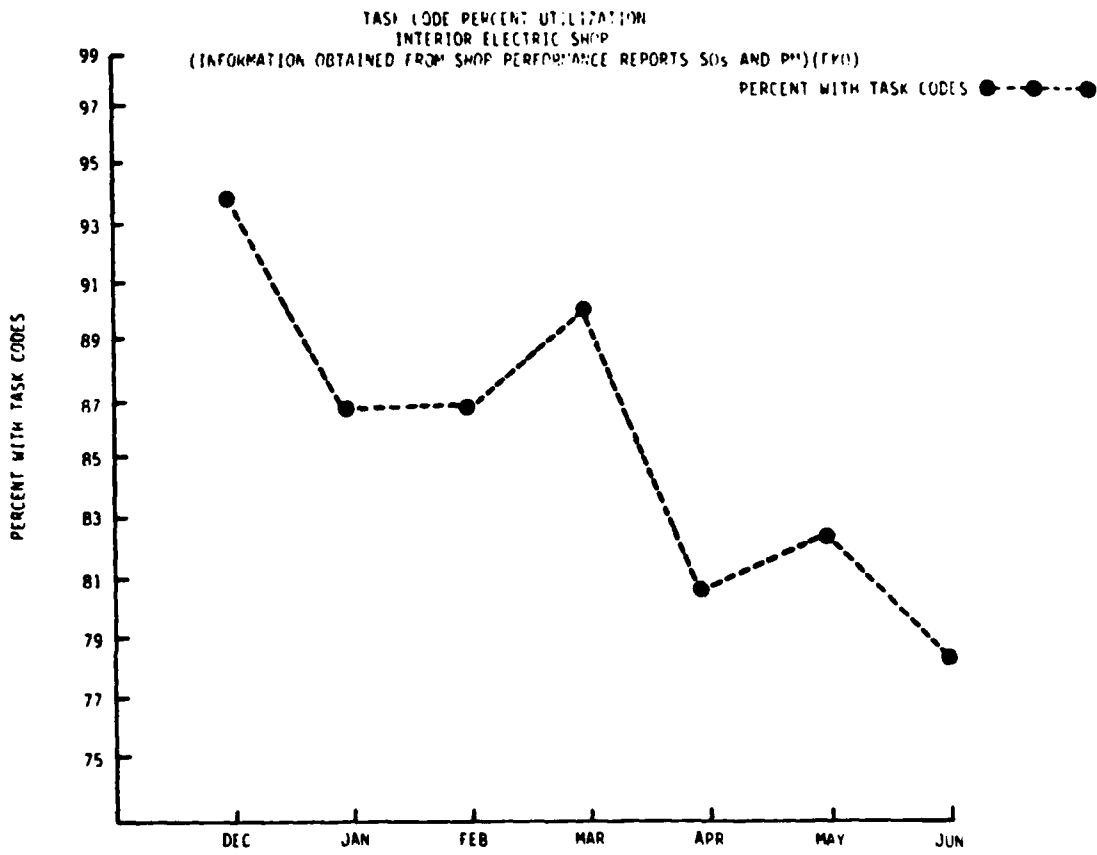
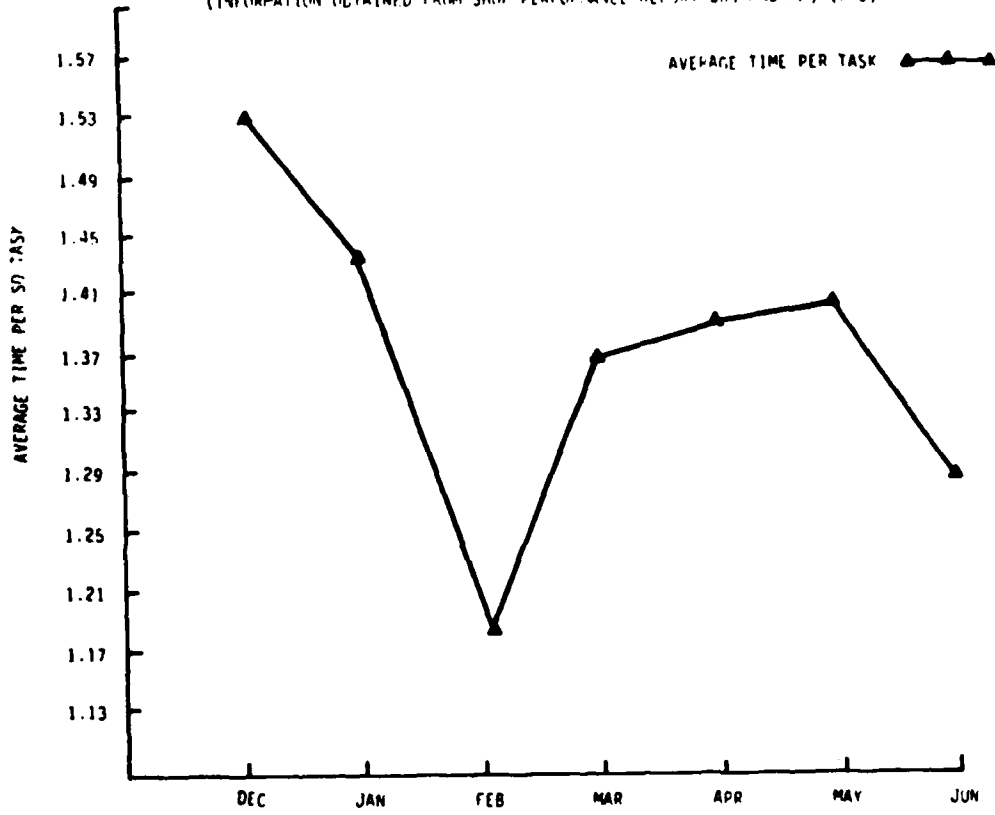
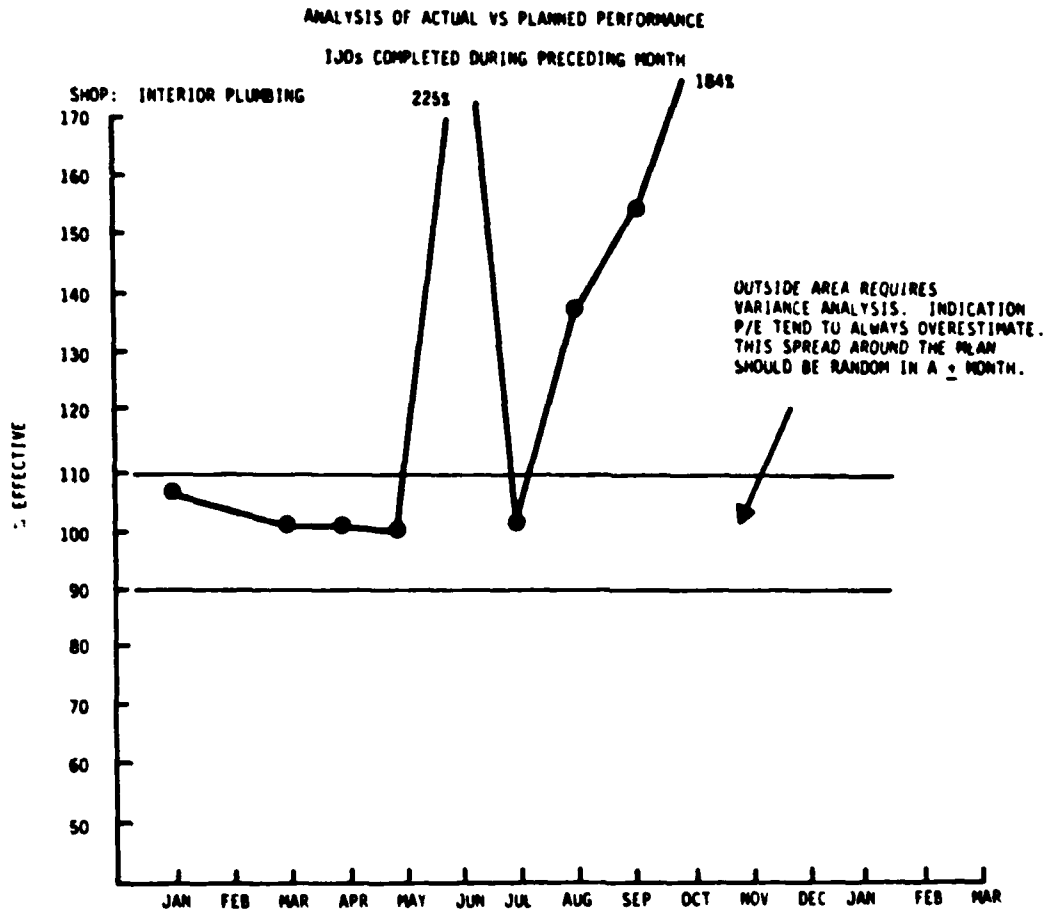


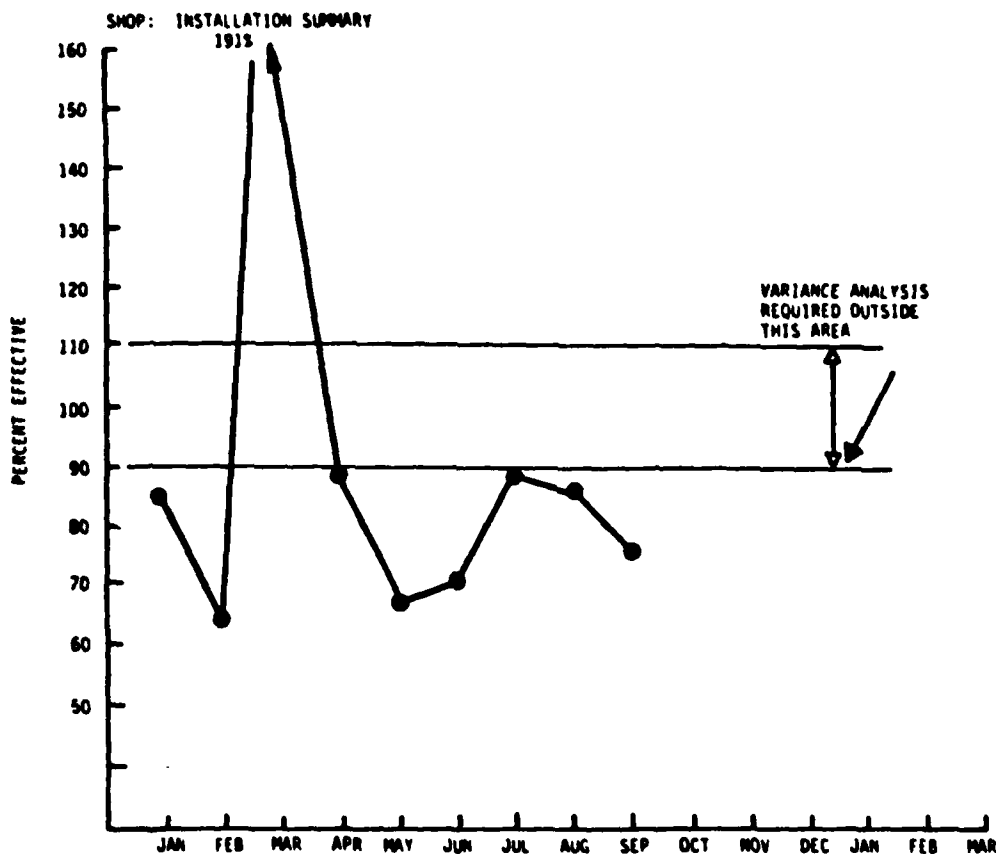
EXHIBIT A-8

AVERAGE TIME PER TASK
INTERIOR ELECTRIC SHOP
(INFORMATION OBTAINED FROM SHIP PERFORMANCE REPORT SIX AND PM) (FKO)



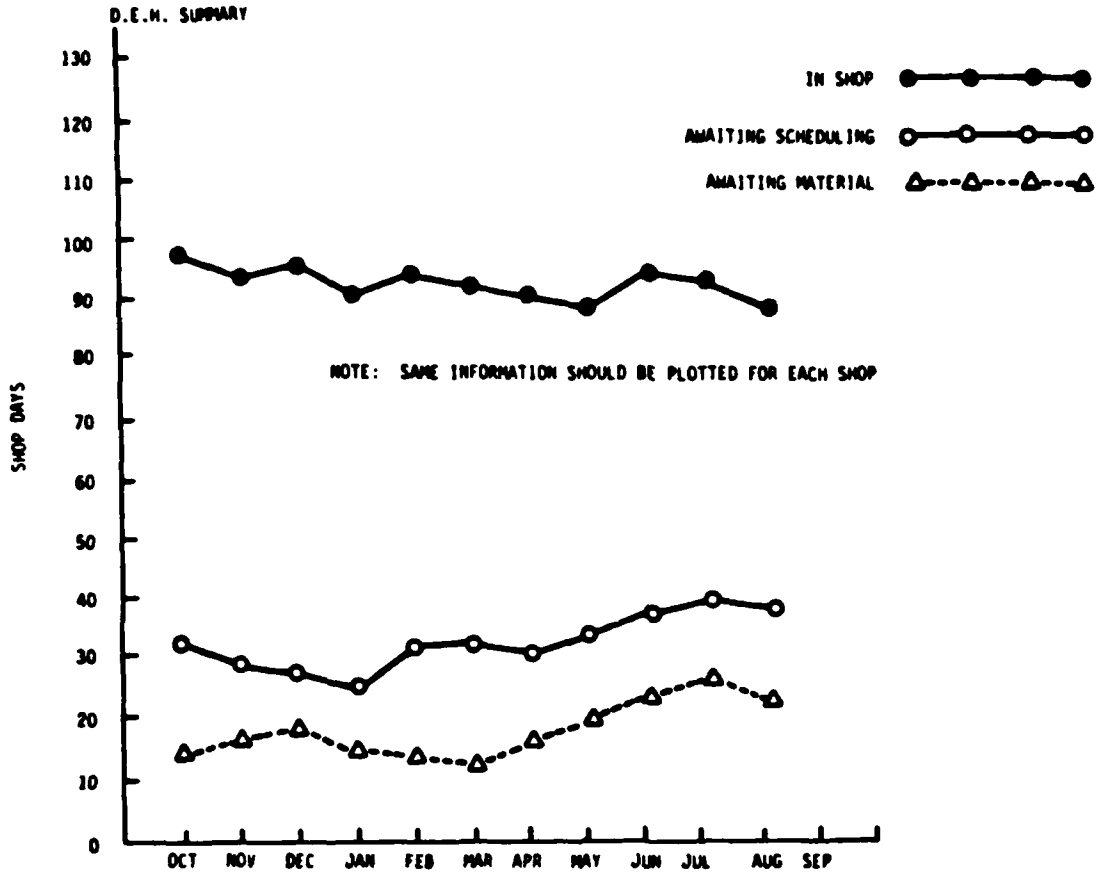


ANALYSIS OF ACTUAL VS PLANNED PERFORMANCE
IJOs COMPLETED DURING PRECEDING MONTH
(INFORMATION OBTAINED FROM SHOP PERFORMANCE ON COMPLETED IJOs) (FLO)

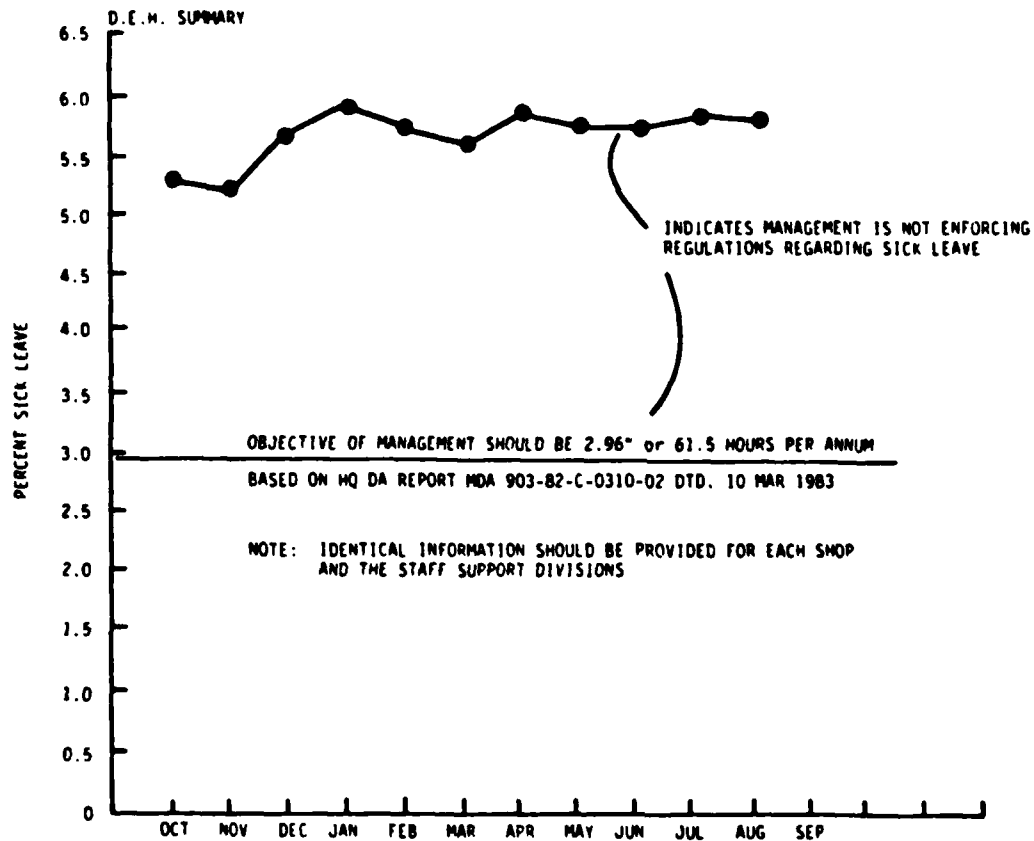


ANALYSIS OF SHOP BACKLOG AND WORKFORCE DISTRIBUTION REPORT (FNO)

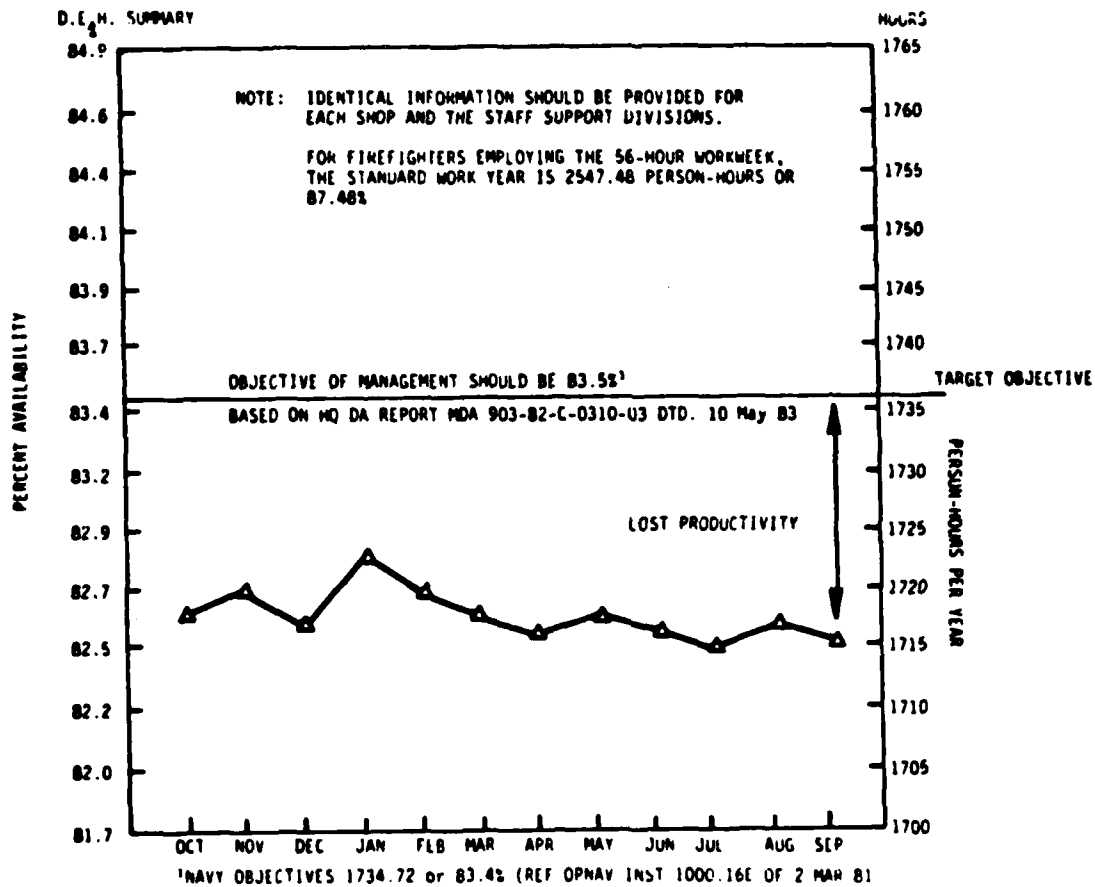
BACKLOG OF INDIVIDUAL JOBS



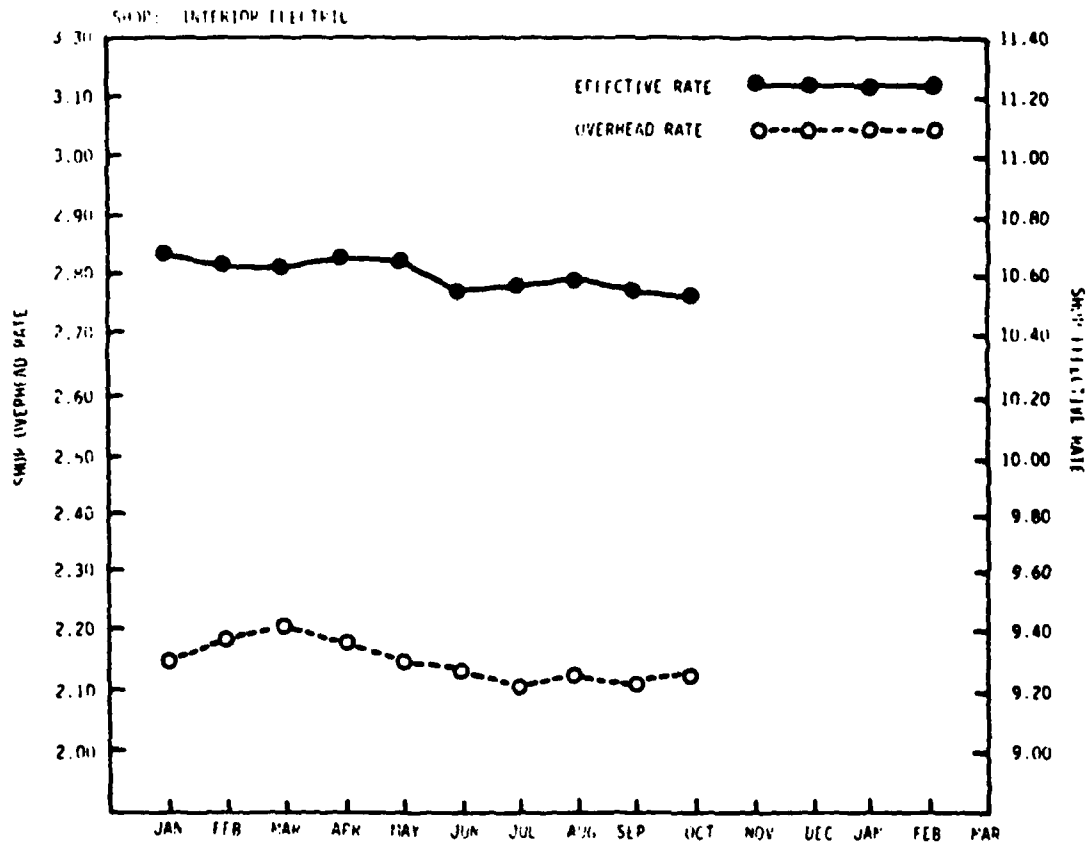
PERCENT SICK LEAVE
ANALYSIS OF BALKLOG AND WORKFORCE DISTRIBUTION (FMO)
DATA IS ACCUMULATIVE FOR FY TO DATE

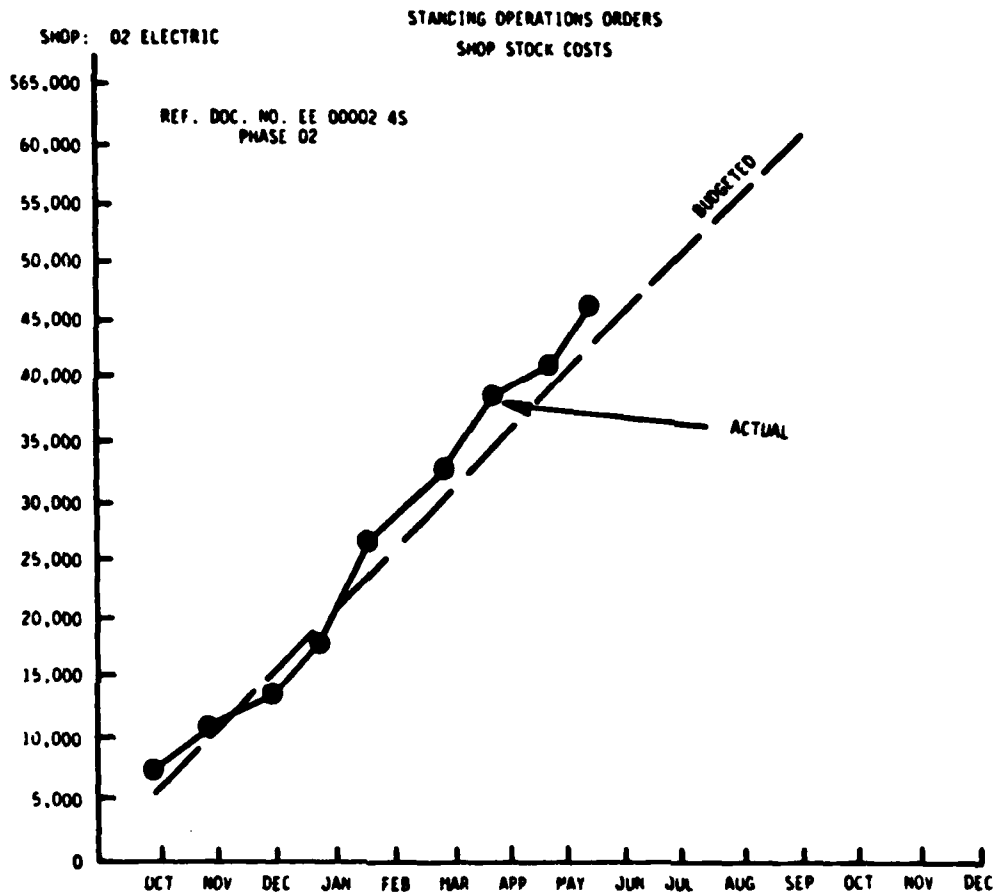


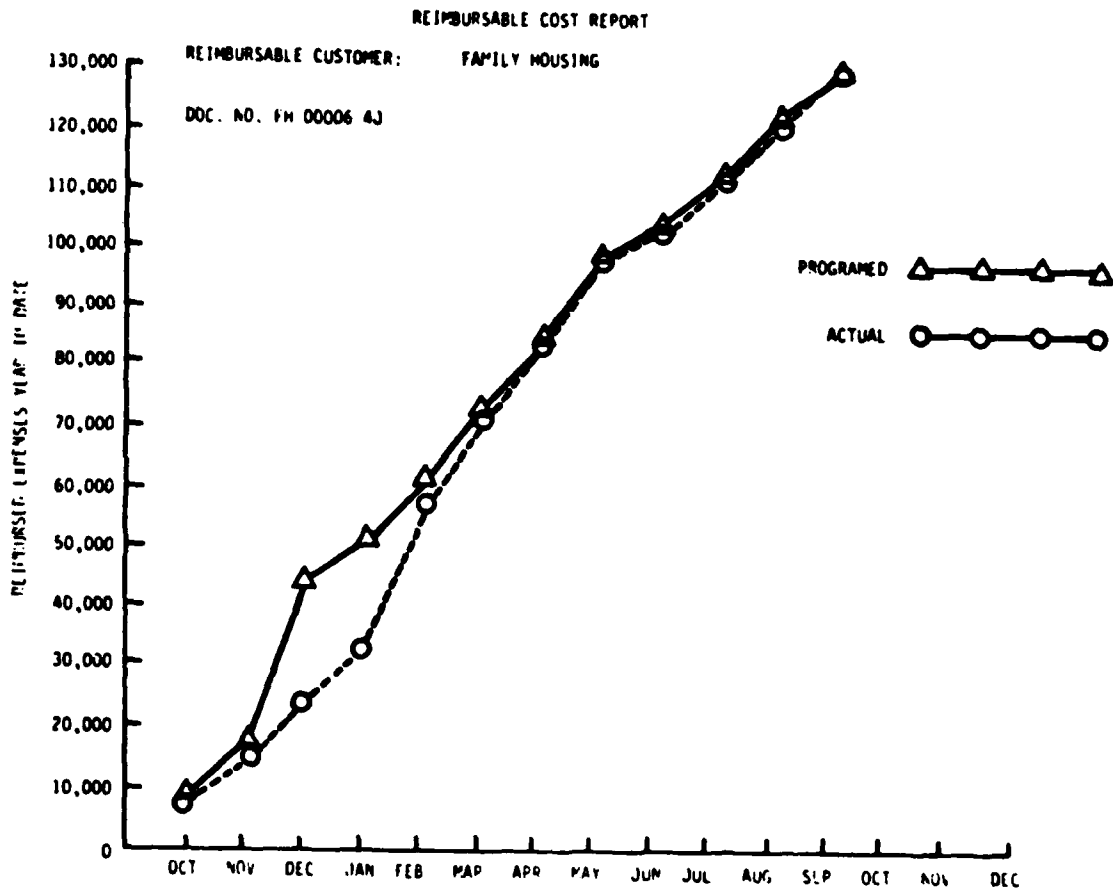
ANALYSIS OF BACKLOG AND WORKFORCE DISTRIBUTION REPORT (FNO)
WORK FORCE AVAILABILITY



SHIP COSTS PER HOUR
ANALYSIS OF SHIP TIME REPORT







ATTACHMENT III-2

STANDARD OPERATING PROCEDURE
(TYPICAL)
SERVICE ORDER CLERK'S RESPONSIBILITIES UNDER IFS

The purpose of this Standard Operating Procedure (SOP) is to outline the responsibilities of the Service Order Clerk in receiving and issuing Service Orders. This SOP is typical and is written in two parts; (1) for FE Organizations utilizing IFDEP terminals for IFS data entry; and (2) for FE Organizations which do not utilize IFDEP for IFS data entry.

1. With FE Organizations utilizing IFDEP terminals, the Service Order Clerk will:

a. Receive Service Order Requests (telephonic, by two-way radio, verbal or written).

b. Analyze the requested work for validity, priority and craft shop required.

c. Prepare the Service Order by researching and assigning the proper task code, and enter the data in the IFDEP terminal. "Print" the Service Order in single copy and forward it to the appropriate shop. (The Service Order will be immediately available in the Service Order Register, thereby eliminating the need for a second copy.)

d. For Emergency Service Order Requests, notify the applicable shop's emergency vehicle by radio immediately after receiving the request. Be sure that the document number is maintained in proper numerical sequence for emergencies along with the routine Service Orders. (A Service Order need not be prepared for emergencies unless needed for backup. However, if an emergency request is responded to by a

ATTACHMENT III-2 (continued)

shop via radio dispatch, an "R" will be entered in Column 30 on the worker's L&E Card (type code) and, in this case, the Service Order will not be entered into IFDEP for IFS).

e. If the Fire Department or some other shop is designated to receive emergency calls after regular duty hours or weekends, the SO clerk should assign a block of serial numbers to be used on all requests received for each day or period of time covered. Calls received during non-duty hours should be for emergency work only and the requestor should be so advised. Routine requests should be called back on the next regular duty shift.

f. Verify the accuracy of the SO Backlog Report weekly by:

(1) Receiving a copy of the SO Backlog Report weekly from each shop on a designated day. The report shall be annotated by the shop foreman.

(2) For those Service Orders annotated as completed, key in the FMI completion transaction, initial the Backlog Report to indicate that the appropriate entries have been made, and return the Report to the appropriate shop.

2. Within FE Organizations not utilizing IFDEP terminals for IFS entry, the Service Order Clerk will:

a. Receive Service Order Requests (telephonic, by two-way radio, verbal or written).

b. Analyze the requested work for validity, priority, and craft shop required.

c. Prepare the Service Order, DA Form 4287, in two copies.

ATTACHMENT III-2 (continued)

d. Forward the original copy of the Service Order to the applicable shop, and send the second copy to keypunch for entry into the IFS. When it is returned, use it as a suspense copy. (The SO should be returned from keypunch immediately after being entered if it is to be of value in checking for duplicate requests which sometimes are made the same day.)

e. For Emergency Service Order Requests, notify the applicable shop emergency vehicle by radio immediately after receiving the request. Be sure that the document number is maintained in proper numerical sequence for emergencies along with the routine Service Orders. (A Service Order need not be prepared for emergencies unless needed for backup. However, if an emergency request is responded to by a shop via radio dispatch, an "R" will be entered in Column 30 on the worker's L&E Card (type code) and, in this case, the Service Order will not be submitted to keypunch).

f. If the Fire Department or some other shop is designated to receive emergency calls after regular duty hours or weekends, the SO clerk should assign a block of serial numbers to be used on all requests received for each day or period of time covered. Calls received during non-duty hours should be for emergency work only and the requestor should be so advised. Routine requests should be called back on the next regular duty shift.

g. After receiving the completed SO from the shop, pull the duplicate SO from the suspense file and destroy it; file the completed copy received from the shop in a completed file in numerical sequence by shop.

ATTACHMENT III-2 (continued)

h. Verify the accuracy of the Service Order Backlog Report by:

(1) Receiving a copy of the SO Backlog Report weekly from each shop on a designated day. The report shall be annotated by the shop foreman.

(2) For those Service Orders annotated as completed, verify the list by checking the shop's completed file. Notify keypunch to enter the FMI completion transaction for all that are verified completed, initial the Backlog Report to indicate that the appropriate entries have been made, and return the report to the appropriate shop.

i. Once the SO Backlog Report is being accurately maintained, there should be no need for a copy of the SO to be maintained in the SO clerk's suspense files (with the exception of #1 priority).

ATTACHMENT III-2 (continued)

STANDARD OPERATING PROCEDURE
(TYPICAL)
WORK RECEPTION'S RESPONSIBILITY UNDER IFS
(WORK REQUEST/WORK ORDER)

The purpose of this Standard Operating Procedure (SOP) is to outline the responsibilities of Work Reception with regard to Work Request/Work Order processing under IFS. Any reference to IFS data entry is meant to be either a manual entry via the IFDEP terminal or forwarding documentation to keypunch, depending upon local FE Organizational policy. The Work Receptionist will perform the following functions:

1. Receive the Work Request, DA Form 4283, from the customer (the customer may or may not be from the FE Organization) and check to see that all customer required data fields have been completed (XFA transaction columns 5-12 and 14-28, and the Job Description and Justification blocks).

2. Verify the document number with the current JOR/IJO Status Report (FAO) to insure that the serial number is not duplicated, and pencil update the current FAO Report with the new Work Request data.

3. Complete the XFA columns 4, 13 and 39-65 on the Work Request and enter the XFA transaction into IFS.

4. Forward the original copy of the Work Request to the designated Work Order approval authority within ERMD, and place a copy of the request in the Master File until the original is returned from the approving official.

5. Receive the original copy of the request from the approving official and:

ATTACHMENT III-2 (continued)

a. If the request is being forwarded for higher approval authority, annotate the Master File copy with the forwarding data and forward the request, or

b. If the Chief ERMD has the approval authority, the approval/disapproval action may already have been completed. Annotate the Master File copy with the approval data and the "Forwarded to Design" or "Forwarded to Estimator" dates, enter the approval in IFS (XFC column 14), and route the request to the appropriate function, or

c. If the Request is disapproved or converted to a Service Order, return a copy to the customer with a brief explanation, and enter the disapproval in IFS (XFC Column 14).

6. For work that has been approved and estimated, receive the Work Request and completed Work Order, DA Form 4284, from the Estimator. Edit for document number, facility number, date, etc., duplicate sufficient copies of the Work Order to distribute to all shops involved, and enter the "Forwarded To" Design, Material Coordinator, or Scheduler date, as appropriate, into IFS. Place the original copy of the Work Request and the Work Order in the Master File after annotating the "Forwarded To" date on the Master File copy.

7. Maintain a Master File of all Work Requests and Work Orders by document number. The Master File copy will be updated each time any data element or transaction is prepared by any function in the FE Organization. The documents will be routed through Work Reception before going to another function, including keypunch, so that the Master File copy can be updated with the most current information and status. This file will provide an audit trail for corrections to input documents processed against any specific document number.

ATTACHMENT III-2 (continued)

8. Check the transactions prepared by all functions for correct document number, facility number and transaction date. The Work Receptionist will insure that the input document data is entered manually on the current FAO Report and the data is entered into IFS. This procedure will insure that Work Reception has the latest status of all JORs and IJOs and, when duplicate or conflicting changes are submitted by other offices, the Work Receptionist can easily detect and resolve the problem prior to IFS entry.

9. Receive two copies of the JOR/IJO Status Report (FAO) and one copy of the Facility Reference Report (FWO).

10. Separate one copy of the JOR/IJO Status Report by Requestor ID and distribute it to all installation requestors. Each Requestor will receive only their portion of the FAO Report.

11. Keep the latest copy of the FAO and FWO Reports within easy reach for reference and manual update. These weekly reports should be kept for a minimum of 90 days to maintain an audit trail and correction record.

12. Provide real-time status on all JORs and IJOs to all FE and installation requestor personnel with the aid of the annotated JOR/IJO Status Report (FAO) and Facility Reference Report (FWO).

ATTACHMENT III-2 (continued)

24 hours in length and/or \$350.00 in cost. Specific instructions for completing the DA Form 4284 are contained in the IFS User's Manual.

6. Forward the completed DA Form 4284 with the original copy of the Work Request, Bill of Materials, and other backup data except job phase calculation sheets, to the Work Receptionist.

7. If additional hours or material are requested after a job has started, consult the EPS Manuals or visit the job site to verify the need. If the estimate does change, forward a copy of the DA Form 4284 to Work Receptionist for the change to be entered into IFS.

ATTACHMENT III-2 (continued)

STANDARD OPERATING PROCEDURE
(TYPICAL)
PLANNER/ESTIMATOR'S RESPONSIBILITIES UNDER IFS
(WORK REQUEST/WORK ORDER)

The purpose of this Standard Operating Procedure is to outline the responsibilities of the Planner/Estimator for processing the Work Request/Work Order under IFS. For processing the Work Request/Work Order, the Planner/Estimator will perform the following functions:

1. Receive a copy of the Work Request, DA Form 4283, from the designated ERMD JOR/IJO approval authority when there is a requirement for a preliminary cost estimate upon which approval action will be based.

2. Make a preliminary cost (desk) estimate using Engineered Performance Standards (EPS) as necessary, and annotate the data on the DA Form 4283 in the "Estimated Cost" block.

3. Return the Work Request to the designated approval authority for approval action. (The approving official will route the approved DA Form 4283 back to the Estimator, via the Work Receptionist, for a detailed estimate.)

4. Receive the original copy of the approved Work Request from Work Reception and check to determine that all necessary data is entered on the document.

5. Prepare one copy of the Work Order, DA Form 4284, by completing the XFD and XFE transactions. Complete the XFE transaction for job phase, shop and skill code and labor, material, and equipment following guidance contained in the EPS manuals. Prepare a Bill of Materials, DA Form 2702, and other backup data as necessary. Visit the job site to determine the most accurate estimate when the job is expected to exceed

ATTACHMENT III-2 (continued)

STANDARD OPERATING PROCEDURE

(TYPICAL)

FOR QUALITY CONTROL

1. The purpose of this Standard Operating Procedure (SOP) is to identify and define the requirement for establishing and maintaining quality control procedures under IFS. While the function is best accomplished when performed by one individual, the Quality Control Clerk, decentralization of error correction procedures is an acceptable alternative. Although the quality control position is not officially recognized, it can be staffed by establishing one of the authorized keypunch spaces as a Lead Data Transcriber/Quality Control Clerk. This SOP is written around centralized quality control and error correction procedures and can be modified in accordance with local FE Organizational policy.

2. The Quality Control Clerk will perform the following functions:

a. Receive, visually edit, make any obvious corrections and forward to keypunch all input source documents. Documents missing essential data should be returned to the originator for correction, and then resubmitted. The input transactions will be visually edited in the following priority.

(1) Assets Accounting (AA) input transactions which establish a facility record on file and are required to edit FEMS work documents for maintenance and repair (K work) and alterations (L work). The following are essential data elements:

(a) Facility Number/Suffix

(b) Functional Group Code

ATTACHMENT III-2 (continued)

- (c) User Code
- (d) Facility Class and Construction Category Code (F4C)
- (e) Activation Status Code
- (f) Complex Code (Family Housing Facilities and Utilities only).

(2) Work authorizing transactions - XFA, XFB, XFC, and XFD inputs which request, approve and establish both in-house and contract work against which all labor and material costs are captured.

(3) Labor and Equipment Transaction - FM1/2 inputs to capture/backout labor cost and equipment usage.

(4) Supply Transactions - FP3/FP4 or AM1/D6A inputs to record issues, turn-ins and material cost corrections.

(5) Real Property Maintenance Activity (RPMA) input transactions which capture other costs, not input via FEMS, and input transactions which update the Inspection Results File.

b. Receive and separate output listings from AMO for distribution to the appropriate FE office or section, and outside agencies. The original copy of each listing will always be retained by the Quality Control Clerk as the history or library copy.

c. Maintain a copy of the following listings to be used in correcting errors:

- (1) Daily Listings
 - (a) Unidentifiable Transactions (AKB-029)
 - (b) Input Transactions this Cycle (AKB-030)
 - (c) Transaction Audit (AKB-031)
 - (d) Uniques Table (FRT)

ATTACHMENT III-2 (continued)

- (e) Uniques Exception List (FRE)
- (f) Uniques Deletion List (FRD)
- (g) Task Code Exception List (FRT)
- (h) FEMS Daily Error List (EFO)
- (i) Assets Error List (AEX)
when inputs are made to the daily cycle
- (j) IFDEP Error List

(2) Weekly Listing - there are no weekly error lists as such except when a daily and weekly cycle are run in sequence.

(3) Monthly Listings

- (a) Assets Error List (AEX)
when inputs are made to the monthly cycle
- (b) Deficiency List Discrepancies (RDE)
- (c) Other Cost Error List (REC)
- (d) Equipment Error List (REE)
- (e) Invalid Finance Transactions (REF)
- (f) Invalid Functional Group Master (REM)
- (g) Invalid Work Package Transactions (REO)
- (h) Inspection Results Error List (RIE)

d. Maintain a copy of the Input Transactions this Cycle (AKB-030) in the library since this list provides the input card image, the audit record for each cost type transaction entered into IFS.

e. Annotate a copy of both the FEMS and RPMA Uniques Tables and Deletion Lists to show the reason for any changes, and retain these in the library to provide an audit trail for all changes to the Uniques Tables.

ATTACHMENT III-2 (continued)

3. Detailed input preparation instructions, keypunch instructions and error correction procedures are included in each of the IFS User's Manuals. Errors should be corrected in the following sequence.

a. Assets Accounting

(1) Missing data required to validate FEMS Work documents (paragraph 2.a.(1) above refers)

(2) Other missing Assets Data

b. Work Authorizing Documents

(1) Work Request Transaction (XFA, XFB, XFC inputs)

(2) Work Order Transaction (XFD, XFE, XFF/XFO inputs)

(3) Service Order Transaction (XFN, XFP inputs)

(4) Engineer Design Estimate Transaction (XFG, XFH, XFJ inputs)

(5) Contract Data Transaction (FHI input)

c. Cost Inputs

(1) Labor and Equipment Transaction (FM1/2 inputs)

(2) Supply Transactions (ZM1/D6A or FP3/4 inputs for SAILS or BASOPS supply)

(3) Contract Data Transaction (FJ1/2 inputs)

d. Uniques inputs and File Maintenance Transactions (F02-F12, R01-R12, FR1-FW1).

4. The previous paragraphs provided a priority sequence for visually editing inputs and correcting the daily error list. However, the need for prompt (daily) correction of all errors appearing on the Error List (EFO Report) cannot be overemphasized since they effect the accurate accumulation of job costs, the useability of the cost reports

ATTACHMENT III-2 (continued)

and the credibility of IFS. Daily error corrections shall be made as follows:

a. Obtain a copy of the following listings to be used in making error corrections:

- (1) FEMS Daily Error List (EFO)
- (2) Unidentifiable Transactions (AKB-029)
- (3) Transaction Audit (AKB-031)

b. Following the sequence outlined in paragraph 3 above, correct the errors as follows:

(1) If the keypunch cards are returned from MIS0 sorted in transaction sequence, the erroneous transaction (card) can be pulled, the correction made directly on the card and then the card resubmitted to keypunch for entering and input to MIS0 with the next daily cycle. This technique works best when the input volume is low and there are few errors.

(2) If no keypunch cards are returned from MIS0, then the errors must be corrected using a new input source document. (To reduce the number of pieces of paper, it is recommended that the installation make up multiple-lined correction sheets for each transaction. This way, corrections for a single type of transaction can go on one sheet of paper).

c. The following reports can be used to verify error messages such as missing data, missing facility number, etc.

(1) IJO/JOR Status Report (FAO) can be checked to determine:

- (a) If a job request for an IJO or S00 is in the system

ATTACHMENT III-2 (continued)

(b) If a job was approved/disapproved

(c) The job status

(2) Facility Reference Report (FWO) can be checked to determine that the:

(a) Service Order is in the system

(b) Service Order is either active or completed

(3) Master Schedule of IJOs (FEO) can be used to determine:

(a) All jobs awaiting scheduling

(b) The number of phases for any job

(c) The jobs released to the shop

(4) Space Utilization Report (AJ0 or AK0) can be used to determine:

(a) The correct user of a facility/building

(b) The building/facility is on file

(5) Facility Description Report (AGO/AGO-1) can be used to determine the data essential to process a Work Order through FEMS. See paragraph 2.a.(1) for a list of the data elements.

ATTACHMENT III-2 (continued)

STANDARD OPERATING PROCEDURE
(TYPICAL)
MATERIAL COORDINATOR'S RESPONSIBILITIES UNDER IFS

1. The Material Coordinator receives the IJOs Awaiting Material Report (FBO) weekly. This report lists all Work Orders (jobs) which require materials before the jobs can be scheduled and worked on. The data fields on the FBO report are Work Order number, shop code, description, date sent to the Material Coordinator, number of hours estimated to accomplish the work, and the number of days the Work Order has been at the Material Coordinator's desk. All Work Orders will appear on this report from the week they are forwarded to the Material Coordinator until the week they are sent to the Scheduler. The Material Coordinator shall:

a. Compare the FBO with the Facilities Engineering Work Orders, physically located at his desk.

b. Correct identified deficiencies as follows:

(1) If the Work Order does not appear on the FBO but is actually located at the Material Coordinator's desk, prepare a Facilities Engineering Work Order (XFD) transaction by filling in card columns 5-13 (document number) and card columns 28-31 (date to Material Coordinator).

(2) If the Work Order is on the FBO but the Material Coordinator has forwarded it to the Scheduler, prepare an XFD transaction by filling in card columns 5-13 and card columns 32-35 (date to Scheduler).

(3) If the Work Order is on the FBO but has not been received by the Material Coordinator, he should check to see if he should actually have the document. IF the answer is no, prepare an XFD

ATTACHMENT III-2 (continued)

transaction by filling in card columns 5-13 and by placing an asterisk (*) in card column 28. This will cause the "Date to Material Coordinator" entry to be deleted.

c. Use the "Remarks" field of the XFD to enter the expected delivery date of materials, GSA delivery number, local purchase invoice number, and/or any other information that will make the status of the Work Order more comprehensive.

d. Forward the XFDs prepared to correct identified deficiencies to the Work Receptionist for IFS input so that the necessary corrections can be made to the FAO.

2. Actually writing a change in the appropriate input form and sending it to be keypunched is the best way to update the output reports. All personnel who work with Facility Engineering Work Orders must send an XFD input to keypunch so that the system will have continuous up-to-date information on the status of jobs in the files.

ATTACHMENT III-2 (continued)

STANDARD OPERATING PROCEDURE
(TYPICAL)
SCHEDULER UNDER IFS
MASTER SCHEDULE OF IJO (FEO) AND SHOP SCHEDULE REPORT (FFO)

1. General

a. The Master Schedule of IJOs (FEO) is printed weekly and a copy is provided to the Scheduler. The report has two parts, the first part being Jobs Awaiting Release to Shops. The second part is identical except that the Jobs Released to Shops part has two more columns of information under labor hours: ACT (actual labor hours expended) and REM (estimated labor hours remaining for completion). Jobs (Work Orders) are listed in document number sequence by Requestor ID and then serial number. Each Work Order is printed in phase sequence showing the skills involved for each shop, the estimated labor hours for each phase and the established priority for each Work Order. All actual labor hours reported on the L&E Cards against a Work Order (document number) are accumulated and printed in the ACT (actual) column under the Labor Hours heading. The remaining labor hours for each phase are printed in the REM column under labor hours. The REM column will contain a zero when phase completion has been indicated on an L&E Card. The report also totals the remaining labor hours for all jobs that have been released to the shops and the estimated labor hours for all jobs that are awaiting release to the shops at the end of Part I and Part II respectively.

b. The Shop Schedule Report (FFO) is printed weekly and a copy is provided to the Scheduler. This report is sequenced by shop and then in numerical document sequence. Each Work Order shows the facility number, each phase of the Work Order, the estimated labor hours for each phase

ATTACHMENT III-2 (continued)

(EST column), the actual hours expended against each phase (ACT column) and the estimated remaining labor hours for each phase (REM column). The days of the week are also listed and are used by the shop Foreman to establish new weekly shop schedules.

2. Actions required to establish the Weekly Master Schedule of IJOs and the Scheduler's portion of the Shop Schedule.

a. Use the Master Schedule prepared for the current week to generate the schedule for the next week. The actual hours shown on the schedules (FE0) and (FF0) are current as of the date the reports were generated. Compensation/adjustments must be made in the REM column to consider the work being accomplished this week (since the report was generated before work started for the scheduled period). These adjustments should be made after discussions with the shop Foremen indicate how many hours have been expended or scheduled since the date of the reports. It is imperative that the Scheduler and the shop Foremen communicate! Unless this is done, more hours will be scheduled than required to complete a job and the shop(s) will come up short of work. (See 3.d for further clarification).

b. Schedule jobs previously released to the shops and not completed. This is to insure that work currently in the shop is completed before new work is released to the shops.

c. The Master Schedule is the main report for determining the new weekly schedule since all phases of all jobs are listed. Start at Part I of the FE0, Jobs Released to Shops. For each Work Order that has labor hours listed under the REM column for a phase, write in the SCH column the number of anticipated labor hours to be devoted to that phase in the next week.

ATTACHMENT III-2 (continued)

d. Review the remaining phases to be completed (phases having remaining labor hours) as above for each Work Order. The phases must be scheduled for completion in the shops in the same sequence as listed on the Master Schedule. The total remaining labor hours for each phase should be the same on the Master Schedule and the Shop Schedule.

e. Enter manually on the Shop Schedule all the scheduled remaining labor hours for each phase. Compare the total scheduled labor hours figure with the available labor hours for the shop. The difference between the two totals is the additional labor hours that need to be scheduled for the shop. Also compare the scheduled shop skill labor hours with the available shop skill labor hours.

f. Select from the jobs listed on the second part of the FEO report (Jobs Awaiting Release to the shop), by priority, sufficient jobs to insure each shop has a full week of work.

g. Enter manually on the Master Schedule the following information for each Work Order selected from Jobs Awaiting Release to Shops: document number, job description, job priority, job phases, phase description, shop code for each phase, the estimated labor hours for each phase, and the facility number(s) for the job. If necessary, prepare this information on another work sheet.

h. Enter manually on the Shop Schedule, under the correct shop code, the following information for each phase of the newly selected Work Order(s): document number, job and phase description, facility number, phase number, and the number of labor hours scheduled for the next week.

ATTACHMENT III-2 (continued)

i. Document the last two steps with a new "to shop" date with an XFD (Facilities Engineering Work ORder) transaction for input prior to the reports (FEO and FFO) being run at MIS0.

j. Do not ever issue a job to the shops that is not listed on the Master Schedule.

3. Actions required to maintain the Master Schedule and Shop Schedule Reports.

a. Record each Work Order sent to the shop on an expedited basis manually on the Master Schedule and Shop Schedule.

b. Check Work Orders released to the shops against the JOR/IJO Status Report (FA0) to insure that the status shown on each Work Order is correct and the Work Order has an approval date listed. The following information is required: document number, facility number, job description, approval (A), dates to Design/Estimator, Material Coordinator and Scheduler, and estimated cost (which should match the total on the Work Order). If any of this data is missing or is incorrect, the appropriate individual (Work Receptionist, Estimator or Material Coordinator) should be informed. This check against the FA0 is necessary to insure that submitted L&E Cards have a valid document to which labor and equipment time may be charged.

c. For each Work Order released to the shops, submit an XFD change to the Work Receptionist for input into the IFS to update the FA0 Report.

d. Establish a procedure for the shop Foremen to submit (preferably in writing) the status of each job scheduled on the previous Shop Schedule. Data submitted should state whether the job is complete

ATTACHMENT III-2 (continued)

or will be completed in the week scheduled. If not complete, the Foremen should advise the Scheduler how many hours are available to expend against the job during the next week and how many hours have been expended during the current week.

ATTACHMENT III-2 (continued)

STANDARD OPERATING PROCEDURE
FOR
SHOP FOREMEN UNDER IFS

The purpose of this Standard Operating Procedure (SOP) is to outline the responsibilities of the Shop Foreman with respect to IFS. The Foremen will perform the following:

1. Collect an L&E Card from each craftsperson at the end of the day.
2. Review each card to insure that a minimum of 8 hours has been reported and charged against the proper labor code. All overtime is to be charged against labor code "B".
3. Review each card to insure that it is legible.
4. Check to insure that document numbers recorded on the L&E Card correspond to the document number on the SO, IJO and SOO.
5. Complete an L&E Card for each craftsperson on leave.
6. Submit all L&E Cards from the previous working day directly to keypunch by 9:00 a.m. each morning.
7. Review all IFS reports that are received, specifically the:
 - Shop Schedule Report (FFO)
 - Shop Performance on Completed IJOs (FLO). Monitor the report to check the performance rating for the shop. If "Actual" continuously exceeds the "Estimated" by 10%, periodically monitor the workers on the job to insure that their time is being spent productively.
 - Shop Performance Report on Service ORders (FKO). Check and review this report the same as the FLO Report.
 - Shop Backlog and Workforce Distribution Report (FNO). Examine the report to see where person-hours were expended. In particular, examine the distribution of work by skill code, the percentage distribution for each area, and the backlog by skill to anticipate potential manning deficiencies.

ATTACHMENT III-2 (continued)

- Service Order Backlog Report (FJO). Review the report weekly to insure that completed SOs are not listed. Annotate discrepancies and forward the annotated copy to the Service Order Clerk on the day specified (see paragraph 1.f.(1), page III-125).

SECTION IV
PRODUCTIVITY REVIEW AND ANALYSIS
OF THE
DIRECTORATE OF ENGINEERING AND HOUSING
AT
THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.
* * * ENGINEERING PLANS AND SERVICES DIVISION * * *

SECTION IV
 PRODUCTIVITY REVIEW AND ANALYSIS
 OF THE
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 THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.

* * * ENGINEERING PLANS AND SERVICES DIVISION * * *

4.1 Review of DEH Contract Workload

A. Finding of Fact

- The FY84 DEH contract workload is illustrated in Table IV-1, below.

TABLE IV-1
 FY84 DEH CONTRACT WORKLOAD

<u>Design Agency</u>	<u>No. Projects</u>	<u>U.S. Dollar Value</u>
In-House	49	\$5,854,000
A&E	54	5,680,000
Buildings & Grounds	28	281,400
Complete	(8)	(28,700)
Active	(20)	(252,700)
Custodial	4	649,800
Utilities	57	386,200
Complete	(35)	(142,100)
Active	(22)	(244,100)

- The current FY85 contract workload plan for the DEH is illustrated in Table IV-2, page IV-2.

TABLE IV-2

FY85 DEH CONTRACT WORKLOAD PLAN

<u>Design Agency</u>	<u>No. Projects</u>	<u>U.S. Dollar Value</u>
In-House	23	\$3,634,400
A&E	48	6,437,800
Buildings & Grounds	14	247,900
Custodial	4	560,500
Utilities	3	51,300
Other Agencies (Troop/Labor Service/German)	9	3,711,700
Unassigned (10/84)	93	7,187,0000

- Buildings and Grounds, and Utilities Division management personnel are tasked:
 - a. To develop specifications and drawings for projects.
 - b. To inspect projects executed in their respective divisions.
- Title I services are used for preparation of contract drawings and specifications.
- Title II services are used for construction contract inspection.
- Seventy-two projects are currently (10/84) awarded/under construction. Dollar value - \$9,200,000.
- One custodial inspector is currently on-board in the Buildings and Grounds Division. Two positions are vacant and are in CPO for recruiting.
- Construction inspection for projects other than those designed in Buildings and Grounds, and Utilities Divisions is accomplished in the Engineer Plans and Services Division (EP&S).
- Contracting Officer Representatives (CORs) are designated in:
 - a. Construction Inspection Branch - EP&S.
 - b. Buildings and Grounds Division.
 - c. Utilities Division.

- The Administrative Clerk position in Buildings and Grounds:
 - a. Is designated as Contracting Officer Representative (COR)
 - b. Prepares all contract documents and coordinates other division personnel input.
 - c. Translates all specifications.

B. Conclusions

- Buildings and Grounds, and Utilities Divisions management personnel are expending significant effort in contract preparation and inspection. Eighty-nine projects were executed in FY84 and are illustrated by type in Table IV-3, below.

TABLE IV-3

FY84 BUILDINGS AND GROUNDS/UTILITIES DIVISION CONTRACTS

<u>Type</u>	<u>B&G</u>	<u>Util</u>	<u>Total</u>
Construction	13	2	15
Service	7	4	11
Agreements	5	0	5
Custodial	4	0	4
Equipment Rental	3	1	4
Mechanical	0	25	25
Electrical	<u>0</u>	<u>25</u>	<u>25</u>
TOTAL	32	57	89

- The FY85 contract workload plan to date is illustrated in Table IV-4, page IV-4.

TABLE IV-4

FY85 BUILDINGS AND GROUNDS/UTILITIES DIVISION CONTRACTS PLAN

<u>Type</u>	<u>B&G</u>	<u>\$</u>	<u>Util</u>	<u>\$</u>	<u>Total \$</u>
Construction	14	\$247,900	3	\$51,300	\$299,200
Custodial	<u>4</u>	<u>560,500</u>	<u>-</u>	<u>-</u>	<u>\$560,500</u>
TOTAL	18	\$808,400	3	\$51,300	\$859,700

- The inspection effort of active projects shown in Table IV-1, page IV-1, and the initial workload for FY85 shown in Table IV-4 above will have a continuing impact on management supervision and coordination within and between divisions. The requirement for increased management involvement is further discussed in Section III.
- As shown in Tables IV-1 and IV-2, pages IV-1 and IV-2, the contract functions are accomplished in three divisions. Bringing these efforts under EP&S by placing the inspection responsibility under the Contracts Inspection Branch or by making a separate division for all contract inspection functions would provide for a more efficient contracting organization and would allow the Buildings and Grounds, and Utilities Division management personnel to be completely devoted to operation of their divisions.
- It is recognized that an additional workload will be placed upon all branches in EP&S. The custodial inspector and the two being recruited would be reassigned to EP&S. The additional design and contract inspection requirements could be accomplished through greater use of Title I and II services.
- It is also recognized that both the Buildings and Grounds, and Utilities Division personnel will still be involved in plans, specifications, and drawing review as an interested recipient of new, repaired, renovated or rehabilitated plant account for which they are responsible for maintaining.

C. Recommendation

- That the DEH take actions necessary to realign the contracting effort for the U.S. Military Community Karlsruhe as discussed above.

SECTION V
PRODUCTIVITY REVIEW AND ANALYSIS
OF THE
DIRECTORATE OF ENGINEERING AND HOUSING
AT
THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.
* * * BUILDINGS AND GROUNDS DIVISION * * *
UTILITIES DIVISION

SECTION V
 PRODUCTIVITY REVIEW AND ANALYSIS
 OF THE
 DIRECTORATE OF ENGINEERING AND HOUSING
 AT
 THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.
 * * * BUILDINGS AND GROUNDS DIVISION * * *
 UTILITIES DIVISION

5.1 Preventive Maintenance Teams

A. Findings of Fact

- Seven Preventive Maintenance (PM) Teams are assigned to the following areas of Karlsruhe/Germersheim:

<u>PM Team Number</u>	<u>Location</u>
1	Paul Revere Village Family Housing
2	Paul Revere Village Family Housing
3	Smiley Barracks and Rhineland Kaserne
4	Gerszewski Barracks
5	Neureut Kaserne
6	Pforzheim Kaserne
7	Germersheim-Engineer Support Division

- | <u>TDA Authorization</u> | <u>Electricians</u> | <u>Plumbers</u> | <u>Carpenters</u> |
|--------------------------|---------------------|-----------------|-------------------|
| Karlsruhe | 5 | 6 | 6 |
| Germersheim | 1 | 2 | 1 |
- Annual Standing Operation Orders (S00s) are issued to each PM Team.
- PM Teams 1 through 6 frequency of visiting buildings/facilities is once every 90 days.
- PM Team 7 frequency of visiting facilities varies by type of building and mission. Troop Housing 90-120 days. Storage 180 days and Administration 120-180 days.
- Building-by-building time requirements for PM tasks have not been calculated and are not listed in the S00 issued to each team.
- Exhibit V-A, page V-8, indicates the type of materials used by the PM Teams. This information was taken from Preventive Maintenance Job Form AER 8-16 covering a period from July 20, 1984 to September 11, 1984.
- As noted on Exhibit V-A, page V-8, several items are self help.

- Two to three days in advance of the PM Team visit a notification letter is provided to Family Housing occupants.
- Notification to all other building occupants does not occur by notice to the building or announcement in the community media.
- The hand maintained records of the PM teams are outstanding.
- Adequate shop/truck stock is maintained for each team.
- Standing Operations Procedure 420-22 dated 3 March 1978 has been published as a guide for the PM Section.

B. Conclusions

- Individual Job Orders (IJOs) should be established for each PM Team defining the facilities to receive PM as well as the frequency of performance. Separate IJOs should be issued for Family Housing and other reimbursable customers in order to properly account for PM costs. IJOs should be developed, directed and controlled for a one month period rather than annually to preclude the possibility of charging idle time, overruns from other jobs, or any nonproductive time. Standard hours required for the total square footage of all facilities must be calculated in order to determine the required manpower for each PM cycle.
- Presently there is no recorded data substantiating what tasks the PM Teams are performing and no standards to measure shop performance. When IFS becomes operational, task codes will be required. Sources for development of PM Shop Task Codes are contained in the Service Handbook, TB 420-30; and Preventive/Recurring Maintenance Handbook, TB 420-34. Exhibit V-B, page V-10, contains a suggested listing of PM task codes from another DEH work sampled.
- Currently all facilities at Karlsruhe, regardless of mission, are on a 90 day cycle. The cycle should be changed to be as shown in the Technical Manual - Preventive Maintenance Facilities Engineering Buildings and Structures - TM 5-610. It is recognized that no specific cycle is recommended for Family Housing; however, once every 90 days is considered excessive. The optimum cycle of 120 days as noted in TM 5-610 should be implemented and then analyzed as to effectiveness. The cycles currently in use at Germersheim are in conformance with TM 5-610.
- The PM Team visit should be scheduled at least 30 days in advance in order to notify the building occupants of the proposed visit. In addition to the letter of notification which includes the deficiency checklist to occupants of Family Housing, announcement in the Community News Media and through Community Organizations will facilitate the full cooperation and assistance from building occupants.

By issuing a 30 day schedule, updated bi-weekly, the work reception clerk will be able to check, upon receipt of and before issuing a Service Order, the schedule of PM Team visits. Routine SO requests should then be transferred to the PM Team for accomplishment.

- The PM teams are accomplishing Self-Help work in all areas of the community, especially in Family Housing. This work, although necessary, should be accomplished by the occupants of buildings, and repair and utility units as appropriate. Increased occupant accomplishment of household tasks that any homeowner would be expected to perform will decrease the self help tasks now performed by the PM teams. See Section V, para. 5.2, page V-4, for further discussion of Self Help. An evaluation of the amount of self help work accomplished is necessary in conjunction with establishing the standard hours for tasks required for manpower determination, to define the total preventive maintenance team requirements. The establishment of a DO IT NOW TEAM should be considered after this evaluation is accomplished. See Section V, para. 5.3, page V-5, for discussion of the DIN concept.
- Although a significant amount of hand clerical work is done, the outstanding records maintained by the PM Shop are effectively being used to reorder shop (truck) stock for each PM Team. The shop is commended for their attention-to-detail approach of managing the PM operation.

C. Recommendations

- Develop a task code listing for the PM Shop.
- Discontinue issuing annual SOOs and issue monthly IJOs for each PM Team by cost accounting function.
- Revise the cycles of the Karlsruhe PM Teams 1 through 6 in accordance with TM5-610 and Family Housing Teams to 120 days.
- Publish a PM Team schedule to the Community through the media.
- Evaluate the self help accomplished by the PM Shop with the view of possibly reducing the overall person-hours requirements.
- Consideration should be given to placing the PM Team records on the WANG Computer complete with a data base program to provide for more efficient record keeping.
- After the above recommendations are implemented, SOP 420-22 should be revised to reflect the current operation of the PM Teams.

- See Exhibits II-EE, page II-63, and II-FF, page II-67, for further discussions of Preventive Maintenance Teams.

5.2 Self Help

A. Finding of Fact

- Karlsruhe has a self-help program which is described in DEH letter AERQ-ESS dated 5 June 1984.
- Self-help instruction classes to new occupants of family housing and troop billeting are conducted in the evenings once a month and each Friday during the day. Instruction is done by the NCO in Operations and the clerk storekeeper in supply. No classes were observed. A self-help issue card is provided to each attendee after completion of the class.
- A Self-Help Issue Point (SHIP) is colocated with the DEH supply warehouse and is open Monday thru Friday, 1200 - 1600 hours. Issues from October 1983 to September 1984 have been as follows:

<u>Month</u>	<u>Number of Issues</u>
<u>Family Housing Issues FY84</u>	
October	188
November	137
December	115
January	153
February	140
March	156
April	145
May	128
June	159
July	193
August	175
September	131
12 Month Total	1781

Average per month 148

<u>Month</u>	<u>Issues on S0s</u>
<u>Troop Issues, FY84</u>	
October	Issues on S0s
November	Issues on S0s
December	Issues on S0s
January	Issues on S0s
February	3
March	5
April	4
May	4
June	6
July	5
August	6
September	7

- The SHIP has a stockage listing of 64 line items. All items were in the bins or on shelves. The SHIP warehouse position was staffed with a DEH warehouse man however it was learned that a new employee would be on board as of 1 October 1984.
- A review of the Preventive Maintenance Shop records revealed that self-help tasks were being accomplished by the PM shop. Items include flush balls, mirror clamps, soap dishes, drain stopper and chains, faucets, faucet aerator screens, faucet handles, clothes hooks, cabinet hooks, insect screens, appliance lamps, fluorescent lamps, incandescent lamps (7w - 100w), receptacles, toilet paper rollers, toilet seats, towel racks, shower curtain rods, shower heads, shower hoses, starters, door stops, and faucet washers. See Section V, para. 5.1, page V-1, for discussion of PM team self-help interface.

B. Conclusion

- The program can be made more effective through command emphasis of occupant self-help responsibilities, revised procedural changes insure compliance, and program revision to provide greater customer access and assistance. The emphasis should result in an increase in occupant accomplishment of normal household tasks an owner would be expected to perform and should show a decrease in the self-help tasks now performed by the PM shop.

C. Recommendation

- Insure all occupants of family housing are attending self-help classes. Follow-up on troop units as well.
- Coordinate the self-help program with work reception. The customer should be informed to report to SHIP for assistance if the service call is a self-help task.
- Review the operation hours and consider operation after working hours, such as open until 1800 and open on Saturdays during Spring and Fall clean ups.
- Add items marked on Exhibit V-A, pages V-8&9 to the Self-Help list.

5.3 DIN (Do It Now) Team Concept

A. Finding of Fact

At several installations previously visited by HAMM ASSOCIATES, the institution of a "DIN Team" was observed handling a large portion of service orders.

The creation of a radio-dispatched, service-order shop would lead to quicker response and better utilization of DEH resources. The so-called "DIN Team" concept would incorporate the organization of several cross-trained general mechanics, who would respond to all service calls received by work reception, regardless of the craft nature required. A dispatcher would receive these service calls and would be responsible for tracking each craftsperson by geographic area. Once a craftsperson completes a service order and clears with Service Order Reception, it is the dispatcher's responsibility to direct the craftsperson to the location of the next closest service order.

Several keys to this concept must be considered: (1) for best results, craftspersons should be knowledgeable in all areas of carpentry, plumbing, electricity or masonry that they might encounter, (2) the dispatcher will have to be knowledgeable and experienced as to what types of tasks these craftspersons will be expected to perform, as well as skillful in planning and coordinating incoming service calls with craftspeople in the field, (3) the craftspersons will have to be equipped with hand held two-way radios as well as individual vehicles, stocked with sufficient supplies to cover any possible maintenance/repair that may occur.

The specific implementation of the DIN Team would be at Paul Revere Village, Smiley Barracks, Gerszewski Barracks, Rheinland Kaserne, Neureut Kaserne, Pforzheim and Germersheim. Due to the physical separation of some of these facilities, the organization of small service-order shops dispatched from a central location may be conducive to higher production and quicker service order response time. Small supply substations at

each facility, stocked with high-use items, would support the respective DIN Teams. Ideally DIN Team craftspersons would be dispatched from each substation in the morning and would be kept busy throughout the day answering various service calls assigned to them by the dispatcher.

Should a DIN Team member(s) deplete a supply of service orders for a particular day, coordination between the dispatchers and all shop foremen would help to direct available DIN Team craftspersons to assist with ongoing independent job orders or complex service orders. The key to the organization and optimal utilization of a DIN Team is the flexibility provided each "DIN" craftsperson by hand-held two-way radios and independent vehicular support.

B. Conclusion

The implementation of a DIN shop equipped with radios and vehicles would help to decrease the service order backlog and increase response time. The DIN shop would also release other DEH shops to concentrate on more complex, independent job orders.

C. Recommendation

The U.S. Military Community Karlsruhe should implement a DIN (Do It Now) shop, equipped with radios and vehicles, to handle the majority of service calls received from occupants and customers.

The DIN team organization at Karlsruhe and Germersheim would receive all service orders that are either carpentry, plumbing, electric, masonry, or paint in nature. Those service orders which require a high level of craft skill or specialized parts or extensive labor activity would be turned back in to the dispatcher, by radio, at the day's end for reassignment to the appropriate shops.

EXHIBIT V-A

P.M. TEAM MATERIAL LIST

<u>Material</u>	<u>Self-Help</u>	<u>Quantity Used</u>
Ball, Flush	X	2
Bell		4
Breakers, Circuit		22
Caps, Screw		2
Chain, Pull	X ¹	4
Clamps, Mirror	X	6
Connector, 90°		1
Coupling, Rubber		3
Cover, Junction Box		4
Dish Soap	X	21
Door Closure Cab.	X ¹	2
Door Dead Bolt		1
Door Handle	X ¹	19
Door Lock		20
Door Nameplate	X ¹	57
Drain Plug w/Chain	X	4
Faucet	X	30
Faucet, Aerator Screen	X ¹	89
Faucet Handle	X	178
Faucet, Mixing		27
Faucet, Shield		1
Fuses	X	18
Gaskets	X	21
Glass		20
Globes	X ¹	2
Handle, Flush		19
Hook, Clothes	X	5
Insect Screen	X ¹	18
Knobs, Cabinet	X	53
Lamp, Alley		50
Lamp, Appliance	X	2
Lamp, Circular	X ¹	10
Lamp, Exit		25
Lamp, Fluorescent	X	569
Lamp, Living Room	X ¹	2
Lamp, 7w-100w	X	724
Lamp, 200w-400w		52
Lampshade, Kitchen		1
Latch, Door		8
Light, Mirror		7
Locknut		1
Mirror		25
O Rings		2

¹ Recommend add to Self Help list.

EXHIBIT V-A (continued)

<u>Material</u>	<u>Self-Help</u>	<u>Quantity Used</u>
Pipe, Clip		4
Pipe, Flush		1
Pipe, Intake		1
Pipe, Vent		5
Plastic Dowel		40
Plug, Wall		9
Racks, Towel	X	10
Receptacle	X	134
Receptacle - Plates		179
Roller, Toilet Paper	X	15
Rosettes		16
Screws	X	412
Seat, Toilet	X	24
Shower Arm		9
Shower Curtain Rod	X ¹	3
Shower Head	X	57
Shower Hose	X ¹	13
Socket, Light		15
Spring Lid		11
Starter	X	225
Stop, Door	X	38
Stopper	X	9
Switch, Light		22
Switch, Plate		120
Switch, Pull		3
Switch, Pull Chain		6
Swivel Arm		4
Toilet Bolts		4
Toilet Bowl		2
Trap		6
Urinal Bowl		2
Urinal Flusher		3
Valves		9
Valve, Elbow		1
Valve, Float	X	4
Valve, Reducing		2
Valve, Regulating		2
Valve, Tank		1
Washers	X	101
Wood Pegs		78

¹ Recommend add to Self Help list.

14X PREVENTIVE MAINTENANCE

<u>TASK</u>	<u>HRS</u>	<u>TITLE</u>	<u>DESCRIPTION</u>
01	.5	NO SHOW/NO ENTRY	Lost time, no work involved, work belongs to another shop, waiting for or running down keys, no one home.
02	2.3	RPR/RPL 100LF MLDG	TRIM Trim, remove old molding and replace covemold, baseboard, door or window trim . 100 LF
03	1.8	RPL CER W TILE 1SF	BATHROOM OR KITCHEN Remove old tile, clean wall, replace tile grout & clean tile. 1SF
04	1.1	RPL BATH RM ACC	Replace bathroom accessories (one ea) medicine cabinet, mirror, shower rod, toilet paper holder, soap dish, towel bar, shelf etc.
05	1.5	INST/RPL EX VENT	VENT - Install/replace, dryer vent, bathroom vent, kitchen vent, attic vent, foundation vent, remove birds nest from vent.
06	.9	RPL CLG TILE 10SF	CEILING Remove & replace 12"X12" or 12"X24" suspended glued or stapled ceiling tile. 10 S.F.
07	1.1	RPL CLG TILE 32SF	Replace 4 EA 2'X4' suspended ceiling, lay in panels, include cutting around objects.
08	.8	RPR/RPL GYP CL 10SF	Remove old sheetrock, replace with new, clean up area.
09	2.9	RPR/RPL FRAMING 12LF	Remove & replace joist frame work nailers or furring strips 12 L.F.
10	3.5	RPL KIT CAB 2LF	SHELVING/CABINETS Fabricate new & replace existing kitchen cabinet or shelving.
11	2.5	RPR KIT CAB EA	Fabricate & replace door, repair or replace door, repair framing, replace hinges, pulls, slides, catch.
12	2.0	INST/RPL ARM CLO.	DOOR, PERSONNEL Replace or install arm type hydraulic closure mounted to top of door or jamb.
13	.9	RPR/ADJ HYD CLOSURE	Repair or readjust hydraulic arm type door closure that i mounted to top of door.
14	.9	RPL 12X12 Pane	Replace glass, 12"X12" in wood or metal door.
15	4.5	INST DR W/CLO LK	Install new door with closure, lock, and new jamb.
16	2.9	RPL DOOR	Replace door only on existing jamb, wood or metal.

14X PREVENTIVE MAINTENANCE

<u>TASK</u>	<u>HRS</u>	<u>TITLE</u>	<u>(continued) DESCRIPTION</u>
17	1.8	ADJ RPR DR OR JAMB	Adjust door, plane off door to fit. Tighten or replace hinges, replace lock, reoil jamb.
18	1.1	RPL/INST LOCK/LATCH	Replace lock or latch, change type lock using lock converters, steel, wood or storm door.
19	3.3	ADJUST GAR DR	DOORS GARAGE (HOUSING) Adjust tension spring or realign door.
20	6.9	RPR MECH GAR DR	Repair or replace mechanism, such as tracks, springs or rollers on garage doors.
21	1.7	RPR/RPL SRN/STRM DRS	SCREEN/STORM DOORS Repair or replace screen or storm doors. Replace screens repair frames, replace hardware.
22	1.0	RPR/RPL WEATHER STP	WEATHER STRIPPING DOORS Repair or replace weatherstrip around doors, personnel, overhead, and sliding doors. 1-14LF.
23	.8	RPR/RPL SUB FLR 10SF	FLOORS Repair or replace subfloor 1 inch lumber or plywood.
24	.8	RPR/RPL UNDLYMT 32SF	Repair or replace underlayment per 1-32 S.F. plywood, particle board, or masonite.
25	.4	RPL FLR CVRNG 10SF	Replace vinyl, asphalt tile, or linoleum per 10 S.F.
26	2.3	RPR/RPL HAND RAILS	HANDRAILS Repair or replace wood or metal handrails on porch or steps.
27	2.8	RPL TRDS/RISERS 5EA	STAIRWAY Replace up to 5 risers or stair treads on wood steps.
28	1.3	SFTY TREADS INST	Install safety tread rubber or metal on average stairway.
29	.4	RPR WD PORCH 16SF	PORCH, WOOD Replace decking or replace sills or repair steps 4'X4' average height.
30	2.4	RPL WD PORCH 16SF	Replace all material on 4'X4' wood porch with average height.
31	2.0	SEAL AROUND VENT	ROOF REPAIR Seal built up or shingle roof around vent pipe or any type flue.
32	3.3	ASPHALT SHINGLE 33SF	Remove and replace 33 SF of square butt asphalt shingles.
33	1.1	RL RENG OVRLY 100SF	Install roll roofing over existing unserviceable roof.
34	1.8	RMV/RPL RL RF 100SF	Remove old roll roofing and install new roofing.
35	.4	RPR SMALL LEAK	Repair small leak on built up, shingle or metal roof.

14X PREVENTIVE MAINTENANCE

(continued)

<u>TASK</u>	<u>HRS</u>	<u>TITLE</u>	<u>DESCRIPTION</u>
36	.8	RPR/RPL RF SHTG 10SF	Remove and replace 10 S.F. of roof sheeting, 1" or plywood material.
37	.2	RPR/RPL FCA BD 10LF	Remove & replace fascia board regardless of width.
38	1.1	SHEETROCK RPL 4X8	WALLS Move and reinstall 1 piece 4X8' sheetrock on wall up to 9' ceiling.
39	.8	SHTRK, PATCH HOLE 1'	Patch hole in sheetrock wall up to 12" include install nailers.
40	.8	RPL TLE 12"X12" 10SF	Replace 12"X12" acoustical tile 10 S.F. on wall.
41	1.4	TAPEING DRYWALL 32SF	Drywall and tape 32 S.F. sheetrock 3 coats and sand, wall or ceiling.
42	.4	STRP W/WD STRPS 32SF	Strip wall with wood batten strips, can also be used on ceiling 32 S.F.
43	.8	HNG BLTN BRDS OR SGN	SIGNS OR BULLETIN BOARDS Hang any size of bulletin board or wood sign from ceiling or wall.
44	1.0	CAULK WINDOWS 1EA	WINDOWS METAL OR WOOD Caulk or recaulk metal or wood window.
45	.5	RPL WINDOW SCREEN	Replace window screen on any size wood or metal storm screen combination.
46	.8	RPR/ADJUST WINDOW	Readjust & Align window sash, replace latch or any small part on window.
47	1.4	RPL MAJOR WIN PARTS	Replace any part on window or sash includes balance.
48	1.2	RPL WIN GLASS	Replace window glass or plexiglass up to 4'X4', glazed, thermopane, or fab thermopane.
49	1.0	RPL TRAVERSE ROD	Repair, restring, replace any size traverse rod or vtn blind.
50	.8	RPL MTL SDNG/TM 10SF	SIDING & METAL TRIM Replace metal siding or trim on structure, skirting or flashing.
51	.8	INS MTL SDG/TRM 10SF	Install 10SF metal siding, flashing, or trim on structure or skirting.
52	.8	RPL WOOD SIDING 10SF	SIDING, WOOD OR MASONITE Replace 10 S.F. wood or masonite siding, board & batt, or on shed doors.
53	.8	INSTL 10SF WD SDNG	Install 10 S.F. of wood, masonite, board & batt or drop siding.

14X PREVENTIVE MAINTENANCE

(continued)

<u>TASK</u>	<u>HRS</u>	<u>TITLE</u>	<u>DESCRIPTION</u>
			PLUMBING
54	1.1	RPR WATER LEAK	Repair water leak in supply line, water fountain, commode sink, lavatory or urinal. Traps or drains.
55	1.1	UNSTOP TRAP	Unstop plug drain on urinal, bathtub, sink, lavatory & shower.
56	3.2	UNSTOP ALL DRAINS	Unstop drain below trap by removing fixture or from vent pipe.
57	1.2	RPL TRAP-SUPPLY	Replace S or P trap on sink, lavatory, urinal, fountain or replace flexible supply line on above items also shut off valves.
58	1.2	RPR LEAK FAC	Repair leaking faucets, replace washers, o-rings, handles reseal valves, or interior faucets, repair flushometer ballcock assembly.
59	1.4	RPL FAC-VALVES	Replace faucets on kit, mop and lavatory units. Replace flush valves, & ballcock assembly.
60	4.2	RPL FIXTURES	Replace water closets, sinks, urinals.
61	1.5	RPR/RPL GARB DISP	Unstop, repair or replace garbage disposal.
62	1.3	RPL SHWR HD PTS	Replace trip lever, head faucet or face on shower head assembly.
63	1.1	CAULK TUBS/SHOWRS	Recaulk bathtub or showers install water wings on bathtubs or showers.
64	2.5	RPL EXTR FAUCET	Replace exterior faucet & valves.
			PLAY EQUIPMENT
65	2.5	RPR PLAYGRD EQ 1 PC	Repair/replace teeter-totter sandbox, sliding board.
			CLOTHES POLE/LINE
66	2.8	RPR CLOTHES LINE	Repair or replace clothes line poles, anchors or structure.
			GUTTERS-DOWN SPOUTS
67	1.9	RPR GTRS DNW SPT 10'	Replace/repair 10' sections of gutters, downspout, splash block.
			ELECTRIC
68	1.5	RPL ELEC WIRE 25'	Remove/replace electric wire any size.
69	1.1	RPR/RPL DR BUZZER	Repair or replace door buzzer bell or transformer.
70	1.3	RPL CIRCUIT BRK	Install or replace 110 volt or 220 volt circuit breaker.
71	.7	RESET CIRCUIT BRK	Reset breaker or replace fuse in panel or disconnect switch.

14X PREVENTIVE MAINTENANCE
(continued)
DESCRIPTION

<u>TASK</u>	<u>HRS</u>	<u>TITLE</u>	<u>DESCRIPTION</u>
72	1.1	RPL TOG SWITCH	Replace toggle switch 1 P, 3 or 4 way timer switch or dimmer switch.
73	1.1	RPL RECEPTACLE	Replace 115 or 230V receptacle.
74	.4	RPL COVER PLATE	Replace receptacle or SW cover.
75	1.2	RPL LIGHT FIXT	Replace lighting fixture any type.
76	1.5	RPL SMOKE DET	Replace smoke detector battery or 110 volt.
77	1.5	REPAIR LIGHT FIXT	Replace ballast, replace socket fluorescent ends or starter.
78	1.2	HTR ELE RPL	Replace water heater element in H-W heater or pop off valve.
			MISCELLANEOUS
79	1.5	RPL/CLEAN AF	Clean or replace air filter.
80	1.5	CLOTHES DRYER	Check vent, voltage or relays.
81	.4	FURNACE PILOT	Check out for no heat or pilot light out, replace thermo-couple.
			PAINT
82	3.3	PNT RM 10X12	Prepare surface and paint one room 10' x 12', cut in around doors/windows and ceiling.
83	1.6	TOUCH UP RM 10X12	Spot paint or paint only a portion of 10' x 12' room.
84	1.0	PNT DR WINDOW	Paint door and jamb or paint window and jamb or similiar item.
85	1.0	TRIM MTL 100 LF	Paint 100 l.f. or stain and varnish 50 l.f. base, door, window casing, etc.
86	1.2	PNT EXTR 10X10	Paint exterior surface of wood or masonite siding.
87	1.8	STAIN VARN 20 SF	Stain & varnish two coats, 20 s.f. sand between coats. Windows, doors, cabinets, etc.
88	6.0	STRIP REFINISH	Strip old varnish, restain and varnish surface, sand between coats. 20 s.f. of doors, cabinets.
89	.5	MIX BLEND 1 GAL	Mix paint or stain to establish color or to match colors.
90			
91			
92			
93			

14X PREVENTIVE MAINTENANCE
(continued)

<u>TASK</u>	<u>HRS</u>	<u>TITLE</u>	<u>DESCRIPTION</u>
94			
95			
96			
97			
98	3.0	TRANS TO LAKE	One round trip to Lake Ozark Rec. for maintenance and repair.
99		DUMMY TASK FOR SOO DO NOT USE FOR SO OR PM	

SECTION VI
PRODUCTIVITY REVIEW AND ANALYSIS
OF THE
DIRECTORATE OF ENGINEERING AND HOUSING
AT THE
U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.

* * * HOUSING DIVISION * * *

SECTION VI
PRODUCTIVITY REVIEW AND ANALYSIS
OF THE
DIRECTORATE OF ENGINEERING AND HOUSING
AT THE
U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.

* * * HOUSING DIVISION * * *

6.0 INTRODUCTION

The Housing Division is responsible for 1291 units of family housing, 299 units of leased quarters, the unaccompanied officers quarters and unaccompanied senior enlisted quarters. There are approximately 1200 families living on the local economy. The Consolidated Furnishings Management Branch supports all of these units in addition to all of the barracks.

6.1 Organization

A. Findings. The Housing Division is currently organized as shown in Exhibit VI-A, page VI-8. In order to streamline the organization and improve services to the soldier, the DEH has proposed to reorganize the Housing Division as shown in Exhibit VI-B, page VI-9.

B. Conclusion. The proposed organization changes and internal staffing changes will be discussed on an individual basis in the following paragraphs.

C. Recommendation. Based on the discussions to follow, HAMM ASSOCIATES recommends the Housing Division be reorganized as shown in Exhibit VI-C, page VI-10.

6.2 Budget Office Support

A. Findings. When the housing function was transferred to the DEH from the DIO, the budget functions were consolidated at Karlsruhe on a limited

basis. Technical responsibility for the budget function was assigned to the Chief Budget Section, Engineer Resources Management Division and the incumbent's job description was modified accordingly. However, responsibility for personnel matters, including performance evaluations, for the two individuals involved, Housing Budget Analyst and Account Technician, remains with the Chief, Housing Division. The two individuals are physically located in the Budget Office, approximately one kilometer from the Housing Office.

B. Conclusion. The divided responsibilities for this function creates an unsatisfactory situation which is avoidable.

- The two individuals are forced to serve two bosses -- one for technical matters and one for performance evaluation. This places them in an unsavory position should differences of opinions arise between the Chief, Housing Division, and Chief, Budget Section.
- The Chief, Budget Section, theoretically only has control over their technical proficiency and assignments. Leave schedules and other personnel matters must be coordinated through the Chief, Housing Division.
- Conversely, the Chief, Housing Division, is responsible for personnel matters and not technical proficiency or job assignments.

C. Recommendations. Assign total supervisory responsibilities for the Housing Division, Budgeting and Accounting functions, to the Chief Budget Section. Should questions arise concerning the Budget Section's support of the Housing Division they should be worked out between the Chief, Housing Division, and Chief, Engineer Resource Management Division.

6.3 Housing Referral Section

A. Findings. The authorized staffing for the Housing Referral Section is as follows:

Housing Referral NCO	E-7	1
Housing Referral Specialists	GS-5	1
Lead Housing Referral Clerk	C-5a	1
Housing Referral Clerk	C-5	5

The Housing Referral NCO is the key contact point for the soldier for any problems he/she may be having in the Housing Division. The Housing Referral Specialist, GS-5, position is vacant. The DEH has requested this position be upgraded and reclassified as an LN position. One Housing Referral Clerk, C-5, position is vacant.

At Germersheim, this function is coordinated by the Housing Project Assistant, C-6, whose primary responsibility is the Leased Housing Program. There is one Housing Referral Clerk assigned full time at Germersheim. The Housing Referral workload at Germersheim cannot be determined at this time as the troop unit assignments for this area are being revised.

B. Conclusion. If the Housing Referral Office is not the most important service organization supporting the newly arrived soldier in a foreign country, it cannot be very far down the priority list. A soldier's whole attitude towards his new duty station can be influenced by the quality of the support provided by this office. This office requires credibility with both the soldier and the landlords. Personnel are involved in legal problems and with local tenant organizations. They must learn and stay knowledgeable with the rental market and German real estate laws. They should be searching out new listings and accompanying

the soldier when making trips to referrals. German real estate agents charge two to three months rent as a fee for referral and do not accompany clients. There are no multiple listing services as are used in CONUS. For these reasons it is imperative that there be stability in this organization and that it be fully staffed at all times.

The Housing Referral NCO is the soldiers "ombudsman" in the Housing Division. His attention is necessarily diverted from providing full time direction to this staff not only while he is assisting the soldier with problems within the Housing Division, but also with other assigned military duties and for these reasons should be a staff assistant to the Chief, Housing Division, and not in a direct supervisory position over one portion of the organization. This will also give him higher visibility and increased credibility in the community.

C. Recommendations

- The Civilian Personnel Office should proceed immediately with upgrading and reclassify as a Local National position the Housing Referral Specialist as the DEH has requested. Exhibits VI-D, page VI-11, and VI-E, page VI-14, are job descriptions now in use for the CONUS activities and can be used as a basis for an upgrade.
- Reassign the Housing Referral NCO as the Staff NCO reporting directly to the Chief, Housing Division.
- Fill positions on a priority basis as vacancies occur.
- As the Germersheim troop unit assignments are finalized, determine staffing requirements and establish a sub-office at Germersheim under the supervision of the Chief, Housing Referral.

6.4 Inspection Section

A. Findings. This section is responsible for pretermination, termination, and assignment inspections for both government owned family housing and leased quarters.

The Chief, Housing Division, does not consider the inspectors to be fully utilized and proposes to reassign this section to the Facilities Management Branch and increase the duties to include not only the three change of occupancy inspections but also exterior facility inspections and area inspections, and to estimate quantities and cost of work to be done. The inspectors are not trained in cost estimating. It is proposed to train them in this area.

By shifting this section to the Facilities Management Branch they will also be available to assist in housing project and IJO preparation.

B. Conclusions. This section should be performing other functions beside the three change of occupancy inspections. The inspectors should be performing exterior area inspections noting deficiencies and corrective actions required generating work orders or SOs as the situation indicates. The incumbents should be accurately determining change of occupancy workload requirements including the amount of work required by the floor refinishing and painting contracts and the work to be assigned to the DEH shops.

Although the inspectors should be aware of cost estimating procedures in order to insure a more accurate definition of the work requirements on their part they do not need to produce cost estimates. Upon identification of the quantities of work for the requirements contracts, the work is automatically costed based on the contract unit prices. IJOs are estimated by the P&Es.

In work sampling housing inspectors at several activities, it has been HAMM ASSOCIATES' findings that each change of occupancy inspection, be it pretermination, termination or assignment, requires an average of

45 to 60 minutes including time to complete the necessary paperwork and travel to the next inspection. Based on this criteria the amount of change of occupancy time can be estimated on a daily, weekly, monthly or seasonal basis and area inspections or other inspections (in support of the Facilities Management Branch, for example) can be planned and programmed.

The majority of this section's workload is in direct support of the Assignment/Termination Section and for this reason control should remain with the Family Housing Branch.

C. Recommendation

- Rewrite the Family Housing Inspector's job description to include area inspections, identifying quantities of work, and performing other inspections as assigned in support of the Facilities Management Branch. Exhibits VI-F, page VI-17, and VI-G, page VI-19, are examples of job descriptions containing these duties. Disregard paragraph 1 to Exhibit VI-G.
- Determine the amount of time required on a periodic (monthly) basis for change of occupancy inspections. Have the Facilities Management Branch schedule inspections required in support of their programs.
- Keep the Inspection Section under the Family Housing Branch.

6.5 Leased Housing Section

A. Finding. The Housing Project Assistant, C-6, who is responsible for this program, coordinates the Germersheim Housing Referral function as part of his assigned duties. In actuality he reports directly to the Chief, Housing Division vice the Chief Family Housing Branch as is shown on Exhibit VI-A, page VI-8. The proposal is to move the Leased Housing function under the Facilities Management Branch.

The Leased Housing program requires the incumbent to work with developers constructing leased quarters, deal with real estate agents and

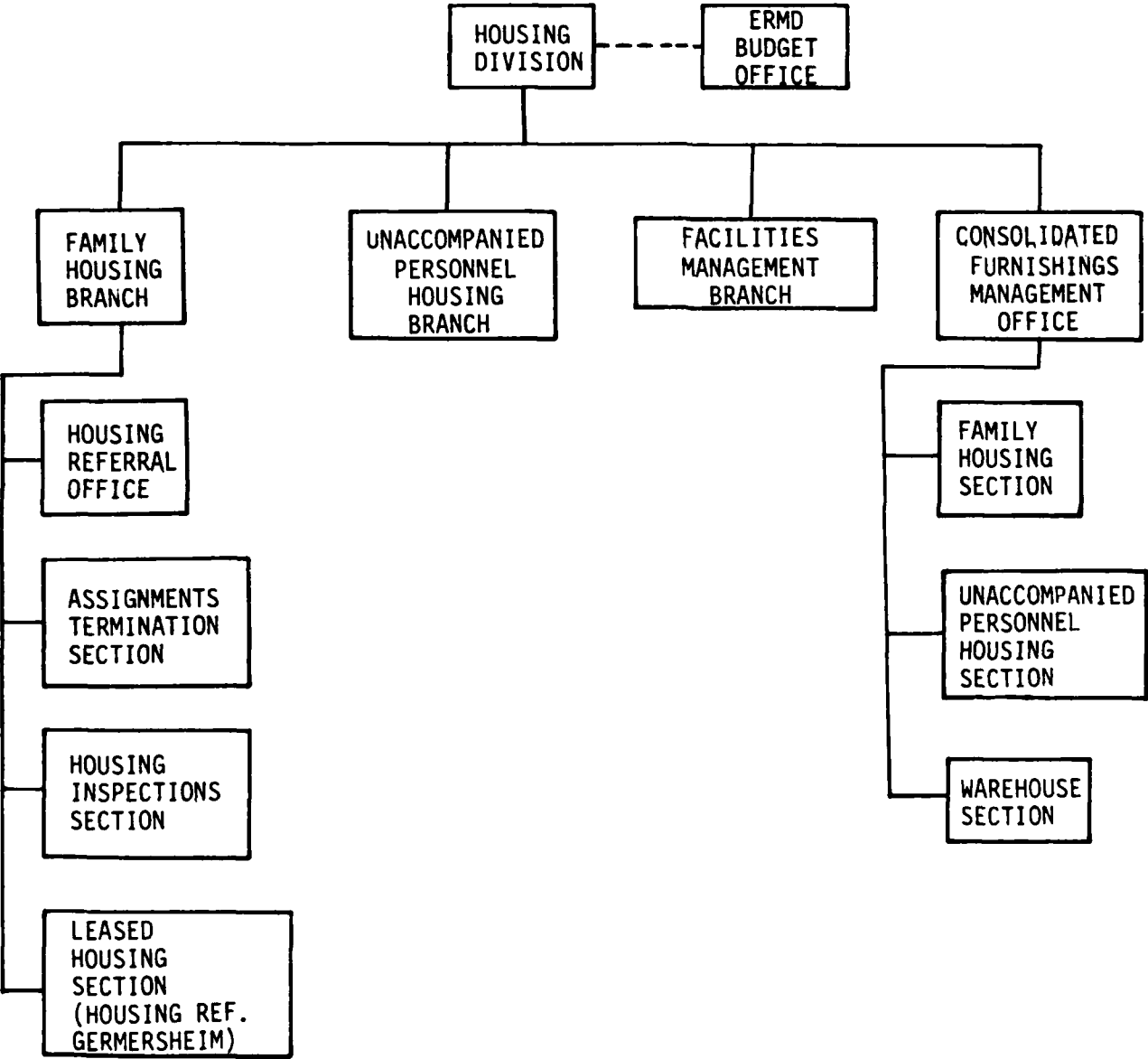
landlords on leasing matters and coordinate with the Federal Assets Office.

B. Conclusions. The incumbent performing these functions should be located in Karlsruhe where the planning, decision making and primary coordination effort with German authorities takes place. The Germersheim housing referral function is not clearly defined at this time as the number of troops to be assigned has not been identified.

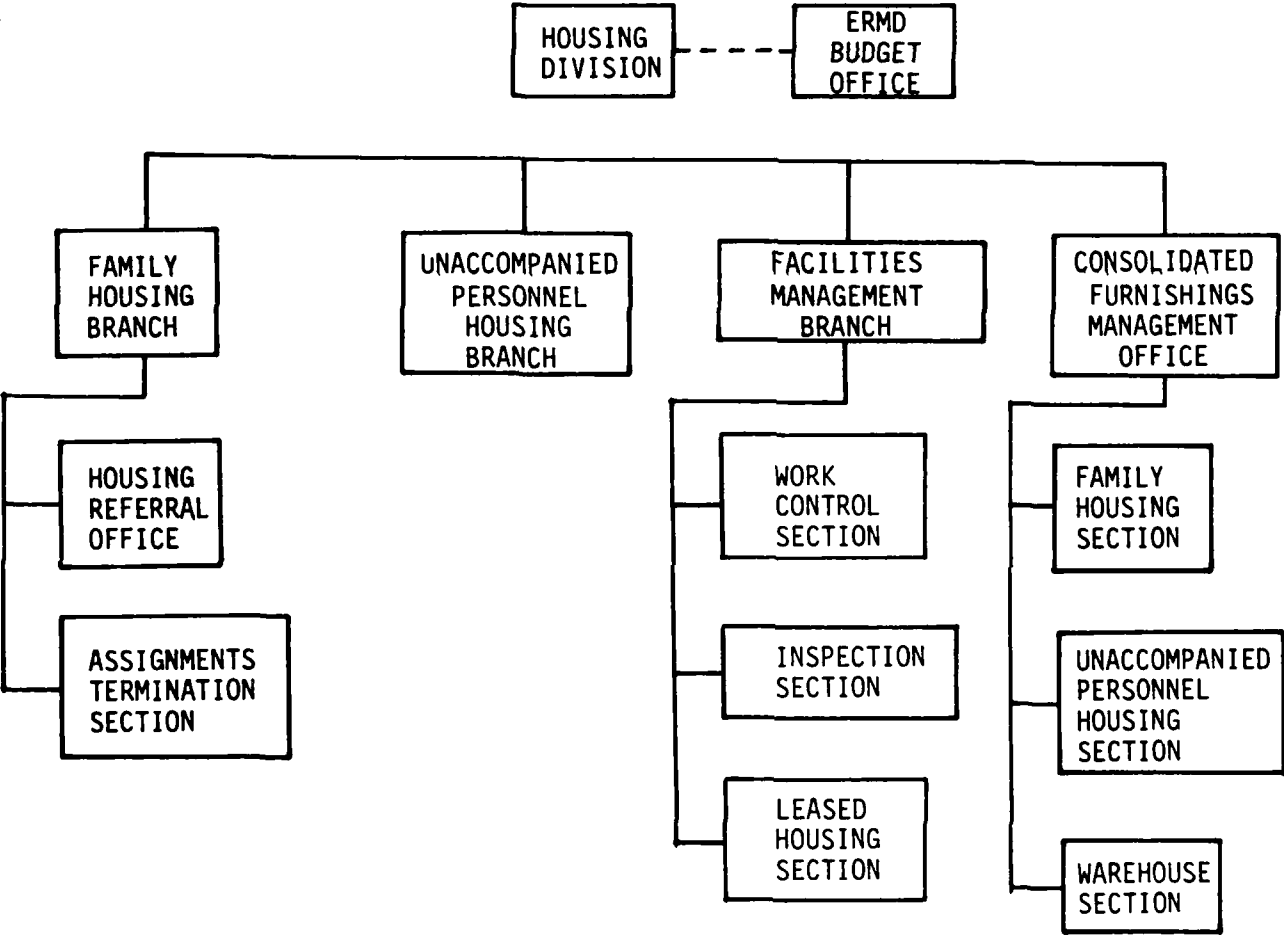
C. Recommendations

- Assign the Leased Housing Program to the Facilities Management Branch.
- Reassign the responsibilities for the Germersheim Housing Referral program to the Chief, Housing Referral office.
- The Housing Referral function at Germersheim may require additional staffing by the Housing Referral Office as troop assignments are revised.

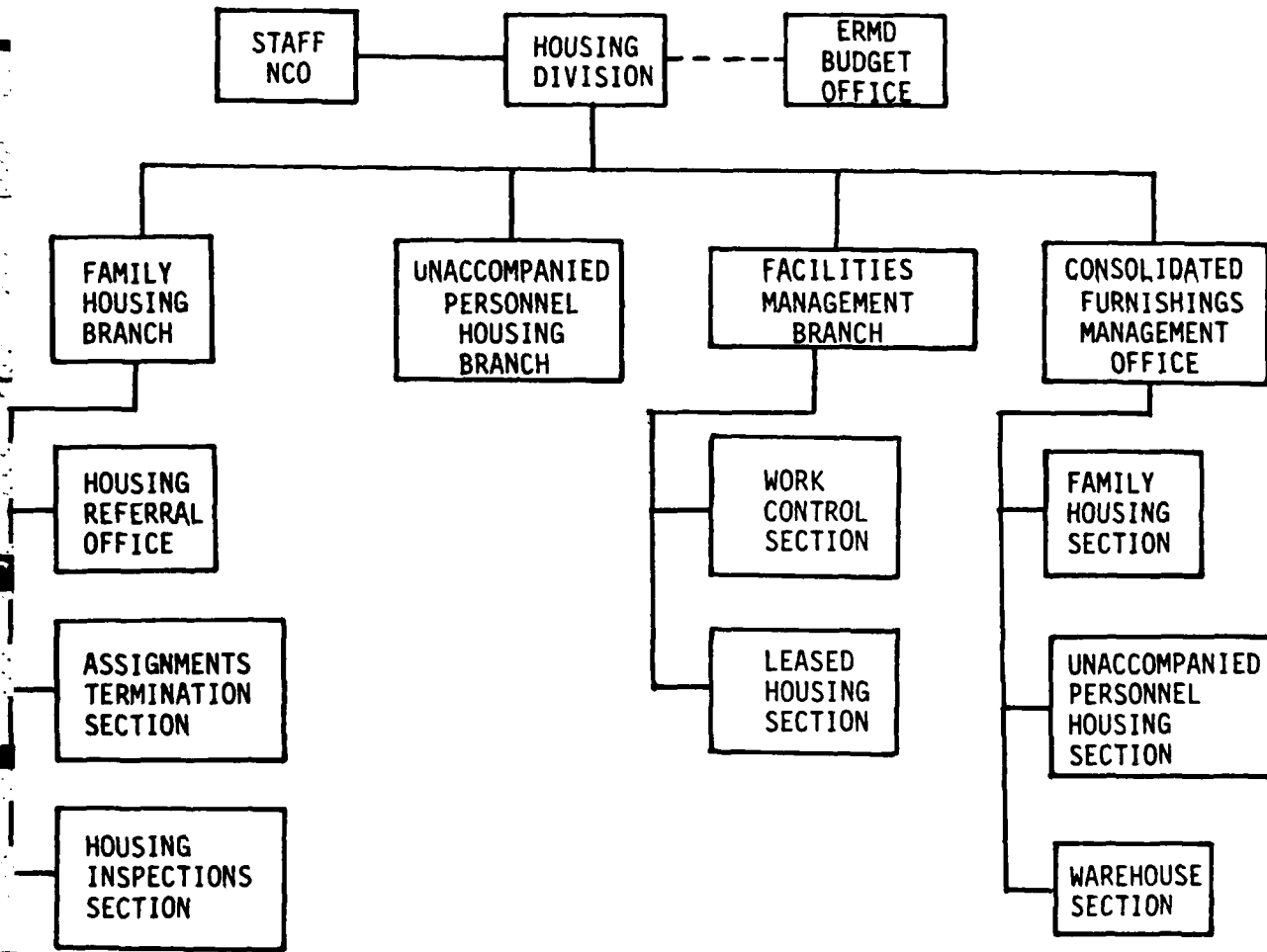
DEH KARLSRUHE
HOUSING DIVISION
CURRENT ORGANIZATION



DEH KARLSRUHE
HOUSING DIVISION
DEH PROPOSED ORGANIZATION



DEH KARLSRUHE
HOUSING DIVISION
HAMM ASSOCIATES' PROPOSED ORGANIZATION



DEPARTMENT OF THE ARMY JOB DESCRIPTION <small>For use of this form, see CPR 501. The proponent agency is DCSPER</small>		JOB NUMBER 8726-S	
2. INSTALLATION OR HEADQUARTERS OFFICE		3. ORGANIZATIONAL LOCATION <i>(Complete on organization copy only)</i> DFE, Housing Division Referral Services Branch	
4. CITATION TO APPLICABLE STANDARD AND THE DATE OF ISSUANCE USCSC/PCS, GS-301, Oct 61; DA CPOS, GS-301 DA CPOS, GS-1173.		5. TITLE Housing Management Officer	
		6. PAY SCHEDULE GS	7. OCC CODE 1173
		8. GRADE 11	
		9. FAIR LABOR STANDARDS ACT <input checked="" type="checkbox"/> EXEMPT <input type="checkbox"/> NONE XEMPT	
		10. COMP LEVEL 91	
11. EVALUATION APPROVAL			
TITLE, PAY SCHEDULE, OCC CODE, AND GRADE OF THIS JOB HAVE BEEN FIXED IN ACCORDANCE WITH OFFICIAL POLICY AND GRADE LEVEL STANDARDS			
		12 March 1981	
<small>(Signature)</small>		<small>(Date)</small>	
12. JOB CONTENT APPROVAL <i>(COMPLETE ON ORGANIZATION COPY ONLY)</i>			
a. I CERTIFY THAT THIS IS AN ACCURATE STATEMENT OF THE MAJOR DUTIES AND RESPONSIBILITIES OF THIS POSITION AND ITS ORGANIZATIONAL RELATIONSHIPS AND THAT THE POSITION IS NECESSARY TO CARRY OUT GOVERNMENT FUNCTIONS FOR WHICH I AM RESPONSIBLE. THIS CERTIFICATION IS MADE WITH THE KNOWLEDGE THAT THIS INFORMATION IS TO BE USED FOR STATUTORY PURPOSES RELATING TO APPOINTMENT AND PAYMENT OF PUBLIC FUNDS AND THAT FALSE OR MISLEADING STATEMENTS MAY CONSTITUTE VIOLATIONS OF SUCH STATUTES OR THEIR IMPLEMENTING REGULATIONS.			
		<i>2 Mar 81</i>	
<small>(Signature of Approving Supervisor)</small>		<small>(Date)</small>	
b. THIS JOB DESCRIPTION WITH SUPPLEMENTAL MATERIAL IS ADEQUATE FOR PURPOSE OF EVALUATION.			
		12 March 1981	
<small>(Signature of Position Classification Specialist)</small>		<small>(Date)</small>	
13. STATEMENT OF DUTIES AND RESPONSIBILITIES			
<u>SUPERVISORY CONTROLS</u>			
Works under the very general supervision of the Chief, and/or Deputy Division Chief, Housing Division. Serves as Installation Housing Referral Services Officer with full responsibility for the Housing Referral Services Branch program. Plans and executes all work necessary to accomplish the mission within the framework of established policy and procedures. Non-routine problems are discussed with supervisor and objectives and policies are formulated as a result of these conferences. Work is subject to periodic review for compliance with procedures and regulations.			
<u>MAJOR DUTIES</u>			
Technically directs and supervises the operation of the Housing Referral Services Branch, located separately from the Housing Division in the installation Personnel Center. Service is provided for approximately 20,000 authorized personnel which results in about 5,000 placements per year. Interprets regulations, directives and broad instruction received from higher headquarters and develops internal policies and procedures for the operation of the Referral Services Branch.			

1. Supervises Branch functions with personnel management responsibility for recommending changes in position structure, assigning duties, accomplishing work load requirements, training and instruction of subordinates in referral activities, sick and annual leave administration, establishing performance requirements and rating employee performance, counseling employees, interview and selection of employees for position vacancies, developing position descriptions, maintaining employee discipline and incentive programs, and development of internal operating policies and procedures. Supervises one Housing Management Assistant, GS-1173-9 and one GS-1173-7, two Housing Information Clerks, GS-303-4 and usually two or more SD service-members serving as Housing Information Clerks. 20%

2. Obtains maximum listings of available rental and sales units to accommodate incoming personnel through positive and aggressive action. Establishes working relationships with 700-1000 civilian housing project operators, managers, real estate brokers, and property owners to encourage open housing policies and to obtain signed assurances of non-discrimination for all housing listed with the Branch. Prepares and maintains data required for use in counseling housing applicants. Maintains liaison with municipal, county, state and federal agencies having parallel interests in equitable and non-discriminatory housing for DOD personnel within the several adjacent cities which comprise the proximity standard metropolitan statistical area. Represents installation commander in meetings with other such agencies. 20%

3. Develops (in concert with DFE policy and DA directives) standards of location, suitability and condition as prerequisites for listing for rental or sale to DOD personnel applying for housing assistance. When deemed to be in the best interests of DOD, inspects housing listed for general conformance with such standards or to determine any corrections necessary to meet standards for listing. Schedules periodic reinspections in suspect problem areas. Coordinates correction of health, safety or fire hazards with proper authorities when necessary. Maintains maps of communities within commuting distance to depict as accurately as possible the locations of rental and sales property, significant proposed or under-construction projects, and suitable/unsuitable areas and environment. 10%

4. Supervises the complaints program, which results in receiving, arbitrating and resolving complaints from both landlord and tenant on tenant/landlord relations, rent increases, health and sanitation problems, discriminatory practices and other various complaints related to off-post housing. Reviews complaints resolution files handled by subordinate Housing Management Assistants. Investigates or directs the investigation of complaints thoroughly and impartially in accordance with prescribed regulations and directives. Establishes and maintains close coordination with the Directorate of Human Resources Development, G5, Staff Judge Advocate, Housing and Urban Development, Preventive Medicine, County Health Departments and other agencies, both government and private, to resolve complaints. Complaints that cannot be resolved within prescribed authorities will be forwarded through appropriate channels for further action as necessary. Insures that all complaints of discrimination are immediately investigated to determine validity of the allegation. In all cases the complainant will be advised of the results of the investigation, provided assistance, when requested in filing the complaint with Housing and Urban Development, and initiating action to impose restrictive sanctions when discrimination has in fact been practiced. 15%

5. Responsible for insuring that all personnel authorized to draw basic allowances for quarters, at the single or dependent rate, are in and out processed. Directs a

suitable housing, processing of applications for on post housing, general practices in leasing, responsibilities of tenants/landlords, financial assistance available, temporary lodging, and other pertinent information. Develops the program of counselling to provide needed assistance to families incoming and departing the installation. 10%

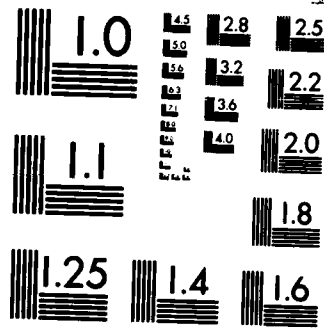
6. Establishes procedures which will insure control of the advertising of rental or sales property in or on all official media under the control of the command. Directs the maintenance of daily records of the numbers of housing applicants by type of housing desired, number of complaints processed, inspection performed, and other data for statistical purposes. Prepares, maintains and submits to this and higher headquarters reports as necessary and required by current directives. Prepares all one-time required reports pertinent to the operation of the Housing Referral Services program. 10%

7. Responsible for the accumulation and documentation of source data in annual and periodic housing surveys on occupancy of on and off-post housing by military members and determination of its suitability. Furnishes this data, together with lists of suitable rental vacancies, for documentation in the Family Housing New Construction Program to the Chief Housing Division. Coordinates with MISO on automated systems for housing surveys. 10%

- Performs other duties as assigned.

- Assignment to duties other than those described above for a period in excess of 30 days constitutes a misassignment and must be corrected immediately by submission of Standard Form 52 to either detail or permanently assign the employee to those duties. Failure to follow this procedure constitutes a merit system violation.

DEPARTMENT OF THE ARMY JOB DESCRIPTION <small>For use of this form see CPR 501 the proponent agency is DCSPER</small>		1 JOB NUMBER DA-284	
2. INSTALLATION OR HEADQUARTERS OFFICE		3. ORGANIZATIONAL LOCATION <i>(Complete on organization copy only)</i>	
4. CITATION TO APPLICABLE STANDARD AND THE DATE OF ISSUANCE CPOS 301 Housing Referral Officer Position CPOS 1173 Housing Management		5. TITLE Housing Management Officer	
		6. PAY SCHEDULE GS	7. OCC CODE 1173
		8. GRADE 11	9. FAIR LABOR STANDARDS ACT <input checked="" type="checkbox"/> EXEMPT <input type="checkbox"/> NONEXEMPT
10. COMP LEVEL			
11. EVALUATION APPROVAL			
TITLE, PAY SCHEDULE, OCC CODE, AND GRADE OF THIS JOB HAVE BEEN FIXED IN ACCORDANCE WITH OFFICIAL POLICY AND GRADE LEVEL STANDARDS			
_____ <i>(Signature)</i>		_____ <i>(Date)</i>	
12. JOB CONTENT APPROVAL (COMPLETE ON ORGANIZATION COPY ONLY)			
a. I CERTIFY THAT THIS IS AN ACCURATE STATEMENT OF THE MAJOR DUTIES AND RESPONSIBILITIES OF THIS POSITION AND ITS ORGANIZATIONAL RELATIONSHIPS AND THAT THE POSITION IS NECESSARY TO CARRY OUT GOVERNMENT FUNCTIONS FOR WHICH I AM RESPONSIBLE. THIS CERTIFICATION IS MADE WITH THE KNOWLEDGE THAT THIS INFORMATION IS TO BE USED FOR STATUTORY PURPOSES RELATING TO APPOINTMENT AND PAYMENT OF PUBLIC FUNDS AND THAT FALSE OR MISLEADING STATEMENTS MAY CONSTITUTE VIOLATIONS OF SUCH STATUTES OR THEIR IMPLEMENTING REGULATIONS.			
_____ <i>(Signature of Approving Supervisor)</i>		_____ <i>(Date)</i>	
b. THIS JOB DESCRIPTION WITH SUPPLEMENTAL MATERIAL IS ADEQUATE FOR PURPOSE OF EVALUATION.			
_____ <i>(Signature of Position Classification Specialist)</i>		_____ <i>(Date)</i>	
13. STATEMENT OF DUTIES AND RESPONSIBILITIES			
<u>SUPERVISORY CONTROLS</u>			
Works under the very general supervision of the Family Housing Manager or the Installation Housing Officer, with full delegated responsibility for the directing of the installation Off-Post Housing Program. Plans and executes the program within the framework of established policy and procedures. Discusses unusual problems arising with superiors; proposes actions to be taken; or recommends new policies. Work is subject to periodic review for compliance with procedures, policies and regulations.			
<u>MAJOR DUTIES</u>			
Plans, directs, coordinates, supervises, manages and reviews the installation's <u>Off-Post Housing Referral Program</u> . This involves providing personalized and convenient assistance to military members and families (also eligible DA civilians) in locating adequate civilian off-post housing and providing information concerning availability of housing at the next duty station. The scope and complexity of the program is indicated by having <u>10,500</u> assessment of "Qualified Personnel" result in <u>10,000</u> placements in a one-year period.			



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

1. Interprets regulations, directives and broad instruction received from higher headquarters and develops specified policy for establishment and operation of installation or area referral office. Develops separate listings of properties which may be purchased. All listings are prepared to accord with DA policy of nondiscrimination. Establishes working relations with housing project operators and managers, real estate brokers, news media, and property managers to encourage open housing policies (as required for DA personnel) and to maintain listings current. Develops procedures for obtaining a signed assurance of nondiscrimination for all housing listed. Prepares a brochure of available schools, churches, shopping centers, bus routes and other community facilities for use in counseling housing applicants.

2. In coordination with the Family Housing Manager, develops standards of location, suitability and condition, prerequisite to acceptance for listing for rental or sale to Army personnel applying for housing assistance. Inspects housing listed for general conformance with standards and determines any corrections necessary to meet standards for listing. Schedules periodic reinspections in problem areas. Exercises tact and diplomacy in coordinating correction of health, safety, or fire hazards with proper authorities when necessary.

3. Arbitrates disputes between renters and landlords or property managers. Evaluates and effectively deals with such disputes in an equitable and humanitarian manner. Must be generally conversant on applicable ordinances and regulations affecting occupancy of listed housing by DA personnel. Counsels personnel applying for housing as to general practice in leasing, deposits required, responsibility of occupant in normal care of premises, and maintenance which may be expected from the owner/management. Secures reports from personnel of housing obtained or reasons for failure to obtain suitable housing.

4. Maintains liaison with municipal, county, or state agencies having parallel interests in equitable and nondiscriminatory housing of DA personnel with adjacent communities. Represents installation commanders in meetings with such agencies. Determines zones of suitability from a standpoint of commuting distance/time for housing to be listed. Periodically checks zones established for changes in traffic loads, patterns and travel time. Coordinates with applicable traffic authorities.

5. Establishes procedures for the commander which will insure a positive control of the advertising of rental or sale property in or on official media under the control of the command. Advises personnel displaying interest in home purchases for determination of eligibility for payment by Service Department of mortgage insurance premiums to the Federal Housing Administration under the provisions of the in-service loan 222 program. Veterans Administration Home Loan guarantees are also available for qualified personnel (reference AR 608-8). Maintains daily records of the numbers of housing applicants by type of housing desired for statistical purposes. Prepares, maintains, and submits

to higher headquarters reports as necessary and required by regulation.

6. Supervises and trains subordinate personnel in referral activities such as making inspections of dwellings and furniture; the preparation of budget data as necessary; the compilation and maintenance of sale and rental lists of dwellings available in the listing area; and the dissemination of information regarding all functions of the referral function.

Performs other duties as assigned.

This is a sensitive position and incumbent must be cleared to handle Classified Information in accordance with CPR I-2 and AR 604-5.

2. RECEIVES ADVANCE NOTIFICATION OF TERMINATION of on and off-Post living quarters, and in connection therewith, conducts required inspections. Observes general condition of the quarters, and adjacent grounds, including installed fixtures and equipment, and determines the existence of obvious neglect, abuse or willful damage therein. Prepares report of findings and condition, and where appropriate, signs necessary clearance to effect termination by occupant. In the event of damages or obvious abuse, and based on the extent of same, recommends appropriate action to be taken.

3. BASED ON RESULTS AND FINDINGS OF INSPECTIONS, prepares and submits work order to the Engineer Section to effect required repairs. Conducts follow-up during the course of repairs, and informs supervisor of the status of work in progress. When considered necessary, and/or as directed by supervisor, contacts appropriate maintenance official to insure availability of quarters for new occupants by the scheduled date.

4. INSPECTS GOVERNMENT OWNED FURNITURE. Determines where damages exist, the cause, responsibility and corrective action necessary. Initiates necessary administrative action to correct damage and issues the responsible individual.

5. ALONE OR IN CONJUNCTION WITH SUPERVISOR, INSPECTS QUARTERS during the period of occupancy in accordance with an established schedule, or in connection with a complaint action. Where applicable, prepares a report of inspection and findings, and recommends appropriate action.

6. ASSISTS CHIEF OF FAMILY HOUSING in the programing of repair or improvement projects.

PERFORMS OTHER DUTIES AS ASSIGNED.

DEPARTMENT OF THE ARMY JOB DESCRIPTION		1. INSTALLATION OR HEADQUARTERS OFFICE HQ, US Army QM Center & Fort Lee Fort Lee, Virginia 23901		3. JOB NUMBER 13,223	
2. CITATION TO APPLICABLE STANDARD AND ITS DATE OF CHANGE NSCSC JGS WG-4749-0 dtd May 74 Flora Annexpt		4. TITLE Maintenance Mechanic		7. GRADE 1	
5. EVALUATION APPROVAL Title, pay schedule, code and grade of this job have been fixed in accordance with Department of the Army official policy and grade level standards.		5. PAY SCHEDULE WG		6. OCC. CODE 4749	
		SIGNATURE SYLVIA J. SHIPE		DATE 4/9/76	
9. SUPERVISORY CONTROLS, DUTIES, AND WORKING CONDITIONS (Indicate percent of time for each duty, where pertinent.) (Continue statement of duties, etc. on reverse side if necessary.) MAJOR DUTIES					
<p>1. Performs preventive maintenance repairs to buildings and structures to include: Adjusting ranges, repairing and replacing venetian blinds, repairing and replacing screens, caulking bathtubs and sinks, replacing window panes, installing exhaust fans, installing mirrors, etc. Insures programed maintenance and repair work is completed within prescribed time. Performs a variety of repairs to buildings, structures, and grounds involving intermediate level repairs within electrical, painting, plumbing, and other working trades.</p> <p>2. Inspects all family housing dwelling units. Inspects all units prior to occupants vacating them to determine maintenance work required such as floor refinishing work, painting, repair and/or replacement of furniture and major household appliances, roofing, plastering, etc. Provides occupants vacating units with handouts on housing clearance policies and procedures and instructs them on cleaning of quarters requirements. Insures units are left in a clean and habitable condition before relieving them of responsibility of the unit. Provides information to Construction Engineer and Family Housing Manager as to which dwelling units require contractual services for painting and floor refinishing. Maintains records and writes up work requirements recommended for accomplishment on units. Prepares job order request and schedules keys for all necessary work accomplishment which requires more than 16 man hours in any one respective dwelling unit. Controls and checks accomplishments of work maintenance of dwelling units when so required by management. Notifies Engineer personnel as to normal maintenance and repair work requirements, assuring work is scheduled and accomplished between occupants of all family housing units. Conducts assignment inspection; physically checking new occupants into quarters and explaining to occupants requirements while residing on post. Conducts special inspections of family housing structures, grounds and utilities making inspections for Construction Engineers working on project development. Makes determination of requirements when damages are caused by fires, storms, wind, etc. Checks playgrounds for needed improvements and repairs. May drive a 1/2 ton vehicle or sedan and perform operator's maintenance.</p>					
10. JOB CONTENT APPROVAL (Complete on organization file copy only.)					
ORGANIZATION LOCATION					
THIS STATEMENT ACCURATELY DESCRIBES THE WORK REQUIRED IN ONE POSITION OR IN EACH OF A GROUP OF POSITIONS IN THE ABOVE ORGANIZATION.			THE ABOVE DESCRIPTION, WITH SUPPLEMENTAL MATERIAL, IS ADEQUATE FOR PURPOSES OF EVALUATION.		
SIGNATURE OF APPROVING SUPERVISOR Do not sign here. See reverse for additional certification.			SIGNATURE OF ANALYST		
11. READY APPROVAL					
DATE					
SUPERVISOR'S APPROVAL					
ANALYST'S SIGNATURE					

DA FORM 374
1 JUN 61

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

For use of this form, see CFR 501; the proponent agency is Office of the Deputy Chief of Staff for Personnel.

Performs other duties as assigned.

SKILLS AND KNOWLEDGES

1. Must have a intermediate level knowledge of principles and skills in use of tools common to trades. Must be able to accurately determine problem, identify tools needed, and make necessary repairs. Must have knowledge of safety practices, understand purpose and limitations of equipment and tools.

2. In making inspections, must have a working knowledge of plumbing carpentry, kitchen equipment repair, electricity, hearing and painting in order to recognize deficiencies and refer repairs to Engineers. Must be able to accurately determine problem, identify repairs needed, explain trouble and probable cause to occupant, supervisor, and Engineers personnel.

RESPONSIBILITY

Works under general supervision, receiving instructions as to work assignments, priorities to be observed and deadlines to be met. Plans and lays out work and determines materials needed. Work is periodically reviewed for compliance with established policies, procedures and regulations.

PHYSICAL EFFORT

May work from ladders and where areas are hard to reach places. Requires incumbent to stand, stoop, bend, kneel, climb, and work in tiring and uncomfortable positions. Arm movements may be considerable when using hand tools. May occasionally lift and carry materials and equipment weighing 40 pounds and over.

WORKING CONDITIONS

Work is performed primarily inside with occasional outside tasks. Inside work is in buildings, adequately heated, lighted and ventilated. Outside exposure to heat and cold can be protected against by proper clothing.

I certify that this is an accurate statement of the major duties and responsibilities of this position and its organizational relationships, and that the position is necessary to carry out government functions for which I am responsible. This certification is made with the knowledge that this information is to be used for statutory purposes relating to appointment and payment of public funds, and that false or misleading statements may constitute violations of such statutes or their implementing regulations.

(Signature of immediate supervisor)

Date

SECTION VII
PRODUCTIVITY REVIEW AND ANALYSIS
OF THE
DIRECTORATE OF ENGINEERING AND HOUSING
AT
THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.
* * * RPMA SUPPLY SUPPORT * * *

SECTION VII
 PRODUCTIVITY REVIEW AND ANALYSIS
 OF THE
 DIRECTORATE OF ENGINEERING AND HOUSING
 AT
 THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.

* * * RPMA SUPPLY SUPPORT * * *

7.0 INTRODUCTION

This section contains an analysis of the Supply and Storage Division.

7.1 Zero Balance Rate

A. Findings of Fact

- Analysis of available supply management reports revealed the following in regard to zero balance.

<u>Report</u>	<u>Line Items</u>	<u>Zero</u>	<u>Percent Items</u>
84/06/28	1,269	107	8.43
84/07/06	1,283	103	8.02
84/07/12	1,285	102	7.94
84/07/19	1,293	103	7.97
84/08/09	1,295	107	8.26
84/08/16	1,297	110	8.48
84/08/23	1,297	139	10.72

Analysis of the zero balance report dated 84/08/23 reveals that 39 items are candidates for drop based on demand data for the past 12 months. Subtracting 39 from 139 leaves 100 line items with a zero balance. This equates to a 7.71% of the stock items in the warehouse having a zero balance (100/1297). Exhibit VII-A, page VII-9, is an example of a weekly supply status report generated by the Division Chief. He calculates the zero balance rate only on those items that cannot be supported from the main warehouse, Item C, Exhibit VII-A.

B. Conclusion. In conjunction with the number of line items carried in the warehouse, the zero balance rate directly impacts on the supply support provided to the maintenance shops. While no targets have been officially established by the U.S. Army it is our opinion that the zero balance rate should and can be maintained below 5%. All items of actual

zero balance in the subwarehouse should be included in the calculations including those items to be added to the inventory and which are at zero balance. Not including every line item provides a misleading picture. If a worker requires a stocked item which is not available it is irrelevant if the item is in transfer status from the main warehouse.

C. Recommendation. Management should continue to closely monitor the zero balance rate. Should it continue above 5%, the reorder points for the troublesome line items should be checked for validity. The shop stock procedures should be reviewed as discussed in paragraph 7.3, page VII-5, since abuse of these procedures is generally the cause for zero balances. Zero balance calculations should include items to be added to stock and items in transfer status.

7.2 FESS Communications System

A. Finding

- The FESS System at Karlsruhe has been down the following times during the month of August 1984 and through 7 September 1984.

8/8/84	0730 - 1600
8/9/84	0730 - 1600
8/14/84	0730 - 0830
8/14/84	0920 - 1600
8/21/84	1500 - 1600
8/22/84	0820 - 0830
8/22/84	1000 - 1100
8/22/84	1230 - 1500
8/23/84	0730 - 0930
8/23/84	1000 - 1600
8/29/84	0730 - 1600
8/30/84	0730 - 1600
8/31/84	0730 - 1600
9/3/84	0730 - 1600
9/4/84	0730 - 1600
9/5/84	0730 - 1600
9/6/84	1215 - 1600
9/7/84	0730 - 1600

- Currently there are two FESS terminals at Karlsruhe; however there is only one line to Mannheim, therefore, only one terminal may be operated at a time. There is no printer at Karlsruhe, all hard copy reports must be delivered from Mannheim.
- The single line to Mannheim takes the following route:
 - Bundespost leased line Karlsruhe to Building 9 Campbell Barracks.
 - U.S. Army microwave from Campbell Barracks to Konigstuhl.
 - Microwave Konigstuhl to Seckenheim (passes back over Bldg. 9 Campbell Barracks).
 - U.S. Army land line Seckenheim to Funary.
 - Land line Funary to Building 9 Taylor Barracks.
- According to Mr. Bob Wartenby, RPMA Supply Office, USAISAE, the majority of the communications downtime is due to problems with the U.S. Army microwave and land line. He also advised that a Bundespost leased line from Building 9 Campbell Barracks to Building 9 Taylor Barracks would cost approximately 400 Deutsch Marks a month or 4800 Deutsch Marks per year.
- From January 1984 through September 1984 supply personnel made 56 trips to Mannheim to input data into FESS and spent 179 hours of overtime because the local terminals were down due to communications line problems. The estimated annual additional cost to the U.S. Army due to poor communication is \$5,357. See Exhibit VIII-B, page VIII-10, for the calculations.
- The Supply and Storage Division is maintaining the following manual work.
 - Daily warehouse issues, number issues, number line items.
 - Purchase orders under \$1,000.
 - Purchase orders over \$1,000.
- Karlsruhe does not receive Open Order Report Local vs Depot.
- On 20 September 1984 there were 31 purchase orders, representing 140 line items, for a total value of \$103,340 not entered into FESS due to nonavailability of the computer. The outstanding entries are summarized in Exhibit VII-C, page VII-11.

B. Conclusion. The current FESS communications system at DEH Karlsruhe is unsatisfactory and requires upgrading. This is particularly important with IFS coming on-line in the fall.

FESS is an automated supply system intended to support the Directorate of Engineering and Housing (DEH) at the installation level. The eight major objectives of FESS are:

- Improve inventory management
- Maintain the FE supply catalog
- Manage supply demand data
- Provide immediate and reliable job order supply accounting
- Control supply procedures
- Eliminate tedious manual computations (ROP & ROQ)
- Improve financial inventory accounting
- Provide automated interface with IFS and SAILS

The FESS system may be divided into functional areas:

- Stock Control
- Storage
 - Issuing
 - Receiving
 - Physical Inventory
- Engineer Resource Management
 - Material Coordinator
 - Estimator/Planner
 - Work Order Clerk

Two FESS terminals are marginally adequate for the DEH Karlsruhe. The fact that only one can be used at a time is unsatisfactory, and that coupled with the unreliability of the communications with Mannheim negates the benefits of having FESS. With the introduction of IFS this

becomes even more important. FESS, as currently operating at Karlsruhe fails to meet the following major objectives:

- Maintain the FE supply catalog (current and useful)
- Improve inventory management
- Provide immediate and reliable job order supply accounting
- Control supply procedures
- Provide automated interface with IFS and SAILS

The communications problems between Campbell Barracks and Taylor Barracks can be virtually eliminated by leasing a Bundespost line for this portion and at the same time creating an annual cost avoidance of 9717 Deutsch Marks.

C. Recommendations

- Request the 21st Support Command install a second communication line between Mannheim and Karlsruhe.
- Request 21st Support Command bypass the military system between Campbell Barracks and Taylor Barracks.

7.3 Shop Stock Procedures

A. Findings

- Army Regulation 420-17 states:
 - "Shop/truck stocks may be authorized in instances where the shop or preventive maintenance work is such as to require small quantities of numerous expendable items at frequent intervals."
 - "A separate list of expendable supplies will be prepared in triplicate for each shop/truck (local and/or off-post) authorized to maintain shop/truck stock. The list will show the name of the foreman or individual in charge of the shop or truck; the name of the person authorized to order and receive the stock; the applicable cost code to which the items are chargeable when received (under IFS, cost code will be summary level only (J.0000, K.0000, L.0000 and M.0000), and the maximum quantities authorized for shop/truck stock. Each list will be signed by the facilities engineer and validated by the accountable officer. Shop stock listings will be reviewed and authorized quantities recomputed at least quarterly."

- "(1) A semi-annual inspection of shop stocks will be conducted jointly by the accountable property officer, the applicable division chief (B&G, Utilities) and shop foreman."
- "(2) A statistical sampling will be made to determine if the items authorized for shop/truck stocks represent 15 days of supply."

- Semi-annual inspections of Shop Stock are not being conducted as required by AR 420-17. Exhibit VII-D, page VII-12, is a summary of approved shop stock lists.

B. Conclusion. The current procedures for issuing, tracking and controlling shop stock are not in accordance with AR 420-17.

C. Recommendations

- Require all shops to submit shop/truck stock lists as required by AR 420-17.
- Perform the semi-annual inspections as required by AR 420-17.

7.4 Actual Inventory vs FESS Inventory

A. Findings. A random review of the subwarehouse inventory by line item showed that the chances are 95 out of 100 that between 44.5% and 62.1% of the line items in the Karlsruhe supply warehouse have incorrect balances compared to the FESS inventory. Exhibit VII-E, page VII-13, identifies the line items examined.

B. Conclusion. The importance of available supplies for the craftspersons cannot be overly stressed. An improvement in the accountability of stock items in the supply warehouse will lead to increased productivity of the DEH workforce.

C. Recommendations

- Warehouse personnel should conduct a monthly inventory of 10% of the line items stocked.

7.5 FESS Supply Management Report

A. Finding. The information contained in the FESS Supply Management Report provides the Supply Division Chief and the Director a wealth of information as to status of support to the workforce.

B. Conclusion. The information presented in this report is invaluable. Through proper use of the data it is possible to track trends in any category to establish seasonal adjustment, determine areas where more attention is needed and to measure improvements. In order to display the data in an easy to read format use of trend line graphs is suggested. Exhibits VII-F through VII-M, pages VII-18 through VII-25, are examples as to how the data can be displayed. Use of these graphs will assist the Supply Division Chief in identifying areas that may need investigation. Reviewing raw data over a period of months contained in individual reports is cumbersome and not as likely to be done consistently as reviewing a graph that shows status over several months using the examples provided.

The following types of information can be derived from the graphs and analyzed:

- Exhibit VII-F, page VII-18, shows that stock items have increased by 4.8% from 1 October 1982 to 11 October 1983, while Exhibit VII-G, page VII-19, shows a stock excess increase of 11.5%. While these graphs will not tell you why excesses have far exceeded the stock increase it does indicate a problem which requires attention.
- With the increase in stock by 4.8% Exhibit VII-H, page VII-20, shows a corresponding decrease in stock zero balance of 17.1%. This indicates favorable attention has been given to this area.
- The Fringe Line Items, Exhibit VII-I, page VII-21, indicates a significant increase (72.3%) which would be a point of concern except in this case the quantity of fringe items are small and should be building up.

- Standby items, Exhibit VII-J, page VII-22, should be expected to stay reasonably level and with .8% change the indication is they have. The Standby Zero Balance level, Exhibit VII-K, page VII-23, decreasing 16.9% is worthy of note; however, since they are for emergency use, if the trend was an increase a problem in the supply system would be indicated.
- The final two graphs, Exhibits VII-L and VII-M, pages VII-24 and VII-25, Line Items Outstanding and Line Items Due Out both are positive indicators. Request for material (outstanding orders) is being acted on faster in the past year and due outs would indicate more material required by the craftspersons is available in the warehouse than was in October 1982.

C. Recommendation. Develop a series of charts to which monthly data can be easily added. Provide updated copies to the Director, Deputy Director and Chief ERMD on a monthly basis.

EXHIBIT VII-A

KARLSRUHE

TOTAL LINE ITEMS STOCKED

1,261

A.	Total Zero Balances as of: 84-09-07	57
	(1) Zero Balances without supporting demand data or bulk purchases* not supported by the RPMA.	10
	(2) Items being transferred (in transit) from main to sub-warehouses.	30
B.	Totals of A(1) and A(2) minus A	40
C.	Total of zero balances which cannot presently be supported by RPMA due to lack of stock at the main warehouse. (Item B minus A).	17
D.	Percentage of Zero Balances compared to total of line items stocked.	1.3%

EXHIBIT VII-B

FESS COMMUNICATIONS LINE
DOWNTIME LABOR COSTS IMPACT

	No. Trips	Overtime Hours
January	6	45.5
February	11	66.0
March	3	0.0
April	3	0.0
May	8	56.0
June	5	0.0
July	0	0.0
August	10	11.5
September	10	23.0
TOTAL	56 trips	202.0 hours

Each trip resulted in approximately 4 hours of lost time -- 3 hours travel and 1 hour mid day computer not available due to daily file maintenance procedures.

Labor costs approximately 15.84 Deutsch Marks per hour (C-4a end step, 2746 DM/month)

$$2746 \text{ DM} \times 12 \text{ mos} / 2080 \text{ hours per yr} = 15.84 \text{ DM/hr}$$

Each Trip = 7.00 DM/day meal allowance

Cost:

56 trips x 4 hrs lost time x 15.84 DM	= 2661
56 trips x 7.00 DM meal allowance	= 392
202 hours O.T. x 1.5 O.T. rate x 12.15 DM/hr	= 4800
9 month total	= 7853 DM

$$\text{Annual Cost} = 12/9 \times 7853 = 10471 \text{ DM}$$

$$10471 / 2.71 \text{ DM} = \$3864$$

Mileage

$$56 \text{ trips} \times 100 \text{ mi/trip} \times \$0.20/\text{mi} \times 12/9 = \$1493$$

$$\text{TOTAL} = \$5357$$

EXHIBIT VII-C

PURCHASE ORDERS WAITING FESS INPUT
AS OF 20 SEPTEMBER 1984

<u>DATE RECEIVED</u> <u>DATE PREPARED</u> *local	<u>NO. LINE ITEMS</u>	<u>\$</u>
17 Sept	37	\$ 2,769.56
11 Sept	5	51,168.63
6 Sept	3	23,880.04
12 Sept*	2	458.04
6 Sept	1	1,704.80
17 Sept	1	1,076.02
12 Sept*	2	49.79
12 Sept*	7	837.42
3 Sept	19	3,046.36
12 Sept*	6	354.54
10 Sept*	7	1,033.73
10 Sept*	6	198.26
10 Sept*	3	811.61
14 Sept*	2	309.43
17 Sept*	4	8.62
17 Sept*	1	55.80
17 Sept*	2	65.71
17 Sept*	3	214.52
19 Sept*	1	128.56
3 Sept*	2	1,005.45
6 Sept	7	4,981.63
6 Sept	3	965.70
6 Sept	4	987.34
6 Sept	2	1,976.38
6 Sept	2	1,439.34
29 Aug*	7	774.29
5 Sept*	3	632.32
6 Sept	1	910.71
6 Sept	1	272.40
5 Sept	1	942.62
6 Sept	1	1,180.81
31	140 line items	\$130,340.43

SHOP STOCK LISTS

<u>SHOP # or Unit</u>	<u>DATE APPROVED</u>
02	7 May 82
PM #3	7 May 82
01	7 May 82
05	3 May 82
16	6 May 82
03	7 May 82
GERMERSHEIM	Apr 78
01	Mar 82
05	Mar 82
02/12	Mar 82
04	Mar 82
03/19	Mar 82
PM #1	July 82
PM #2	Mar 82
PM #4	Mar 82
PM #5	Mar 82
PM #6	Mar 82

EXHIBIT VII-E

SUPPLY WAREHOUSE INVENTORY

<u>ITEM</u>	<u>ON-HAND</u>	<u>FESS</u>	<u>DIFFERENCE</u>
5975-00-V02-2107C	1679	1769	90
5935-00-V02-4770C	42	63	21
5935-00-V02-1477C	1	1	0
5935-00-V02-5288C	34	34	0
5935-12-178-1507C	10	12	2
5970-00-419-4291C	23	23	0
5920-00-V02-4836C	2	2	0
5935-00-V02-1812C	30	30	0
5935-00-V02-1787C	61	62	1
5975-00-V02-2379C	22	21	(1)
6210-00-V02-2720C	2	2	0
6210-00-V02-6628C	1	1	0
6230-00-V02-6707C	2	2	0
5930-00-V02-5136C	3	4	1
6240-00-V52-0518C	853	860	7
6240-00-V52-0522C	10	3	(7)
6240-12-123-0472C	1514	1493	(21)
6240-00-V52-0466C	31	20	(11)
6240-00-V02-3063C	93	81	(12)
6210-00-V02-2816C	6	6	0
6240-00-V52-0532C	70	66	(4)
6210-00-V02-2783C	41	41	0
5935-00-V02-5397C	15	15	0
5940-00-V02-2033C	10	10	0
5975-00-V02-2418C	200	38	(162)
6240-00-V52-0406C	79	79	0
4510-00-V01-9747C	21	22	1
4510-00-V02-8480C	26	46	20
5330-00-V01-6343C	9	10	1
4730-00-826-4268C	121	125	4

<u>ITEM</u>	<u>ON-HAND</u>	<u>FESS</u>	<u>DIFFERENCE</u>
5340-00-V02-0154C	50	57	7
5340-00-V02-4357C	59	55	(4)
5330-00-V01-6487C	19	19	0
4730-00-V02-6928C	10	10	0
4730-00-V52-9137C	4	4	0
4510-00-V02-8590C	39	39	0
5330-00-V01-9555C	24	23	0
4730-00-V02-6934C	36	23	(13)
4730-12-162-6726C	1	1	0
4510-00-V01-9724C	36	34	(2)
4730-00-V01-7903C	6	6	0
4510-00-V02-8359C	3	3	0
4510-00-V02-8706C	210	209	(1)
4510-00-364-3035C	26	26	0
4510-00-V02-8494C	10	7	(3)
4510-00-V02-8300C	7	7	0
4510-00-V02-8388C	3	3	0
4510-00-V02-8248C	3	6	3
4510-00-V02-8339C	4	5	1
4510-00-V02-8532C	15	14	(1)
4510-00-V02-8369C	29	29	0
4730-12-135-1745C	11	11	0
4730-12-135-0665C	11	11	0
4730-12-135-0692C	3	3	0
4730-00-V52-7923C	7	7	0
4730-12-135-1717C	11	9	(2)
4730-12-135-1761C	14	68	54
4730-00-V01-7940C	11	9	(2)
4730-00-V52-8479C	10	10	0
4730-00-V01-8303C	2	2	0
5920-12-137-8081C	22	21	(1)
5920-12-165-7259C	3	3	0
5310-12-124-3870C	11	12	1
6210-00-V02-6541C	22	22	0

<u>ITEM</u>	<u>ON-HAND</u>	<u>FESS</u>	<u>DIFFERENCE</u>
4720-00-729-5338C	4	4	0
5305-12-126-9840C	23	23	0
5306-00-727-4743C	5	5	0
4710-00-V02-3132C	7	7	0
5305-00-V01-8796C	5	10	5
4710-00-V02-3121C	9	9	0
3439-00-284-6191C	2	2	0
4730-00-V02-3184C	1	1	0
4730-00-V02-3158C	10	20	10
4820-00-V02-7020	22	17	(5)
4730-12-150-0159	9	9	0
4730-00-V01-8035	14	13	(1)
4510-00-V02-9940	30	33	3
4820-00-V01-7448	8	8	0
5670-00-V81-2035	21	21	0
4730-00-V01-7385	33	45	12
4820-00-V01-6818	3	2	(1)
4730-00-V02-3280	4	2	(2)
4820-00-V02-9983	4	4	0
4730-00-V01-7255	7	7	0
4730-00-V01-7257	8	8	0
4520-00-V02-8863	29	76	47
4820-00-V01-8592	0	0	0
4820-00-V02-9381	2	3	1
4730-00-V02-3162	8	7	(1)
4520-00-V02-8947	1	1	0
4820-12-135-4567	16	17	1
5305-00-V01-8737	7	4	(3)
5305-12-124-0161	13	2	1
5305-12-126-0796	6	8	2
5305-12-126-7436	0	0	0
5305-00-V01-8750	84	84	0
5340-00-V02-0233C	25	66	41
8020-00-682-6492	9	0	(9)

<u>ITEM</u>	<u>ON-HAND</u>	<u>FESS</u>	<u>DIFFERENCE</u>
5315-00-889-2755	9	0	(9)
5340-00-664-1705	13	13	0
8020-00-V01-9870	14	15	1
5315-00-753-3882	22	25	3
5340-00-243-6190	3	2	(1)
8020-00-200-3487	1	3	2
5340-00-V02-3847	9	9	0
8020-00-582-1693	3	3	0
5340-00-V02-7383	3	3	0
9320-00-V01-6396	0	0	0
6850-00-973-9091	8	9	1
5340-00-V01-9990	68	73	5
5340-00-V02-7306	224	199	(25)
5340-00-V02-0388	121	129	8
4010-00-129-6049	1	3	2
5350-00-221-0886	4	3	(1)
4510-00-V02-8700	4	4	0
4510-00-V01-7617	6	7	1
7105-00-V01-6323	43	44	1
6210-00-V02-2701	1	3	2
8010-00-V81-4039	29	32	3
8010-00-V81-4033	0	12	12
8010-00-598-8067	6	6	0
8040-00-V81-4903	48	70	22

Number Items

122

Actual Less Than FESS

38

Actual More Than FESS

27

Total Not Matching

65 or 53.3%

EXHIBIT VII-E (continued)

STATISTICAL ANALYSIS OF SAMPLE

CORRECT: 57

INCORRECT: 65

$$\mu p = \sqrt{\frac{pq}{n}}$$

Where: μp = Standard Error
 p = Record Accuracy
 q = 1 - p, Error Rate
 n = Sample Size

$$\mu p = \sqrt{\frac{(.553)(.467)}{122}} = 0.0452$$

$$CL = Z\mu p$$

Where: CL = Confidence Level
 Z = Confidence Coefficient¹

$$CL = 1.96 (.0452) = 0.0885$$

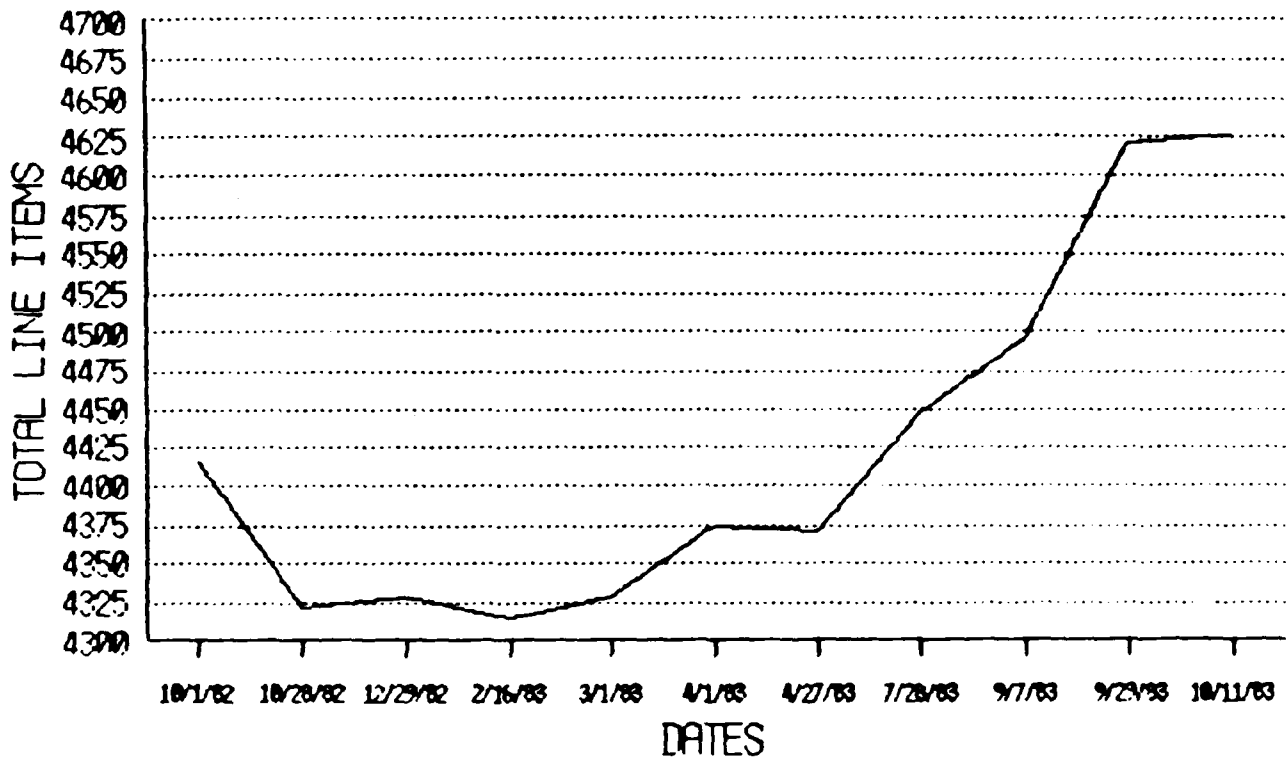
$$UCL = .533 + .088 = .621 \text{ or } 62.1\%$$

$$LCL = .533 - .088 = .445 \text{ or } 44.5\%$$

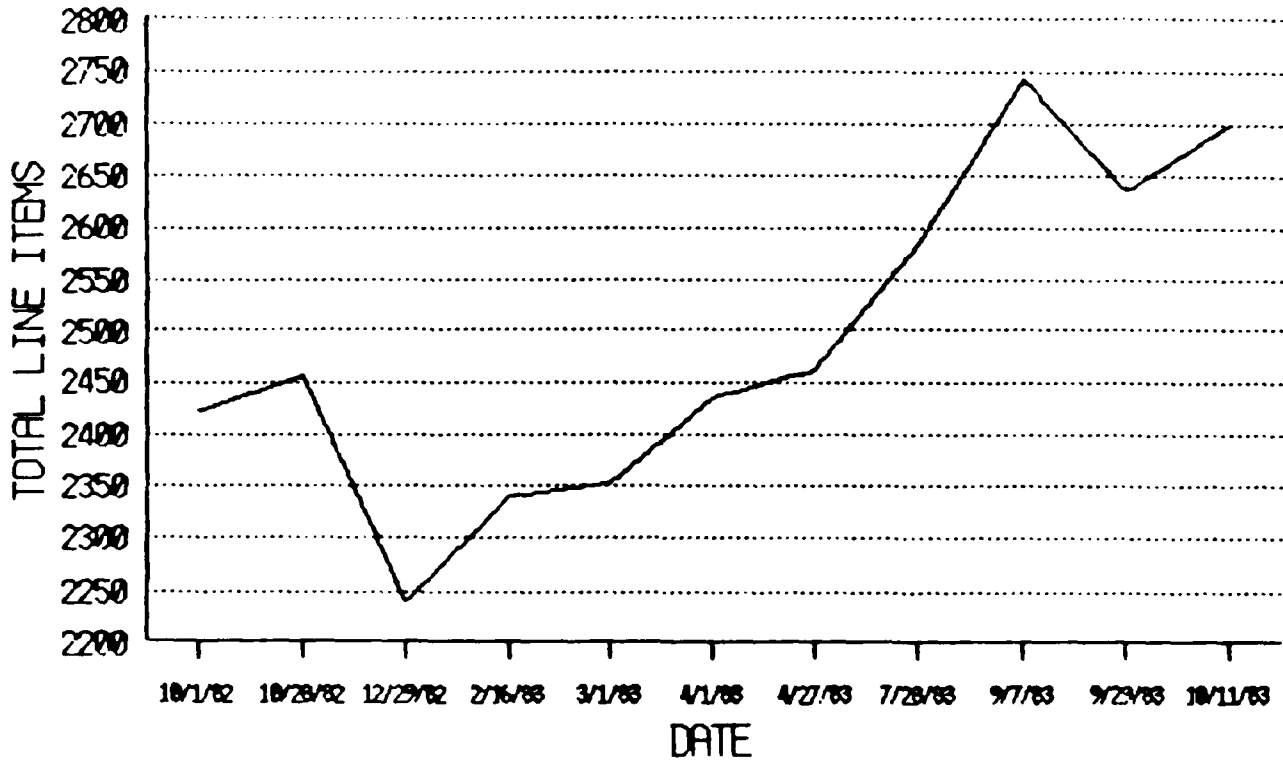
In plain terms this means that, the chances are 95 out of 100 that between 44.5% and 62.1% of the line items in the Karlsruhe Supply Warehouse have incorrect balances compared to the FESS inventory.

¹ For a confidence level of 95 percent, the confidence coefficient is 1.96.

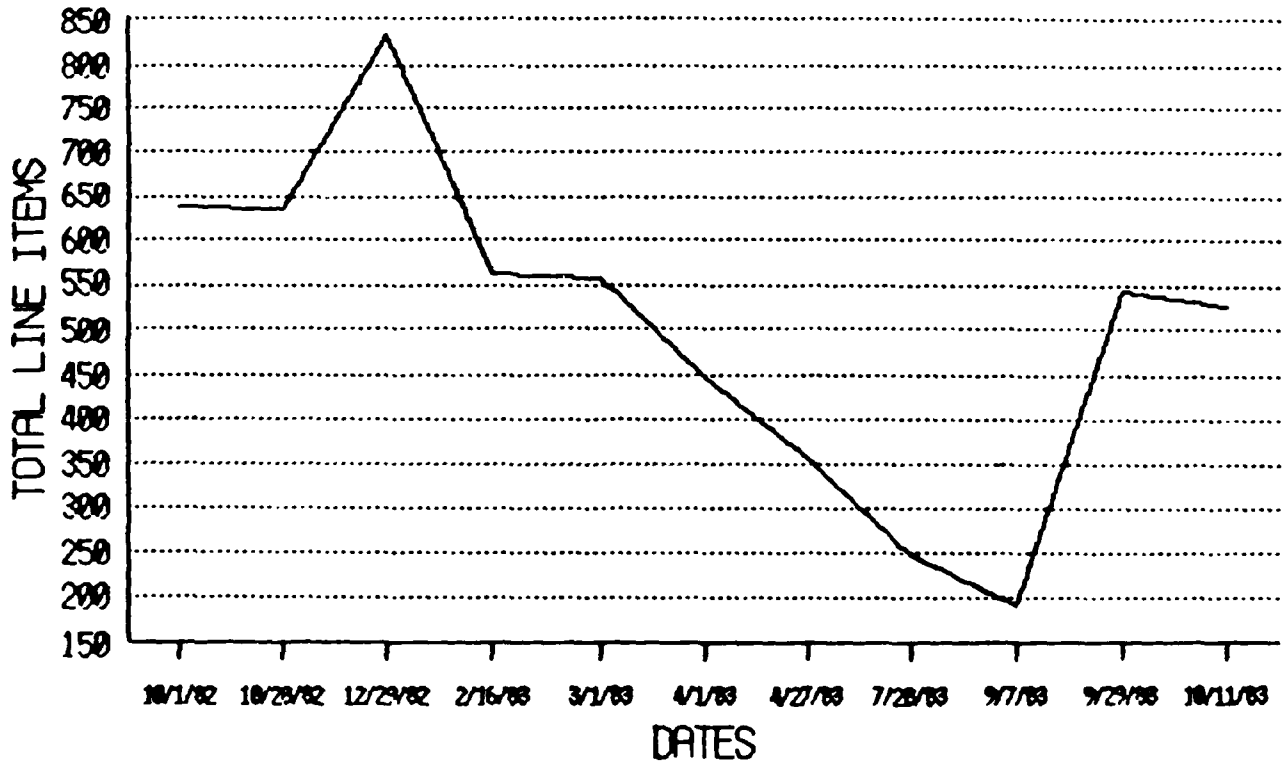
STOCK ITEMS



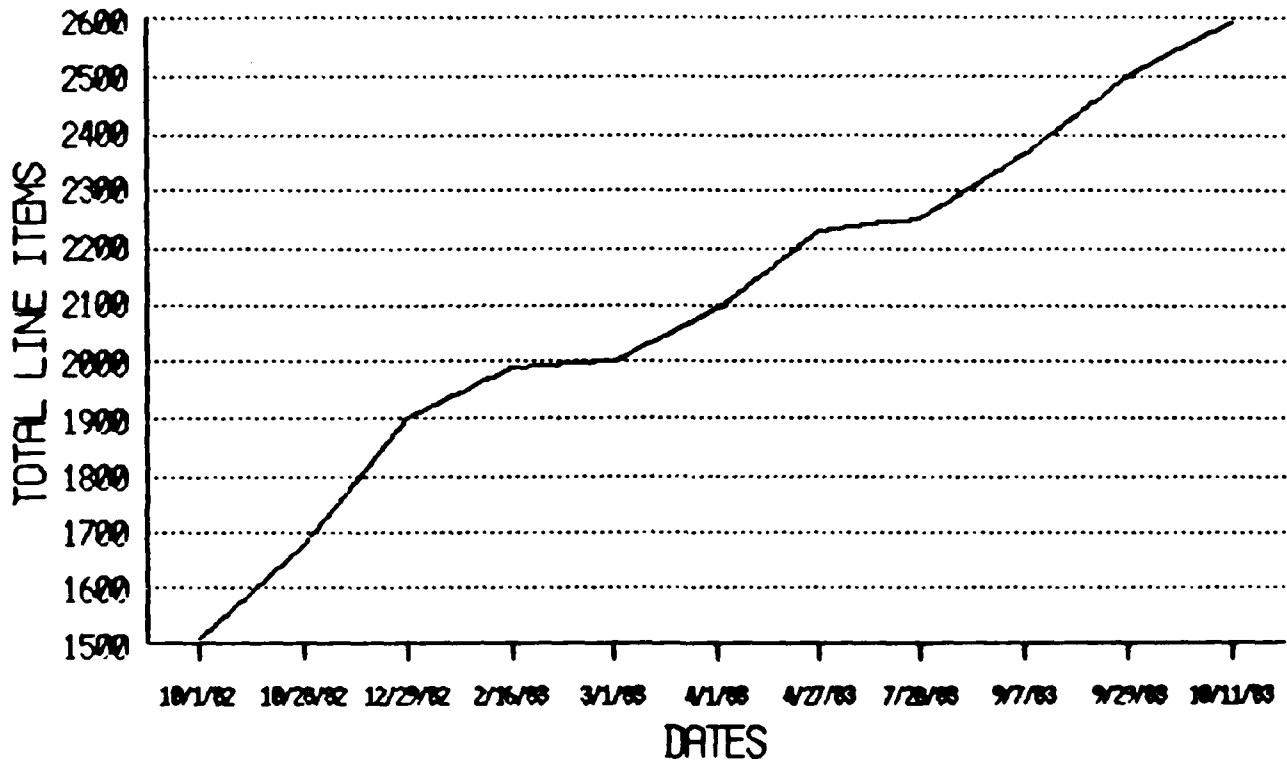
STOCK EXCESS



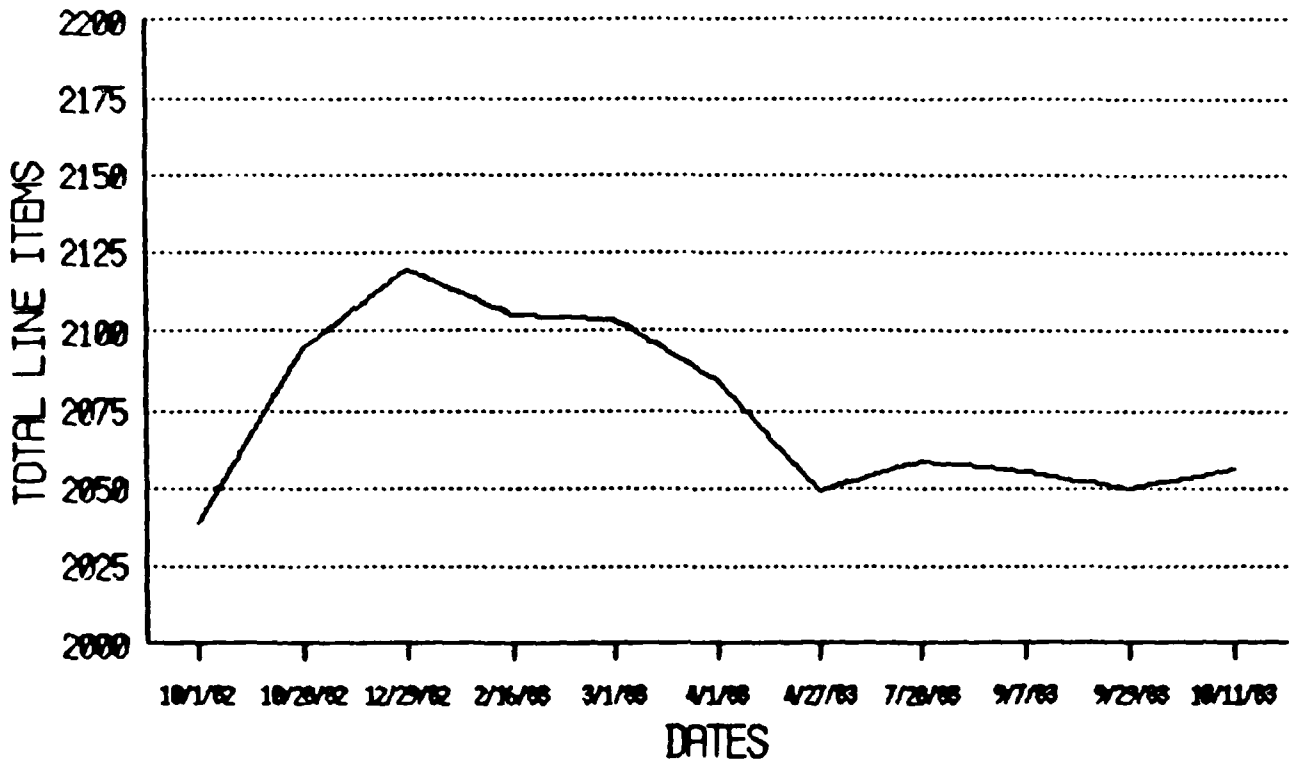
STOCK ZERO BALANCE



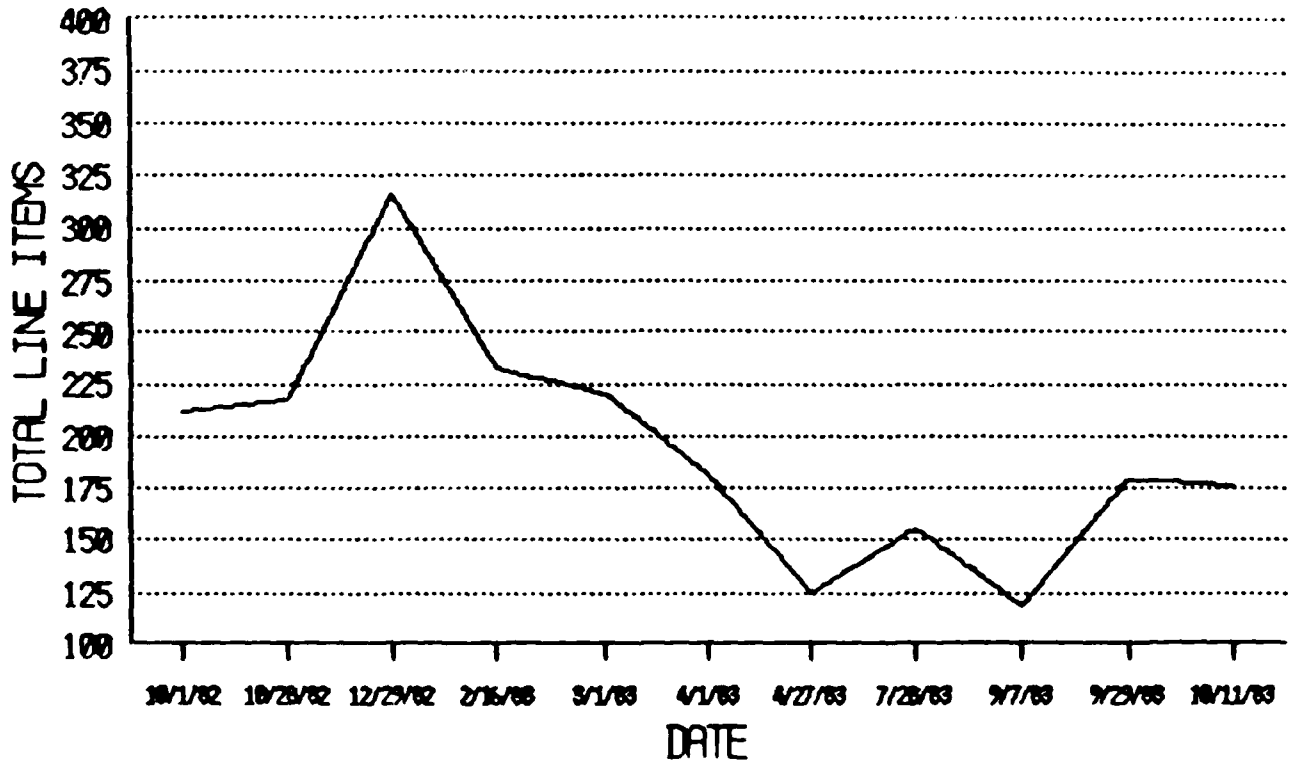
FRINGE ITEMS



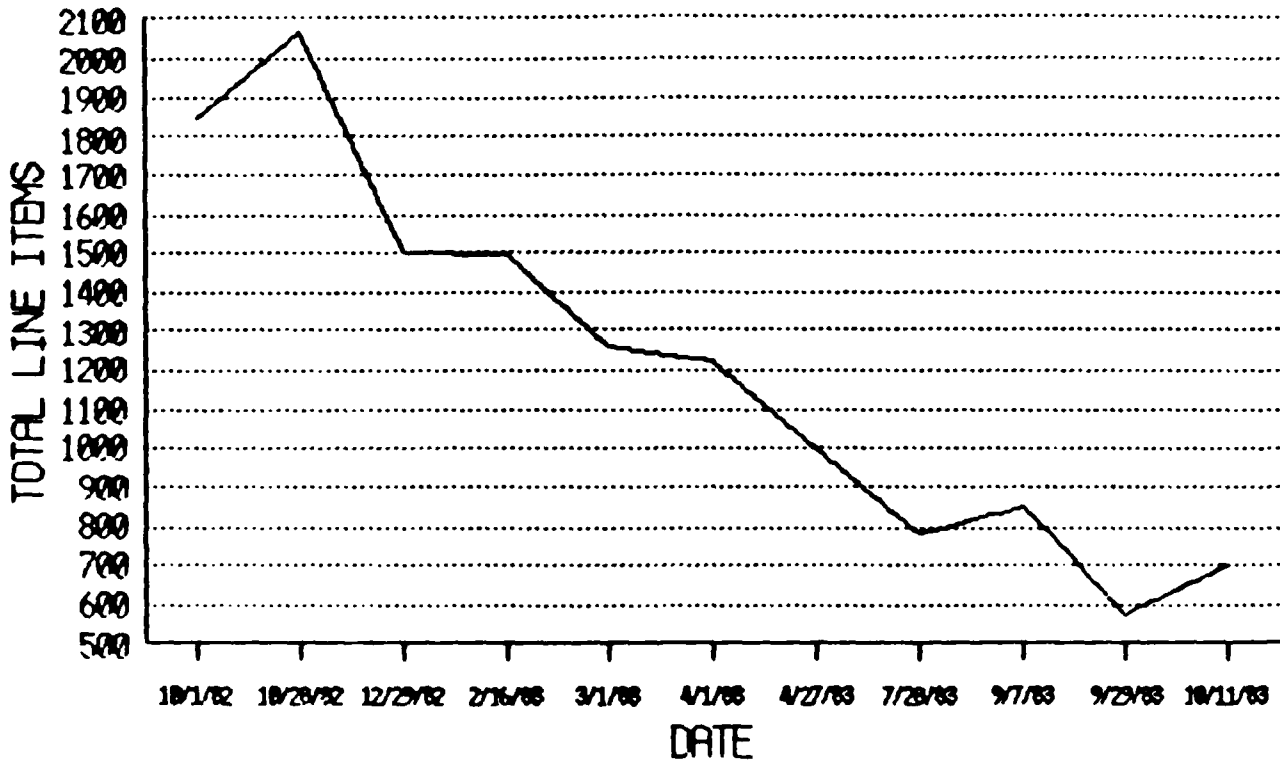
STANDBY ITEMS



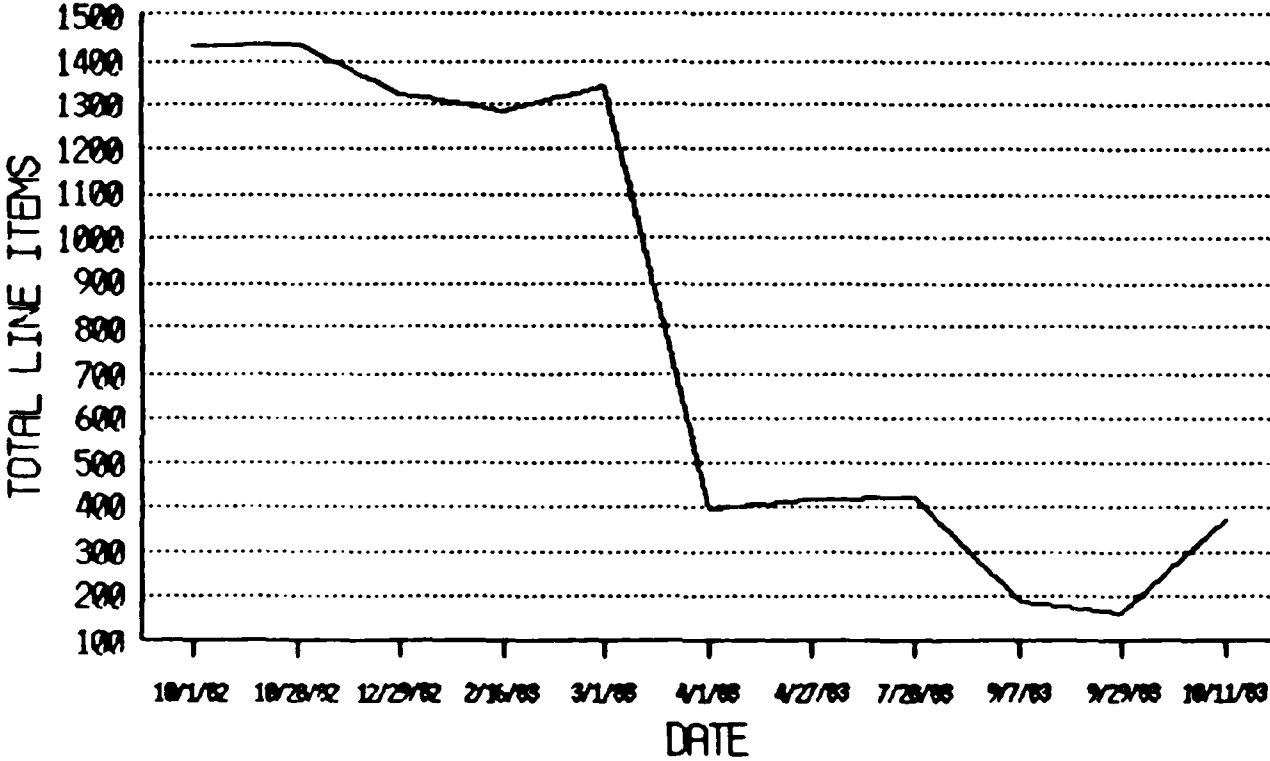
STANDBY ZERO BALANCE



OUTSTANDING ORDERS



DUE OUTS



SECTION VIII
DIRECTORATE OF ENGINEERING AND HOUSING
THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.

* * * EMPLOYEE SURVEY * * *

SECTION VIII

DIRECTORATE OF ENGINEERING AND HOUSING THE U.S. MILITARY COMMUNITY KARLSRUHE, F.R.G.

* * * EMPLOYEE SURVEY * * *

8.1 INTRODUCTION

To assist in the review and analysis of the DEH at U.S. Military Community Karlsruhe, an employee survey was distributed to all shop personnel (including Germersheim) serving the community. This survey is intended to provide additional information to be used in identifying areas affecting productivity, as perceived by the workers.

8.2 BACKGROUND

The employee survey was organized into two parts. The first part (questions 1-28) was designed to measure the employees perception of the DEH organization, while the second part (questions 29-37) was designed to elicit their perceptions of specific areas such as logistic support, planning/estimating and tools and equipment.

Since the responses were not identified by shops, specific problem areas within the respective shops cannot be addressed however overall results, as presented, can be beneficial to the DEH organization.

8.3 QUESTIONNAIRE, PART I

The twenty-eight questions included in the first section are divided into seven categories. These categories are designed to record employee perceptions of the following organizational elements:

<u>Question</u>	<u>Category</u>
1-3	<u>Organizational Communication</u> - the way information is disseminated which assists getting the job done in the best way possible.

- 4-6 Organizational Climate - the perceived properties within the work environment which influence employee behavior.
- 7-9 Organizational Policies and Procedures - the administrative aspects of the organization which enhance productivity.
- 10-14 Supervisory Effectiveness - the perception of the effectiveness of direct supervision on the productive effort.
- 15-19 Team Work - the manner in which employees view the work group as a coordinated team working together.
- 20-24 Internal (Work Group) Communications - the degree in which employees share information on job related events.
- 25-28 Worker Satisfaction - overall worker perception of how well their individual needs are being met.

The responses in part one of the questionnaire were collected and presented in separate exhibits. Exhibit VIII-A, page VIII-7, shows questions 1-28, category and percentage of response for the five different ratings (Very Little to Very Great) for each question. Exhibit VIII-B, page VIII-11, shows questions 29-37 and percentage of response for the different ratings for each question, in table form. A no response rating is also shown in Exhibits VIII-A and VIII-B for those respondents who did not answer a question. Findings of Fact referencing these percentages will be discussed in paragraph 8.5 of this section.

Exhibits VIII-C to VIII-E, page VIII-13 to VIII-15, illustrate graphically the responses received for questions 1-28. In these exhibits, the horizontal axis represents the 7 different categories discussed above. The vertical axis represents weighted average rating¹

¹ All questions were answered on a five point Likert Scale. Each "very little extent" answer received one point, each "little extent" answer received two points, etc. A "no response" in a category received zero points. The weighted average rating is the sum of points for a category, divided by the total number of responses in that category.

for each category. The average rating for the seven categories is represented by a solid line. The results for U.S. Military Community Karlsruhe are displayed in Exhibit VIII-C, page VIII-13. Exhibit VIII-D, page VIII-14, represents U.S. Military Community Karlsruhe (less Germersheim), and Exhibit VIII-E, page VIII-15, Germersheim.

Exhibit VIII-F, page VIII-16, is a copy of the DEH Employee Questionnaire as translated by the USMCA Karlsruhe, Civilian Personnel Office.

8.4 QUESTIONNAIRE, PART II

The nine questions in the second part were added to the survey to provide management with information on areas specific to operations at Karlsruhe. No attempt has been made to analyze this data. The results shown in Exhibit VIII-B, pages VIII-11 and VIII-12, are a percentage spread of the replies received and are provided for informational purposes only.

8.5 SUMMARY

A survey of attitudes and perceptions provides results which may be used to identify possible areas of concern. The results provide a one-time "snapshot" of the organization and, therefore, cannot be used as solid evidence that deficiencies exist. It is important that assumptions about differences in answers not be made, but this information should be used to initiate a dialogue with those elements of the organization which indicate less positive perceptions.

8.5.1 Findings of Fact

A. In total, the average weighted score of 4.20 for questions 1-28 is very high, indicating very positive feelings in the seven categories outlined above.

B. In general, workers have positive considerations about Category A, Organizational Communication. Total score - 3.96.

C. While workers also have relatively good perceptions about Category B, Organizational Climate, over 48% consider that little or very little recognition (a lack of appreciation) is given to people who work hard. Total score - 3.74.

D. The general perception of Category C, Organizational Policies and Procedures indicates that administrative aspects do not effectively enhance productivity. Over 28% of the respondents considered that people at higher levels of the organization were not (little/very little) aware of problems at the worker level. Total score - 3.95.

E. Workers' perceptions of Category D, Supervisory Effectiveness, were very high. Over 86% of the respondents considered that supervisors were either great or very great in their effectiveness. Total score - 4.37.

F. Workers viewed very highly their work group, Category E, as a coordinated team working together. Over 90% responded in the great/very great ratings. Total score - 4.53.

G. For Category F, Internal Communications, workers apparently considered that fellow employees shared information to a large extent on job-related events. Total score - 3.87.

H. Overall, Category G, Worker Satisfaction was reported at very high levels. Almost 94% of the workers responded to great/very great satisfaction in all category questions. Total score - 4.71.

8.5.2 Conclusion

As previously stated, valid conclusions cannot be drawn without supporting information. The findings of fact identified above indicate

those areas within the organization which may benefit from open discussions of perceived problems.

In spite of modern technology in computers and management information systems, the human element is still the most vital and complex factor in any operation or service. The manager's function is to plan, direct, control, monitor and motivate subordinate individuals to maximize production. However, reaction to the way managers plan, direct, control, monitor and motivate is based on perception, and not necessarily on fact. A sense of individual worth and organizational recognition is the basic motivator for most individuals, and it is management's responsibility to provide this type of motivating environment.

8.5.3 Recommendations

In light of the findings of fact and conclusion presented above, the following recommendations are presented:

- A. Peruse the employee survey results to identify those areas requiring discussion.
- B. Convene meetings with DEH personnel and ask what aspects of the organization they were thinking about when answering the survey questions.
- C. Ask for suggestions on how to reduce or eliminate perceived roadblocks to efficient operation.
- D. Listen to suggestions, record them and, if an immediate answer/decision is not possible, specify a date by which an answer/decision will be provided.
- E. Institute a policy whereby the DEH, Deputy, Division Chiefs, and Branch Chiefs visit all shops on a periodic basis to share ideas and problems.

F. Continue assembly of all employees quarterly for an address by the DEH and Community Commander to recognize new employees, farewell departing employees, make formal awards to appropriate employees, and provide a social gather of all DEH perosnnel.

SURVEY QUESTIONS, CATEGORIES, AND RESPONSE PERCENTAGES
(U.S. MILITARY COMMUNITY KARLSRUHE)

	PERCENTAGES				
	To a very little extent	To a little extent	To some extent	To a great extent	To a very great extent
ORGANIZATIONAL COMMUNICATIONS					
1. To what extent is the amount of information you get from your supervisor adequate to meet your daily job assignment?	2.3	1.1	18.2	37.5	39.8
2. How receptive are those above you to your ideas and suggestions?	0.0	12.5	19.3	37.5	29.6
3. To what extent are you asked for ideas when decisions are being made that will affect you?	8.0	12.5	15.9	22.7	39.8
ORGANIZATIONAL CLIMATE					
4. To what extent do you feel motivated to contribute your best efforts to the organization's mission and tasks?	0.0	1.1	5.7	26.2	65.9
5. To what extent are there things about this organization (people, policies, or conditions) that encourage you to work hard?	0.0	10.2	17.0	35.3	36.4
6. To what extent do people who work hard receive recognition (e.g. incentive awards)?	40.9	5.6	14.8	21.6	14.8
ORGANIZATIONAL POLICIES AND PROCEDURES					
7. To what extent are work activities sensibly organized in your shop?	2.3	3.4	12.5	37.5	43.2
8. To what extent is the workload and time available taken into consideration in planning your work group assignments?	1.1	2.3	14.8	38.6	40.9
9. People at higher levels of the organization are aware of the problems at your level.	11.4	19.3	14.8	20.4	31.8
SUPERVISORY EFFECTIVENESS					
10. To what extent does your supervisor encourage the members of your work group to work as a team?	1.1	4.5	13.7	26.2	53.4
11. To what extent does your supervisor encourage the members of your work group to give their best effort?	0.0	4.5	10.2	23.9	61.4
12. To what extent does your supervisor expect high standards of performance from the members of your work group?	1.1	2.3	8.0	11.4	76.1
13. To what extent does your supervisor help you plan, organize and schedule your work ahead of time?	0.0	4.5	9.1	42.1	43.2
14. To what extent does your supervisor offer you ideas to help solve job-related problems?	0.0	5.7	6.8	26.1	61.4

TEAM WORK

	To a very little extent	To a little extent	To some extent	To a great extent	To a very great extent	No response
15. To what extent do members of your work group exchange opinions and ideas?	1.1	4.5	4.5	30.7	58.0	1.1
16. How much do members of your work group encourage each other to work as a team?	1.1	3.4	12.5	15.9	67.1	0.0
17. To what extent do members of your work group maintain high standards of performance?	0.0	1.1	8.0	26.1	64.8	0.0
18. To what extent do members of your work group offer each other ideas for solving job-related problems?	0.0	1.1	2.3	23.9	72.7	0.0
19. To what extent does your work group plan together and coordinate its efforts?	2.3	1.1	12.5	21.6	61.4	1.1

INTERNAL (WORK GROUP) COMMUNICATIONS

20. To what extent do you have confidence and trust in the members of your work group?	1.1	4.5	5.7	21.6	67.1	0.0
21. To what extent is information about important job related events widely exchanged within your work group?	0.0	1.1	5.7	34.1	59.1	0.0
22. To what extent does your work group make good decisions and solve problems effectively?	1.1	2.3	6.8	27.3	62.5	0.0
23. To what extent has your work group been adequately trained to handle emergency situations?	8.0	17.0	20.5	13.6	39.8	1.1
24. To what extent do nonsupervisory personnel influence what goes on in your work group?	38.7	28.4	19.3	4.5	8.0	1.1

WORKER SATISFACTION

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Fairly satisfied	Very satisfied	No response
25. All in all, how satisfied are you with the people in your work group?	1.1	2.3	4.5	18.2	73.9	0.0
26. All in all, how satisfied are you with your supervisor?	1.1	0.0	2.3	13.6	83.0	0.0
27. All in all, how satisfied are you with this organization?	3.4	2.3	3.4	13.6	77.3	0.0
28. All in all, how satisfied are you with your job?	1.1	1.1	5.7	8.0	84.1	0.0

SURVEY QUESTIONS, CATEGORIES, AND RESPONSE PERCENTAGES
(GERMETSHEIT)

	To a very little extent	To a little extent	To some extent	To a great extent	To a very great extent	No response
ORGANIZATIONAL COMMUNICATIONS						
1. To what extent is the amount of information you get from your supervisor adequate to meet your daily job assignment?	5.6	2.8	8.3	38.9	44.4	0.0
2. How receptive are those above you to your ideas and suggestions?	5.6	5.6	11.1	19.4	52.7	5.6
3. To what extent are you asked for ideas when decisions are being made that will affect you?	8.3	2.8	5.6	36.1	30.9	8.3
ORGANIZATIONAL CLIMATE						
4. To what extent do you feel motivated to contribute your best efforts to the organization's mission and tasks?	0.0	0.0	5.6	13.9	77.7	2.8
5. To what extent are there things about this organization (people, policies, or conditions) that encourage you to work hard?	0.0	2.8	19.4	33.3	38.9	5.6
6. To what extent do people who work hard receive recognition (e.g. incentive awards)?	36.1	16.7	16.7	22.2	0.0	8.3
ORGANIZATIONAL POLICIES AND PROCEDURES						
7. To what extent are work activities sensibly organized in your shop?	0.0	5.6	2.8	36.0	50.0	5.6
8. To what extent is the workload and time available taken into consideration in planning your work group assignments?	2.8	5.6	5.6	41.7	33.2	11.1
9. People at higher levels of the organization are aware of the problems at your level.	13.9	8.3	13.9	11.1	33.3	19.5
SUPERVISORY EFFECTIVENESS						
10. To what extent does your supervisor encourage the members of your work group to work as a team?	5.6	2.8	0.0	22.2	61.1	8.3
11. To what extent does your supervisor encourage the members of your work group to give their best effort?	0.0	0.0	5.6	36.1	47.2	11.1
12. To what extent does your supervisor expect high standards of performance from the members of your work group?	0.0	0.0	0.0	27.8	66.6	5.6
13. To what extent does your supervisor help you plan, organize and schedule your work ahead of time?	11.1	5.6	2.8	25.0	47.2	8.3
14. To what extent does your supervisor offer you ideas to help solve job-related problems?	13.8	5.6	2.8	25.0	50.0	2.8

	PERCENTAGES				
	To a very little extent	To a little extent	To some extent	To a great extent	To a very great extent
15. To what extent do members of your work group exchange opinions and ideas?	0.0	2.8	2.8	27.7	61.1
16. How much do members of your work group encourage each other to work as a team?	0.0	2.8	2.8	25.0	66.6
17. To what extent do members of your work group maintain high standards of performance?	0.0	0.0	5.6	19.4	72.2
18. To what extent do members of your work group offer each other ideas for solving job-related problems?	0.0	0.0	5.6	16.6	72.2
19. To what extent does your work group plan together and coordinate its efforts?	2.8	0.0	5.6	30.5	58.3

TEAM WORK

15. To what extent do members of your work group exchange opinions and ideas?
16. How much do members of your work group encourage each other to work as a team?
17. To what extent do members of your work group maintain high standards of performance?
18. To what extent do members of your work group offer each other ideas for solving job-related problems?
19. To what extent does your work group plan together and coordinate its efforts?

INTERNAL (WORK GROUP) COMMUNICATIONS

20. To what extent do you have confidence and trust in the members of your work group?
21. To what extent is information about important job related events widely exchanged within your work group?
22. To what extent does your work group make good decisions and solve problems effectively?
23. To what extent has your work group been adequately trained to handle emergency situations?
24. To what extent do nonsupervisory personnel influence what goes on in your work group?

	PERCENTAGES				
	Very dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Fairly satisfied	Very satisfied
25. All in all, how satisfied are you with the people in your work group?	2.8	0.0	2.8	2.8	88.8
26. All in all, how satisfied are you with your supervisor?	0.0	2.8	2.8	19.4	72.2
27. All in all, how satisfied are you with this organization?	0.0	0.0	2.8	16.6	80.6
28. All in all, how satisfied are you with your job?	0.0	0.0	0.0	2.8	94.4

WORKER SATISFACTION

25. All in all, how satisfied are you with the people in your work group?
26. All in all, how satisfied are you with your supervisor?
27. All in all, how satisfied are you with this organization?
28. All in all, how satisfied are you with your job?

EXHIBIT VIII-B

SURVEY RESULTS QUESTIONS 29-37

		<u>RESPONSE PERCENTAGES</u>		
		<u>Total</u>	<u>KR¹</u>	<u>GH²</u>
29.	In general, do you think the supply support provided is:			
	EXCELLENT	12.1	15.9	2.8
	GOOD	61.3	68.2	44.4
	FAIR	16.9	11.4	30.6
	POOR	8.9	4.5	19.4
	VERY POOR	0.0	0.0	0.0
	NO RESPONSE	0.8	0.0	2.8
30.	In general, do you feel the planning and estimating for your assignments are:			
	UNDERESTIMATED	1.6	1.1	2.8
	OVERESTIMATED	0.0	0.0	0.0
	ARE ACCURATE	78.2	86.4	58.3
	I DON'T KNOW	12.1	12.5	11.1
	NO RESPONSE	8.1	0.0	27.8
31.	Are vehicle assignments adequate for your shop?			
	YES	76.6	83.0	61.1
	NO	7.3	9.1	2.8
	I DON'T KNOW	6.4	6.8	5.6
	NO RESPONSE/NOT APPLY	9.7	1.1	30.5
32.	The equipment and tools provided by the Government are:			
	EXCELLENT	18.6	18.2	19.4
	SATISFACTORY	62.1	65.9	52.8
	POOR	10.5	12.5	5.6
	UNSATISFACTORY	4.0	2.3	8.3
	NO RESPONSE	4.8	1.1	13.9
33.	For the work you do, do you feel you are:			
	PAID FAIRLY	53.2	65.9	22.2
	UNDERPAID	45.2	31.8	77.8
	OVERPAID	0.0	0.0	0.0
	DON'T KNOW	0.0	0.0	0.0
	NO RESPONSE	1.6	2.3	0.0

¹ Karlsruhe

² Germersheim

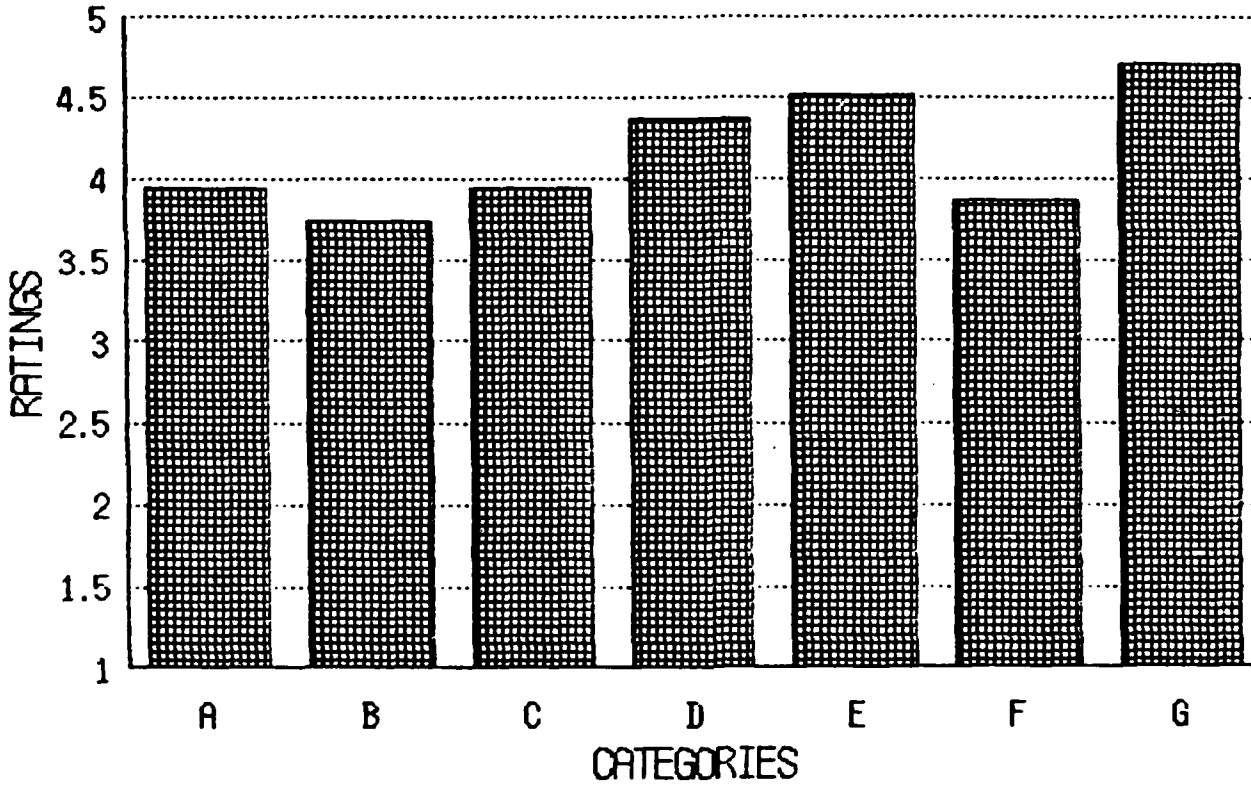
EXHIBIT VIII-B (continued)

RESPONSE PERCENTAGES

	<u>Total</u>	<u>KR</u> ¹	<u>GH</u> ²
34. When going to pick up material for an IJO, you find the material is:			
ALWAYS THERE	33.1	37.5	22.2
USUALLY THERE	55.6	56.8	52.8
USUALLY NOT THERE	7.3	3.4	16.7
NEVER THERE	0.0	0.0	0.0
NO RESPONSE	4.0	2.3	8.3
35. Work is interrupted due to nonavailability of material:			
OFTEN	3.2	0.0	11.1
HALF THE TIME	4.8	4.5	5.6
SELDOM	56.5	61.4	44.4
NEVER	30.7	34.1	22.2
NO RESPONSE	4.8	0.0	16.7
36. In general, do you feel you are:			
OVERWORKED	21.8	12.5	44.4
UNDERWORKED	1.6	2.3	0.0
NEITHER	66.9	80.6	33.3
DON'T KNOW	3.2	2.3	5.6
NO RESPONSE	6.5	2.3	16.7
37. How often does your foreman visit you at the job site?			
ONCE A DAY	14.5	13.6	16.7
MORE THAN ONCE A DAY	73.4	70.5	80.5
ONCE A WEEK	6.5	8.0	2.8
SELDOM	0.8	1.1	0.0
NO RESPONSE	4.8	6.8	0.0

¹ Karlsruhe
² Germersheim

EMPLOYEE SURVEY RESULTS -- TOTAL



CATEGORIES

- A. Organizational Communications
- B. Organizational Climate
- C. Organizational Policies and Procedures
- D. Supervisory Effectiveness
- E. Team Work
- F. Internal (Work Group) Communications
- G. Worker Satisfaction

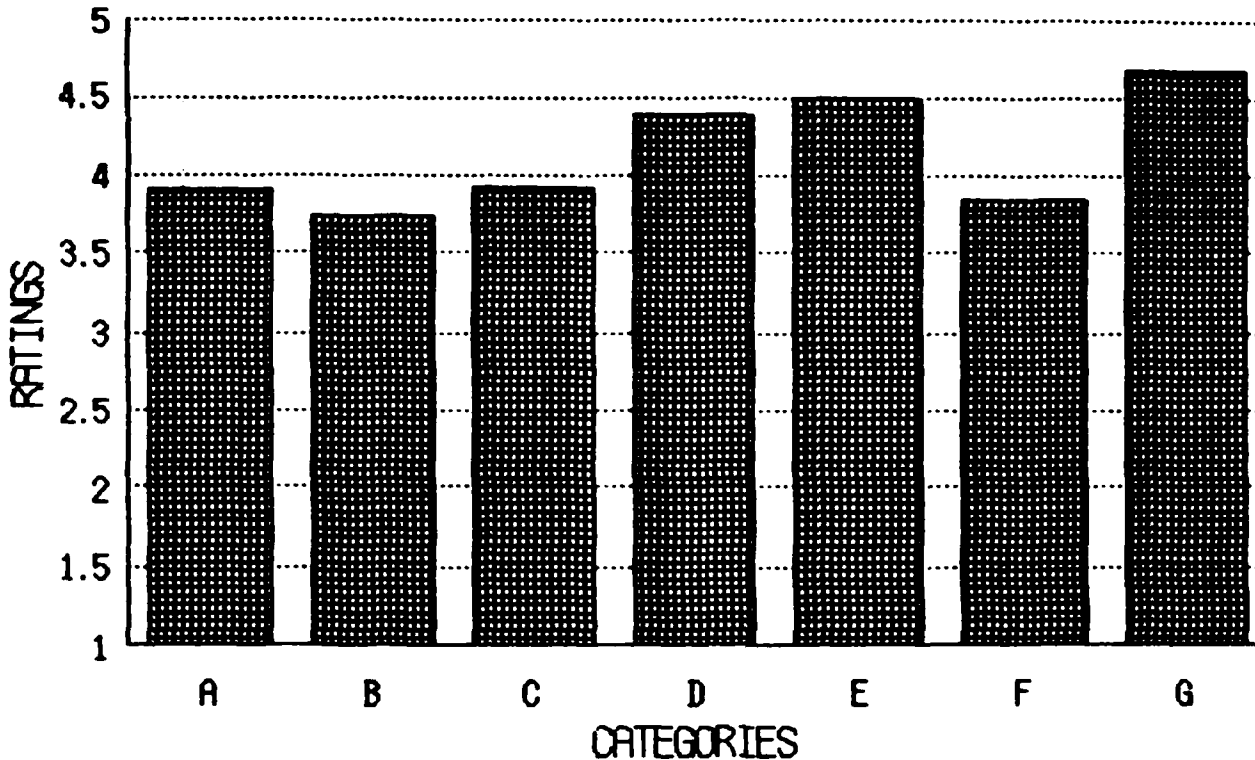
RATINGS - QUESTION 1-24

- 1 - To a very little extent
- 2 - To a little extent
- 3 - To some extent
- 4 - To a great extent
- 5 - To a very great extent

RATINGS - QUESTION 25-28

- 1 - Very dissatisfied
- 2 - Somewhat dissatisfied
- 3 - Neither satisfied nor dissatisfied
- 4 - Fairly satisfied
- 5 - Very satisfied

EMPLOYEE SURVEY RESULTS KARLSRUHE ONLY



CATEGORIES

- A. Organizational Communications
- B. Organizational Climate
- C. Organizational Policies and Procedures
- D. Supervisory Effectiveness
- E. Team Work
- F. Internal (Work Group) Communications
- G. Worker Satisfaction

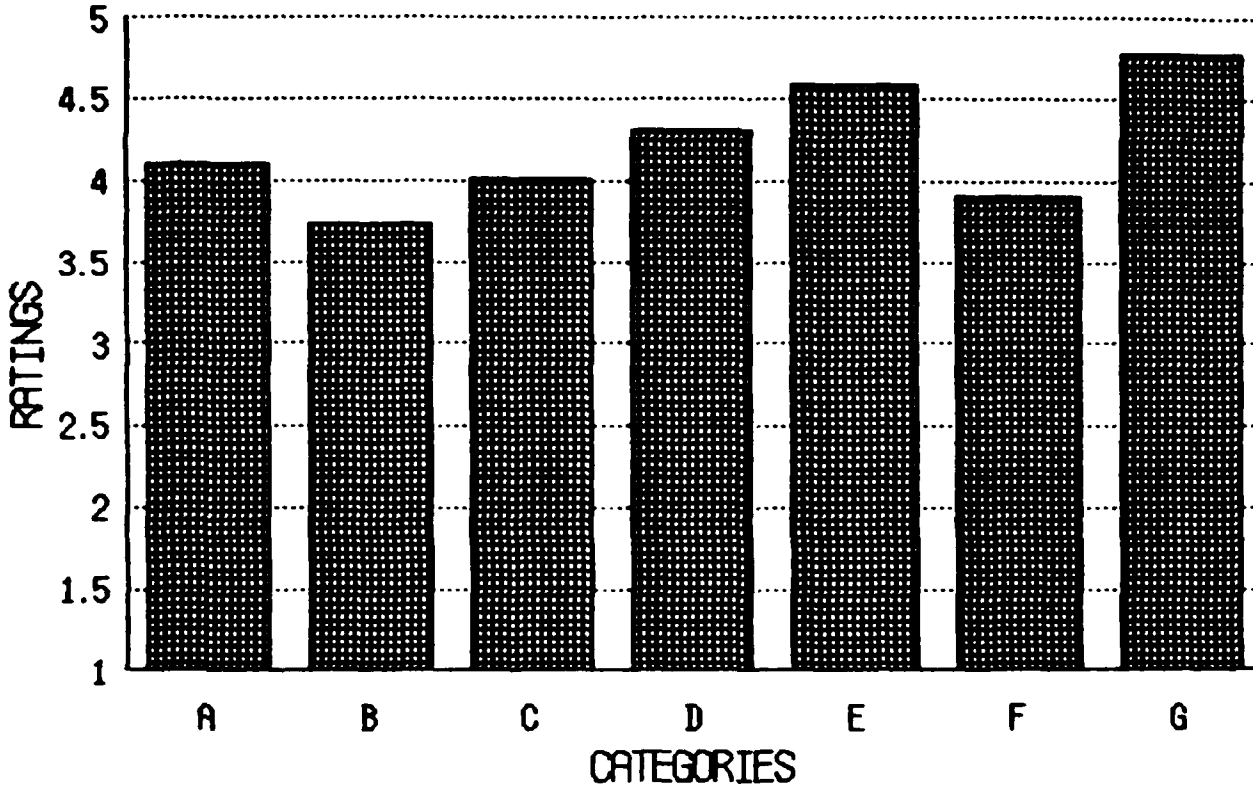
RATINGS - QUESTION 1-24

- 1 - To a very little extent
- 2 - To a little extent
- 3 - To some extent
- 4 - To a great extent
- 5 - To a very great extent

RATINGS - QUESTION 25-28

- 1 - Very dissatisfied
- 2 - Somewhat dissatisfied
- 3 - Neither satisfied nor dissatisfied
- 4 - Fairly satisfied
- 5 - Very satisfied

EMPLOYEE SURVEY RESULTS GERMERSHEIM ONLY



CATEGORIES

- A. Organizational Communications
- B. Organizational Climate
- C. Organizational Policies and Procedures
- D. Supervisory Effectiveness
- E. Team Work
- F. Internal (Work Group) Communications
- G. Worker Satisfaction

RATINGS - QUESTION 1-24

- 1 - To a very little extent
- 2 - To a little extent
- 3 - To some extent
- 4 - To a great extent
- 5 - To a very great extent

RATINGS - QUESTION 25-28

- 1 - Very dissatisfied
- 2 - Somewhat dissatisfied
- 3 - Neither satisfied nor dissatisfied
- 4 - Fairly satisfied
- 5 - Very satisfied

Fragebogen fuer Beschaeftigte des Heeresbauamtes Karlsruhe
DEH Employee Questionnaire

Allgemeine Information
Demographic Data

Wie lange arbeiten Sie schon bei DEH? _____
How long have you been at this command?

Wie lange sind Sie schon in Ihrer jetzigen Arbeitsgruppe? _____
How long have you been assigned to your present work group?

Wie lange sind Sie insgesamt bei der U.S. Armee beschaeftigt? _____
How many years of federal service have you accumulated?

Zu welcher Lohn-/Gehaltsgruppe gehoeren Sie? _____
What is your current pay grade?

In welcher Werkstatt arbeiten Sie? _____
To what shop are you assigned?

Welche beruflichen Zukunftsplaene haben Sie? (Bitte nur eine Antwort ankreuzen.)
What are your current work plans? (Please circle one choice.)

- a. bis zum Erreichen des Rentenalters bei DEH arbeiten.
To remain at DEH until retirement.
- b. Wechsel des Arbeitsplatzes/Arbeitgebers.
To seek employment elsewhere.
- c. Unentschlossen in Bezug auf berufliche Zukunft.
Undecided about my work plans.

Anleitung
(Survey Instructions)

1. Der Wert dieses Fragebogens haengt von der aufrichtigen und gewissenhaften Beantwortung aller Fragen ab. Die ausgefuellten Frageboegen werden streng vertraulich behandelt.
The value of this survey depends upon your being straight forward in answering this questionnaire. Your answer sheets will be collated by E. L. Hamm and Associates, and no one from your organization will see them.
2. Bitte beantworten Sie die Fragen, indem Sie das entsprechende Kaestchen ankreuzen. Wenn keine der vorgegebenen Antworten exakt auf Ihren Fall zutrifft, waehlen Sie bitte eine, die Ihrer Antwort am naechsten kommt.
All questions can be answered by checking the appropriate space. If you do not find the exact answer that fits your case, select the one that is closest to it.

3. Auf jede Frage sind fuenf verschiedenen Antworten moeglich. Bitte lesen Sie sich alle Antworten genau durch und kreuzen Sie die an, welche in Ihren Augen Ihrer Situation am ehesten entspricht. Each question has five possible responses. To answer these questions, go through them carefully one at a time and check one answer that best represents your feelings.
4. DIES IST KEINE PRUEFUNG, es gibt also keine richtigen oder falschen Antworten. Die beste Antwort ist die Antwort, welche Ihre Meinung zu der betreffenden Frage am genauesten wiedergibt. THIS IS NOT A TEST, so there are no right or wrong answers. The best answer is the one which most accurately describes how you feel about each issue.

Bitte beachten Sie: In den folgenden Fragen bezieht sich der Begriff "Arbeitsgruppe" auf alle Personen, die unter Anleitung ein und desselben Vorgesetzten/Meisters arbeiten, mit dem Begriff "Dienststelle" ist DEH insgesamt gemeint.

NOTE: In the following questions, WORK GROUP refers to all those persons who report to the same supervisor. ORGANIZATION refers to the entire DEH.

sehr wenig
To a very little extent
 etwas
To a little extent
 etwas mehr
To some extent
 viel mehr
To a great extent
 sehr viel
To a very great extent

1. In welchem Ausmass erhalten Sie genaue Arbeitsanweisungen von Ihrem Vorgesetzten/Meister?
To what extent is the amount of information you get from your supervisor adequate to meet your daily job assignments?
2. Kommt man Ihren Ideen und Vorschlaegen entgegen?
How receptive are those above you to your ideas and suggestions?
3. Fragt man Sie nach Ihrer Meinung wenn Aenderungen beschlossen werden, die Sie betreffen?
To what extent are you asked for ideas when decisions are being made that will affect you?
4. Wie stark fuehlen Sie sich motiviert, gute Leistungen zum Wohle Ihrer Dienststelle zu erbringen?
To what extent do you feel motivated to contribute your best efforts to the organization's mission and tasks?

--	--	--	--	--

--	--	--	--	--

--	--	--	--	--

--	--	--	--	--

- | | |
|--|---|
| | sehr wenig
To a very little extent
etwas
To a little extent
etwas mehr
To some extent
viel mehr
To a great extent
sehr viel
To a very great extent |
| 5. In welchem Ausmass tragen in Ihrer Dienststelle bestimmte Dinge (z. B. Personen, Dienstvorschriften, Arbeitsbedingungen) dazu bei, dass Sie sich zu guten Leistungen angespornt fuehlen?
To what extent are there things about this organization (people, policies or conditions) that encourage you to work hard? | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 6. In welchem Ausmass werden besonders gute Leistungen belohnt (z. B. durch Leistungspraemien)?
To what extent do people who work hard receive recognition (e.g. incentive awards)? | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 7. Werden Arbeitsablaeuft an Ihrer Arbeitsstelle sinnvoll organisiert?
To what extent are work activities sensibly organized in your shop? | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 8. Stehen bei der Zuweisung von Arbeitsauftraegen die auszufuehrende Arbeit und die dazu zur Verfuegung stehende Zeit in einem sinnvollen Verhaeltnis?
To what extent is the workload and time available taken into consideration in planning your work group assignments? | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 9. Wissen Leuten in hoeheren Positionen ueber Ihre Probleme Bescheid?
People at higher levels of the organization are aware of the problems at your level. | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 10. In welchem Ausmass foerdert Ihr Vorgesetzter die Zusammenarbeit aller Mitarbeiter?
To what extent does your supervisor encourage the members of your work group to work as a team? | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| 11. Spornt Ihr Vorgesetzter Sie und die anderen Mitglieder Ihrer Arbeitsgruppe zu guten Leistungen an?
To what extent does your supervisor encourage the members of your work group to give their best effort? | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |

sehr wenig
To a very little extent
etwas
To a little extent
etwas mehr
To some extent
viel mehr
To a great extent
sehr viel
To a very great extent

12. Erwartet Ihr Vorgesetzter, dass Sie und die anderen Mitglieder Ihrer Arbeitsgruppe stets gute Leistungen erbringen?
To what extent does your supervisor expect high standards of performance from the members of your work group?
13. Hilft Ihnen Ihr Vorgesetzter bei der zeitlichen und organisatorischen Planung Ihrer Arbeitsauftraege?
To what extent does your supervisor help you plan, organize and schedule your work ahead of time?
14. Hilft Ihnen Ihr Vorgesetzter mit Vorschlaegen weiter, wenn es darum geht, Probleme, die bei der Verrichtung Ihrer Arbeit entstehen, zu loesen?
To what extent does your supervisor offer you ideas to help solve job-related problems?
15. Findet unter den Mitgliedern Ihrer Arbeitsgruppe ein Ideenund Meinungs Austausch statt?
To what extent do members of your work group exchange opinions and ideas?
16. Foerdern die Mitglieder Ihrer Arbeitsgruppe den Teamgeist?
How much do members of your work group encourage each other to work as a team?
17. Bemuehen sich die Mitglieder Ihrer Arbeitsgruppe darum, stets gute Leistungen zu erbringen?
To what extent do members of your work group maintain high standards of performance?
18. Helfen sich die Mitglieder Ihrer Arbeitsgruppe untereinander mit Vorschlaegen weiter, wenn es darum geht, Probleme zu loesen, die bei der Verrichtung ihrer Arbeit entstehen?
To what extent do members of your work group offer each other ideas for solving job-related problems?

sehr wenig
to a very little extent
etwas
to a little extent
etwas mehr
to some extent
viel mehr
to a great extent
sehr viel
to a very great extent

19. Planen und koordinieren die Mitglieder Ihrer Arbeitsgruppe die zu verrichtende Arbeit miteinander?
To what extent does your work group plan together and coordinate its efforts?

--	--	--	--	--

20. Haben Sie Vertrauen zu den anderen Mitgliedern Ihrer Arbeitsgruppe?
To what extent do you have confidence and trust in the members of your work group?

--	--	--	--	--

21. Besprechen Sie wichtige Informationen und Ereignisse mit Ihren Arbeitskollegen?
To what extent is information about important job related events exchanged within your work group?

--	--	--	--	--

22. Werden in Ihrer Arbeitsgruppe gute Entscheidungen getroffen und Probleme geloest?
To what extent does your work group make good decisions and solve problems effectively?

--	--	--	--	--

23. Wurde Ihre Arbeitsgruppe in angemessener Weise fuer Notfaelle geschult?
To what extent has your work group been adequately trained to handle emergency situations?

--	--	--	--	--

24. Haben andere Personen als Ihre Vorgesetzten Einfluss auf das, was in Ihrer Arbeitsgruppe vorgeht?
To what extent do non-supervisory personnel influence what goes on in your work group?

--	--	--	--	--

nicht unbefriedigt
Very dissatisfied
etwas unbefriedigt
Somewhat dissatisfied
nicht befriedigt oder unbefriedigt
Neither satisfied nor dissatisfied
etwas befriedigt
Fairly satisfied
sehr befriedigt
Very satisfied

25. Sind Sie insgesamt gesehen mit den Mitgliedern Ihrer Arbeitsgruppe zufrieden?
All in all, how satisfied are you with the people in your work group?

--	--	--	--	--

26. Sind Sie insgesamt gesehen mit Ihrem Vorgesetzten/Meister zufrieden?
All in all, how satisfied are you with your supervisor?

--	--	--	--	--

27. Sind Sie insgesamt gesehen mit Ihrer Dienststelle zufrieden?
All in all, how satisfied are you with this organization?

--	--	--	--	--

28. Sind Sie insgesamt gesehen mit Ihrer Arbeitsstelle zufrieden?
All in all, how satisfied are you with your job?

--	--	--	--	--

Zusaetzliche Fragen (Bitte kreuzen Sie die Antwort an, die Ihrer Meinung nach am ehesten zutrifft.)
 Check the one response you feel is most appropriate.

29. Nach Ihrer Meinung, ist die Materialversorgung im allgemeinen:
 In general, do you think the supply support provided is:

AUSGEZEICHNET EXCELLENT	GUT GOOD	RELATIV GUT FAIR	DUERFTIG POOR	SEHR DUERFTIG VERY POOR
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

30. Wie beurteilen Sie die Planung und Organisation (Kosten, Zeit, Arbeitsaufwand) der Ihnen uebertragenen Arbeit?
 In general, do you feel the planning and estimating for your job assignments are:

UNTERSCHAETZT UNDERESTIMATED	UEBERSCHAETZT OVERESTIMATED	RICHTIG ARE ACCURATE	WEISS NICHT I DON'T KNOW
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

31. Stehen Ihrer Werkstatt genugend Fahrzeuge zur Verfuegung?
 Are vehicle assignments adequate for your shop?

JA YES	NEIN NO	WEISS NICHT I DON'T KNOW
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

32. Das von der Armee zur Verfuegung gestellte Material und die Werkzeuge sind
 The equipment and tools provided by the Government are:

AUSGEZEICHNET EXCELLENT	ZUFRIEDENSTELLEND SATISFACTORY	DUERFTIG POOR	SEHR DUERFTIG UNSATISFACTORY
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

33. Glauben Sie, dass Sie fuer die Arbeit, die Sie verrichten _____ sind?
 For the work you do, do you feel you are:

ANGEMESSEN BEZAHLT PAID FAIRLY	UNTERBEZAHLT UNDERPAID	UEBERBEZAHLT OVERPAID	WEISS NICHT DON'T KNOW
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

34. Wenn Sie Material fuer einen benoetigen, ist das Material dann
 When going to pick up material for an IJO, you find the material is:

IMMER ZU ERHALTEN
 ALWAYS THERE

GEWOEHNLICH ZU ERHALTEN
 USUALLY THERE

GOWOEHNLICH NICHT ZU ERHALTEN
 USUALLY NOT THERE

NIEMALS ZU ERHALTEN
 NEVER THERE

35. Kommt es vor, dass die Arbeit unterbrochen werden muss, weil das
 notwendige Material fehlt?
 Work is interrupted due to nonavailability of material:

SEHR OFT
 OFTEN

HAEUFIG
 HALF THE TIME

SELTEN
 SELDOM

NIE
 NEVER

36. Fuehlen Sie sich
 In general, do you feel you are:

UEBERARBEITET
 OVERWORKED

NICHT AUSGELASTET
 UNDERWORKED

KEINS VON BEIDEN
 NEITHER

WEISS NICHT
 DON'T KNOW

37. Wie oft kommt Ihr Vorarbeiter zu Ihrer Arbeitsstelle?
 How often does your foreman visit you at the job site?

EINMAL AM TAG
 ONCE A DAY

MEHRMALS TAEGLICH
 MORE THAN ONCE A DAY

EINMAL IN DER WOCHE
 ONCE A WEEK

SELTEN
 SELDOM

Ausaetzliche Bemerkungen:
 Additional Comments:

END

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6-85

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