

STRATEGIC AIR COMMAND

A STUDY OF FEMALES
ON
MINUTEMAN/PEACEKEEPER CREWS
31 JANUARY 1985



HEADQUARTERS
STRATEGIC AIR COMMAND

Offutt Air Force Base, Nebraska

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS STRATEGIC AIR COMMAND
OFFUTT AIR FORCE BASE, NEBRASKA 68113

4 FEB 1985

Duane H. Cassidy
Lieutenant General, USAF
Deputy Chief of Staff, Manpower
and Personnel
Headquarters United States Air Force
Washington, D.C. 20330

Dear General Cassidy

We have concluded our in-depth study of the possible introduction of females on gender-specific (all-female/all-male) Minuteman/Peacekeeper crews. The study concentrated on impacts on mission effectiveness, cost, equal opportunity in career progression, scheduling, and morale. Written surveys, telephone interviews, and one-on-one interviews were accomplished with 1400 officers to obtain overall perceptions of the gender-specific crew concept. Included in these perceptions were significant comments on mixed crews. These comments reaffirmed the results of the 1980 AFMPC survey. We concluded that introducing additional stress into an already demanding missile crew environment was not considered prudent. Therefore, we continue to support previous findings that did not recommend the mixed crew concept. The details of these and other factors bearing on the introduction of female crews in the Minuteman/Peacekeeper force are discussed in the attached study report.

We have determined that introducing females onto gender-specific crews is feasible and have initiated plans to implement this concept beginning this year. The optimum female representation at the first wing will be determined in a detailed implementation plan that I have directed my staff to develop for my approval. Our staffs must work together to insure the introduction of females into Minuteman/Peacekeeper operations is accomplished in the most expeditious, efficient manner possible.

Since their introduction in 1978, women have performed admirably in the Titan weapon system. I'm pleased to expand the opportunity for women to serve in our nation's deterrent force.


B. L. DAVIS
General, USAF
Commander in Chief

1 Atch
Formal Study Report

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INTRODUCTION

In Jun 1984, a HQ USAF Special Study Team (HQ USAF/MPZ) was formed to examine the current and future utilization of females in the Air Force. As part of the overall effort, the Special Study Team requested Headquarters Strategic Air Command (HQ SAC) investigate the implementation of gender-specific (i.e., adding all-female crews to the current all-male crew force) crews in the Minuteman/Peacekeeper crew force. (Any reference to "Minuteman" includes Peacekeeper due to the equivalent nature of Minuteman and Peacekeeper duties.)

The HQ USAF Special Study Team and HQ SAC felt that the mixed crew concept should not be formally investigated at this time. In a survey conducted in 1980, AFMPC found that there was a generally negative reaction to the mixed crew concept by missile crew members and their spouses. It was logically construed then that implementing mixed crews would add significant crew member stress. The added stress would arise from the strong negative spousal reaction to mixed crews as well as the concerns voiced by the crew members themselves. Adding this factor to the already demanding missile crew environment was not considered prudent.

The basic framework of the HQ SAC study was to investigate the possible implementation of female crews on an equitable basis and in a manner that would be least disrupt-

tive to the current crew environment. Because of these factors, it appeared the best approach was to investigate gender-specific first. Provided a positive outcome would result from gender-specific crew implementation, it would be feasible that mixed crews be investigated at a later date.

The HQ SAC Chief of Staff established a HQ SAC Study Team on 26 Dec 84. Each team member was chosen to provide special expertise. The designated team chief was Colonel Lee Forbes, Assistant Deputy Chief of Staff/Personnel. Colonel Forbes had extensive experience in personnel management and design and use of survey instruments. The secretary was Lt Colonel John Ficklin (HQ SAC/DPXP) who had both Titan and Minuteman missile experience and had worked this issue in the past. Lt Colonel James Webb (HQ SAC/XOKM) was chosen because of his Minuteman missile experience, particularly as a Minuteman squadron commander. Major Russell Anarde (HQ SAC/DPRM) had both Titan and Minuteman missile experience and was the Chief of HQ SAC missile officer assignments. Major Ibra January (HQ SAC/DPZ) had Minuteman missile experience and was the HQ SAC Chief, Equal Opportunity and Treatment Division. Major Glen Outlaw (HQ SAC/XPMR) had Minuteman missile experience and was the HQ SAC Chief, Manpower Requirements Division. Captain Patricia Fornes (HQ SAC/DOMM) had Titan missile experience and was the HQ SAC Missile Evaluation and Training representative. Captain Emi Vishoot (HQ SAC/DPXYA) was chosen because of her

expertise as an analyst and was a HQ SAC Command Personnel Analyst.

To provide further insight, members from outside of HQ SAC were also chosen. Major J. David Pesterfield (15AFCOS/DOXM) had Minuteman missile experience and was the 15th Air Force representative. Major Deborah Jermunson (2ACCS/DOCX) brought her Titan missile experience and airborne command and control expertise and was the first operationally ready female Titan crew commander in SAC. Captain James Mackin (HQ 8AF/MNOT) had Minuteman missile experience and was the 8th Air Force representative. Captain Bonnie Schwartz (381 SMW/CCE) had very recent Titan crew experience and was the 1984 missile combat crew commander of the best Titan crew in SAC. Captain Martin Pellum (HQ AFMPC/MPCY) was also involved as a special consultant because of his expertise in devising/conducting surveys.

The Study Team began its formal efforts at its organizational meeting 2 Jan 85. Timelines were determined and basic objectives were formulated. The driving deadline was to provide the final HQ SAC Study Team results to HQ USAF/MPZ by 31 Jan 85.

This study is divided into five chapters. Chapter One explains the basic objectives pursued by the HQ SAC Study Team as well as the timelines involved. Chapter Two is devoted to explaining how the data for this study was

collected. The methods used to compile the data and numerical results are examined in Chapter Three. An assessment of the overall study effort is provided in Chapter Four. A summary appears in Chapter Five.

CHAPTER 1

OBJECTIVES AND COMMITTEES

The HQ SAC Study Team was formed to provide an assessment of the feasibility of introducing gender-specific (all-female and all-male) crews in Minuteman/Peacekeeper. The HQ SAC Study Team assessment was to be developed for inclusion in the HQ USAF Special Study Team report on current and future utilization of females in the Air Force.

Two committees were formed within the HQ SAC Study Team. The objective of the survey committee was to determine perceptions of introducing females on gender-specific Minuteman/Peacekeeper crews. The objective of the implementation committee was to examine factors bearing upon the introduction of female crews in Minuteman.

CHAPTER 2

DATA COLLECTION METHODS

Survey Committee

The survey committee developed three methods of data collection: written surveys, telephone interviews, and one-on-one interviews. A total of 1310 officers were surveyed. The written survey had four versions. Version one was a survey for 40 Titan unit missile operations staff officers, 100 male crew members and 50 female crew members. Version two was designed for 150 Minuteman operations staff officers and 600 crew members. Three hundred forty support officers (e.g., finance, personnel, transportation, etc.) were surveyed using the third version. The fourth version was developed for 20 missile students going through Initial Qualification Training (IQT) in the 4315th Combat Crew Training Squadron (CCTS), Vandenberg AFB, CA.

While the overall purpose of each method was to measure perceptions about gender-specific crews, each of the written surveys was designed to obtain unique data. Minuteman missile operations staff officers and crew members were surveyed for their perceptions of how gender-specific crews would impact the current Minuteman organization. Titan missile operations staff officers and crew members were sur-

veyed to gain information on the number of male and female crew members willing to voluntarily cross-train into Minuteman. Support officers were surveyed to gain an insight into the potential pool of officers who might cross-train into Minuteman. Finally, IQT students were surveyed to gain insights from personnel who were familiar with missile crew duty, but who were not yet influenced by operational experience in Minuteman units.

Telephone interviews were conducted with 57 senior missile staff personnel stationed at Minuteman units, Titan units, and Vandenberg AFB, CA. Senior staff interviewed ranged from squadron commanders through wing commanders. The interviews began with an opening statement and used an interview outline to guide the discussion. Two interviewers were on the telephone at all times, one to ask questions and one to record. The persons interviewed were advised that two people were on the line and that the interviews were being conducted on a non-attribution basis. This interview was designed to provide corollary data comparing senior staff opinions with those of more junior staffs and crew members.

One-on-one interviews were conducted with 40 male and 40 female Titan crew members at McConnell AFB, KS and Little Rock AFB, AR. Two male/female interviewers from the HQ SAC Study Team conducted these interviews. Each Study

Team member interviewed ten male and ten female Titan crew members. Like the senior staff telephone interview, this interview used an interview guide to direct the discussion. These interviews were also conducted on a non-attribution basis. These interviews were also designed to add corollary information to the written surveys.

Implementation Committee

The implementation committee focused on five primary areas: resource availability, manpower impacts, training considerations, implementation management, and career progression. First, the potential personnel resources available to implement and maintain female gender-specific crews were examined. These data were requested from several external sources. One request was sent to the Air Force Manpower and Personnel Center (AFMPC) seeking data from the missile officer assignments section (PALACE MISSILE). PALACE MISSILE provided data that identified the potential number of experienced female officer resources which could be available to cross-train into Minuteman. They also submitted information on the historical manning of our Titan units. Other requests were sent to the HQ AFMPC Directorate of Personnel Procurement, the Air Force Academy (USAF), and HQ Air Training Command (ATC) Officer Commissioning Program Analysis Office (ATCOC). The latter was necessary to gain information about the size and pipeline impacts of Reserve

Officers' Training Corps (ROTC), USAFA, and Officer Training School (OTS) resources.

Second, a manpower analysis of a gender-specific crew policy was conducted. As part of this analysis, all Minuteman unit training divisions (DOT) were requested to prepare monthly crew schedules using various percentages of females, provide demographic and duty not involving alert (DNIA) data, and outline current wing operations policies (e.g., leaves, number of alerts per crew per month, etc.). These inputs served both as an impact measurement of gender-specific crews on unit scheduling and as a baseline for determining potential requirements for additional manpower authorizations. A HQ SAC Surgeon General medical opinion on DNIA status for pregnant female missile crew members was also included in the analysis.

Third, potential training impacts were investigated. Requests were sent to the 4315 CCTS and Minuteman unit DOTs. The 4315 CCTS was asked to identify their maximum training capacity under current/increased instructor manning and what curriculum modifications would be needed to train initial cadre female gender-specific crews. Further, Minuteman unit DOTs were asked to determine additional unit training requirements for initial female gender-specific crews.

Fourth, career progression was examined. Career progression problems unique to a gender-specific crew con-

cept were explored and policy and procedure impacts identified. The HQ SAC Judge Advocate provided legal opinions on equal opportunity and treatment implications.

Finally, the committee concentrated on how a gender-specific assignment and utilization policy would be implemented. Initial crew compositions, sequence of wing implementation, and prospective build up schedules were developed and analyzed. 4315 CCTS training parameters, female officer resource availability and unit training requirements were included into this review.

CHAPTER 3

DATA COMPILATION

Survey Committee

The results of the written surveys, telephone interviews, and one-on-one Titan crew member interviews generally supported the acceptance of the gender-specific use of females on Minuteman/Peacekeeper crews. A majority of the officers felt that the Air Force should afford women the opportunity to serve in the Minuteman/Peacekeeper missile operations career field. The gender-specific crew concept was viewed as a viable means of accomplishing that goal. However, the written surveys clearly pointed to widely differing views concerning gender-specific crews versus mixed crews. In the area of spousal reaction, results of the three survey methods showed that the majority of spouses would be supportive of gender-specific crews. Lastly, most officers predicted that unit and crew morale would not suffer with the introduction of females into the Minuteman/Peacekeeper crew force.

Written Surveys

Separate surveys were developed for officers in each of four target groups: Minuteman operations, Titan operations, nonrated line with under seven years active commissioned

service, and students in Initial Qualification Training (IQT). Overall, 1310 surveys were completed during 8 - 11 January 1985.

A majority of the support officers (82%) and missileers (70%) felt the Air Force should afford women the opportunity to work in the Minuteman/Peacekeeper weapon systems. Fewer of the missileers (52%), however, favored the gender-specific crew concept as a method for implementing such a policy change. Unsolicited written comments indicated that at least a portion of this difference was attributable to a feeling that officers should be assigned to crew duty regardless of gender.

While about one-half favored gender-specific crews, over one-third did not. This dichotomy was characterized by a considerable portion of the respondents at the extremes of the scale -- 51% of those who agreed said "strongly agree" and 48% of those who disagreed said "strongly disagree."

Currently, slightly over one-third of the male missileers said they intend to remain in the missile career field while only about one-tenth of the females expressed similar intentions. One might expect, however, that more females would consider remaining in the missile career field if allowed to crossflow into Minuteman, since 60% indicated this change would improve their career opportunities.

A majority of the females (71%) and just under one-half of the males (46%) felt their spouses currently did not favor their continuance in missiles. Respondents indicated this support/lack of support would change very little under the gender-specific scenario.

Slightly under one-half of the missile officers felt there would be some preferential treatment toward women, although more males (55%) than females (11%) felt it would exist.

Finally, the perceived impact on Minuteman unit morale was split, with about one-third believing it would go up, one-third believing it would go down and one-third being undecided. Few Titan officers (19%) or Minuteman officers (29%) felt their personal morale would be enhanced.

Telephone Interviews

Fifty-seven senior missile staff officers participated in unstructured telephone interviews 8 - 14 January 1985.

The results indicated a general acceptance of the gender-specific use of females on Minuteman/Peacekeeper crews. Of the senior officers surveyed, 56% favored the concept while 40% were opposed. Most staff members questioned the decision to discount the mixed crew concept and in fact 40% commented they would prefer mixed crews.

Responses to perceived spousal reaction and unit morale questions were mixed. Sixty-five percent felt gender-specific crewing would not cause any perceptible spousal reaction, while 14% anticipated some initial problems which would be eventually resolved. Unit morale was perceived to be less affected by the gender-specific crew concept: 35% felt there would be no effect on morale; 21% foresaw a positive effect; and 14% anticipated some initial problems which would eventually be rectified as women gained experience and credibility.

In terms of impact on missile career field retention, 65% stated male retention rates would not be affected; 47% felt it would have no impact on female retention.

One-on-One Interviews

A total of 80 one-on-one Titan officer crew member interviews were conducted at Little Rock and McConnell AFBs. The results indicated considerable support for the gender-specific crew concept. While 77% of those crew members interviewed accepted the gender-specific concept, 61% preferred the mixed crew concept. However, there was a strong reluctance on the part of the Titan crew members to crossflow onto the Minuteman/ Peacekeeper crew force: 65% of the male crew members and 70% of the female crew members stated they would not volunteer.

Although voluntary crossflow onto Minuteman/Peacekeeper operational crews was not considered an attractive career option, 57% males and 35% females indicated that they would accept a Minuteman/Peacekeeper assignment if involuntarily selected. Only 7% of the male officers stated they would separate from the Air Force, while 27% of the female officers stated they would separate. The overall perceived spousal reaction to gender-specific crewing was positive.

Implementation Committee

Overview

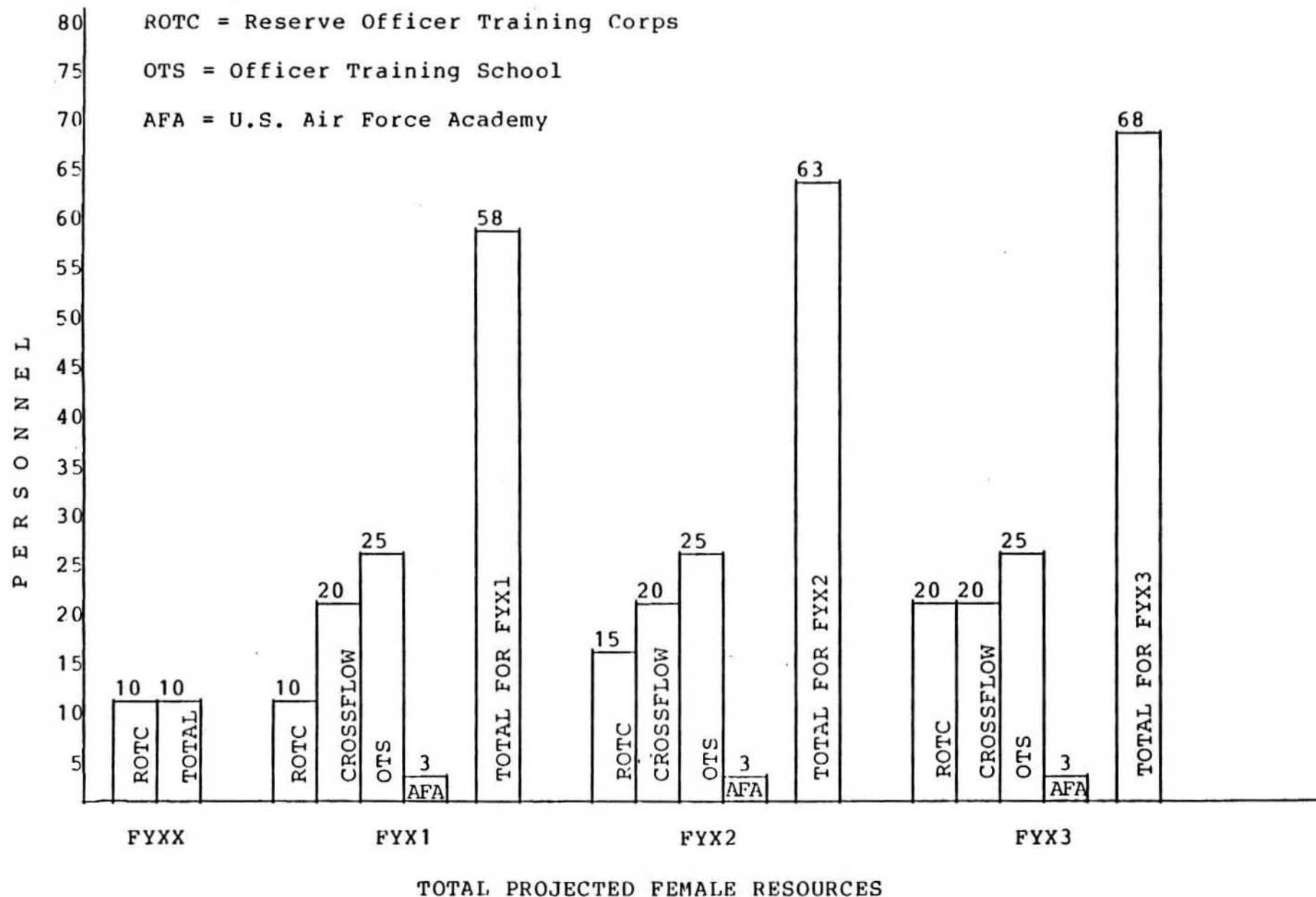
The results of Minuteman and Titan wings, 4315 CCTS inputs, HQ AFMPC data, manpower analysis, and the SAC Surgeon General and Judge Advocate opinions indicated a gender-specific crew concept can be implemented; however, certain problem areas must be recognized and dealt with. Implementation would begin with an 80/20 male female mix at one wing over an 18 month period. Adequate training capacity at 4315 CCTS exists to support this schedule. An 80/20 mix will increase crew manpower requirements at the selected Minuteman wing by two authorizations at an estimated cost of \$60,000 (2 x \$30,000) annually. The SAC Surgeon General determined, as with female Titan crew members, pregnancy would result in an automatic profile change to duty not involving alert status for female crew members. Some problems exist in alert scheduling. For instance, gender-

specific may require an entire standby crew be utilized when changes to the daily alert schedule are made. Career progression poses significant equal opportunity concerns. Serious difficulties for progression to alternate command post/squadron command post (ACP/SCP), flight commander, and instructor/evaluator crew positions have been identified. This latter condition provides a clear avenue for possible equal opportunity and treatment (EOT) violations that may result in adverse litigation. Each of these areas, in addition to other pertinent topics, are discussed in the following sections.

Resource Availability

The current pipeline for missiles is made up chiefly of direct accessions and crossflow officers (officers levied by other support career fields for four year missile crew tour). Direct accessions include Reserve Officer Training Corps (ROTC), Air Force Academy (USAF), and Officer Training School (OTS) graduates. If gender-specific crews were introduced into Minuteman/Peacekeeper, these sources along with the current Titan female crew force would supply the bulk of personnel resources.

The number of female officers available to support gender-specific Minuteman/Peacekeeper crews depends, in large part, on the timing of an implementation decision. Figure 3-1 summarizes by notional fiscal year, the number of



1. NOTE: FROM FYX3 ON, TOTAL REMAINS CONSTANT AT 68
2. NOTE: THESE FIGURES REPRESENT LOW-END PRODUCTION ESTIMATES PROVIDED BY HQ AFMPC
3. NOTE: NUMBERS MAY VARY SLIGHTLY BASED ON TIMING OF IMPLEMENTATION DECISION. DATA LEVELS BASED ON NOMINAL FYXX START DATE
4. NOTE: CROSSFLOW NUMBERS INCLUDE TITAN FEMALE VOLUNTEERS.

FIGURE 3-1

females available for Minuteman duty from each major input source. As the graph shows, it will take approximately three fiscal years to reach a stable output level (steady state) of approximately 68 female officers annually. This production level assumes no additional recruitment above current levels. If larger numbers than those projected are desired, a concerted recruitment effort would be necessary. Lead time for full production for the major input sources vary from three years in the case of ROTC and one year for the USAFA to a matter of months for OTS and crossflow officers. Availability of Titan female officers to retrain to Minuteman will be governed by the Titan deactivation schedule and volunteer status (assuming a policy of volunteers only). Approximately 65 Titan female officers remain at McConnell and Little Rock AFBs and some of those at McConnell are scheduled for assignment to Little Rock as part of Titan deactivation. Any decision to curtail present Titan crew tours to support a gender-specific crew must be weighed against potential impacts on Titan deactivation.

In sum, any decision to implement gender-specific crews must carefully consider the lead time required to reach full production (steady state) levels. The next area examined manpower analysis.

Manpower Analysis

In order to assess the potential manpower impact of placing females on Minuteman crews, information was soli-

cited from Minuteman wing scheduling offices and the SAC Surgeon General. Wing schedulers were asked to construct monthly schedules using gender-specific crews assuming female populations of 10, 20 and 30 percent. The object was to determine the impact of gender-specific crews on alert averages, standby crew call outs, usable crew rates, and scheduling workload. The SAC Surgeon General provided an opinion on how pregnancy would affect a female crew member's availability for alert duty. How these inputs influenced manpower requirements determination are discussed in the following pages.

Wing Scheduling Impact: Apart from career progression management, wing scheduling is the biggest challenge. The study team was concerned with the impact gender-specific crews would have on the mechanics of developing and managing the wing schedule.

To explore this perceived impact, the study group tasked each Minuteman unit to model schedules using a 90/10, an 80/20, and a 70/30 male/female crew ratio. The scheduler used the present wing rates for duty not involving alert (DNIA), leaves, and Personnel Reliability Program (PRP) decertifications when developing the schedules. The schedulers also estimated the amount of extra time needed to develop schedules with gender-specific crews. The results were consistent: all wings said they could support gender-specific crews.

Most of the wings' alert rates (how many alerts per month the average line crew performs) became equitable at 20 percent female manning, although, it appears 10 percent can be managed (Figure 3-2). The standby alert rate (how often a crew goes on alert from standby status) closely affected the outcome of the wings' alert rate. Four of the six wings were able to balance this affect while the other two wings dealt with this factor differently. One had an alert imbalance in favor of males, the other wing had an imbalance in favor of the females. The wings were, for the most part, uniform in their estimates of time needed to develop gender-specific crew schedules. Five wings reported increases of zero to eight hours per month while one reported needing 16 - 20 hours. Based on this information, no manning increases appear necessary for the scheduling function. Wing scheduling will be more complicated but can support gender-specific crews.

Current missile operations concepts require an extra crew on standby status each day to be used in case a crew or crew member scheduled for alert must be replaced. Currently, if only one crew member must be replaced, only the corresponding member of the standby crew is dispatched. The second crew member remains on standby status. Under the gender-specific crew concept, occasions will arise where the gender of the standby crew is different from the crew member needing replacement. In these cases, the entire standby

GENDER-SPECIFIC SCHEDULING STUDY

BASE	CREWS AUTH	CREWS AVAIL	MALE/FEMALE CREW RATIO	AVERAGE ALERTS LINE CREWS MALE/FEMALE	WING BACK-UP ALERT RATE	ADDITIONAL SCHEDULING TIME NEEDED	COMMENTS
44SMW Ellsworth	92	91	10% 82/10 20% 74/18 30% 64/28	6.5 / 5.5 6.2 / 6.0 6.3 / 5.7	24%	5 hrs	
90SMW FE Warren	121	120	10% 109/12 20% 97/24 30% 85/36	6.7 / 6.7 6.6 / 6.9 6.6 / 6.9	19%	None	
91SMW Minot	89	76 ¹	10% 80/9 20% 71/18 30% 62/27	6.4 / 5.8 6.5 / 5.4 6.4 / 5.6	45% ²	None	¹ 15% reduction based on PRP/ DNIA rates ² 45% based on monthly schedule; 25- 29% based on weekly schedule
321SMW Grand Forks	90	81	10% 80/9 20% 72/18 30% 63/27	6.5 / 6.3 6.6 / 6.5 6.4 / 6.2	25%	5 hrs	
341SMW Malmstrom	123	112	10% 111/12 20% 99/24 30% 83/40	5.6 / 5.1 5.6 / 5.5 5.6 / 5.6	28%	8 hrs	
351SMW Whiteman	88	87	10% 79/9 20% 70/18 30% 61/27	5.9 / 7.0 5.2 / 7.0 6.0 / 6.5	25%	16-20 hrs	

FIGURE 3-2

crew will be dispatched to replace the entire alert crew. Figure 3-3 shows how often this is likely to occur. Inputs from Minuteman wing schedulers show that, on the average, the standby crew is used 23.7% of the time. This is an aggregate figure and does not separate single crew member replacement from whole crew replacement. The calculations in Figure 3-3 assume 23.7% to be a single member replacement rate after publishing the weekly alert schedule. The calculations also assume a uniform gender distribution throughout the schedule. In other words, given 10% females, on any given day 10% of the crews going on alert would be female. Likewise, of the 30 standby alerts normally scheduled in a month, 10% would be female crews. At 10% females, this would happen about once a month. At 30% it would happen about three times a month.

Medical Considerations: It is the SAC Surgeon General position that no medical restrictions would prohibit assigning women to Minuteman/Peacekeeper crews. The Surgeon General did state that women should be placed in duty not involving alert (DNIA) status at first confirmation of pregnancy until 30 days after delivery.

The complications associated with pregnancy support this decision. The problems of Titan propellants which may produce birth defects, do not exist in the Minuteman system. However, there is controversy over whether or not the noise

ADDITIONAL STANDBY ALERT USE

	FEMALE POPULATION		
	10%	20%	30%
1. Probability of replacing a crew member (note 1)	.237	.237	.237
2. Probability of male crew	.9	.8	.7
3. Probability of female crew	.1	.2	.3
4. Probability of replacing male (line 1 x line 2)	.213	.190	.166
5. Probability of replacing female (line 1 x line 3)	.024	.047	.071
6. Male sick and male standby (line 4 x line 2)	.192	.152	.116
7. Male sick and female standby (line 4 x line 3)	.021	.038	.050
8. Female sick and female standby (line 5 x line 3)	.002	.009	.021
9. Female sick and male standby (line 5 x line 2)	.022	.038	.050
10. Probability of gender mismatch (line 7 + line 9)	.043	.076	.100
11. Standby crews scheduled each month (note 2)	30	30	30
12. Whole standby crews used (line 10 x line 11)	1.29	2.28	3.00

NOTES:

1. Average use rate of standby crews is based on wing scheduler inputs (Ellsworth, 24; FE Warren, 19; Grand Forks, 21; Malmstrom, 28; Minot, 25; Whiteman, 25). Based only on substitutions after monthly alert schedule is published.
2. Assumes only one standby crew scheduled each day.

FIGURE 3-3

and vibration of the Minuteman capsule is miscarriage-producing. Miscarriages occur in up to 25% of all pregnancies during the first 12 weeks. This risk doubles for females who have had a previous miscarriage. Additionally, incapacitating morning sickness occurs in about 20% of all pregnancies.

In the event of a miscarriage, a female must be examined and treated as soon as possible by appropriate medical authorities. A miscarriage often occurs without warning and is accompanied by several hours or days of abdominal cramps. These discomforts of a typical miscarriage are not compatible with alert duty.

A commander must also address Personnel Reliability Program issues that may arise from the emotional responses to a miscarriage. The specific circumstances and support mechanisms for the female involved will determine the time required to resolve the emotional impact.

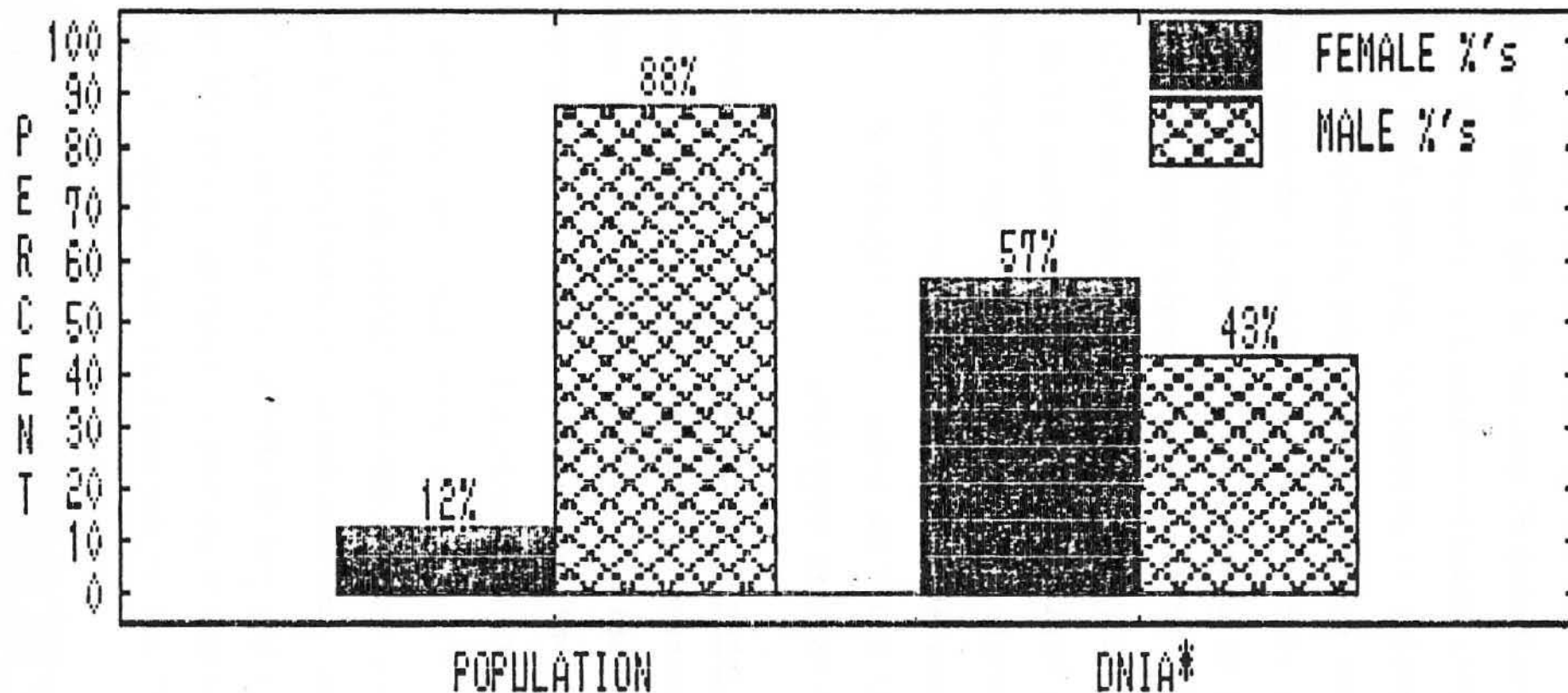
Of course, females whose pregnancies are at or near completion cannot be considered for alert duty. Some pregnancies deliver at 36 weeks and some at 42 weeks. The prospect of labor and delivery in a Minuteman launch control facility (LCF) is medically unacceptable.

We also examined Titan duty not involving alert (DNIA) rates for calendar years 1983 and 1984. We found that women

contributed a disproportionately higher share of the DNIA rate. In 1983, females composed 12 percent of the Titan force but contributed 57 percent of the DNIA days (Figure 3-4). For 1984, females composed 17 percent of the Titan force but provided 47 percent of the DNIA days (Figure 3-5). It appears that pregnancies are the principal cause of these higher rates, since the Titan officer pregnancy rate was 4.4% compared to overall Air Force officer average of 2.4%. While the Titan II data infers female crew members are not available for alert duty at the same rate as their male counterparts, explanations for the differing rates were not conclusive enough for extrapolation to the Minuteman weapon system. Our review suggests that close monitoring of manning trends would be required if females were to enter Minuteman/Peacekeeper crew duty.

Weapons System Description: As shown in Figure 3-6, Minuteman is currently deployed at six bases in four different configurations. The Boeing-built ground support system (WS-133A-M), commonly referred to as "Minuteman Mod," is deployed at five locations in three configurations: Command Data Buffer (CDB), using the Minuteman III missile; Improved Launch Control System (ILCS), using the Minuteman II missile; and Software Status Authentication System (SSAS), also using the Minuteman II missile. The Sylvania-built ground support system is commonly referred to as "Minuteman II" and is deployed at two bases. Each system

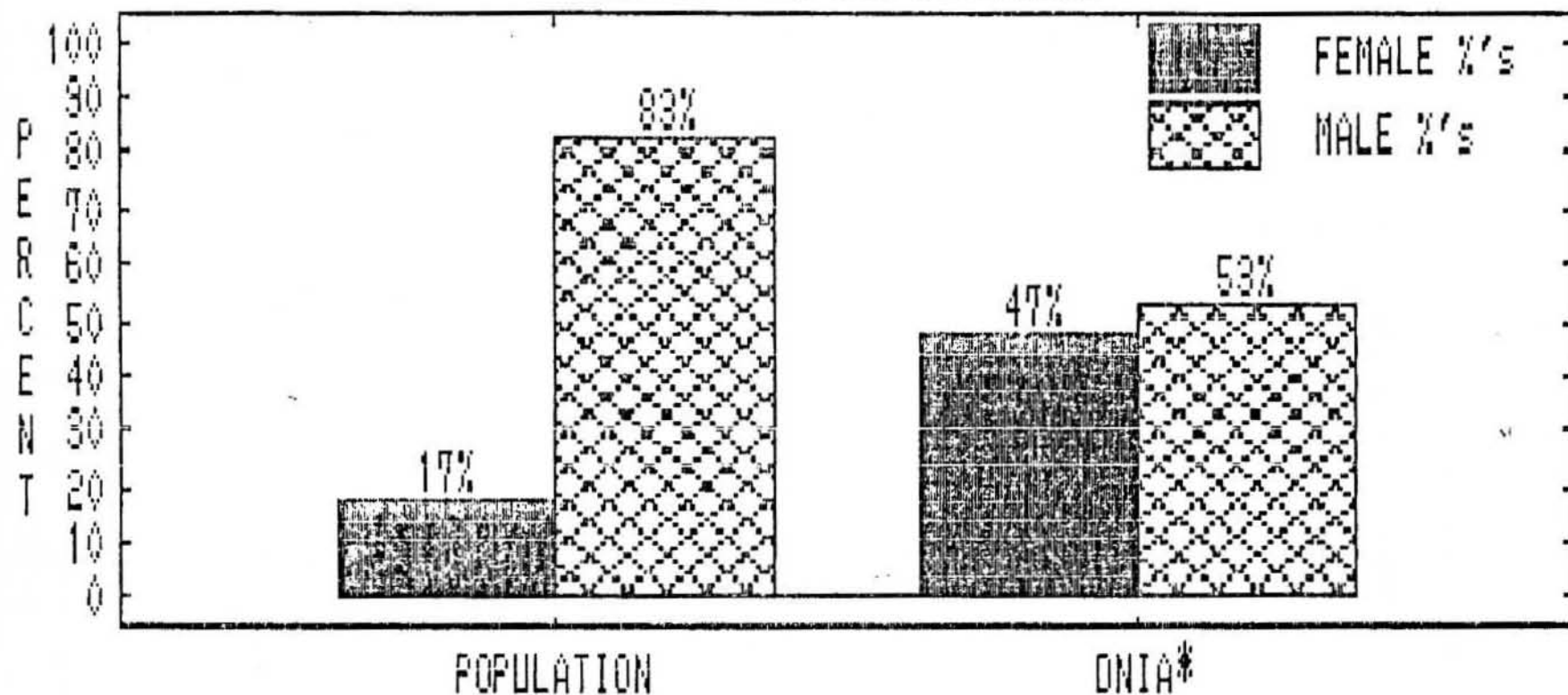
1983 TITAN CREW MEMBER POPULATION/DNIA RATES (LITTLE ROCK AND McCONNELL)



	MEN	WOMEN	TOTAL
POPULATION	377(88%)	52(12%)	429
DNIA DAYS	1399(43%)	1757(57%)	3096

*DNIA: DUTY NOT INVOLVING ALERT - PERSON IS NOT AVAILABLE FOR ALERT DUTY. CAUSES MAY BE INJURY, MEDICATION, PREGNANCY, ETC.

1984 TITAN CREW MEMBER POPULATION/DNIA RATES (LITTLE ROCK AND McCONNELL)



	MEN	WOMEN	TOTAL
POPULATION	332(83%)	69(17%)	401
DNIA DAYS	2201(53%)	1951(47%)	4152

*DNIA: DUTY NOT INVOLVING ALERT - PERSON IS NOT AVAILABLE FOR ALERT DUTY. CAUSES MAY BE INJURY, MEDICATION, PREGNANCY, ETC.

UNIT DESCRIPTION			
<u>AIR FORCE BASE</u>	<u>MINUTEMAN CONFIGURATION</u>	<u>NUMBER OF SQUADRONS</u>	<u># OF LAUNCH CONTROL CENTERS</u>
Ellsworth, SD	WS-133A-M (SSAS)	3	15
FE Warren, WY	WS-133A-M (CDB)	4	20
Grand Forks, ND	WS-133B (CDB)	3	15
Malmstrom, MT	WS-133A-M (ILCS)	3	15
Malmstrom, MT	WS-133B (CDB)	1	5
Minot, ND	WS-133A-M (CDB)	3	15
Whiteman, MO	WS-133A-M (ILCS)	3	15

FIGURE 3-6

has unique operating requirements demanding a dedicated training program. Crew members trained in one system cannot perform alert duty in another system without extensive retraining. For this reason, the 564th Strategic Missile Squadron (SMS) at Malmstrom AFB was treated as a separate wing in computing manpower impacts.

Manpower Impact: Mathematical analysis shows a potential requirement for additional manpower authorizations to support the use of females on Minuteman crews. The size of the impact will depend upon the size of the female crew member population (see Figure 3.7).

The occasional need to use the entire standby crew to substitute for an individual crew member because of a gender mismatch will not increase manpower requirements. Use of the first standby crew member is accounted for in current manpower levels. Use of the second standby crew member would be offset by the availability for duty of the second member of the crew being replaced. In many cases, scheduling changes could be made to assign the replaced crew to an alert scheduled later in the month for the standby crew.

The use of gender-specific crews will also likely require additional manpower authorizations to compensate for the potential extended loss of female crew members because of pregnancy. This impact ranges from 1 additional authorization to support 10% females at one wing, to 19 for 30%

MANPOWER IMPACT SUMMARY

ADDITIONAL MANPOWER NEEDED

<u>BASE</u>	GENDER SPECIFIC (% FEMALE)		
	<u>10%</u>	<u>20%</u>	<u>30%</u>
Ellsworth	1	2	3
FE Warren	1	2	3
Grand Forks	1	2	3
Malmstrom	1	2	3
Malmstrom - 564th SMS	1	1	1
Minot	1	2	3
Whiteman	1	2	3
TOTALS	7	13	19
PERSONNEL COST (\$1,000)*	210	390	570

*Assuming additional authorizations in grade of O-1 (second lieutenants) at \$30,000/year.

FIGURE 3-7

fleet-wide (six wings) (Figure 3-8). In the opinion of the SAC Surgeon General, females should be relieved of alert duty as soon as pregnancy is determined and remain off alert duty through delivery and a 30-day convalescent leave. This extended loss (nine to ten months) of a crew member is not accounted for in current missile manpower authorizations. The impact will be greatest on gender-specific crews because of very limited flexibility in pairing spare crew members for alert duty. Titan II historical data on female officer crew members shows a 4.4% average pregnancy rate for 1983 and 1984, the only years for which the data was available. This is 2% higher than the average Air Force female officer pregnancy rate used in the latest Air Force Man-Hour Availability Factor study. Applying the Titan II rate to Minuteman produces the manpower impacts shown in Figure 3-9. The actual impact could be higher or lower and vary from year to year as an uncontrolled variable. As noted in Figure 3-9, nearly 27% of the female launch officers at McConnell AFB were pregnant sometime in 1983. While no explanation was available for this high rate, it serves to illustrate the potential for wide fluctuations in female crew losses.

These additional manpower costs are estimates based on several assumptions about crew force composition and alert schedules. These assumptions may or may not prove valid in the dynamic environment of the real world. Actual manpower

MANPOWER IMPACT DETAIL
GENDER-SPECIFIC CREWS

		FEMALE POPULATION		
		10%	20%	30%
1.	Three-Squadron Wings (90 crews)			
a.	Pregnancy impact	.792	1.584	2.376
b.	Whole manpower	1	2	3
2.	FE Warren AFB (4 squadrons, 121 crews)			
a.	Pregnancy impact	1.056	2.112	3.168
b.	Whole manpower	1	2	3
3.	564th SMS, Malmstrom AFB (33 crews)			
a.	Pregnancy impact	.264	.528	.792
b.	Whole manpower	1	1	1
4.	Total impact			
a.	Ellsworth	1	2	3
b.	FE Warren	1	2	3
c.	Grand Forks	1	2	3
d.	Malmstrom - 3 squadrons	1	2	3
e.	Malmstrom - 564th SMS	1	1	1
f.	Minot	1	2	3
g.	Whiteman	1	2	3
h.	GRAND TOTAL	7	13	19

FIGURE 3-8

PREGNANCY IMPACT

HISTORICAL DATA

FEMALE LAUNCH OFFICERS

<u>BASE</u>	1983		1984		TOTAL	
	<u># PREG</u>	<u># ASGND</u>	<u># PREG</u>	<u># ASGND</u>	<u># PREG</u>	<u># ASGND</u>
McConnell	8*	30*	2	38	2	38
Little Rock	1	22	1	31	2	53
			TOTAL		4	91
			% PREGNANT		4.4	

*1983 McConnell data excluded from computations to prevent distortion

MANPOWER IMPACT

FEMALE POPULATION
10% 20% 30%

Three-Squadron Wings (180 crew members)

a. Number female crew members	18	36	54
b. Pregnancy rate	.044	.044	.044
c. Females lost from alert duty	.792	1.584	2.376

FE Warren AFB (242 crew members)

a.	Number female crew members	24	48	72
b.	Pregnancy rate	.044	.044	.044
b.	Females lost from alert duty	1.056	2.112	3.168

564th SMS, Malmstrom AFB (66 crew members)

a. Number female crew members	6	12	18
b. Pregnancy rate	.044	.044	.044
c. Females lost from alert duty	.264	.528	.792

FIGURE 3-9

additives in support of female crew members will have to be validated through experience.

Training Considerations

Training of gender-specific crews focused on 4315th Combat Crew Training Squadron (CCTS) impacts and supplemental unit training requirements. Information provided by 4315 CCTS and Minuteman wing training divisions formed the basis for assessment. The 4315 CCTS segment looked at maximum student production capability and explored required adjustments to curriculum to train an initial group of female officers, some of whom would enter wing crew duty directly as a crew commander. The wing training segment examined current requirements to certify missile crew members combat ready and looked at additional training necessary to prepare initial female cadre crews for alert duty.

The 4315 CCTS maximum production capability exceeds current requirements. Figure 3-10 summarizes class loading factors by type weapon system. As shown, the maximum production level is 490 students. This load assumes 1) instructor manning at 100% or higher; 2) minimum simulator maintenance and 3) minimum simulator scheduling for Air Training Command simulator maintenance training. Changes to any of these factors will likely impact production capability. At the current level of approximately 420 students,

4315 CCTS CLASS LOADING FACTORS

FY85

WEAPON SYSTEM	BASES ¹	TPR ²	MAX ³ LOAD	OPT ⁴ LOAD	CLASSES/ COURSE LENGTH
MMM CDB	FW/MP	143	168	144	8 classes x 15 wks
MMM ILCS	MB/WT	129	136	121	9 classes x 13 wks
MM II CDB	GM/MB	90	96	90	8 classes x 15 wks
MMM (SSAS) EJ		<u>65</u>	<u>90</u>	<u>72</u>	9 classes x 12 wks
TOTAL		427	490	427	

FY86

WEAPON SYSTEM	TPR	MAX LOAD	OPT LOAD
MMM CDB	139	168	144
MMM ILCS	120	136	121
MM IICDB	92	96	90
MMM SSAS	<u>65</u>	<u>90</u>	<u>72</u>
TOTAL	416	490	427

NOTES:

1. Base Code:

FW - FE Warren	MB - Malmstrom	WT - Whiteman
MP - Minot	GM - Grand Forks	EJ - Ellsworth

2. Trained Personnel Requirement

3. Maximum Load - The largest number of students the 4315 CCTS can train without degrading quality of training.

4. Optimum Load - The number of students the 4315 CCTS can train maintaining ideal student to instructor ratios.

INSTRUCTOR MANNING AUTHORIZATIONS

MMM CDB - 26 MMM ILCS - 23 MMII CDB - 16 MMM (SSAS) - 12
 Emergency War Order Instructors - 5
 Courseware Developers - 20

FIGURE 3-10

however, the trained personnel requirement (TPR) has room for sizable expansion/adjustment. Unless manpower requirements are significantly higher under the gender-specific crew concept, training capability is not a limiting factor.

In the area of curricula, similar positive results were obtained. Students undergoing 4315 CCTS initial qualification instruction are trained to the level necessary for direct assignment to the crew commander position, if required. As such, no adjustments to 4315 CCTS curricula are necessary to begin training all female crews, and more specifically, the initial group of female crews. The "bottom line" of this phase of study is that the 4315 CCTS can begin training of gender-specific crews at any point, within current capabilities and curricula structure. After initial qualification training, crew officers report to the missile wings for additional training. This additional training was reviewed next. Two different circumstances were examined: training of initial group of female crews and unit training requirements after the initial build up of female crews.

Upon arrival at their assigned unit, the initial crews will be required to accomplish additional training, over and above the normal 15 - 21 day unit orientation program. This is required since neither of the crew members will have ever been alert qualified in the weapon system. The normal unit orientation course is designed to familiarize the new crew

members with the local emergency war order assignments and procedures. The additional training would focus on increased field training tours with emphasis on alert-peculiar items and emergency action procedures. Five of the six Minuteman units indicated this additional training could be accomplished in 5 to 7 work days. One unit projected 60 days which included additional time for study and successful completion of a standardization evaluation. This evaluation is a unit policy established by the wing staff for any crew with a new commander.

Future classes arriving at the unit will not require this additional time for upgrade since the new female crew members will be paired with current experienced combat ready female crew members.

Career Progression

In the review of factors that would impact career progression, equal opportunity issues become critically important. Using gender-specific crews, there is a possibility that programs and procedures may be viewed as a form of "separate, but equal" segregation. It is important that these plans guarantee that selection or nonselection not be based solely on sex. As stated in AFR 30-2, para 5-3a, "It is Air Force policy to conduct its affairs free from arbitrary discrimination, according to United States laws, and to provide equal opportunity and treatment for all mem-

bers irrespective of their race, color, religion, national origin, sex, or age." As men and women progress to select positions, such as evaluator (DOV) or instructor (DOT), Alternate Command Post or Squadron Command Post crew members, and flight commanders, the gender-specific concept must be carefully monitored to ensure progress on a par with their abilities. Historically, these select positions have been performed in the context of an integral crew. If an individual is selected for a DOT or DOV crew position and cannot be paired due to gender-specific alert restrictions, that person will perform all instructor or evaluator duties with another DOT/DOV crew member. Alerts would be scheduled with a line crew member of the same gender. This would require changes to SACR 50-16, Vol I, ICBM Training, and SACR 55-16, Vol II, ICBM Combat Crew Standardization and Evaluation. However, this approach would contradict the Command philosophy on integral missile crew alerts. Inherent in the integral crew concept is, "Train the way you fight!"

At this juncture, the problems that may arise as a result of gender-specific crews are dependent on the specific facts of a case. Programs and procedures may cause litigation that requires a decision by a court. However, though there is the risk of litigation, this should not be viewed as an absolute ban to the use of gender-specific crews. What it does imply is that programs must be closely moni-

tored to guarantee that "separate, but equal" segregation does not develop.

Implementation

The question of how to introduce gender-specific crews into the Minuteman force was particularly challenging. The concept of gender-specific crews is without precedent. There is no experience to validate many of the assumptions made in this study. Because of the large number of unknowns, the high risk of a six-wing, fleet-wide implementation is unacceptable. A gradual implementation, starting with one Minuteman wing, will provide a learning curve, allow validation of manpower impacts, make optimal use of limited available volunteer personnel resources and minimize the impact of unforeseen problems. Lessons learned can be applied to follow-on implementation at other Minuteman wings.

While gender-specific appears workable at female populations as low as 10%, wing scheduling and career progression problems become easier to manage as the female crew member population increases. Based upon wing inputs and study group analysis it appears that a 20% female crew population will provide the most equitable and efficient operation. Therefore, the first wing should be built to a 20% female crew population before proceeding to the second. This build up will take approximately 18 months and at that time

results analyzed to validate 20% as the optimum level. Implementation of gender-specific crews at the other five Minuteman bases will be based upon this optimum population in conjunction with available personnel resources.

Experience and maturity in the initial increments of female crew members is considered crucial to the successful implementation of gender-specific crews. Half of these females will become crew commanders without having any Minuteman crew experience. To minimize the adverse impact on wing proficiency, the first four to five female crew commanders and deputy crew commanders will have prior Titan II crew experience. While specific operation of the Minuteman system is completely different from Titan, the general experience with checklist discipline, crew coordination, and emergency action message processing will provide a solid foundation for Minuteman weapon system training. Additional female deputy crew commanders will be active duty officers with three to seven years commissioned service from other Air Force career fields. While they will not have any missile operations experience, they will have a level of maturity not available in new accessions. After several months these initial crews will be split, the deputies upgraded to commanders, and both crew members will be assigned new deputy crew commanders. This effectively doubles the number of female crews where at least one member has experience in the weapon system. These follow-on depu-

ties will be a mixture of both active duty officers and new accessions through the build-up period.- The active duty officers will continue to upgrade after several months to provide experienced commanders for new accessions. Once the build up is complete and self-sustaining, new crew members assigned to the wing will be mostly new accessions. By this time, however, the wing will be "growing" its own crew commanders from the accessions assigned earlier.

CHAPTER 4

ASSESSMENT

A number of considerations are pertinent to the possible introduction of females on gender-specific Minuteman crews. The survey data highlighted the perceptions of unit personnel and provided a strong indication of the potential number of female volunteers willing to retrain into Minuteman. Implementation study results indicated the concept could be initiated, but special management actions would be necessary. Additionally, concerted management by HQ AFMPC and HQ SAC, and strong leadership by the wing staff would be required.

One factor which was clearly apparent in all of the surveys was the strong interest shown in this subject. The verbal comments received during the interviews and the unusually high number (over 45%) of optional written comments indicate that this is apparently an emotional issue and should be considered as such if the concept is implemented.

The majority of officers surveyed felt women should be given the opportunity to serve on Minuteman crews. How they should serve was a point of contention. Forty-three percent of the Titan personnel favored the gender-specific concept whereas 44% opposed it. For Minuteman personnel, the split was 54% in favor, 35% opposed. Unsolicited comments on the

viability of gender-specific crews pointed toward a preference for mixed crews (a male and a female on the same crew). Sixty-four support officers and 187 missile officers provided written comments favoring mixed crews and 23 of the 57 senior staff officers interviewed voiced preference for mixed crews.

No matter which crew concept is used in Minuteman, a portion of the female crew members should include crossflows from other support career fields. Currently the all-male Minuteman crew force is sustained with a yearly input of 80% accessions (2nd Lieutenants) and 20% crossflow officers, most of whom are volunteers. Crossflow officers are normally 1st Lieutenants or Captains who come into Minuteman from a support career field such as finance, personnel, etc. These crossflow officers provide an invaluable source of Air Force experience and maturity to the crew force. If gender-specific crews were implemented, highly qualified, motivated female crossflows would be essential, particularly in the initial cadre. The survey results indicate this could be a problem in the future. Only 9% (14) of the female support officers indicated they would volunteer for gender-specific crew duty, while 77% (119) said they would not. In the Titan female crew force, only 20% (8) would volunteer. Because Titan missiles are being deactivated, there will be no female Titan crew members by Oct 87. Thus, by 1988, it is possible that the volunteer female crossflow resource would fall short of requirements.

Another area of potential concern would be additional stress on the crew members caused by an adverse spousal reaction. With the gender-specific concept, this does not appear to be a problem. Sixty-five percent of the senior staff felt there would be no perceptible spousal reaction and 45% of the Titan crew force interviewed felt their spouses would be supportive. Another indication of positive spousal reaction was reflected in the written survey. Of the 31% (234) of the Minuteman officers who felt their spouses supported their continuing in the missile operations career field, only 20% (47) felt their spouses would encourage them to change career fields if gender-specific crews were introduced.

Closely related to spousal reaction and its impact is the potential effect of gender-specific crews on morale. In the telephone interviews with senior staff officers, 35% felt there would be no effect on morale while 21% foresaw a positive effect. In the written surveys, Minuteman officers were split in their opinions: 34% felt there would be a negative impact, 31% thought the impact would be positive, and 35% felt there would be no effect. Overall it appears that the influence of implementing gender-specific crews would range from little effect on morale to a slightly positive effect.

Although it appears gender-specific crews would have little effect on morale, implementation would be a complex

process. The Study Team identified several significant factors, including how to begin, personnel resources, training, costs, wing management and career progression. Considering the resources available, the 4315 CCTS capacity, and unit upgrade requirements, the Study Team determined a phased implementation would be optimum. Phased implementation would begin with one wing. The wing would be built to a 20% female crew population before proceeding to a second wing. This approach enables female officers to enter the system at a rate which shouldn't seriously disrupt current crew manning policies/procedures. In addition, it allows initial Deputy Missile Combat Crew Commanders (DMCCCs) to upgrade to Missile Combat Crew Commander (MCCC) in the normal time rather than force them into MCCC status early.

The ability to extend implementation across Minuteman was also examined. The implementation committee studied female force sizes of 10%, 15%, and 20%. Ten percent female officer representation equals a force-wide total of approximately 120, 15% equals 180, and 20% equals 240. Based upon data provided concerning potential resources from ROTC, OTS, USAFA, and the crossflow program, it appears that 10% to 15% is attainable using essentially all volunteers. Above 15% would very likely require bringing in non-volunteers which was viewed by the Study Team as an unattractive option. In addition to the numbers required, some of the initial female crew members would have to upgrade directly to MCCC,

bypassing the normal progression from DMCCC to MCCC. To support this demanding requirement, initial classes should include former Titan crew members and crossflow officers. Based upon inputs from AFMPC and the survey results, these resources are adequate through 1987 from various support career fields and from Titan. After 1987, however, there will no longer be any Titan officers available. The volunteer crossflow resource may supply only the minimum number (according to the support officer survey data) necessary to sustain. If operating on this narrow of a margin any hiccup in the system would necessitate identifying non-volunteers. In sum, resource availability will ultimately determine the scope of implementation.

Training of these new crew members received close scrutiny by the 4315 CCTS and unit training offices. The 4315 CCTS determined training females in current Minuteman operations would require essentially no modifications to schedules or procedures. Unit training offices stated there would be no new additional training for female DMCCCs and an average of one week of additional training for females directly upgrading to MCCC. Thus training would be no impediment.

As with training, additional costs do not appear to be unduly restrictive. A 20% female representation at a three squadron wing would require an increase of two authoriza-

tions or approximately \$60,000 a year. The cost of training would also be negligible because the small increase in crew members will not increase annual student production quotas.

Once gender-specific crews have been implemented, continuous special attention and actions will be necessary to sustain it. Determining the annual trained personnel requirement (TPR) would be twice as involved with gender-specific crews as it is today. Currently, TPR criteria includes rank, experience, and past performance. With gender-specific crews these same three criteria must be applied to both sexes, thus creating two distinct TPRs.

Wing management of these new resources would provide the greatest challenge. On a day-to-day basis, standby crews are provided in the event a scheduled crew member cannot go on alert. These crew members are currently replaced on a one-for-one basis. With gender-specific crews, if there is a gender mismatch, instead of replacing one crew member, the whole crew would need to be replaced. Although this would normally present no serious challenges, it could periodically become a major obstacle to efficient scheduling.

Duty not involving alert (DNIA) is the term used to denote all reasons why a crew member might not be available to perform alert duties. According to the data provided by the two Titan units (Figures 3-4 and 3-5), the DNIA rate for females has historically been higher than for males.

Additionally, the SAC Surgeon General position is that female crew members who might be in Minuteman should be placed on DNIA as soon as pregnancy is diagnosed. Consequently, it can reasonably be expected that the female DNIA rate in Minuteman would be higher than the male DNIA rate. The HQ SAC Study Team recommends an analysis of DNIA rates be performed within three years of gender-specific implementation to determine if additional manpower authorizations are required.

The most complex problem with gender-specific crews rests in the area of career progression. There are distinct positions of progression within each squadron and within the wing. In the squadrons, crew members aspire to be promoted from line crew to squadron command post (SCP), alternate command post (ACP), and flight commander crews. In the wing, the highest positions sought by the crews are those of instructors and evaluators. Each of the squadron and wing positions require special qualifications. Currently, these positions are filled on a "best-qualified" basis (i.e., the most highly qualified crew member is chosen first). Gender-specific crews would seriously complicate this procedure, particularly if the female representation were small.

Within the squadron, female crew members would sometimes have to be moved to SCP, ACP, or flight commander positions based upon gender rather than qualifications. This practice could raise serious legal and/or equal opportunity issues.

Equal opportunity issues also surface when considering instructor/evaluator integral crew alert duty. The integral crew concept has been the foundation of crew duty, since it promotes crew cohesion and proficiency on alert. Command regulations and policies could be changed to allow instructors and evaluators to perform their shop duties on a mixed crew basis, and their alert duties with a different person of the same sex, if necessary. However, this would cause non-integral crew alerts. Non-integral crew alerts within the two most prestigious crew functions (instructor/evaluator) in the wing could have an impact on morale and mission readiness. If the regulations/policies are not changed, progression to instructor or evaluator duties would have to be done on a gender basis, once again raising legal and equal opportunity and treatment issues.

The SAC Judge Advocate stated that there is no legal reason why females could not be placed on gender-specific crews. However, the use of such crews may be viewed as a form of "separate, but equal" segregation. It is Air Force policy that selection or nonselection for duties not be based solely upon sex (AFR 30-2). While the introduction of gender-specific crews may increase the risk of adverse litigation, it should not be considered as an obstacle to implementation.

CHAPTER FIVE

SUMMARY

In summary, the concept of gender-specific crew implementation in Minuteman/Peacekeeper is feasible. Missile senior staff and crew member reactions to the gender-specific scenario were generally favorable, with some reservations, and apparently will cause little adverse spousal reaction or morale problems if the concept were implemented. Bringing women into the Minuteman/Peacekeeper weapon systems on a gender-specific basis would not cause any significant cost or training problems.

While cost and training problems are not a factor, several other issues raised by the gender-specific concept require consideration. The resources necessary to implement this concept are available initially, but could become a problem in the future, due in part to the expected low volunteer rate indicated in the support officer surveys. Managing the trained personnel requirement would be more complicated since manning requirements for males and females would have to be considered separately. Additionally, once implemented, gender-specific crewing would require special management actions at the wing level. Standby and alert scheduling would be constrained by gender-specific crews requirements. Furthermore, career progression within the wing will be complicated by legal and equal opportunity

treatment issues raised by the selection on the basis of "gender-qualified" vs "best-qualified." Finally, manpower increases may be required in the future based upon a recommended analysis performed three years after implementation.

GLOSSARY

Accessions: Newly commissioned officers from OTS, ROTC, or USAFA.

ACP/SCP Crews (Alternate Command Post/Squadron Command Post Crews): Crews designated to serve alerts at sites with additional wing/squadron command, control, and communications responsibilities. These sites have the capability to assume command of the wing if the normal command post is destroyed. Requires additional specialized training.

AFMPC (Air Force Manpower and Personnel Center): Located at Randolph AFB, this organization is responsible for managing all personnel and manpower programs in the Air Force.

Alert: Time spent at a launch control center; usually 24 hours. A line crew will normally perform eight alerts each month.

CDB (Command Data Buffer): Weapon system deployed by Minot, F.E. Warren, Grand Forks AFBs and one squadron at Malmstrom AFB.

Crossflow: A program in which support officers with 3 - 7 years active service spend a four-year tour of duty as a missile combat crew member.

DMCCC: Deputy Missile Combat Crew Commander.

DNIA (Duty Not Involving Alerts): Crew member unable to serve on alert due to illness, injury, pregnancy, etc.

DOT (Deputy Commander for Operations, Training Division): Division which is tasked to perform operational training functions at a wing. Assigned crews act as instructors.

DOV (Deputy Commander for Operations, Standardization Evaluation Division): Division which evaluates the crew's capability to perform the assigned mission. Assigned crews act as evaluators.

EWO (Emergency War Orders): Policies and procedures for executing the Single Integrated Operations Plan (SIOP).

Flight Commander: Missile Combat Crew Commander responsible for the management of one launch control facility/launch control center and its assigned crews.

Gender-Specific Crew Concept: Adding all-female crews to the current all-male Minuteman crew force.

ILCS (Improved Launch Control System): Weapon system deployed at Whiteman AFB and Malmstrom AFB.

Integral Crew: Crew members who are paired and assigned to a specific crew by formal personnel action and who perform all crew actions as such.

IQT (Initial Qualification Training): Formal missile officer technical training conducted at Vandenberg AFB by the 4315th Combat Crew Training Squadron.

LCC (Launch Control Center): An underground facility which contains the equipment used to monitor and, if necessary, launch missiles. Geographically separated from base by a distance normally of 30 to 140 miles.

Line Crew Member: A Missile Combat Crew Commander or Deputy Missile Combat Crew Commander not assigned to instructor or evaluator duty. Normally pulls eight alerts per month.

MCCC: Missile Combat Crew Commander.

Mixed Crew Concept: Missile crew comprised of one female and one male member (gender-mixed).

OTS (Officer Training School): A comprehensive military training program for Air Force officer candidates located at Lackland AFB. One of the three Air Force officer commissioning sources.

PALACE MISSILE: Missile officer assignments section at the Air Force Manpower and Personnel Center.

Pipeline: Term used to describe process of identifying and assigning students to formal missile school.

PRP (Personnel Reliability Program): Program designed to monitor crew member's ability to control nuclear weapons (Air Force Regulation 35-99).

ROTC (Reserve Officers' Training Corps): Two- or four-year military training program for officer candidates operated in conjunction with American universities and colleges. One of the three Air Force officer commissioning sources.

Simulator: Computerized training device used to duplicate an actual launch control center. Used for hands-on weapon system and emergency war order training.

SSAS (Software Status Authentication System): Weapon system deployed at Ellsworth AFB.

Support Officer: Officer assigned support duties, i.e., transportation, supply, etc.

TPR (Trained Personnel Requirement): The number of students entering initial qualification training annually to replace crew members completing four year missile crew tours.

USAFA (United States Air Force Academy): Four-year Air Force administered military training program and accredited academic curriculum for officer candidates. One of the three Air Force officer commissioning sources.

4315 CCTS (Combat Crew Training Squadron): Training squadron located at Vandenberg AFB responsible for providing formal technical missile training. All missile launch officers are graduates of the squadron.

APPENDIX FOUR - SUMMARY OF THE FORCE PROJECTION MODEL

APPENDIX FOUR - SUMMARY OF THE FORCE PROJECTION MODEL

Introduction

This appendix provides a summary of the Force Projection Model (FPM) referenced in the body of the report. A brief overview on the general operations of the model is presented first, followed by a more detailed discussion of each aspect of the model.

Overview of the Force Projection Model

The Force Projection Model (FPM) ages the active enlisted force by year-of-service based on a user-specified set of continuation rates. The model segments the enlisted force into four groups--men and women in two groups of Air Force Specialties (AFSs). The FPM uses a different set of continuation rates for each of the four groups. Also, crossflow, or migration, between the AFS groups is allowed for each gender, but this migration is regulated by USAF manning constraints.

For each year, the FPM first ages the existing inventory of men and women in each AFS group and allows the crossflow between groups to take place. The overall accession levels for each AFS group are then determined to be the difference between the resulting inventory after losses and a fixed, specified end strength. The mix of male and female accessions for each group can be specified as desired. After the accessions are added into the inventory, the FPM calculates different descriptive statistics of the force structure, such as the amount of crossflow between AFS groups. The resulting force structure is then used to project the number of individuals in certain subgroups of interest. This process of aging the force with separations and migration and then filling the vacancies with accessions is accomplished on a year-to-year basis until the steady state is achieved. The FPM also has the capability to examine any particular year between FY 1984 and the steady state. The remainder of this appendix discusses each main facet of the FPM in more detail.

Air Force Specialty (AFS) Groups

The FPM divides the active enlisted force into two AFS groups called high concentration and low concentration based on the female representation in each AFS. This was done because the retention and migration of personnel differ widely based on their AFS. Due to the lack of data on female retention in many of the AFSs and the amount of computer modelling required, the AFSs were aggregated to two

groups. The high concentration AFSs are those whose percentage of women in FY 1984 exceeded the total USAF enlisted percentage of 11.4 percent. Approximately 42 percent of the FY 1984 Air Force enlisted authorizations were in the high concentration group. Table 4.1 lists the AFSs in the high concentration group. The remainder of the AFSs, those whose percentage of women was below the USAF average, was defined as low concentration and are listed in Table 4.2.

Table 4.1. High Female Concentration Enlisted AFSs

<u>AFS NUMBER</u>	<u>TITLE</u>
20XXX:	Intelligence
23XXX:	Audio-Visual
25XXX:	Weather
27XXX:	Command Control System Operations
29XXX:	Communication Operations
39XXX:	Maintenance Management Systems
51XXX:	Computer Systems
56XXX:	Sanitation
60XXX:	Transportation
61XXX:	Services
62XXX:	Food Services
64XXX:	Supply
65XXX:	Contracting
66XXX:	Logistics Plans
67XXX:	Accounting and Finance
69XXX:	Management Analysis
70XXX:	Administration
73XXX:	Personnel
74XXX:	Morale, Welfare, and Recreation
75XXX:	Education and Training
79XXX:	Public Affairs
87XXX:	Band
90XXX:	Medical
91XXX:	Medical
92XXX:	Medical
98XXX:	Dental

Table 4.2. Low Female Concentration Enlisted AFSs

<u>AFS NUMBER</u>	<u>TITLE</u>
10XXX:	First Sergeant
11XXX:	Aircrew Operations
12XXX:	Aircrew Protection
22XXX:	Geodetic
24XXX:	Safety
30XXX:	Communications Electronics Systems
31XXX:	Missile Electronic Maintenance
32XXX:	Avionics Systems
34XXX:	Training Devices
36XXX:	Wire Communications Systems Maintenance
40XXX:	Intricate Equipment Maintenance
42XXX:	Aircraft Systems Maintenance
43XXX:	Aircraft Maintenance
44XXX:	Missile Maintenance
46XXX:	Munitions and Weapons Maintenance
47XXX:	Vehicle Maintenance
54XXX:	Mechanical Electrical
55XXX:	Structural/Pavements
57XXX:	Fire Protection
59XXX:	Marine
63XXX:	Fuels
81XXX:	Security Police
82XXX:	Special Investigations

Continuation Rates

The men and women within each AFS group are aged by year of service using historical continuation rates. A continuation rate is that percentage of the people in an AFS group at the beginning of a year who are also present in that AFS group at the end of the year. People who crossflow out of the AFS group are counted as a loss in the calculation of the continuation rates. The rates used in the FPM were historical five year averages over the period of FY 1980 through FY 1984. This period of time encompasses both extremely good and very poor retention years.

Deriving the female rates for the year groups with more than ten years of service required additional work. The cell sizes of these year groups were too small to use in the continuation rate calculations. To compensate for small cell sizes, these year group rates were extrapolated using the following method. First, the women's rates for those year groups with sufficient cell sizes were compared to the men's rates for the same year groups, and a factor was derived that defined the relationship between the male and female rates. For example, if the female rates exceeded the

male rates by five percent, the factor was 1.05. Then, for those year groups without a sufficient number of women, the male rates for those year groups were adjusted by the year group factors to obtain the female rates.

Migration

The FPM allows for the crossflow, or migration, of men and women between the high and low concentration AFS groups. The migration rates used in the model were calculated by year group and derived as the average of the historical rates over the FY 1980 to FY 1984 period. For those female year groups whose cell sizes were insufficient to calculate a migration rate, the same procedure that was used to extrapolate the continuation rates was employed with the female migration rates. The FPM regulated the migration flow into the AFSC groups so that a group did not become overmanned in the top five enlisted grades (Staff Sergeant through Chief Master Sergeant). The model allowed migration up to the point where the top five grades were manned at 100 percent. The total number of authorizations for the top five grades was determined with the use of the USAF sliding scale methodology. Those individuals prevented from migrating were then assumed to be subject to the applicable continuation rates. A more detailed discussion on migration is contained in chapter 6 of this report.

Starting Year Groups

The FPM required starting inventories, by year of service, for each combination of gender and AFS group. The end of FY 1984 inventories were used.

End Strength

The FPM maintained the active enlisted end strength at 500,000 to the steady state. However, the growth in the end strength to this level from the FY 1984 starting point was assumed to be what is stated in the FY 1986 President's Budget. That is, the FY 1985 end strength was 489,493, and the FY 1986 end strength was 497,442. For FY 1987 out to the steady state, the end strength was held fixed at 500,000. The total authorizations for the two AFS groups at each end strength were held proportional to the FY 1984 enlisted force structure.

Accessions

The annual total accession levels for the two AFS groups were calculated as the difference between the total