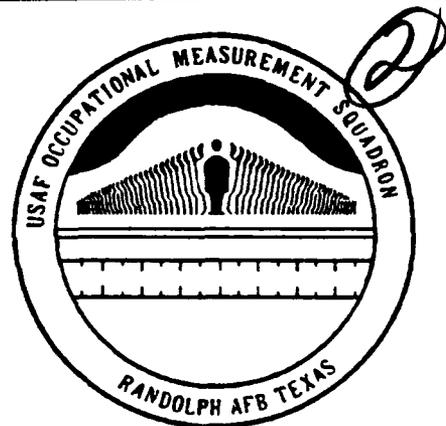




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# OCCUPATIONAL SURVEY REPORT



93-02989

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AIRCRAFT ELECTRICAL AND ENVIRONMENTAL  
SYSTEMS

AFSCs 452X5, 454X5, AND 454X6

AFPT 90-452-885

JANUARY 1993

OCCUPATIONAL ANALYSIS PROGRAM  
USAF OCCUPATIONAL MEASUREMENT SQUADRON  
AIR TRAINING COMMAND  
RANDOLPH AFB, TEXAS 78150-5000

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## PREFACE

This report presents the results of an Air Force (AF) Occupational Survey of the Electrical and Environmental Systems career ladders (AF Specialty Codes (AFSC) 452X5, 454X5, and 454X6). Authority for conducting occupational surveys is contained in AF Regulation (AFR) 35-2. Computer products used in this report are available for use by operations and training officials.

First Lieutenant Paul K. Daly, Inventory Development Specialist, developed the survey instrument; First Lieutenant Lester A. Ball, Occupational Analyst, analyzed the data and wrote the final report. Mr Wayne Fruge provided computer programming support, and Mr Richard G. Ramos provided administrative support. Lieutenant Colonel James L. Antenen, Chief, Airman Analysis Section, United States Air Force Occupational Measurement Squadron (USAFOMS), reviewed and approved this report for release.

Copies of this report are distributed to Air Staff sections, major commands (MAJCOMs), and other interested training and management personnel. Additional copies are available upon request to the USAFOMS, Attention: Chief, Occupational Analysis Flight (OMY), 1550 5th Street East, Randolph Air Force Base (AFB), Texas 78150-4449 (Defense Switched Network 487-6623).

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## SUMMARY OF RESULTS

1. Survey Coverage: The Electrical and Environmental Systems (AFSCs 452X5, 454X5, and 454X6) career ladders were surveyed to obtain current task and equipment data for use in examining current training programs and classification alternatives. Survey results are based on 2,931 responses from Electrical and Environmental Systems personnel, which constitute 52 percent of the assigned population. Personnel in the Superintendent and Chief Enlisted Manager (CEM) levels were not surveyed.

2. Specialty Jobs: Structure analysis identified six job clusters and six independent job types (IJT). Personnel in the Flightline Maintenance cluster comprise 53 percent of the sample and perform a wide variety of technical tasks related to the maintenance of various electrical and environmental systems. Members of the In-Shop Maintenance cluster perform intermediate level maintenance, as well as maintaining batteries and oxygen carts. Respondents who grouped in the Supervisory job perform supervisory and administrative functions. With the exception of Instructors, Quality Assurance, and Maintenance Scheduling, the remaining five jobs are basically specialized versions of Flightline Maintenance and In-Shop Maintenance.

3. Career Ladder Progression: Personnel in the Electrical and Environmental Systems career ladders show a typical pattern of career ladder progression. The 3- and 5-skill level personnel perform essentially a technical job. At the 7-skill level, first-line supervisors perform a mixture of technical and supervisory tasks. AFR 39-1 specialty descriptions drafted at the June 1992 Utilization and Training Workshop (U&TW) provide an accurate overview of maintenance tasks and duties performed within the career ladder. However, these descriptions do not completely portray the nature of flightline maintenance. By excluding cross-utilization training duties, the descriptions fail to describe the teamwork required among flightline specialties to generate sorties.

4. Training Analysis: A match of survey data to the AFSC 452X5 Specialty Training Standard (STS) drafted at the U&TW identified 46 line items on the STS not supported by survey data. A similar match of data to the Plan of Instruction (POI) for the C3ABR45235 course, revealed that eight POI objectives are not supported. Career ladder functional managers and training personnel should carefully review these nonsupported STS and POI items to justify their continued inclusion in the training documents.

5. Job Satisfaction Analysis: Overall, current survey respondents are generally satisfied with their jobs. When compared to other mission equipment maintenance personnel surveyed in 1991, Electrical and Environmental Systems personnel show somewhat higher job satisfaction. Compared to the 1984 Environmental Systems survey and the 1985 Electrical Systems survey, job satisfaction improved slightly for all first- and second-enlistment personnel. Job satisfaction decreased slightly for career airmen, compared to the former Environmental Systems career ladder. Personnel in the Field Training Detachment (FTD) Instructor and Quality Assurance jobs are more satisfied with their jobs than members of the other groups.

6. Implications: By combining three career ladders, each having two primary job clusters, the aggregate job structure looks about the same as the individual job structures. In other words, the dichotomy between flightline maintenance and in-shop maintenance remains. One proposed alternative would have created two specialties, Flightline Maintenance and In-Shop Maintenance, rather than one Electrical and Environmental Systems specialty. The AFR 39-1 job descriptions accurately describe the jobs and tasks performed by personnel at all skill levels, and job satisfaction was positive for the jobs identified. The overall analysis of the training documents suggests that some modifications to the STS and the POI may be needed.

OCCUPATIONAL SURVEY REPORT (OSR)  
ELECTRICAL AND ENVIRONMENTAL SYSTEMS CAREER LADDERS  
(AFSCs 452X5, 454X5, and 454X6)

INTRODUCTION

This is a report of an occupational survey of the Electrical and Environmental Systems career ladders conducted by the Occupational Analysis Flight, USAFOMS. The Headquarters Air Training Command (ATC) Aircraft/Munitions Maintenance Training Division requested this survey to project, plan, and develop Career Development Courses (CDC), STSs, and training for these career ladders due to the Rivet Workforce restructuring of AFSC 423X0, Aircraft Electrical Systems, and AFSC 423X1, Aircraft Environmental Systems. The last surveys pertaining to these career ladders were published in February 1984 (AFSC 423X1) and February 1985 (AFSC 423X0). The merger of the Electrical and Environmental specialties in 1989 resulted in three career ladders: Tactical Electrical and Environmental, Strategic Electrical and Environmental, and Airlift Electrical and Environmental. Members of all three career ladders participated in this survey. In June 1992, a U&TW decided to merge the three ladders into a single Aircraft Electrical and Environmental Systems career ladder (AFSC 452X5), effective April 1993.

Background

The AFR 39-1 Specialty Descriptions for AFSC 45215/35/55 were drafted in June 1992 and become effective April 1993. According to these descriptions, 3- and 5-skill level members are responsible for inspecting, troubleshooting, and maintaining aircraft electrical and environmental systems, subsystems, components, test and associated equipment. These include power systems, landing gear, ignition, lighting, anti-skid, nose wheel steering, master caution and warning panels, fuel control, fire and overheat warning, cabin pressurization, oxygen, fire extinguishing, and cryotainer systems. In addition, 7-skill level members are also responsible for advising on problems in operating and maintaining aircraft electrical and environmental systems, determining proper maintenance procedures, interpreting inspection findings, and reviewing maintenance management publications.

Initial 3-skill level training for AFSC 452X5, 454X5, and 454X6 personnel is provided through a 21-week, Category A course at Chanute AFB IL. All students attend the same training; however, three different AFSCs are awarded upon completion of the course. In the future, all airmen will be awarded AFSC 45235. After Chanute AFB closes, the course will resume at Sheppard AFB TX. The Apprentice Tactical/Strategic/Airlift Electro-Environmental Systems Specialist course, C3ABR45235/45435/45436, covers principles of operation and troubleshooting of typical aircraft electrical and environmental systems, subsystems, components, and interconnecting wiring; use of maintenance data

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collection forms and systems; and operational fundamentals and maintenance of oxygen systems and cryotainers. Entry into the career ladder currently requires an Armed Forces Vocational Aptitude Battery Mechanical score of 45, Electrical score of 45, and an X factor of K.(70 lbs).

## SURVEY METHODOLOGY

### Inventory Development

The data collection instrument for this occupational survey was USAF Job Inventory (JI) AF Personnel Test (AFPT) 90-452-885, dated August 1991. A tentative task list was prepared after reviewing pertinent career ladder publications and directives, and tasks from the previous AFSC 423X0 and 423X1 OSRs. The preliminary task list was refined and validated through personal interviews with 39 subject-matter experts (SMEs) representing a variety of MAJCOMs at the following locations:

<u>BASE</u>	<u>REASON FOR VISIT</u>
Chanute AFB IL	Location of ATC Technical Training School
Dyess AFB TX	Bomb Wing and Tactical Airlift Wing
Davis-Monthan AFB AZ	Tactical Training Wing and Electronic Combat Squadron
Travis AFB CA	Military Airlift Wing
Castle AFB CA	Bomb Wing
Hurlburt Field FL	Special Operations Wing AFSOC representation
Luke AFB AZ	Tactical Training Wings

Other personnel contacted included AF Military Personnel Center classification personnel, functional and resource managers, and the AF functional manager.

The resulting JI contained 968 tasks grouped under 26 duty headings, with a background section requesting such information as grade, job title, time in present job, time in service, job satisfaction, equipment used or operated, and aircraft maintained in performance of the incumbent's job.

### Survey Administration

From August 1991 through January 1992, Military Personnel Flights at operational bases worldwide administered the inventory to eligible Duty Air Force Specialty Code (DAFSC) 452X5, 454X5, and 454X6 personnel. Members eligible for the survey consisted of the total assigned 3-, 5-, and 7-skill level population, excluding the following: (1) hospitalized personnel; (2) personnel in transition for a permanent change of station; (3) personnel retiring during the time inventories were administered to the field; and (4) personnel in their job less than 6 weeks. Participants were selected from a computer-generated mailing list obtained from personnel data tapes maintained by the Human Resources Directorate, Armstrong Laboratory.

Each individual who completed the inventory first filled in an identification and biographical information section and then checked each task performed in the member's current job. After checking all tasks performed, each individual then rated each task on a 9-point scale showing relative time spent on that task, as compared to all other tasks checked. The ratings ranged from 1 (very small amount time spent) to 9 (very large amount spent).

To determine relative time spent for each task checked by a respondent, all of the incumbent's ratings are assumed to account for 100 percent of the member's time spent on the job and are summed. Each task rating is then divided by the total task ratings and multiplied by 100 to provide a relative percentage of time spent for each task.

### Survey Sample

Personnel were selected to participate in this survey so as to ensure an accurate representation across MAJCOMs and military paygrades. Table 1 reflects the distribution, by MAJCOM, of assigned AFSC 452X5, 454X5, and 454X6 personnel as of August 1991. The 2,931 respondents in the final sample represent 52 percent of all assigned Electrical and Environmental Systems personnel. Table 2 reflects the distribution by paygrade groups. As shown by both tables, the survey sample accurately reflects the overall AFSC 452X5, 454X5, and 454X6 population.

### Task Factor Administration

Job descriptions alone do not provide sufficient data for making decisions about career ladder documents or training programs. Task factor information is needed for a complete analysis of the career ladder. To obtain the needed task factor data, selected senior Electrical and Environmental Systems personnel (generally E-6 or E-7 technicians) also completed a second booklet for either training emphasis (TE) or task difficulty (TD). These booklets were processed separately from the JIs. This information is used in a number of different analyses discussed in more detail within the report.

TABLE 1  
452X5, 454X5, AND 454X6 MAJCOM DISTRIBUTION

<u>COMMAND</u>	<u>PERCENT OF ASSIGNED</u>	<u>PERCENT OF SAMPLE</u>
TAC	28	28
MAC	20	22
SAC	19	24
USAFE	11	11
ATC	9	4
PACAF	6	5
AFSC	3	3
SOC	3	2
AFLC	2	1
EUR	*	*

Total Assigned as of August 1991: 5,660  
 Total Eligible for Survey: 4,495\*\*  
 Total in Sample: 2,931  
 Percent of Eligible in Sample: 65%  
 Percent of Assigned in Sample: 52%

\* Less than 1 percent

\*\* Excludes those in PCS, retirement, discharge, or hospital status; and those with less than 6 weeks on the job

TABLE 2

PAYGRADE DISTRIBUTION OF AFSCs 452X5, 454X5, AND 454X6

<u>PAYGRADE</u>	<u>PERCENT OF ASSIGNED*</u>	<u>PERCENT OF SAMPLE</u>
AIRMAN	22	20
E-4	28	28
E-5	26	28
E-6	14	16
E-7	9	8

\* As of August 1991

TD. TD is defined as an estimate of the length of time the average airman takes to learn how to perform each task listed in the inventory. One hundred twenty experienced supervisors rated the difficulty of the tasks in the inventory using a 9-point scale ranging from 1 (easy to learn) to 9 (very difficult to learn). Interrater agreement for these 120 raters was acceptable. TD ratings are normally adjusted so tasks of average difficulty have a value of 5.00 and a standard deviation of 1.00. Any task with a difficulty rating of 6.00 or greater is considered to be difficult to learn.

TE. TE is defined as the amount of structured training that first-enlistment personnel need to perform tasks successfully. Structured training is defined as training provided by resident technical schools, FTDs, mobile training teams, formal on-the-job training (OJT), or any other organized training method. One hundred twenty-four experienced noncommissioned officers (NCO) rated tasks in the inventory on a 10-point scale ranging from 0 (no TE required) to 9 (high TE required). Interrater agreement for the 124 raters was acceptable. The average TE rating is 2.11, with a standard deviation of 1.30. Tasks with a TE rating of 3.41 or greater are considered to have high TE.

When used in conjunction with the primary criterion of percent members performing, TD and TE ratings can provide insight into first-term personnel training requirements. Such insights may suggest a need for lengthening or shortening portions of instruction supporting AF specialty entry-level jobs.

#### SPECIALTY JOBS (Career Ladder Structure)

Each USAF Occupational Analysis begins with an examination of the career ladder structure. The structure of jobs within the Electrical and Environmental Systems career ladders was examined on the basis of similarity of tasks performed and the percent of time spent ratings provided by job incumbents, independent of other specialty background factors.

Each individual in the sample performs a set of tasks called a job. An automated job clustering program organizes individual jobs into similar units of work. This hierarchical grouping program is a basic part of the Comprehensive Occupational Data Analysis Program system for job analysis. Each individual job description (all the tasks performed by that individual and the relative amount of time spent on those tasks) in the sample is compared to every other job description in terms of tasks performed and the relative amount of time spent on each task in the JI. The automated system locates the two job descriptions with the most similar tasks and percent time ratings and combines them to form a composite job description. In successive stages, the system adds new members to initial groups, or forms new groups, based on the similarity of tasks performed and similar time ratings in the individual job descriptions.

The basic identifying group used in the hierarchical job structuring process is the job type. When there is a substantial degree of similarity between job types, they are grouped together and identified as a cluster. Specialized job types too dissimilar to fit within a cluster are labeled independent job types (IJT). The job structure resulting from this grouping process (the various jobs within the career ladder) can be used to evaluate the accuracy of career ladder documents (AFR 39-1 Specialty Descriptions and STSs) and to gain a better understanding of current utilization patterns. The above terminology will be used in the discussion of the AFSC 452X5, 454X5, and 454X6 career ladder structures.

### Overview of Specialty Jobs

Based on the similarity of tasks performed and the amount of time spent performing each task, six clusters and six IJTs were identified within the survey sample. Figure 1 illustrates the division of jobs performed by Electrical and Environmental Systems personnel. A listing of these clusters and jobs is provided below. Table 3 presents the relative time spent by respondents in each duty. The stage (ST) number shown beside each title references computer-printed information; the letter (N) stands for the number of personnel in each group.

- I. FLIGHTLINE MAINTENANCE CLUSTER (ST244, N=1,563)
- II. IN-SHOP MAINTENANCE CLUSTER (ST144, N=508)
- III. SUPERVISORY CLUSTER (GP169, N=215)
- IV. TECHNICAL TRAINING INSTRUCTOR CLUSTER (ST327, N=40)
- V. FTD INSTRUCTOR IJT (ST226, N=17)
- VI. QUALITY ASSURANCE IJT (ST238, N=29)
- VII. BATTERY, OXYGEN CART MAINTENANCE CLUSTER (ST082, N=37)
- VIII. HELICOPTER CLUSTER (ST758, N=27)
- IX. CROSS-UTILIZATION TRAINING IJT (ST281, N=13)
- X. WIRING IJT (ST275, N=13)
- XI. MAINTENANCE SCHEDULING IJT (ST578, N=12)
- XII. AIRBORNE WARNING AND CONTROL SYSTEM (AWACS) IJT (ST377, N=10)

The respondents forming these jobs account for 85 percent of the survey sample. The remaining 15 percent were performing tasks or series of tasks which did not group with any of the defined jobs. Some of the job titles

AIRCRAFT  
ELECTRICAL AND ENVIRONMENTAL SYSTEMS  
JOBS

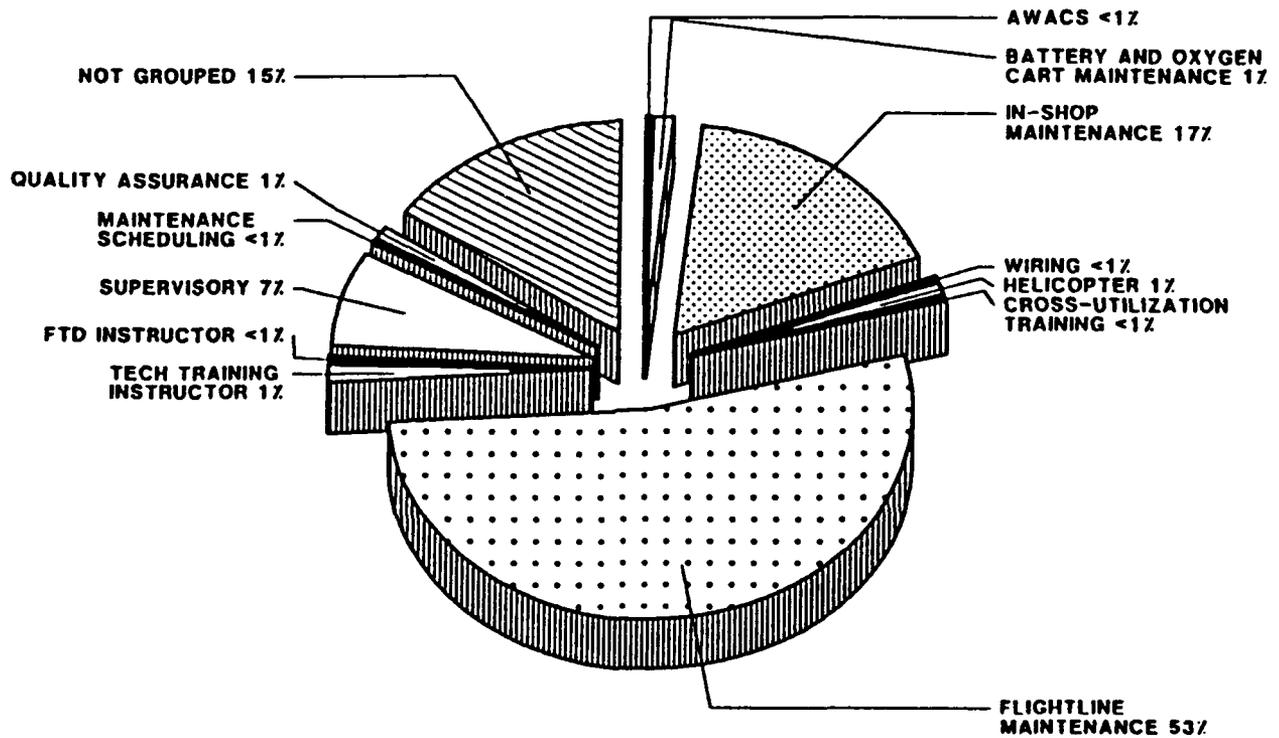


FIGURE 1

TABLE 3

DISTRIBUTION OF DUTY TIME SPENT BY MEMBERS OF CAREER LADDER  
(RELATIVE PERCENT OF JOB TIME)

DUTIES	FLTLINE MAINT (ST244, N=1,563)	IN-SHOP MAINT (ST144, N=508)	SUPVRY (GP169, N=215)	TECH TNG INSTR (ST327, N=40)
A ORGANIZING AND PLANNING	1	2	17	1
B DIRECTING AND IMPLEMENTING	1	2	19	11
C INSPECTING AND EVALUATING	2	3	21	4
D TRAINING	2	3	13	63
E PERFORMING ADMINISTRATIVE AND SUPPLY FUNCTIONS	8	13	24	13
F PERFORMING AIRCRAFT ELECTRO-ENVIRONMENTAL FUNDAMENTAL MAINTENANCE	11	17	1	5
G MAINTAINING AIRCRAFT POWER SUPPLY AND DISTRIBUTION SYSTEMS	10	7	1	*
H MAINTAINING ENGINE CONTROL SYSTEMS	1	*	*	0
I MAINTAINING LANDING GEAR SYSTEMS	7	2	*	*
J MAINTAINING CARGO DOOR AND RAMP SYSTEMS	1	*	*	*
K MAINTAINING FUEL SYSTEMS	1	*	*	0
L MAINTAINING FLIGHT CONTROL SYSTEMS	2	*	*	1
M MAINTAINING BATTERIES	1	8	*	0
N MAINTAINING MASTER CAUTION PANEL CONTROL AND WARNING SYSTEM CIRCUITS	4	2	*	0
O MAINTAINING FIRE AND OVERHEAT WARNING SYSTEMS	5	2	*	0
P MAINTAINING LIGHTING SYSTEMS	5	4	*	1
Q MAINTAINING ANTI-ICING SYSTEMS	4	1	*	0
R MAINTAINING AIRCRAFT FIRE EXTINGUISHING SYSTEMS	3	2	*	0
S MAINTAINING AIRCRAFT OXYGEN SYSTEMS AND ASSOCIATED EQUIPMENT	6	14	*	0
T MAINTAINING AIRCRAFT PRESSURIZATION SYSTEMS	3	1	*	0
U MAINTAINING AUXILIARY AIR AND BLEED AIR DISTRIBUTION SYSTEMS	6	2	*	*
V MAINTAINING LIQUID COOLANT OR LIQUID CYCLE REFRIGERATION SYSTEMS	1	*	*	0
W MAINTAINING AIRCRAFT AIR-CONDITIONING SYSTEMS	8	3	*	*
X MAINTAINING MISCELLANEOUS ELECTRO-ENVIRONMENTAL CONTROL SYSTEMS	1	7	*	0
Y MAINTAINING TEST EQUIPMENT	*	2	*	0
Z PERFORMING CROSS-UTILIZATION TRAINING (CUT) DUTIES	6	1	1	*

\* Denotes less than 1 percent

TABLE 3 (CONTINUED)

DISTRIBUTION OF DUTY TIME SPENT BY MEMBERS OF CAREER LADDER  
(RELATIVE PERCENT OF JOB TIME)

DUTIES	FTD INSTR (ST226, N=17)	QUALITY ASSURANCE (ST238, N=29)	BTRY, OX CART MAINT (ST082, N=37)	HELI (ST758, N=27)
A ORGANIZING AND PLANNING	5	3	2	*
B DIRECTING AND IMPLEMENTING	5	5	*	1
C INSPECTING AND EVALUATING	6	14	1	1
D TRAINING	30	5	1	2
E PERFORMING ADMINISTRATIVE AND SUPPLY FUNCTIONS	12	11	13	12
F PERFORMING AIRCRAFT ELECTRO-ENVIRONMENTAL FUNDAMENTAL MAINTENANCE	9	4	12	19
G MAINTAINING AIRCRAFT POWER SUPPLY AND DISTRIBUTION SYSTEMS	4	11	3	10
H MAINTAINING ENGINE CONTROL SYSTEMS	0	2	*	2
I MAINTAINING LANDING GEAR SYSTEMS	*	6	1	5
J MAINTAINING CARGO DOOR AND RAMP SYSTEMS	*	1	0	2
K MAINTAINING FUEL SYSTEMS	0	1	*	2
L MAINTAINING FLIGHT CONTROL SYSTEMS	1	2	*	*
M MAINTAINING BATTERIES	1	3	36	1
N MAINTAINING MASTER CAUTION PANEL CONTROL AND WARNING SYSTEM CIRCUITS	1	3	*	7
O MAINTAINING FIRE AND OVERHEAT WARNING SYSTEMS	1	4	1	4
P MAINTAINING LIGHTING SYSTEMS	1	3	3	9
Q MAINTAINING ANTI-ICING SYSTEMS	1	2	2	3
R MAINTAINING AIRCRAFT FIRE EXTINGUISHING SYSTEMS	1	3	1	5
S MAINTAINING AIRCRAFT OXYGEN SYSTEMS AND ASSOCIATED EQUIPMENT	3	7	16	0
T MAINTAINING AIRCRAFT PRESSURIZATION SYSTEMS	4	1	1	0
U MAINTAINING AUXILIARY AIR AND BLEED AIR DISTRIBUTION SYSTEMS	8	2	1	*
V MAINTAINING LIQUID COOLANT OR LIQUID CYCLE REFRIGERATION SYSTEMS	1	1	0	0
W MAINTAINING AIRCRAFT AIR-CONDITIONING SYSTEMS	6	3	2	1
X MAINTAINING MISCELLANEOUS ELECTRO-ENVIRONMENTAL CONTROL SYSTEMS	0	3	3	1
Y MAINTAINING TEST EQUIPMENT	*	1	1	*
Z PERFORMING CROSS-UTILIZATION TRAINING (CUT) DUTIES	1	*	1	12

\* Denotes less than 1 percent

TABLE 3 (CONTINUED)

DISTRIBUTION OF DUTY TIME SPENT BY MEMBERS OF CAREER LADDER  
(RELATIVE PERCENT OF JOB TIME)

DUTIES	CROSS- UTIL TNG (ST281, N=13)	WIRING (ST275, N=13)	MAINT SCHD (ST578, N=12)	AWACS (ST377, N=10)
A ORGANIZING AND PLANNING	*	1	13	3
B DIRECTING AND IMPLEMENTING	1	1	13	2
C INSPECTING AND EVALUATING	1	2	4	2
D TRAINING	*	2	1	2
E PERFORMING ADMINISTRATIVE AND SUPPLY FUNCTIONS	4	9	70	16
F PERFORMING AIRCRAFT ELECTRO-ENVIRONMENTAL FUNDAMENTAL MAINTENANCE	6	63	0	17
G MAINTAINING AIRCRAFT POWER SUPPLY AND DISTRIBUTION SYSTEMS	4	4	0	8
H MAINTAINING ENGINE CONTROL SYSTEMS	*	*	0	*
I MAINTAINING LANDING GEAR SYSTEMS	2	3	0	*
J MAINTAINING CARGO DOOR AND RAMP SYSTEMS	1	*	0	0
K MAINTAINING FUEL SYSTEMS	*	*	0	*
L MAINTAINING FLIGHT CONTROL SYSTEMS	1	*	0	*
M MAINTAINING BATTERIES	*	*	0	1
N MAINTAINING MASTER CAUTION PANEL CONTROL AND WARNING SYSTEM CIRCUITS	1	1	0	*
O MAINTAINING FIRE AND OVERHEAT WARNING SYSTEMS	4	1	0	5
P MAINTAINING LIGHTING SYSTEMS	6	3	0	6
Q MAINTAINING ANTI-ICING SYSTEMS	3	1	0	2
R MAINTAINING AIRCRAFT FIRE EXTINGUISHING SYSTEMS	2	1	0	7
S MAINTAINING AIRCRAFT OXYGEN SYSTEMS AND ASSOCIATED EQUIPMENT	8	*	0	4
T MAINTAINING AIRCRAFT PRESSURIZATION SYSTEMS	2	1	0	1
U MAINTAINING AUXILIARY AIR AND BLEED AIR DISTRIBUTION SYSTEMS	5	1	0	3
V MAINTAINING LIQUID COOLANT OR LIQUID CYCLE REFRIGERATION SYSTEMS	0	0	0	11
W MAINTAINING AIRCRAFT AIR-CONDITIONING SYSTEMS	9	1	0	6
X MAINTAINING MISCELLANEOUS ELECTRO-ENVIRONMENTAL CONTROL SYSTEMS	*	*	0	1
Y MAINTAINING TEST EQUIPMENT	0	2	0	2
Z PERFORMING CROSS-UTILIZATION TRAINING (CUT) DUTIES	40	3	0	*

\* Denotes less than 1 percent

given by these respondents included Bench Stock Monitor, Tool Room Monitor, Wash Rack, Precision Management Equipment Laboratory, Dorm Manager, Aircraft Mechanic, Production Supervisor, Expeditor, Noncommissioned Officer-in-Charge (NCOIC) Cable Repair, Bilingual Instructor, Supply Liaison, Debriefing, Dispatcher, Mobility NCO, CDC Writer, Safety NCO, and Training NCO. Table 4 displays selected background information, such as DAFSC distributions across each group, predominant paygrades, average months in service (i.e., Total Active Federal Military Service (TAFMS)), and average number of tasks performed.

### Group Descriptions

The following paragraphs contain brief descriptions of the six clusters and six IJTs identified through the career ladder structure analysis. The Appendix lists representative tasks for each cluster and IJT.

I. FLIGHTLINE MAINTENANCE CLUSTER (ST244). The 1,563 members performing these jobs represent 53 percent of the total survey sample. Members of the Flightline Maintenance cluster of jobs inspect, remove or install, and perform operational checks on the full range of systems of the career ladder. These include power supply and distribution, air-conditioning (AC), landing gear, oxygen, lighting, and others. Representative tasks of this job include:

- perform operational checks of AC power systems
- perform operational checks of antiskid systems
- walk wings or tails during aircraft towing operations
- remove or install aircraft air-conditioning system components
- isolate exterior lighting circuit malfunctions
- isolate aircraft AC power distribution circuit malfunctions
- remove or install bleed air ducting

Within this cluster, jobs vary by aircraft maintained. For example, F-16 flightline maintenance differs from B-52 flightline maintenance due to differences in task performance on various aircraft systems. Personnel working on F-16s maintain canopy seal pressurization, anti-G suit, nose-wheel or nose-gear steering, defogging, and speed brake control systems. B-52 personnel maintain Non-Electrostatic Application glass anti-icing systems, bomb doors, crew entry doors, and bail-out or ejection warning circuits.

A majority of personnel who perform flightline maintenance work are in the grades of E-4 and E-5 and report an average of 7 1/2 years TAFMS. Thirty-six percent are in their first enlistment, and 58 percent report holding the 5-skill level. Three-fourths are assigned in the continental United States (CONUS).

TABLE 4

SELECTED BACKGROUND DATA FOR SPECIALTY JOBS

	FLTLINE MAINT (SI244)	IN-SHOP MAINT (SI144)	SUPVRY (GP169)	TECH TNG INSTR (SI327)	FTD INSTR (SI226)	QUALITY ASSURANCE (ST238)
NUMBER IN GROUP	1,563	508	215	40	17	29
PERCENT OF SAMPLE	53%	17%	7%	1%	.5%	1%
PERCENT IN CONUS	75%	71%	71%	100%	88%	76%
DAFSC DISTRIBUTION (PERCENT)						
45235, 45435, 45436	13%	13%	0%	2%	0%	0%
45255, 45455, 45456	58%	56%	8%	60%	47%	28%
45275, 45475, 45476	29%	31%	92%	38%	43%	73%
AVERAGE PAYGRADE	E-4	E-4	E-7	E-5	E-5	E-6
AVERAGE TICF (MOS)	82	81	165	99	121	146
AVERAGE TAFMS (MOS)	91	92	193	110	124	157
PERCENT IN FIRST ENLISTMENT	36%	40%	0%	2%	0%	0%
PERCENT SUPERVISING	53%	56%	86%	20%	24%	38%
AVERAGE NUMBER OF TASKS PERFORMED	215	170	62	20	43	93

TABLE 4 (CONTINUED)

SELECTED BACKGROUND DATA FOR SPECIALTY JOBS

	BTRY, LOX CART MAINT (ST082)	HELI (ST758)	CROSS- UTIL TNG (ST281)	WIRING (ST275)	MAINT SCHED (ST578)	AWACS (ST377)
NUMBER IN GROUP	37	27	13	13	12	10
PERCENT OF SAMPLE	1%	1%	.5%	.5%	.5%	.5%
PERCENT IN CONUS	59%	74%	38%	85%	100%	90%
DAFSC DISTRIBUTION (PERCENT)						
45235, 45435, 45436	44%	4%	8%	24%	0%	10%
45255, 45455, 45456	54%	81%	69%	46%	50%	90%
45275, 45475, 45476	3%	15%	23%	31%	50%	0%
AVERAGE PAYGRADE	E-3	E-4	E-4	E-5	E-5	E-4
AVERAGE TICF (MOS)	40	73	76	90	137	65
AVERAGE TAFMS (MOS)	43	77	106	96	145	83
PERCENT IN FIRST ENLISTMENT	68%	37%	23%	39%	0%	40%
PERCENT SUPERVISING	14%	44%	31%	31%	42%	40%
AVERAGE NUMBER OF TASKS PERFORMED	47	152	84	51	15	156

II. IN-SHOP MAINTENANCE CLUSTER (ST144). The 508 members of this cluster of jobs represent 17 percent of the total survey sample. These members perform primarily off-equipment tasks such as maintaining liquid oxygen carts and batteries and repairing connector plugs and wiring. Members report spending most of their time in the functional work areas of Electro-Environmental Shop and Phase Maintenance. A majority of respondents reported having the In-Shop Specialist/Technician and In-Shop and Phase Specialist/Technician job titles. Representative tasks of this job include:

- crimp wires to splices or terminals
- remove or install pins on connector plugs
- perform operational checks of LOX carts
- assemble or disassemble nickel cadmium batteries
- annotate AFTO Forms 350 (Reparable Item Processing Tag)
- remove or install LOX cart components
- solder wires to connector plugs, control boxes, or control panels

Job variations within this cluster result from aircraft peculiarities. For example, the work performed in a tanker shop differs from the work performed in a helicopter shop. Some of the tasks which distinguish tanker work from helicopter work involve gaseous oxygen carts and integrated drive generators. Tasks performed in shop for helicopters and performed by only a small percentage of tanker personnel involve fire extinguishing systems, advisory panels, air turbine motors, and scissor switches.

As with the Flightline Maintenance cluster, most performing these jobs are in the grades of E-4 and E-5 and report an average of 7 1/2 years time in service. Thirty-four percent are in their first enlistment, and 56 percent report holding the 5-skill level. Seventy-one percent of the group is assigned in the CONUS.

III. SUPERVISORY CLUSTER (GP169). These jobs involve supervisory and administrative duties almost exclusively, with very little time spent maintaining Electrical and Environmental Systems. Job titles given by respondents in this cluster include NCOIC Electro-Environmental, Shift Supervisor, Flight Chief, Shop Chief, Section Chief, Production Supervisor, Production Manager, and Production Superintendent. Representative tasks of this job include:

- counsel personnel
- write EPRs
- conduct or participate in staff meetings
- interpret policies, directives, or procedures for subordinates
- write recommendations for individual recognition
- determine work priorities

evaluate individuals for compliance with performance standards  
schedule leaves or passes

Variations within this cluster depend upon the amount of involvement with Core Automated Maintenance Systems (CAMS) or with various additional duties. Furthermore, supervisory work done in conjunction with flightline maintenance differs from supervisory work involving in-shop maintenance.

Members in the Supervisory cluster average 16 years TAFMS, and two-thirds are master sergeants. Seventy-one percent of the cluster is assigned in the CONUS.

IV. TECHNICAL TRAINING INSTRUCTOR CLUSTER (ST327). Members of this cluster are responsible for teaching the Apprentice Electrical and Environmental Systems Specialist course at Chanute AFB IL. Sixty-three percent of their time is spent performing tasks in the Training duty. Representative tasks of this job include:

- administer tests
- conduct resident course classroom training
- demonstrate operation of equipment
- counsel trainees on training progress
- counsel personnel
- write test questions
- write lesson plans
- evaluate progress of resident course students

All of these personnel are in the grades of E-4, E-5, or E-6 and average 8 years TAFMS. Members of this cluster hold AFSC 452X5 (37 percent), 454X5 (23 percent), or 454X6 (40 percent).

V. FTD INSTRUCTOR IJI (ST226). Like the Technical Training Instructors, this job focuses on instructing. Additionally, members of this group perform operational checks on various systems. Representative tasks of this job include:

- conduct field training detachment (FTD) classroom training
- demonstrate how to locate technical information
- demonstrate operation of equipment
- administer tests
- write lesson plans
- develop course curricula, plans of instruction (POIs), or specialty training standards (STs)

- perform operational checks of bleed air distribution systems
- perform operational checks of aircraft air-conditioning systems
- perform operational checks of equipment cooling system

Overall, these personnel have an average TAFMS of 10 years 4 months, and the majority are staff sergeants. Seventy percent hold AFSC 452X5, as compared to 37 percent of Technical Training Instructors. Eighty-eight percent are assigned in the CONUS.

VI. QUALITY ASSURANCE IJT (ST238). The Quality Assurance job involves inspecting maintenance actions in progress and upon completion on the flight-line and in shop. Members of this job also ensure proper completion of maintenance forms, serve as consultants at interpreting technical data, and review task qualification of others. Representative tasks of this job include:

- evaluate maintenance procedures
- inspect LOX system components
- evaluate individuals for compliance with performance standards
- inspect LOX carts
- inspect fire and overheat detection circuit components
- inspect bleed air ducting
- inspect landing gear control and warning circuit components
- inspect bleed air overheat warning system components

Members of the Quality Assurance job have an average TAFMS of 13 years, and the majority are technical sergeants. Seventy-six percent are assigned in the CONUS.

VII. BATTERY, OXYGEN CART MAINTENANCE CLUSTER (ST082). Performed primarily in the battery shop, this entry-level job involves tearing down, rebuilding, and charging batteries. As an extension of in-shop maintenance, this job also involves some cryogenics, such as purging and repairing oxygen carts. Representative tasks of this job include:

- perform capacitance tests or services on nickel cadmium batteries
- remove or install cells on nickel cadmium batteries
- assemble or disassemble nickel cadmium batteries
- clean nickel cadmium batteries
- inspect aircraft batteries
- remove or install connectors on nickel cadmium batteries

- crimp wires to splices or terminals
- purge LOX carts
- remove or install LOX cart components

One job within this cluster primarily involves batteries. Work in the other job is almost evenly divided between batteries and oxygen carts.

Members of this job have an average TAFMS of 3 1/2 years. The personnel performing this job are the most junior personnel of the 12 jobs identified; 51 percent are in the grades of E-2 or E-3. Fifty-nine percent are assigned in the CONUS.

VIII. HELICOPTER CLUSTER (ST758). The 27 members of this cluster spend the majority of their time performing tasks in 4 duties: electro-environmental fundamental maintenance, cross-utilization training, administrative and supply, and power supply and distribution systems. While this job is basically flightline maintenance, helicopter maintainers report greater involvement in ground handling and services. Representative tasks of this job include:

- isolate exterior lighting circuit malfunctions
- launch or recover aircraft
- perform operational checks of master caution warning systems
- walk wings or tails during aircraft towing operations
- perform operational checks of exterior lighting circuits
- perform operational checks of DC power systems
- jack or level aircraft

These personnel average 6 1/2 years TAFMS, and 7 of the 27 are located overseas. Fifty-two percent are in the grade of E-4. All hold AFSC 454X6.

IX. CROSS-UTILIZATION TRAINING IJT (ST281). The 13 members of this job spend approximately 40 percent of their time performing cross-utilization training duties. Like the Helicopter job, this job is basically flightline maintenance. Most of these members selected Flightline Specialist/Technician or Assistant Crew Chief as their job titles. Representative tasks of this job include:

- perform single-point aircraft refueling or defueling
- position or remove aircraft chocks
- launch or recover aircraft
- marshall aircraft
- ground aircraft
- perform thruflight or postflight inspections
- position nonpowered or powered AGE to aircraft

Overall, these personnel average 9 years TAFMS, and the majority are staff sergeants. Sixty-two percent are assigned outside the CONUS. All hold AFSC 454X6.

X. WIRING IJT (ST275). The 13 members of this job spend approximately 63 percent of their time performing aircraft electro-environmental fundamental maintenance. Primarily an in-shop job, most systems maintenance tasks are performed on electrical systems rather than environmental systems. Representative tasks of this job include:

- remove or install connector plugs
- crimp wires to splices or terminals
- interpret wiring diagrams or schematics
- splice electrical wiring, other than Kapton
- fabricate wiring harnesses
- remove or install compact wire bundles
- remove or install wiring in control boxes or panels

Members of the Wiring job average 8 years TAFMS; 10 of the 13 respondents are in the grades of E-4 or E-5. Eleven are assigned in the CONUS, and 9 of the 13 members were assigned to the Aircraft Electrical Systems career ladder (AFSC 423X0) prior to October 1988.

XI. MAINTENANCE SCHEDULING IJT (ST578). The 12 members of this job spend approximately 70 percent of their time performing administrative and supply tasks. Like the Supervisory job, this job involves overseeing maintenance activities; however, Maintenance Scheduling is primarily concerned with CAMS rather than personnel. Representative tasks of this job include:

- perform CAMS inquiries for scheduled aircraft discrepancies
- open CAMS
- change CAMS workcenter event narratives
- perform CAMS inquiries for uncompleted maintenance event listings
- update aircraft maintenance discrepancies in CAMS
- schedule or reschedule aircraft discrepancies in CAMS
- change core automated maintenance system (CAMS) job standard narratives

Overall, their average TAFMS is 12 years, and they range in paygrade from sergeant to master sergeant. All are assigned in the CONUS.

XII. AWACS IJT (ST377). The 10 members of this job work at the 552nd Component Repair Squadron at Tinker AFB OK. The job is basically in-shop maintenance with several tasks being performed during phase inspections. The

job largely involves inspecting and performing operational checks of various electrical and environmental systems. Representative tasks of this job include:

- inspect air-conditioning ducting
- inspect liquid coolant systems
- splice electrical wiring, other than Kapton
- perform CAMS inquiries for uncompleted maintenance event listings
- remove or install connector plugs
- perform operational checks of liquid coolant systems
- perform operational checks of aircraft refrigerators
- remove or install rheostats

Members of the AWACS job average 7 years TAFMS and hold AFSC 454X6. Five of the 10 respondents are staff sergeants; 4 are senior airmen/sergeants; and 1 is an airman.

#### Comparison of Current Job Structure to Previous Studies

The results of the specialty job analysis were compared to the previous OSRs, AFPT 90-423-502, dated February 1984, and AFPT 90-423-501, dated February 1985. Table 5 lists the major jobs identified in the 1992 report and their equivalent jobs from the 1984 AFSC 423X1 and 1985 AFSC 423X0 OSRs. A review of the jobs performed by the current sample indicates that the first six 1992 jobs were matched directly to similar jobs identified in the 1984 and 1985 reports. The remaining jobs in the current study were either matched to one of the previous studies or were too specialized for a direct match.

The identified career ladder structure for the Electrical and Environmental Systems career ladder in the present survey reflects the combining of tasks within jobs since the merger of the Electrical Systems career ladder and the Environmental Systems career ladder. For example, tasks previously performed by Liquid Oxygen System Personnel and tasks performed by the Battery Shop Cluster can now be identified within the same cluster: Battery, Oxygen Cart Maintenance. Smaller, specialized jobs result from maintenance organizational changes, the implementation of CAMS, Rivet Workforce, or aircraft such as AWACS and helicopters.

#### ANALYSIS OF DAFSC GROUPS

An analysis of DAFSC groups, in conjunction with the analysis of the career ladder structure, is an important part of each occupational survey. The DAFSC analysis identifies differences in tasks performed at the various

TABLE 5

## JOB SPECIALTY COMPARISONS BETWEEN CURRENT AND 1984 AND 1985 SURVEYS

	CURRENT SURVEY (N=2,931) 452X5, 454X5, 454X6	PERCENT OF SAMPLE	1984 SURVEY (N=1,551) 423X1	PERCENT OF SAMPLE	1985 SURVEY (N=1,814) 423X0	PERCENT OF SAMPLE
1.	FLIGHTLINE MAINTENANCE CLUSTER (N=1,563)	53	ENVIRONMENTAL SYSTEMS MAINT PERSONNEL CLUSTER (N=1,170)	75	FLIGHTLINE MAINT CLUSTER (N=815)	45
2.	IN-SHOP MAINTENANCE CLUSTER (N=508)	17	FIRE EXTINGUISHING SYSTEM PERSONNEL (N=12)  LIQUID CYCLE REFRIGERA- TION SYSTEM PERSONNEL (N=9)	1  .6	IN-SHOP MAINTENANCE CLUSTER (N=142)	8
3.	SUPERVISORY CLUSTER (N=215)	7	NCOIC ENVIRONMENTAL CONTROL (N=67)	4	SUPERVISORY CLUSTER (N=129)	7
4.	TECHNICAL TRAINING INSTRUCTOR CLUSTER (N=40)	1	FORMAL TRAINING INSTRUCTORS (N=20)	1	TRAINER CLUSTER (N=40)	2
5.	FTD INSTRUCTOR IJT (N=17)	.5				
6.	BATTERY, OXYGEN CART MAINTENANCE CLUSTER (N=82)	1	LIQUID OXYGEN SYSTEM PERSONNEL (N=107)	7	BATTERY SHOP CLUSTER (N=80)	4
7.	QUALITY ASSURANCE IJT (N=29)	1			QUALITY CONTROL INSPEC- TORS CLUSTER (N=20)	1
8.	HELICOPTER CLUSTER (N=27)	1			LINE QUALITY CONTROL PERSONNEL IJT (N=5)	.3

TABLE 5 (CONTINUED)

JOB SPECIALTY COMPARISONS BETWEEN CURRENT AND 1984 AND 1985 SURVEYS

CURRENT SURVEY (N=2,931) 452X5, 454X5, 454X6	PERCENT OF SAMPLE	1984 SURVEY (N=1,551) 423X1	PERCENT OF SAMPLE	1985 SURVEY (N=1,814) 423X0	PERCENT OF SAMPLE
9. CROSS-UTILIZATION TNG CLUSTER (N=13)	.5				
10. WIRING IJT (N=13)	.5				
11. MAINTENANCE SCHEDULING IJT (N=12)	.5			MAINT CTRL & SCHEDULING CLUSTER (N=26)	1
12. AWACS IJT (N=10)	.5				
13. NOT GROUPED (N=50)	15	NOT GROUPED (N=155)	10	NOT GROUPED (N=210)	12
		TECHNICAL ORDER LIBRARIANS (N=11)	.7	TRANSIENT ACFT MAINT PERSONNEL IJT (N=61)	3
				TROUBLESHOOTING & MAINT CLUSTER (N=200)	11
				AVIONICS MAINTENANCE SPECIALIST IJT (N=5)	.3
				TROUBLESHOOTING AND INSP CLUSTER (N=30)	2
				OVERSEAS OV-10 MAINT PERSONNEL IJT (N=5)	.3
				LOGISTICS SUPPORT SPECIALIST IJT (N=10)	.6
				LIGHTING & ANTI-SKID CIRCUIT SPECL IJT (N=5)	.3
				DEPOT LEVEL MAINT CLUSTER (N=31)	2

skill levels. This information may be used to evaluate how well career ladder documents, such as AFR 39-1 Specialty Descriptions and the STS, reflect what career ladder personnel are actually doing in the field.

A comparison of the duty and task performance between personnel at the 3-skill and 5-skill level indicates that, while there are some minor differences, by and large, the jobs they perform are essentially the same. Therefore, they will be discussed as a combined group. Nine-skill level and CEM code personnel in the AFSC 45XXX career field were not surveyed and are not discussed in this report.

The distribution of skill-level groups across the career ladder jobs is displayed in Table 6, while Table 7 offers another perspective by displaying the relative percent time spent on each duty across the skill-level groups.

A typical pattern of progression is noted within the Electrical and Environmental Systems career ladder, with personnel at the lower skill levels spending most of their time on technical tasks. More relative time is spent on duties involving supervisory, managerial, and administrative tasks (see Table 7, Duties A, B, C, D, and E) as they move upward to the 7-skill level. It is also obvious, however, that 7-skill level personnel are still involved with technical task performance, as will be pointed out in the specific skill-level group discussions below.

#### Skill-Level Descriptions

DAFSCs 45235/55, 45435/55, 45436/56. The 1,894 airmen in the 3- and 5-skill level group (representing 65 percent of the survey sample) perform an average of 166 tasks, with 138 tasks accounting for approximately 50 percent of their time. As shown in Table 6, 59 percent of these airmen are in the Flightline Maintenance cluster. They spend approximately 14 percent of their time performing aircraft electro-environmental fundamental maintenance, and 11 percent on administrative and supply duties (see Table 7).

Examples of tasks likely to be performed by 3- and 5-skill level personnel include: remove or install connector plugs and remove or install fuses, current limiters, or circuit breakers. Table 8 displays selected representative tasks performed by a majority of these airmen.

DAFSCs 45275, 45475, 45476. Seven-skill level personnel represent 35 percent of the survey sample and perform an average of 155 tasks, with 127 tasks accounting for 50 percent of their relative job time. Thirty percent of their relative job time is spent on tasks in supervisory, managerial, and training duties, with 15 percent of their time dedicated to administrative and supply functions (see Table 7). Table 9 lists representative tasks for these incumbents and shows these senior personnel perform several of the same technical tasks as junior personnel, while also being responsible for supervision on the flightline and in the shop. For example, a comparison of Tables 8 and 9 reveals that generic tasks such as crimping wires, interpreting schematics, turning in parts, and annotating Air Force Technical Order Forms 350, are performed by 3-, 5-, and 7-skill level personnel.

TABLE 6  
 DISTRIBUTION OF SKILL-LEVEL PERSONNEL  
 ACROSS CAREER LADDER JOBS

JOBS	DAFSC			
	45235/45255 45435/45455 45436/45456 (N=1,894)		45275 45475 45476 (N=1,037)	
	NUMBER	PERCENT	NUMBER	PERCENT
1 FLIGHTLINE MAINTENANCE	1110	59%	453	44%
2 IN-SHOP MAINTENANCE	351	19%	157	15%
3 SUPERVISORY	17	1%	198	19%
4 TECHNICAL TRAINING INSTRUCTOR	25	1%	15	1%
5 FTD INSTRUCTOR	8	*	9	1%
6 QUALITY ASSURANCE	8	*	21	2%
7 BATTERY, OXYGEN CART MAINTENANCE	36	2%	1	*
8 HELICOPTER	23	1%	4	*
9 CROSS-UTILIZATION TRAINING	10	*	3	*
10 WIRING	9	*	4	*
11 MAINTENANCE SCHEDULING	9	*	3	*
12 AWACS	10	*	0	*
13 NOT GROUPED	278	15%	169	16%

\* Denotes less than 1 percent

TABLE 7  
RELATIVE PERCENT TIME SPENT PERFORMING DUTIES BY DAFSC GROUPS

DUTIES	DAFSC	
	45235/45255 45435/45455 45436/45456 (N=1,894)	45275 45475 45476 (N=1,037)
A ORGANIZING AND PLANNING	1	6
B DIRECTING AND IMPLEMENTING	1	8
C INSPECTING AND EVALUATING	1	8
D TRAINING	3	8
E PERFORMING ADMINISTRATIVE AND SUPPLY FUNCTIONS	11	15
F PERFORMING AIRCRAFT ELECTRO-ENVIRONMENTAL FUNDAMENTAL MAINTENANCE	14	8
G MAINTAINING AIRCRAFT POWER SUPPLY AND DISTRIBUTION SYSTEMS	9	6
H MAINTAINING ENGINE CONTROL SYSTEMS	1	1
I MAINTAINING LANDING GEAR SYSTEMS	5	4
J MAINTAINING CARGO DOOR AND RAMP SYSTEMS	*	*
K MAINTAINING FUEL SYSTEMS	1	1
L MAINTAINING FLIGHT CONTROL SYSTEMS	2	1
M MAINTAINING BATTERIES	3	2
N MAINTAINING MASTER CAUTION PANEL CONTROL AND WARNING SYSTEM CIRCUITS	3	2
O MAINTAINING FIRE AND OVERHEAT WARNING SYSTEMS	4	3
P MAINTAINING LIGHTING SYSTEMS	5	3
Q MAINTAINING ANTI-ICING SYSTEMS	3	2
R MAINTAINING AIRCRAFT FIRE EXTINGUISHING SYSTEMS	3	2
S MAINTAINING AIRCRAFT OXYGEN SYSTEMS AND ASSOCIATED EQUIPMENT	7	5
T MAINTAINING AIRCRAFT PRESSURIZATION SYSTEMS	3	2
U MAINTAINING AUXILIARY AIR AND BLEED AIR DISTRIBUTION SYSTEMS	5	3
V MAINTAINING LIQUID COOLANT OR LIQUID CYCLE REFRIGERATION SYSTEMS	1	1
W MAINTAINING AIRCRAFT AIR-CONDITIONING SYSTEMS	6	4
X MAINTAINING MISCELLANEOUS ELECTRO- ENVIRONMENTAL CONTROL SYSTEMS	2	2
Y MAINTAINING TEST EQUIPMENT	1	1
Z PERFORMING CROSS-UTILIZATION TRAINING (CUT) DUTIES	5	3

\* Denotes less than 1 percent

TABLE 8

## REPRESENTATIVE TASKS PERFORMED BY 3- AND 5-SKILL LEVEL PERSONNEL

TASKS	PERCENT MEMBERS PERFORMING (N=1,894)
F172 Crimp wires to splices or terminals	86
F211 Remove or install pins on connector plugs	82
F204 Remove or install connector plugs	80
F163 Clean connector plugs	76
G299 Perform operational checks of AC power systems	75
F209 Remove or install fuses, current limiters, or circuit breakers	75
F187 Interpret wiring diagrams or schematics	73
F183 Inspect electro-environmental systems for corrosion	73
F222 Splice electrical wiring, other than Kapton	73
G300 Perform operational checks of DC power systems	73
F182 Inspect electrical bonds or grounds	71
P566 Perform operational checks of exterior lighting circuits	71
F196 Perform solderless connector insertions or extractions	69
E117 Annotate AFTO Forms 350 (Reparable Item Processing Tag)	68
F154 Assemble or disassemble connector plugs	68
P568 Perform operational checks of interior lighting circuits	68
G301 Perform operational checks of external power systems	67
E143 Turn in parts, other than bench stock	66
I382 Perform operational checks of antiskid systems	66
F221 Solder wires to connector plugs, control boxes, or control panels	66
W817 Remove or install air-conditioning ducting	66
U763 Remove or install bleed air ducting	66
P563 Isolate exterior lighting circuit malfunctions	66
W812 Perform operational checks of aircraft air-conditioning systems	64
U732 Inspect bleed air ducting	64
Z967 Walk wings or tails during aircraft towing operations	63
W819 Remove or install aircraft air-conditioning system components	62
E134 Perform CAMS inquiries for scheduled aircraft discrepancies	61
E133 Open CAMS	60

TABLE 9

## REPRESENTATIVE TASKS PERFORMED BY 7-SKILL LEVEL PERSONNEL

TASKS	PERCENT MEMBERS PERFORMING (N=1,037)
C68 Write EPRs	78
B23 Counsel personnel	78
E108 Annotate AF Forms 623 (On-The-Job Training Record)	73
D80 Demonstrate how to locate technical information	66
D81 Demonstrate operation of equipment	65
E109 Annotate AF Forms 797 (Job Qualification Standard Continuation/Command JQS)	64
A6 Determine work priorities	62
E133 Open CAMS	62
B37 Supervise Electrical and Environmental Systems Specialists (AFSCs 45255, 45455, 45456)	62
E134 Perform CAMS inquiries for scheduled aircraft discrepancies	62
D79 Counsel trainees on training progress	62
E117 Annotate AFTO Forms 350 (Reparable Item Processing Tag)	62
F172 Crimp wires to splices or terminals	62
E136 Perform CAMS inquiries for uncompleted maintenance event listings	61
E121 Close CAMS	60
F211 Remove or install pins on connector plugs	60
F204 Remove or install connector plugs	59
C48 Evaluate individuals for compliance with performance standards	59
E143 Turn in parts, other than bench stock	57
F163 Clean connector plugs	57
D75 Conduct OJT	56
F187 Interpret wiring diagrams or schematics	55
G299 Perform operational checks of AC power systems	55
E129 Inventory equipment, tools, or supplies	54
D94 Maintain training records, charts, or graphs	54
E118 Annotate condition tags, such as DD Forms 1574- or 1577-series	54
C69 Write recommendations for individual recognition	53
A17 Plan or schedule work assignments	52

Tasks which best distinguish the 7-skill level personnel from their junior counterparts are presented in Table 10. As expected, the key difference is a greater emphasis on supervisory functions for 7-skill level airmen.

#### Summary

Normal career ladder progression within the Electrical and Environmental Systems career ladder is evident, with personnel at the 3- and 5-skill levels spending the vast majority of their job time performing technical tasks. A shift toward supervisory functions occurs at the 7-skill level, although members still spend 54 percent of their relative duty time performing technical functions.

### ANALYSIS OF AFR 39-1 SPECIALTY DESCRIPTIONS

Survey data were compared to the AFR 39-1 Specialty Descriptions for Electrical and Environmental Systems Specialists and Technicians. These descriptions, which were developed at the June 1992 U&TW, resulted from the decision to merge the Tactical, Strategic, and Airlift Electrical and Environmental Systems career ladders. The descriptions for the 3-, 5-, and 7-skill levels were generally accurate, depicting the highly technical aspect of the job, as well as the increase in supervisory responsibilities previously described in the DAFSC analysis. The descriptions also capture the primary responsibilities of members in the 12 jobs identified by the job structure analysis process. However, tasks which define the CUT job are not reflected on the specialty descriptions. CUT tasks are not included because they are not specific to Electrical and Environmental Systems personnel. These tasks are performed by personnel throughout the AFSC 45XXX career field.

### TRAINING ANALYSIS

Occupational survey data represent one of many sources of information which can be used to assist in the development of a training program relevant to the needs of personnel in their first enlistment. Factors which may be used in evaluating training include the overall description of the job being performed by first-enlistment personnel, overall distribution across career ladder jobs, percentages of first-job (1-24 month TAFMS) or first-enlistment (1-48 months TAFMS) members performing specific tasks or using certain equipment or materials, as well as TE and TD ratings (previously explained in the SURVEY METHODOLOGY section).

TABLE 10

REPRESENTATIVE TASK DIFFERENCES BETWEEN  
3-/5-SKILL LEVEL AND 7-SKILL LEVEL PERSONNEL  
(PERCENT MEMBERS PERFORMING)

TASKS	DAFSC		DIFFERENCE
	(N=1,894)	(N=1,037)	
Z968 Wash aircraft	35	13	22
F211 Remove or install pins on connector plugs	82	60	22
F209 Remove or install fuses, current limiters, or circuit breakers	75	54	21
G300 Perform operational checks of DC power systems	73	52	21
F204 Remove or install connector plugs	80	59	21
F222 Splice electrical wiring, other than Kapton	73	52	21
F183 Inspect electro-environmental systems for corrosion	73	53	20
G299 Perform operational checks of AC power systems	75	55	20
F154 Assemble or disassemble connector plugs	68	49	19
<hr/>			
C68 Write EPRs	29	78	-49
B23 Counsel personnel	31	78	-47
C69 Write recommendations for individual recognition	13	53	-40
A17 Plan or schedule work assignments	13	52	-39
C48 Evaluate individuals for compliance with performance standards	20	59	-39
B37 Supervise Electrical and Environmental Systems Specialists (AFSCs 45255, 45455, 45456)	25	62	-37
A6 Determine work priorities	26	62	-36
A19 Schedule leaves or passes	4	39	-35
A13 Establish performance standards for subordinates	15	49	-34

### First-Enlistment Personnel

In this study, there are 897 members in their first enlistment (1-48 months TAFMS), representing 31 percent of the survey sample. The job performed by these personnel covers the full range of electrical and environmental activities. As displayed in Table 11, approximately 98 percent of their duty time is devoted to technical or administrative task performance, the majority of which involves maintaining various Electrical and Environmental Systems. Of these systems, maintaining power supply distribution systems, oxygen systems, and associated equipment consumes the greatest time. The vast majority of first-term personnel are involved in day-to-day maintenance activities. Table 12 displays tasks performed by first-enlistment personnel. Examples include: perform operational checks of AC power systems and remove or install bleed air ducting.

Within the groups identified in the SPECIALTY JOBS section of this report, first-term personnel were present in 7 of the 12 jobs. As shown in Figure 2, 58 percent of first-term personnel surveyed are in the Flightline Maintenance cluster.

### TE and TD Data

TE and TD data are secondary factors that can assist technical school personnel in deciding which tasks should be emphasized in entry-level training. These ratings, based on the judgments of senior career ladder NCOs working at operational units in the field, are collected to provide training personnel with a rank-ordering of those tasks considered important for first-term airman training (TE), along with a measure of the difficulty of those tasks (TD). When combined with data on the percentages of first-enlistment personnel performing tasks, comparisons can be made to determine if training adjustments are necessary. For example, tasks receiving high ratings on both task factors, accompanied by moderate to high percentages performing, may warrant resident training. Those tasks receiving high task factor ratings, but low percentages performing, may be more appropriately planned for OJT programs within the career ladder. Low task factor ratings may highlight tasks best omitted from training for first-term personnel, but this decision must be weighed against percentages of personnel performing the tasks, command concerns, and criticality of the tasks.

To help in this determination, an Automated Training Indicator (ATI) is determined for each task in the inventory. ATI combines first-enlistment percent members performing, and TE and TD data to reach training decisions based on ATC Regulation (ATCR) 52-22, Atch 1. The ATI decisions are numbered 1 to 18, with an 18 being the highest level of training indicated. An ATI of seven or less, leads to a training decision of OJT only. To illustrate how the ATI is determined, if a task has received high TE and TD ratings, and also has a high percentage of first-term members performing, then a high rating is assigned to the task. With a high ATI rating, strong recommendations can be made to emphasize training the task in a resident training course.

TABLE 11

RELATIVE TIME SPENT ON DUTIES BY FIRST-ENLISTMENT PERSONNEL  
(N=897)

<u>DUTIES</u>	<u>PERCENT TIME SPENT</u>
A ORGANIZING AND PLANNING	*
B DIRECTING AND IMPLEMENTING	*
C INSPECTING AND EVALUATING	1
D TRAINING	1
E PERFORMING ADMINISTRATIVE AND SUPPLY FUNCTIONS	10
F PERFORMING AIRCRAFT ELECTRO-ENVIRONMENTAL FUNDAMENTAL MAINTENANCE	16
G MAINTAINING AIRCRAFT POWER SUPPLY AND DISTRIBUTION SYSTEMS	9
H MAINTAINING ENGINE CONTROL SYSTEMS	1
I MAINTAINING LANDING GEAR SYSTEMS	6
J MAINTAINING CARGO DOOR AND RAMP SYSTEMS	*
K MAINTAINING FUEL SYSTEMS	*
L MAINTAINING FLIGHT CONTROL SYSTEMS	2
M MAINTAINING BATTERIES	4
N MAINTAINING MASTER CAUTION PANEL CONTROL AND WARNING SYSTEM CIRCUITS	3
O MAINTAINING FIRE AND OVERHEAT WARNING SYSTEMS	4
P MAINTAINING LIGHTING SYSTEMS	5
Q MAINTAINING ANTI-ICING SYSTEMS	3
R MAINTAINING AIRCRAFT FIRE EXTINGUISHING SYSTEMS	3
S MAINTAINING AIRCRAFT OXYGEN SYSTEMS AND ASSOCIATED EQUIPMENT	8
T MAINTAINING AIRCRAFT PRESSURIZATION SYSTEMS	3
U MAINTAINING AUXILIARY AIR AND BLEED AIR DISTRIBUTION SYSTEMS	5
V MAINTAINING LIQUID COOLANT OR LIQUID CYCLE REFRIGERATION SYSTEMS	1
W MAINTAINING AIRCRAFT AIR-CONDITIONING SYSTEMS	7
X MAINTAINING MISCELLANEOUS ELECTRO-ENVIRONMENTAL CONTROL SYSTEMS	2
Y MAINTAINING TEST EQUIPMENT	1
Z PERFORMING CROSS-UTILIZATION TRAINING (CUT) DUTIES	5

\* Denotes less than 1 percent

NOTE: Columns may not add to 100 percent due to rounding

TABLE 12

## REPRESENTATIVE TASKS PERFORMED BY FIRST-ENLISTMENT PERSONNEL

TASKS	PERCENT MEMBERS PERFORMING (N=897)
F172 Crimp wires to splices or terminals	90
F211 Remove or install pins on connector plugs	84
F204 Remove or install connector plugs	82
F209 Remove or install fuses, current limiters, or circuit breakers	79
F163 Clean connector plugs	78
F187 Interpret wiring diagrams or schematics	78
F183 Inspect electro-environmental systems for corrosion	76
G299 Perform operational checks of AC power systems	76
F222 Splice electrical wiring, other than Kapton	75
F182 Inspect electrical bonds or grounds	74
G300 Perform operational checks of DC power systems	74
P566 Perform operational checks of exterior lighting circuits	74
F154 Assemble or disassemble connector plugs	72
F196 Perform solderless connector insertions or extractions	71
I382 Perform operational checks of antiskid systems	70
P568 Perform operational checks of interior lighting circuits	70
U763 Remove or install bleed air ducting	69
W817 Remove or install air-conditioning ducting	69
G301 Perform operational checks of external power systems	67
P563 Isolate exterior lighting circuit malfunctions	66
E117 Annotate AFTO Forms 350 (Reparable Item Processing Tag)	65
E143 Turn in parts, other than bench stock	65
W812 Perform operational checks of aircraft air-conditioning systems	65
U732 Inspect bleed air ducting	65
W799 Inspect air-conditioning ducting	65
F221 Solder wires to connector plugs, control boxes, or control panels	65

# FIRST-ENLISTMENT JOBS

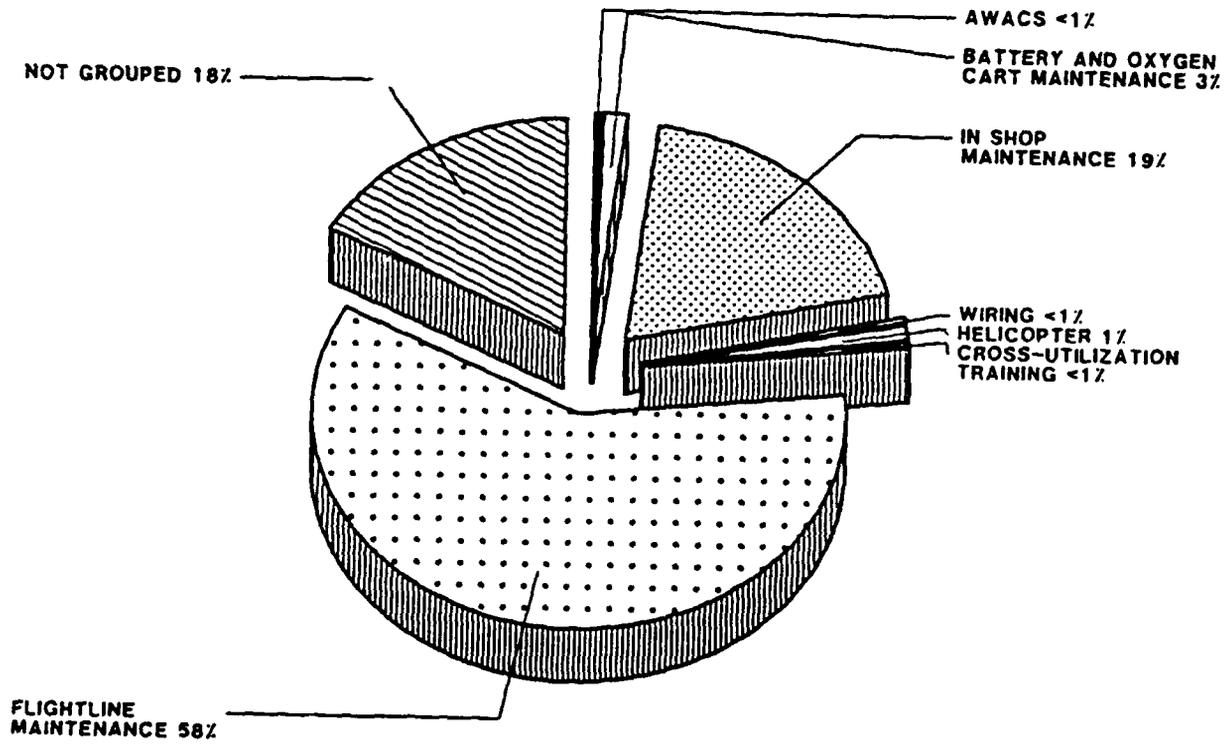


FIGURE 2

Tasks having the highest TE ratings are listed in Table 13. Included for each task are the percentage of first-job and first-enlistment personnel performing and the TD rating. As illustrated in Table 13, most of these tasks pertain to performing operational checks and isolating malfunctions.

Table 14 lists the tasks having the highest TD ratings. The percentage of first-enlistment, 5- and 7-skill level personnel performing, and the TE ratings are also included for each task. Most of these tasks relate to isolating malfunctions. Overall, these tasks are not performed by many airmen and have low TE ratings. For example, only 8 of the top 50 TD tasks rate above average in TE and have at least 30 percent members performing in one of the Table 14 percent members performing columns.

Various lists of tasks, accompanied by TE and TD ratings, are contained in the TRAINING EXTRACT package and should be reviewed in detail by technical school personnel. For a more detailed explanation of TE and TD ratings, see Task Factor Administration in the SURVEY METHODOLOGY section of this report.

### STS

A comprehensive review of STS 452X5, drafted June 1992, was made by comparing survey data to STS elements. To assist specifically in the examination of the STS, technical school personnel from the Lowry Training Center matched job inventory tasks to appropriate sections and subsections of the STS. A complete computer listing displaying the percent members performing tasks, TE and TD ratings for each task, along with the STS matchings, have been forwarded to the technical school for their use in further review of training documents. STS elements with performance objectives were reviewed in terms of TE, TD, and percent members performing information as stipulated in ATCR 52-22, dated February 1989. STS paragraphs containing general knowledge information, subject-matter knowledge requirements, or supervisory responsibilities were not reviewed. Typically, tasks performed by 20 percent or more of personnel in appropriate experience or skill-level groups, such as first-enlistment (1-48 months TAFMS), and 5- and 7-skill level groups, should be considered for inclusion in the STS. Likewise, tasks with less than 20 percent performing in all of these groups should be considered for deletion from the STS.

STS paragraphs containing performance information were reviewed. Forty-six line items on the STS were found to be unsupported by occupational survey data. These items are listed, along with the accompanying JI task and survey data, in Table 15. Thirty of the forty-six line items are actually only two statements: repair components and bench check components. These task statements are applied to numerous aircraft systems in the STS. If two-level maintenance is implemented and depot component repair continues to be performed primarily by civilian technicians, bench checking and repairing components by AFSC 452X5 personnel will virtually disappear. The other unsupported line items involve soldering solid state devices, maintaining battery charging and servicing equipment, cargo door control and warning, liquid coolant

TABLE 13

## TASKS RATED HIGHEST IN TRAINING EMPHASIS (TE)

TASKS	TNG EMP*	PERCENT MEMBERS PERFORMING		TASK DIFF**
		1ST JOB (N=371)	1ST ENL (N=897)	
F172 Crimp wires to splices or terminals	6.39	86	90	2.98
F211 Remove or install pins on connector plugs	6.15	80	84	4.44
G285 Isolate aircraft AC power distribution circuit malfunctions	6.00	47	60	7.69
G299 Perform operational checks of AC power systems	5.99	67	76	5.44
F204 Remove or install connector plugs	5.92	75	82	4.69
F187 Interpret wiring diagrams or schematics	5.90	70	78	6.73
F196 Perform solderless connector insertions or extractions	5.90	68	71	4.51
F222 Splice electrical wiring, other than Kapton	5.85	68	75	3.87
I373 Isolate antiskid circuit malfunctions	5.81	51	59	6.65
G286 Isolate aircraft DC power distribution circuit malfunctions	5.73	43	57	7.13
G284 Isolate AC generator system malfunctions	5.68	46	57	7.65
G301 Perform operational checks of external power systems	5.66	58	67	4.68
G300 Perform operational checks of DC power systems	5.62	67	74	5.16
I382 Perform operational checks of antiskid systems	5.60	66	70	5.14
W802 Isolate aircraft air-conditioning system component malfunctions	5.57	46	56	6.73
F221 Solder wires to connector plugs, control boxes, or control panels	5.56	58	65	5.03
I376 Isolate landing gear control and warning circuit malfunctions	5.45	37	52	7.14
F183 Inspect electro-environmental systems for corrosion	5.44	77	76	3.29
U737 Isolate bleed air system malfunctions	5.38	53	61	6.34
E111 Annotate AFTO Form 781-series (AFORMs Aircrew/Mission Flight Data Document)	5.36	36	42	3.84
F182 Inspect electrical bonds or grounds	5.33	71	74	2.86
T711 Perform leakage checks of cabin or cargo pressurization systems	5.31	57	62	5.83
G291 Isolate external power system circuit malfunctions	5.23	31	47	6.64

\* Training emphasis has an average of 2.11 and a standard deviation of 1.30 (High TE = 3.41)

\*\* Average TD rating is 5.00, and the standard deviation is 1.00

TABLE 14

## TASKS RATED HIGHEST IN TASK DIFFICULTY (TD)

TASKS	TASK DIF*	PERCENT MEMBERS PERFORMING				TNG EMP**
		1-48 TAFMS (N=897)	5-LEVEL (N=1,498)	7-LEVEL (N=1,037)		
A10 Draft budget requirements	8.48	1	2	9	.14	
Y928 Isolate jet engine test cell malfunctions	8.21	2	2	2	.69	
Y922 Isolate aircraft generator test stand malfunctions	7.91	5	6	4	1.59	
C70 Write staff studies, surveys, or special reports, other than training reports	7.75	0	2	14	.29	
G285 Isolate aircraft AC power distribution circuit malfunctions	7.69	60	65	48	6.00	
G284 Isolate AC generator system malfunctions	7.65	57	62	47	5.68	
D74 Conduct field training detachment (FTD) classroom training	7.56	1	3	7	.55	
Y925 Isolate control panel tester malfunctions	7.48	2	4	3	1.28	
Y927 Isolate inverter test stand malfunctions	7.38	0	0	1	.85	
C67 Write civilian performance ratings or supervisory appraisals	7.37	0	1	7	.34	
B39 Supervise foreign exchange technicians	7.24	0	2	2	.13	
L448 Isolate flap and slat control and warning circuit malfunctions	7.21	29	35	25	3.63	
C45 Evaluate budget requirements	7.17	0	1	6	.18	
F178 Fabricate test equipment	7.16	13	16	15	1.44	
I376 Isolate landing gear control and warning circuit malfunctions	7.14	52	59	43	5.45	
K434 Isolate IFR circuit malfunctions	7.13	18	25	21	2.52	
G286 Isolate aircraft DC power distribution circuit malfunctions	7.13	57	63	46	5.73	
Y921 Isolate AC system test set malfunctions	7.07	4	5	5	1.66	
G287 Isolate CSD circuit malfunctions	7.06	34	43	34	4.80	
G290 Isolate EPU circuit malfunctions	7.06	17	17	13	2.82	
Y924 Isolate battery charger malfunctions	7.06	12	12	12	2.41	
A7 Develop new maintenance methods	7.04	8	16	31	1.21	
A12 Establish organizational policies, office instructions (OIs), or standing operating procedures (SOPs)	7.03	1	3	16	.47	
Y926 Isolate electrical or pneumatic component tester malfunctions	7.02	4	4	5	1.48	

\* Average TD rating is 5.00, and the standard deviation is 1.00

\*\* Training emphasis has an average of 2.11 and a standard deviation of 1.30 (High TE = 3.41)

TABLE 15

## EXAMPLES OF STS ITEMS NOT SUPPORTED BY OSR DATA

STS REFERENCE/TASKS	3-LVL COURSE PROF CODE	TNG EMP*	PERCENT MEMBERS PERFORMING			TSK DIF**
			1ST ENL (N=897)	5-SKILL LEVEL (N=1,498)	7-SKILL LEVEL (N=1,037)	
9c(2). SOLID-STATE DEVICES	--					
F195 Perform soldering on solid-state circuit boards		3.22	20	19	11	6.01
F219 Repair printed circuit board tracks		1.47	4	4	3	6.48
14a(3). MAINTAIN CHARGING EQUIPMENT	--					
M462 Bench check battery charger system components		2.83	9	10	9	4.90
Y934 Maintain battery chargers		2.48	17	16	13	5.01
14b(2). OPERATE SERVICING EQUIPMENT	--					
M475 Perform capacitance tests or services on lead acid batteries		2.79	16	16	11	4.16
M477 Perform capacitance tests or services on OAS batteries		1.80	5	4	2	4.79
14b(3). MAINTAIN SERVICING EQUIPMENT	--					
M462 Bench check battery charger system components		2.83	9	10	9	4.90
Y934 Maintain battery chargers		2.48	17	16	13	5.01

\* Training emphasis has an average of 2.11 and a standard deviation of 1.30 (high TE = 3.41)

\*\* Average task difficulty is 5.00, and the standard deviation is 1.00

TABLE 15 (CONTINUED)

EXAMPLES OF STS ITEMS NOT SUPPORTED BY OSR DATA

STS REFERENCE/TASKS	3-LVL COURSE PROF CODE	TNG EMP*	PERCENT MEMBERS PERFORMING		TSK DIF**
			IST ENL (N=897)	5-SKILL LEVEL (N=1,498)	
15h. BENCH CHECK COMPONENTS	--				
G231 Bench check AC buss protection panel (BPP) components		1.81	3	4	2 5.65
G232 Bench check AC buss protection unit (BPU) components		1.60	2	3	2 5.67
G234 Bench check AC control panel solid-state components		1.67	2	3	3 5.69
G236 Bench check AC frequency or load controller solid-state components		1.73	1	3	2 5.58
G237 Bench check AC generator control panel components		1.99	4	5	4 5.79
G239 Bench check AC generator solid-state components		1.67	2	2	2 5.78
G240 Bench check AC power distribution conventional components		1.66	2	4	3 5.48
G242 Bench check AC voltage regulator conventional components		1.84	2	3	2 5.58

20f. REPAIR COMPONENTS

F154 Assemble or disassemble connector plugs		4.85	72	70	49 5.09
F156 Assemble or disassemble control panels		2.13	21	23	16 5.50
F147 Adjust control box switches		2.10	18	19	12 4.53
F148 Adjust conventional amplifiers		1.23	4	3	3 5.07
F149 Adjust power supplies		1.99	18	16	9 4.74

\* Training emphasis has an average of 2.11 and a standard deviation of 1.30 (high TE = 3.41)

\*\* Average task difficulty is 5.00, and the standard deviation is 1.00

TABLE 15 (CONTINUED)

EXAMPLES OF STS ITEMS NOT SUPPORTED BY OSR DATA

STS REFERENCE/TASKS	3-LVL COURSE PROF CODE	TNG EMP*	PERCENT MEMBERS PERFORMING		TSK DIF**
			1ST ENL (N=897)	5-SKILL LEVEL (N=1,498)	
20f. REPAIR COMPONENTS (CONTINUED)					
F150 Adjust relays	--	1.17	14	13	5
F151 Adjust solid-state amplifiers		1.18	2	2	2
F153 Assemble or disassemble amplifier units		.82	5	4	3
F155 Assemble or disassemble control boxes		1.64	14	16	11
27d. INSPECT					
J404 Inspect cargo door control and warning circuit conventional components		2.08	14	17	14
J405 Inspect cargo door control and warning circuit solid-state components		1.39	7	7	5
35c. SELF GENERATING OXYGEN SYSTEMS					
B					
S672 Isolate molecular sieve oxygen generating system (MSOGS) component malfunctions		1.40	2	3	2
S686 Perform operational checks of MSOGSs		1.33	4	3	3
S698 Remove or install MSOGS components		1.23	4	2	2

\* Training emphasis has an average of 2.11 and a standard deviation of 1.30 (high TE = 3.41)  
 \*\* Average task difficulty is 5.00, and the standard deviation is 1.00

refrigeration, and life raft inflation. Training personnel and SMEs should review these areas to determine if inclusion in future revisions to the STS is warranted.

Tasks not matched to any element of the STS are listed at the end of the STS computer listing. These were reviewed to determine if there were any tasks concentrated around any particular functions or jobs. There were 313 tasks not referenced to the STS. One hundred eighteen unreferenced tasks are managerial or supervisory in nature and are normally not matched to an STS. Twenty-seven tasks are cross-utilization training tasks; these were not matched due to the elimination of general aircraft tasks from the STS at the June 1992 U&TW. Examples of technical tasks performed by 20 percent or more respondents of the STS target groups, but which are not referenced to any STS element, are displayed in Table 16. Training personnel and SMEs should review these and other unreferenced tasks to determine if inclusion in the STS is needed.

### POI

Based on assistance from technical school SMEs in matching JI tasks to tentative POI C3ABR45235, dated 1 October 1991, occupational survey data were matched to related training objectives. A similar method to that of the STS analysis was employed to review the POIs. The specific data examined included percent members performing data for first-job (1-24 months TAFMS) and first-enlistment (1-48 months TAFMS) personnel, and TE and TD ratings. Automated Training Indicator ratings for each task were also used.

POI blocks, units of instruction, and criterion objectives were compared against the standard set forth in ATCR 52-22, Attachment 1, dated 17 February 1989 (30 percent or more of the criterion first-enlistment group performing tasks trained, along with sufficiently high TE and TD ratings on those tasks). Per this guidance, tasks trained in the course which do not meet these criteria should be considered for elimination from the formal course if not justified on some other acceptable basis.

Review of the tasks matched to the POI reveals that eight criterion objectives are not supported by OSR data for matched tasks. These objectives pertain to technical order improvement reports, materiel deficiency reports, solid state devices, life raft inflation equipment, start and ignition systems, takeoff warning systems, and flight control systems. Table 17 lists these objectives along with the accompanying JI tasks and survey data.

Many technical tasks performed by over 30 percent of first-enlistment personnel were not matched to the POI. Examples of these tasks with survey data are listed in Table 18. In addition to many members performing these functions, several of these tasks are rated high in terms of TE and TD. Training personnel and SMEs should review these and other unreferenced tasks to determine if training should be provided in the formal course.

TABLE 16

TECHNICAL TASKS PERFORMED BY 20 PERCENT OR MORE 452X5  
GROUP MEMBERS AND NOT REFERENCED TO THE STS

TASKS	PERCENT MEMBERS PERFORMING					TNG EMP*	TASK DIF**
	1ST ENL (N=897)	5-SKILL LEVEL (N=1,498)	7-SKILL LEVEL (N=1,037)				
F180 Inspect control boxes or junction boxes for burning or chaffing	58	57	43		4.26	3.16	
F209 Remove or install fuses, current limiters, or circuit breakers							
F210 Remove or install micro switches	79	75	54		4.56	3.05	
F212 Remove or install relays in control boxes or panels	56	56	41		4.49	4.68	
F205 Remove or install cooling fan motors	59	62	44		3.80	4.17	
F182 Inspect electrical bonds or grounds	30	32	23		2.83	4.48	
F179 Fabricate wiring harnesses	74	72	53		5.33	2.86	
F198 Pot connectors or relays	32	34	26		3.97	5.87	
F174 Fabricate bondings	34	37	28		3.70	3.62	
F208 Remove or install flexible conduits	17	22	20		3.40	3.19	
F218 Remove or install wiring in control boxes or panels	28	30	20		2.45	4.47	
G224 Adjust governors on constant speed drives (CSDs)	29	30	21		2.98	4.97	
	23	24	19		2.92	4.69	

\* Training emphasis has an average of 2.11 and a standard deviation of 1.30 (high TE = 3.41)

\*\* Average task difficulty is 5.00, and the standard deviation is 1.00

TABLE 17

## POI OBJECTIVES NOT SUPPORTED BY OSR DATA

<u>POI OBJECTIVES/TASKS</u>	<u>TNG EMP*</u>	<u>1ST ENL PERCENT MEMBERS PERFORMING (N=897)</u>	<u>ATI</u>	<u>TSK DIF**</u>
III 2c. WITHOUT REFERENCE, IDENTIFY BASIC FACTS PERTAINING TO TECHNICAL ORDER IMPROVEMENT REPORTS				
E113 Annotate AFTO Forms 22 (Technical Order System Publication Improvement Report and Reply)	3.92	13	11	5.23
III 11a. WITHOUT REFERENCE, IDENTIFY BASIC FACTS PERTAINING TO THE MATERIEL DEFICIENCY REPORT (MDR)				
E128 Initiate materiel deficiency reports (MDRs)	3.55	17	11	5.68
III 14c. USING A TRAINER, CTK AND APPLICABLE TECHNICAL MATERIAL, SOLDER A SOLID-STATE DEVICE TO A PRINTED CIRCUIT BOARD				
F195 Perform soldering on solid-state circuit boards	3.22	20	7	6.01
F219 Repair printed circuit board tracks	1.47	4	2	6.48
V 3a. WITHOUT REFERENCE, IDENTIFY OPERATIONAL FUNDAMEN- TALS RELATING TO THE OPERATION OF LIFE RAFT INFLATION EQUIPMENT				
X843 Inspect CO2 liferaft cylinders	1.80	19	2	4.03
X882 Perform leakage checks of CO2 liferaft cylinders	1.52	16	2	3.63

\* Training emphasis has an average of 2.11 and a standard deviation of 1.30 (high TE = 3.41)

\*\* Average task difficulty is 5.00, and the standard deviation is 1.00

TABLE 17 (CONTINUED)  
POI OBJECTIVES NOT SUPPORTED BY OSR DATA

POI OBJECTIVES/TASKS	TNG EMP*	1ST ENL PERCENT MEMBERS PERFORMING (N=897)	ATI	TSK DIF**
VI 1b. USING A START AND IGNITION SYSTEMS TRAINER, CHECKLIST, DIAGRAM AND MULTIMETER, TROUBLESHOOT TWO MALFUNCTIONS WITH NO MORE THAN THREE INSTRUCTOR ASSISTS				
H338 Isolate jet engine ignition system circuit malfunctions	3.65	21	11	6.11
H337 Isolate ignition harness conduit malfunctions	2.77	14	7	5.85
VI 1c. USING A TROUBLESHOOTING CHART, SELECT THE REMEDY FOR THREE OF FOUR GIVEN MALFUNCTIONS OF THE AUXILIARY POWER UNIT START AND IGNITION SYSTEM				
H335 Isolate APU or GTC component malfunctions	2.78	17	7	6.87
H336 Isolate electrical or air-operated starter circuit malfunctions	3.37	23	7	6.14
VI 6c. USING A TAKEOFF WARNING SYSTEM TRAINER, CHECKLIST, DIAGRAM, AND MULTIMETER, TROUBLESHOOT TWO MALFUNCTIONS WITH NO MORE THAN THREE INSTRUCTOR ASSISTS				
F187 Interpret wiring diagrams or schematics	5.90	78	18	6.73
N508 Isolate takeoff warning system circuit malfunctions	3.64	22	11	6.61
N509 Isolate throttle position warning circuit malfunctions	3.19	19	7	6.55

\* Training emphasis has an average of 2.11 and a standard deviation of 1.30 (high TE = 3.41)

\*\* Average task difficulty is 5.00, and the standard deviation is 1.00

TABLE 17 (CONTINUED)  
 POI OBJECTIVES NOT SUPPORTED BY OSR DATA

<u>POI OBJECTIVES/TASKS</u>	<u>TNG EMP*</u>	<u>1ST ENL PERCENT MEMBERS PERFORMING (N=897)</u>	<u>ATI</u>	<u>TSK DIF**</u>
VIII 3c. INDIVIDUALLY, OR IN A GROUP NOT TO EXCEED TWO STUDENTS, EACH STUDENT WILL TROUBLESHOOT TWO GIVEN MALFUNCTIONS USING SELECTED AIRCRAFT FLIGHT CONTROL SYSTEMS, TECHNICAL DATA, MULTI-METER AND MAINTENANCE FORMS				
L448 Isolate flap and slat control and warning circuit malfunctions	3.63	29	11	7.21
L449 Isolate speed brake control circuit malfunctions	3.03	25	7	6.36
L450 Isolate spoiler control circuit malfunctions	3.12	15	7	6.77
L451 Isolate stall warning circuit malfunctions	2.40	8	7	6.84

\* Training emphasis has an average of 2.17 and a standard deviation of 1.30 (high TE = 3.41)  
 \*\* Average task difficulty is 5.00, and the standard deviation is 1.00

TABLE 18

EXAMPLES OF TECHNICAL TASKS PERFORMED BY 30 PERCENT OR MORE  
FIRST-ENLISTMENT PERSONNEL AND NOT REFERENCED TO THE POI

TASKS	TNG EMP*	1ST ENL PERCENT MEMBERS PERFORMING (N=897)	ATI	TSK DIF**
F154 Assemble or disassemble connector plugs	4.85	72	18	5.09
I387 Remove or install antiskid circuit components	4.62	62	18	4.58
I392 Remove or install landing gear control switches	4.30	51	18	5.43
O549 Remove or install fire or overheat loops	4.36	57	18	5.41
P560 Inspect exterior lighting circuit components	3.84	62	18	3.52
P562 Inspect interior lighting circuit components	3.76	59	18	3.61
R643 Remove or install aircraft fire extinguishing system squibs	4.72	50	18	4.88
S697 Remove or install LOX system components	4.16	53	18	5.17
T718 Remove or install cabin or cargo pressurization system components	4.27	60	18	5.40
U753 Perform operational checks of bleed air distribution systems	4.48	63	18	4.53
W817 Remove or install air-conditioning ducting	4.23	69	18	5.29
W819 Remove or install aircraft air-conditioning system components	4.61	64	18	5.75
N518 Remove or install master caution warning circuit components	3.21	50	17	4.41
Z944 Jack or level aircraft	2.44	46	15	4.46
Z945 Launch or recover aircraft	2.95	42	15	4.15
Z946 Marshal aircraft	2.55	31	15	3.62
Z943 Ground aircraft	3.52	53	13	1.32

\* Training emphasis has an average of 2.11 and a standard deviation of 1.30 (high TE = 3.41)

\*\* Average task difficulty is 5.00, and the standard deviation is 1.00

## JOB SATISFACTION ANALYSIS

An examination of the job satisfaction indicators can give career ladder managers a better understanding of some of the factors which may affect the job performance of airmen in the career ladder. The survey booklet therefore included questions covering job interest, perceived utilization of talents and training, sense of accomplishment from work, and reenlistment intentions. The responses of the current survey sample were analyzed by making several comparisons: (1) among TAFMS groups of the Electrical and Environmental Systems career ladder and a comparative sample of personnel from other Mission Equipment Maintenance specialists surveyed in 1991 (AFSCs 452X2A/B/C, 454X1, 456X1A/B, 457X3A/B/C, and 465X0); (2) between current and previous survey TAFMS groups; and (3) across job groups identified in the SPECIALTY JOBS section of the report.

Table 19 compares first-enlistment (1-48 months TAFMS), second-enlistment (49-96 months TAFMS), and career (97+ months TAFMS) group data to corresponding enlistment groups from other Mission Equipment Maintenance AFSCs surveyed during the previous calendar year. These data give a relative measure of how the job satisfaction of Electrical and Environmental Systems personnel compares with similar Air Force specialties. Electrical and Environmental Systems personnel reported higher job satisfaction than members of the comparative sample. The high percentages of positive responses in these comparisons reflect a career ladder where personnel appear to be well satisfied with their jobs.

An indication of changes in job satisfaction perceptions within the career ladder is provided in Table 20, where TAFMS group data for 1992 survey respondents are presented, along with data from respondents to the 1984 and 1985 OSRs. Compared to the former Electrical Systems career ladder (AFSC 423X0), job satisfaction has improved or stayed about the same. Compared to the former Environmental Systems career ladder (AFSC 423X1), only career airmen in the 1992 combined sample report lower job interest, utilization of talents, and utilization of training. Reenlistment intentions have decreased for second-enlistment personnel. However, reenlistment intentions are about the same or lower among all TAFMS groups. The decrease could be more a function of the military drawdown than an indicator of job satisfaction.

Table 21 presents job satisfaction data for the major jobs identified in the career ladder structure. An examination of these data can reveal the influences performing certain jobs may have on overall job satisfaction. Job satisfaction indicators for the specialty job groups suggest that members of the FTD Instructor and Quality Assurance jobs are most satisfied. Members of the CUT and Maintenance Scheduling jobs are least satisfied. Between the largest job clusters, members of the Flightline Maintenance cluster reported higher job satisfaction than members of the In-Shop Maintenance cluster; however, reenlistment intentions are the same.

TABLE 19

COMPARISON OF TAFMS GROUP JOB SATISFACTION INDICATORS  
(PERCENT MEMBERS PERFORMING)

	1-48 MOS TAFMS		49-96 MOS TAFMS		97+ MOS TAFMS	
	1992 E&E (N=897)	1991 COMP SAMPLE (N=2,230)	1992 E&E (N=575)	1991 COMP SAMPLE (N=1,441)	1992 E&E (N=1,456)	1991 COMP SAMPLE (N=2,756)
<u>EXPRESSED JOB INTEREST:</u>						
Interesting	77	72	75	71	76	73
So-So	14	17	16	17	16	15
Dull	8	11	9	12	8	12
<u>PERCEIVED UTILIZATION OF TALENTS:</u>						
Fairly Well To Perfectly	83	79	84	77	84	79
Little Or Not At All	17	20	16	23	16	21
<u>PERCEIVED UTILIZATION OF TRAINING:</u>						
Fairly Well To Perfectly	88	80	86	74	81	73
Little Or Not At All	12	20	14	26	18	26
<u>SENSE OF ACCOMPLISHMENT FROM WORK:</u>						
Satisfied	78	72	75	69	75	70
Neutral	10	13	10	12	9	11
Dissatisfied	11	14	15	18	16	19
<u>REENLISTMENT INTENTIONS:</u>						
Will/Probably Will Reenlist	57	58	70	68	78	75
Will Not/Probably Will Not Reenlist	43	41	30	31	8	12
Will Retire	0	0	0	*	14	13

\* Less than 1 percent

NOTE: Comparative sample is composed of all Mission Equipment Maintenance career ladders surveyed in 1991 (includes AFSCs 452X2A/B/C, 454X1, 456X1A/B, 457X3A/B/C, 465X0)

TABLE 20

COMPARISON OF JOB SATISFACTION DATA  
(PERCENT MEMBERS PERFORMING)

	1-48 MOS TAFMS		49-96 MOS TAFMS		97+ MOS TAFMS		
	1992 (N=897)	1985 423X0 (N=816)	1992 E&E (N=575)	1985 423X0 (N=503)	1992 E&E (N=1,456)	1985 423X0 (N=490)	1984 423X1 (N=355)
<u>EXPRESSED JOB INTEREST:</u>							
Interesting	77	72	75	75	76	76	80
So-So	14	16	16	14	16	14	12
Dull	8	11	9	10	8	9	7
<u>PERCEIVED UTILIZATION OF TALENTS:</u>							
Fairly Well To Perfectly	83	79	84	79	84	80	86
Little Or Not At All	17	21	16	20	16	19	14
<u>PERCEIVED UTILIZATION OF TRAINING:</u>							
Fairly Well To Perfectly	88	83	86	76	81	80	85
Little Or Not At All	12	16	14	23	18	19	15
<u>SENSE OF ACCOMPLISHMENT FROM WORK:</u>							
Satisfied	78	73	75	71	75	67	75
Neutral	10	11	10	12	9	11	8
Dissatisfied	11	15	15	17	16	22	16
<u>REENLISTMENT INTENTIONS:</u>							
Will/Probably Will Reenlist	57	55	70	72	78	76	79
Will Not/Probably Will Not Reenlist	43	41	30	26	8	9	7
Will Retire	0	*	0	*	14	14	14

\* Less than 1 percent

TABLE 21

JOB SATISFACTION DATA FOR CLUSTERS AND INDEPENDENT JOB TYPES  
(PERCENT MEMBERS PERFORMING)

	FLTLINE MAINT (N=1,563)	IN SHOP MAINT (N=508)	SUPVRY (N=215)	TT INSTR (N=40)	FTD INSTR (N=17)	QUALITY ASSURANCE (N=29)
<u>EXPRESSED JOB INTEREST:</u>						
Interesting	80	71	80	72	94	93
So-So	13	19	12	20	6	3
Dull	6	10	7	7	0	3
<u>PERCEIVED UTILIZATION OF TALENTS:</u>						
Fairly Well To Perfectly	88	80	82	77	94	97
Little Or Not At All	12	20	18	22	6	3
<u>PERCEIVED UTILIZATION OF TRAINING:</u>						
Fairly Well To Perfectly	90	88	71	77	100	90
Little Or Not At All	10	12	29	20	0	10
<u>SENSE OF ACCOMPLISHMENT:</u>						
Satisfied	81	71	75	57	88	86
Neutral	8	13	9	20	12	10
Dissatisfied	11	16	16	20	0	3
<u>REENLISTMENT INTENTIONS:</u>						
Will/Probably Will Reenlist	72	72	63	80	82	97
Will Not/Probably Will Not Reenlist	24	24	5	17	18	0
Will Retire	5	4	32	0	0	3

TABLE 21 (CONTINUED)

JOB SATISFACTION DATA FOR CLUSTERS AND INDEPENDENT JOB TYPES  
(PERCENT MEMBERS PERFORMING)

	BTRY, OX CART MAINT (N=37)	HELI (N=27)	CROSS- UTIL TNG (N=13)	WIRING (N=13)	MAINT SCHED (N=12)	AWACS (N=10)
<u>EXPRESSED JOB INTEREST:</u>						
Interesting	62	81	62	54	67	80
So-So	19	11	15	31	0	10
Dull	19	7	23	15	33	10
<u>PERCEIVED UTILIZATION OF TALENTS:</u>						
Fairly Well To Perfectly	68	85	62	77	58	90
Little Or Not At All	32	15	38	23	42	10
<u>PERCEIVED UTILIZATION OF TRAINING:</u>						
Fairly Well To Perfectly	62	78	54	77	33	90
Little Or Not At All	38	22	46	23	67	10
<u>SENSE OF ACCOMPLISHMENT:</u>						
Satisfied	51	81	38	69	58	80
Neutral	22	4	15	8	17	10
Dissatisfied	27	15	46	23	25	10
<u>REENLISTMENT INTENTIONS:</u>						
Will/Probably Will Reenlist	59	67	46	62	50	60
Will Not/Probably Will Not Reenlist	41	33	46	31	25	40
Will Retire	0	0	8	8	25	0

## IMPLICATIONS

As explained in the INTRODUCTION, this survey was conducted primarily to provide training personnel with current information on the Electrical and Environmental Systems specialty for use in reviewing current training programs and training documents since the 1989 merger of Electrical Systems and Environmental Systems. The data compiled from this survey support the current structure of the new AFSC 452X5 career ladder which combines tactical, strategic, and airlift personnel. However, two factors could significantly impact this career ladder and require reevaluation of the job structure. The changing division of maintenance responsibilities between the Operations Group and the Logistics Group in the objective wing structure and the potential elimination of intermediate level maintenance would especially affect the In-Shop Maintenance cluster. The present classification structure, as described by the AFR 39-1 Specialty Descriptions, accurately portrays the jobs in this study.

Analysis of career ladder documents indicates numerous areas of the STS in which bench checking and repairing components are unsupported. While the POI is basically sound, both documents require review.

No serious job satisfaction problems appear to exist within this specialty. Overall, job satisfaction responses were almost all higher than those of a comparative sample of similar Air Force personnel surveyed in 1991.

The findings of this OSR come directly from the survey data collected from Electrical and Environmental Systems personnel worldwide. These data are readily available to training and utilization personnel, functional managers, and other interested parties having a need for such information. Much of the data are compiled into extracts which are excellent tools in the decision-making process. These data extracts should be used when training or utilization decisions are made.

APPENDIX A  
SELECTED REPRESENTATIVE TASKS PERFORMED BY  
CAREER LADDER SPECIALTY JOB GROUPS

TABLE I  
 FLIGHTLINE MAINTENANCE CLUSTER  
 ST244

GROUP SIZE: 1,563	AVERAGE TAFMS: 91 MONTHS
PERCENT OF SAMPLE: 53%	AVERAGE TICF: 82 MONTHS
AVERAGE PAYGRADE: E-4	PERCENT IN 1ST ENL: 33%

TASKS	PERCENT MEMBERS PERFORMING
G239 Perform operational checks of AC power systems	96
P566 Perform operational checks of exterior lighting circuits	94
F211 Remove or install pins on connector plugs	93
F172 Crimp wires to splices or terminals	93
G300 Perform operational checks of DC power systems	93
F204 Remove or install connector plugs	92
P568 Perform operational checks of interior lighting circuits	92
I382 Perform operational checks of antiskid systems	91
P563 Isolate exterior lighting circuit malfunctions	91
W817 Remove or install air-conditioning ducting	90
G301 Perform operational checks of external power systems	89
P565 Isolate interior lighting circuit malfunctions	89
G285 Isolate aircraft AC power distribution circuit malfunctions	88
W812 Perform operational checks of aircraft air-conditioning systems	88
U763 Remove or install bleed air ducting	88
Z967 Walk wings or tails during aircraft towing operations	87
W819 Remove or install aircraft air-conditioning system components	87
I387 Remove or install antiskid circuit components	87
T711 Perform leakage checks of cabin or cargo pressurization systems	87
F163 Clean connector plugs	87
U737 Isolate bleed air system malfunctions	86
I373 Isolate antiskid circuit malfunctions	86
O543 Perform operational checks of fire and overheat warning systems	86
F209 Remove or install fuses, current limiters, or circuit breakers	86
W802 Isolate aircraft air-conditioning system component malfunctions	85
U753 Perform operational checks of bleed air distribution systems	85
T713 Perform operational checks of cabin or cargo pressurization systems	84
G286 Isolate aircraft DC power distribution circuit malfunctions	84

TABLE II  
IN-SHOP MAINTENANCE CLUSTER  
ST144

GROUP SIZE: 508	AVERAGE TAFMS: 92 MONTHS
PERCENT OF SAMPLE: 17%	AVERAGE TICF: 81 MONTHS
AVERAGE PAYGRADE: E-4	PERCENT IN 1ST ENL: 34%

TASKS	PERCENT MEMBERS PERFORMING
F172 Crimp wires to splices or terminals	92
S662 Inspect LOX carts	90
S678 Perform leakage checks of LOX carts	89
F211 Remove or install pins on connector plugs	89
S691 Purge LOX carts	88
S684 Perform operational checks of LOX carts	87
M459 Assemble or disassemble nickel cadmium batteries	87
E117 Annotate AFTO Forms 350 (Reparable Item Processing Tag)	86
S696 Remove or install LOX cart components	86
F204 Remove or install connector plugs	85
F163 Clean connector plugs	85
F221 Solder wires to connector plugs, control boxes, or control panels	85
S669 Isolate LOX cart malfunctions	83
F154 Assemble or disassemble connector plugs	83
F187 Interpret wiring diagrams or schematics	82
M465 Clean nickel cadmium batteries	81
M476 Perform capacitance tests or services on nickel cadmium batteries	81
M481 Remove or install cells on nickel cadmium batteries	81
F196 Perform solderless connector insertions or extractions	81
E143 Turn in parts, other than bench stock	81
F183 Inspect electro-environmental systems for corrosion	80
F222 Splice electrical wiring, other than Kapton	80
E133 Open CAMS	80
F209 Remove or install fuses, current limiters, or circuit breakers	80
M468 Inspect aircraft batteries	78
E121 Close CAMS	78
E129 Inventory equipment, tools, or supplies	78

TABLE III  
SUPERVISORY CLUSTER  
GP169

GROUP SIZE: 215	AVERAGE TAFMS: 193 MONTHS
PERCENT OF SAMPLE: 7%	AVERAGE TICF: 165 MONTHS
AVERAGE PAYGRADE: E-7	PERCENT IN 1ST ENL: 0%

TASKS	PERCENT MEMBERS PERFORMING
B23 Counsel personnel	88
C68 Write EPRs	86
B21 Conduct or participate in staff meetings	78
B32 Interpret policies, directives, or procedures for subordinates	76
C69 Write recommendations for individual recognition	74
A6 Determine work priorities	73
C48 Evaluate individuals for compliance with performance standards	73
A19 Schedule leaves or passes	73
A13 Establish performance standards for subordinates	72
A17 Plan or schedule work assignments	70
A1 Assign personnel to duty positions	68
E108 Annotate AF Forms 623 (On-The-Job Training Record)	63
B40 Supervise military personnel with AFSCs other than 452X5, 454X5, or 454X6	62
C61 Indorse enlisted performance reports (EPRs)	59
B41 Write correspondence, other than supply followup letters	59
A3 Coordinate nonmaintenance activities with other base agencies	58
E109 Annotate AF Forms 797 (Job Qualification Standard Continuation/Command JQS)	58
C59 Evaluate work schedules	57
C65 Perform maintenance activity inspections or self-inspections	57
D94 Maintain training records, charts, or graphs	56
A5 Determine requirements for space, personnel, equipment, or supplies	56
D82 Determine OJT requirements	55

TABLE IV

TECHNICAL TRAINING INSTRUCTOR CLUSTER  
ST327

GROUP SIZE: 40  
PERCENT OF SAMPLE: 1%  
AVERAGE PAYGRADE: E-5

AVERAGE TAFMS: 110 MONTHS  
AVERAGE TICF: 99 MONTHS  
PERCENT IN 1ST ENL: 0%

TASKS	PERCENT MEMBERS PERFORMING
D71 Administer tests	100
D98 Score tests	98
D76 Conduct resident course classroom training	95
D81 Demonstrate operation of equipment	93
D79 Counsel trainees on training progress	88
B23 Counsel personnel	75
D100 Write test questions	73
D99 Write lesson plans	68
D90 Evaluate progress of resident course students	60
D94 Maintain training records, charts, or graphs	58
D80 Demonstrate how to locate technical information	48
E129 Inventory equipment, tools, or supplies	48
Q84 Develop course curricula, plans of instruction (POIs), or specialty training standards (STs)	48
E114 Annotate AFTO Forms 244 (Industrial/Support Equipment Record)	43

TABLE V

FTD INSTRUCTOR IJT  
ST226

GROUP SIZE: 17  
 PERCENT OF SAMPLE: .5%  
 AVERAGE PAYGRADE: E-5

AVERAGE TAFMS: 124 MONTHS  
 AVERAGE TICF: 121 MONTHS  
 PERCENT IN 1ST ENL: 0%

TASKS	PERCENT MEMBERS PERFORMING
D74 Conduct field training detachment (FTD) classroom training	100
D80 Demonstrate how to locate technical information	100
D81 Demonstrate operation of equipment	100
D98 Score tests	100
D71 Administer tests	94
D99 Write lesson plans	94
E129 Inventory equipment, tools, or supplies	76
E132 Maintain technical order (TO) files or TO compliance records	76
D100 Write test questions	71
D84 Develop course curricula, plans of instruction (POIs), or specialty training standards (STs)	71
U753 Perform operational checks of bleed air distribution systems	65
W812 Perform operational checks of aircraft air-conditioning systems	65
A11 Establish or maintain publication libraries	65
D79 Counsel trainees on training progress	65
F187 Interpret wiring diagrams or schematics	59
T713 Perform operational checks of cabin or cargo pressurization systems	59
C48 Evaluate individuals for compliance with performance standards	53
D300 Perform operational checks of DC power systems	53
T711 Perform leakage checks of cabin or cargo pressurization systems	53
F172 Crimp wires to splices or terminals	53

TABLE VI  
 QUALITY ASSURANCE IJT  
 ST238

GROUP SIZE: 29  
 PERCENT OF SAMPLE: 1%  
 AVERAGE PAYGRADE: E-6

AVERAGE TAFMS: 157 MONTHS  
 AVERAGE TICF: 146 MONTHS  
 PERCENT IN 1ST ENL: 0%

TASKS	PERCENT MEMBERS PERFORMING
C53 Evaluate maintenance procedures	97
S663 Inspect LOX system components	97
C48 Evaluate individuals for compliance with performance standards	93
S662 Inspect LOX carts	93
O529 Inspect fire and overheat detection circuit components	90
U732 Inspect bleed air ducting	86
I365 Inspect landing gear control and warning circuit components	86
O527 Inspect bleed air overheat warning system components	86
W799 Inspect air-conditioning ducting	83
I361 Inspect antiskid circuit components	83
M468 Inspect aircraft batteries	83
O528 Inspect engine overheat warning detectors	83
S664 Inspect oxygen quantity indicating or warning system components	83
G267 Inspect AC generator circuit-or distribution circuit components	79
M469 Inspect battery charger system circuit components	79
G274 Inspect external power system circuit components	79
P562 Inspect interior lighting circuit components	79
F183 Inspect electro-environmental systems for corrosion	76
I366 Inspect landing gear control switches	76
F182 Inspect electrical bonds or grounds	76
G283 Inspect TR circuit components	76
F180 Inspect control boxes or junction boxes for burning or chaffing	76
P560 Inspect exterior lighting circuit components	76
R621 Inspect aircraft fire extinguishing electrical control circuit components	76
W801 Inspect equipment cooling system	76
C65 Perform maintenance activity inspections or self-inspections	72
C64 Observe in-process maintenance or initiate on-the-spot corrections	72

TABLE VII

BATTERY, OXYGEN CART MAINTENANCE CLUSTER  
ST82

GROUP SIZE: 37	AVERAGE TAFMS: 43 MONTHS
PERCENT OF SAMPLE: 1%	AVERAGE TICF: 40 MONTHS
AVERAGE PAYGRADE: E-3	PERCENT IN 1ST ENL: 68%

<u>TASKS</u>	<u>PERCENT MEMBERS PERFORMING</u>
M476 Perform capacitance tests or services on nickel cadmium batteries	97
M481 Remove or install cells on nickel cadmium batteries	95
M459 Assemble or disassemble nickel cadmium batteries	89
M465 Clean nickel cadmium batteries	89
M468 Inspect aircraft batteries	76
M483 Remove or install connectors on nickel cadmium batteries	76
F172 Crimp wires to splices or terminals	65
M464 Clean lead acid batteries	59
S691 Purge LOX carts	59
M475 Perform capacitance tests or services on lead acid batteries	57
S696 Remove or install LOX cart components	51

TABLE VIII  
HELICOPTER CLUSTER  
ST758

GROUP SIZE: 27	AVERAGE TAFMS: 77 MONTHS
PERCENT OF SAMPLE: 1%	AVERAGE TICF: 73 MONTHS
AVERAGE PAYGRADE: E-4	PERCENT IN 1ST ENL: 37%

TASKS	PERCENT MEMBERS PERFORMING
F172 Crimp wires to splices or terminals	100
P563 Isolate exterior lighting circuit malfunctions	100
F204 Remove or install connector plugs	100
N510 Perform operational checks of master caution warning systems	100
Z967 Walk wings or tails during aircraft towing operations	96
P566 Perform operational checks of exterior lighting circuits	96
P568 Perform operational checks of interior lighting circuits	96
F211 Remove or install pins on connector plugs	96
G300 Perform operational checks of DC power systems	96
F221 Solder wires to connector plugs, control boxes, or control panels	96
Z944 Jack or level aircraft	96
F154 Assemble or disassemble connector plugs	96
G299 Perform operational checks of AC power systems	96
G286 Isolate aircraft DC power distribution circuit malfunctions	96
F210 Remove or install micro switches	96
F214 Remove or install rheostats	96
P567 Perform operational checks of integral lighting circuits, such as on panels	96
Z955 Position or remove aircraft chocks	93
Z954 Position nonpowered or powered AGE to aircraft	93
F163 Clean connector plugs	93
N506 Isolate master caution warning circuit malfunctions	93
P565 Isolate interior lighting circuit malfunctions	93
G285 Isolate aircraft AC power distribution circuit malfunctions	93
N518 Remove or install master caution warning circuit components	93
F209 Remove or install fuses, current limiters, or circuit breakers	93
Z943 Ground aircraft	89
Z945 Launch or recover aircraft	89
Z964 Tow aircraft	89

TABLE IX

CROSS-UTILIZATION TRAINING IJT  
ST281

GROUP SIZE: 13  
 PERCENT OF SAMPLE: .5%  
 AVERAGE PAYGRADE: E-4

AVERAGE TAFMS: 106 MONTHS  
 AVERAGE TICF: 76 MONTHS  
 PERCENT IN 1ST ENL: 23%

TASKS	PERCENT MEMBERS PERFORMING
Z945 Launch or recover aircraft	100
Z946 Marshal aircraft	100
Z952 Perform single-point aircraft refueling or defueling	100
Z953 Perform thruflight or postflight inspections	100
Z955 Position or remove aircraft chocks	100
Z951 Perform preflight inspections	92
Z954 Position nonpowered or powered AGE to aircraft	92
Z943 Ground aircraft	92
Z944 Jack or level aircraft	85
Z961 Service aircraft hydraulic systems	85
Z963 Service aircraft tires	85
U764 Remove or install bleed air system components, other than ducting	77
Z962 Service aircraft struts	77
Z964 Tow aircraft	69
Z967 Walk wings or tails during aircraft towing operations	69
U748 Perform leakage checks of bleed air systems	69
F172 Crimp wires to splices or terminals	69
Z959 Remove or install aircraft wheel assemblies	62
W812 Perform operational checks of aircraft air-conditioning systems	62
W802 Isolate aircraft air-conditioning system component malfunctions	62

TABLE X

WIRING IJT  
ST275

GROUP SIZE: 13  
PERCENT OF SAMPLE: .5%  
AVERAGE PAYGRADE: E-5

AVERAGE TAFMS: 96 MONTHS  
AVERAGE TICF: 90 MONTHS  
PERCENT IN 1ST ENL: 39%

TASKS	PERCENT MEMBERS PERFORMING
F204 Remove or install connector plugs	100
F172 Crimp wires to splices or terminals	100
F187 Interpret wiring diagrams or schematics	100
F211 Remove or install pins on connector plugs	92
F154 Assemble or disassemble connector plugs	85
F163 Clean connector plugs	85
F176 Fabricate electrical leads	85
F222 Splice electrical wiring, other than Kapton	85
E129 Inventory equipment, tools, or supplies	77
F175 Fabricate compact wire bundles	77
F179 Fabricate wiring harnesses	77
F196 Perform solderless connector insertions or extractions	77
F221 Solder wires to connector plugs, control boxes, or control panels	77
F182 Inspect electrical bonds or grounds	69
F202 Remove or install compact wire bundles	69
F218 Remove or install wiring in control boxes or panels	62
F197 Perform TCTO modifications	54

TABLE XI  
 MAINTENANCE SCHEDULING IJT  
 ST578

GROUP SIZE: 12  
 PERCENT OF SAMPLE: .5%  
 AVERAGE PAYGRADE: E-5

AVERAGE TAFMS: 145 MONTHS  
 AVERAGE TICF: 137 MONTHS  
 PERCENT IN 1ST ENL: 0%

<u>TASKS</u>	<u>PERCENT MEMBERS PERFORMING</u>
E134 Perform CAMS inquiries for scheduled aircraft discrepancies	100
E133 Open CAMS	92
E120 Change CAMS workcenter event narratives	83
E136 Perform CAMS inquiries for uncompleted maintenance event listings	83
E144 Update aircraft maintenance discrepancies in CAMS	75
E140 Schedule or reschedule aircraft discrepancies in CAMS	75
E119 Change core automated maintenance system (CAMS) job standard narratives	67
E141 Start or stop CAMS job following events	67
E137 Perform CAMS inquiries to monitor delayed discrepancies prior to, during, or after scheduling maintenance	67
E142 Track CAMS job following events	58
E121 Close CAMS	58
A6 Determine work priorities	58
B22 Coordinate maintenance activities with maintenance control	50

TABLE XII

AWACS IJT  
ST377

GROUP SIZE: 10  
PERCENT OF SAMPLE: .5%  
AVERAGE PAYGRADE: E-4

AVERAGE TAFMS: 83 MONTHS  
AVERAGE TICF: 65 MONTHS  
PERCENT IN 1ST ENL: 40%

TASKS	PERCENT MEMBERS PERFORMING
W799 Inspect air-conditioning ducting	100
E143 Turn in parts, other than bench stock	100
V778 Inspect liquid coolant systems	100
F222 Splice electrical wiring, other than Kapton	100
E136 Perform CAMS inquiries for uncompleted maintenance event listings	100
E133 Open CAMS	90
F183 Inspect electro-environmental systems for corrosion	90
E121 Close CAMS	90
E117 Annotate AFTO Forms 350 (Reparable Item Processing Tag)	90
R623 Inspect aircraft fire extinguishing systems	90
E120 Change CAMS workcenter event narratives	90
R620 Inspect aircraft fire extinguishing bottles	90
E125 Initiate AF Forms 2005 (Issue/Turn-in Request)	90
F204 Remove or install connector plugs	90
V787 Perform operational checks of liquid coolant systems	90
V772 Add freon to aircraft refrigerators	90
V786 Perform operational checks of aircraft refrigerators	90
F214 Remove or install rheostats	90
F193 Perform phase inspections	80
R637 Perform operational checks of fire extinguishing systems	80
E134 Perform CAMS inquiries for scheduled aircraft discrepancies	80
R621 Inspect aircraft fire extinguishing electrical control circuit components	80
F172 Crimp wires to splices or terminals	80
R624 Inspect aircraft fire suppression systems	80
F163 Clean connector plugs	80
P557 Assemble or disassemble rotating beacons, taxi lights, or landing lights	80